nationalgrid

2025
Massachusetts
Rights-of-Way
Vegetation Management
Yearly Operational Plan

TABLE OF CONTENTS

LIST OF TABLES

APPENDICES

SUMMARY

The purpose of this Yearly Operational Plan (hereafter referred to as “YOP”) is to outline the National Grid USA Electric Companies’ (hereafter referred to as “National Grid”) 2025 program for managing vegetation with herbicides on the included rights-of-way. This program and YOP have been developed in compliance with 333 CMR 11.00, Rights-of-way Management regulations administered by the Massachusetts Department of Agricultural Resources (MDAR).

In compliance with 333 CMR 11.06 and 11.07 and Chapter 85 of the Acts of 2000, the YOP and notification process provides for a 45 day public review and comment period which starts when MDAR publishes a notice in the Environmental Monitor, a 21 day review period for the municipal notification letter (may run simultaneously), and a 48 hour newspaper notice. These review periods give communities an opportunity to provide information that help identify additional areas that may require specific precautions or protection.

Under the supervision of our professional foresters, herbicide applications are part of an Integrated Vegetation Management (IVM) program that also uses mechanical and natural controls and takes into consideration the cultural use of the landscape. This IVM program is outlined in our Five-Year Vegetation Management Plan (VMP):

https://www.nationalgridus.com/Oasis/Operations-Documentation

National Grid retains independent, experienced contractors to perform the treatment applications using herbicide and mechanical control methods. Herbicides are only applied by trained, licensed applicators using hand-held equipment under the direct supervision of certified supervisors/foremen.

Any comments on this YOP should be directed to the contact person listed in Section 9.

1. INTRODUCTION

In compliance with 333 CMR 11.00, Rights-of-way Management, National Grid's Yearly Operational Plan (YOP) outlines their 2025 vegetation management program on selected electrical transmission and sub-transmission rights-of-way. This YOP is consistent with the terms and procedures set forth in National Grid's 2024-2028 Vegetation Management Plan (VMP); with the Massachusetts Pesticide Control Act (Chapter 132B); with all pertinent clauses in Chapter 85 of the Acts of 2000; with the Massachusetts Endangered Species Act (MESA; MGL c. 131 A) and regulations (321 CMR 10.00); Wetlands Protection (310 CMR 10.00) and Drinking Water (310 CMR 22.00) regulations of the Massachusetts Department of Environmental Protection, and with all state and federal acts and regulations that apply to right-of-way vegetation management in the Commonwealth of Massachusetts.

The purpose of 333 CMR 11.00 is to establish a statewide and uniform regulatory process which will minimize the uses of, and potential impacts from, herbicides in rights-of-way on human health and the environment while allowing for the benefits to public safety provided by the selective use of herbicides (333 CMR 11.01).

333 CMR 11.00 (Appendix 1) is the most comprehensive rights-of-way regulation in New England. It requires an Integrated Pest Management (in this case IVM) approach to right-of-way vegetation management; the establishment of standards and procedures to prevent unreasonable risks to humans or the environment, and a multi-layered system of public and municipal notification that requests input about environmentally and culturally sensitive areas. All of this is outlined in National Grid's VMP and annual YOPs, the vehicles for establishing and implementing IVM programs, which serve as guides for the public, state and municipal officials, vegetation management contract personnel and National Grid.

National Grid's IVM program is carried out over the course of a three to five year maintenance cycle on the company's 1,500 miles of rights-of-way throughout the Commonwealth. These transmission and sub-transmission electric line rights-of-way cover a range of terrain types from remote countryside to the middle of busy population

centers. In all locations, the rights-of-way must be kept clear of vegetation that may interfere with the safe, reliable delivery of electric services. To achieve this goal, National Grid utilizes the IVM program described in the VMP and summarized below in Section 3.

2. LOCATION OF PROPOSED HERBICIDE TREATMENTS IN 2025

The rights-of-way proposed for herbicide treatments in 2025 are listed in Appendix 2 and the rights-of-way listed to facilitate “touch up” on segments treated in 2024 are listed in Appendix 3. The municipalities, through which they pass, are listed in two tables in Appendix 4, one for the municipalities for 2025 lines and one for the municipalities for 2024 “touch-up” lines (some municipalities are listed in both tables). Please note that the proposed ROWs may change due to workplan constraints.

3. INTEGRATED VEGETATION MANAGEMENT, INCLUDING ALTERNATIVE CONTROL METHODS

National Grid’s selective use of herbicides for vegetation management is done within the context of the IVM program outlined in our VMP. In brief: IVM is a combination of mechanical, chemical and natural controls that minimize the disadvantages and maximize the benefits of each. The integration of all three controls creates a well-balanced program that reduces the negative impact on compatible vegetation while controlling incompatible vegetation. IVM is an environmentally responsible means of intentionally managing succession by maintaining vegetation below heights that interfere with the delivery of electrical service.

Mechanical and chemical controls are the direct techniques used to target incompatible vegetation (for example, mowing, hand-cutting, selective pruning and herbicide applications, as described in Section 6 of the VMP). Natural control is the process of working with the cycles of plant succession and interspecies competition to facilitate the spread and stabilization of early succession plant communities that discourage the establishment of taller, woody vegetation. Natural controls are the result of the conscientious, selective use of mechanical and chemical controls. All three

controls depend upon each other in a continuous cycle that employs the unique advantages of each.

The cultural component of the IVM program is not technically a control method. Cultural controls are recognizing and managing landscape changes along the right-of-way that prescribe the choice of IVM techniques and adapting or limiting the specific control methods to suit the management situation. These are areas of a right-of-way in which geologic, geographic, climactic, environmental and legal factors along with economic, agricultural, social and recreational uses of the landscape affect the application of IVM management techniques to the existing vegetation.

Within an IVM program, inspections, timing of applications and avoiding fixed schedules maximizes control while minimizing herbicide use. The rights-of-way scheduled for mechanical and chemical treatments in 2025 have incompatible vegetation heights that average from six to ten feet and/or low to moderate densities. Where herbicides are applied by trained, licensed and certified applicators using hand held equipment, applicators will walk to each incompatible plant and apply the minimal effective amount of herbicide (selective herbicide applications).

Mechanical control methods will be used where regulatory, cultural and/or National Grid policy restrictions require hand cutting and/or mowing, including but not limited to the following situations:

1. All vegetation over 12 feet in height will be cut or mowed and when appropriate the stumps treated with herbicides to prevent re-sprouts.

2. All conifers less than two feet in height are not treated.

3. Non sprouting conifers taller than two feet are hand-cut or mowed without herbicides applied to the stumps.

4. Pitch Pine stumps which re-sprout are cut and treated with herbicides.

5. Hand cutting and/or mowing are used in “no-spray” *sensitive areas* (see Appendix 6).

6. Mowing and/or hand cutting are used in areas where easement, National Grid policy and/or landowner agreements preclude herbicide applications.

7. Right-of-way sections devoid of trees: areas where compatible, low growing, shrubs, ferns and grasses make up the vegetative cover; wet areas where a high water table prevents trees from growing; and areas where land use prevents the establishment of trees are not treated with herbicides.

4. IDENTIFICATION OF INCOMPATIBLE TARGET VEGETATION

The primary target “pest” on an electric right-of-way is woody vegetation, primarily trees that are capable of interrupting the safe delivery of energy products to our customers. Other incompatible vegetation includes dense woody vegetation, vines, noxious, nuisance and poisonous vegetation, and all vegetation that interferes with access around structures, access roads & trails, substations and anywhere in which vegetation prevents access to the right-of-way for inspections, maintenance, repairs and emergency access to the lines.

With a few exceptions, all incompatible species will be removed or controlled during a treatment operation. Within the cleared width of the right-of-way, all incompatible species, except conifers less than two feet tall, will be removed or controlled.

Tree species are identified as woody plants that mature at heights exceeding 15 feet. These trees must be removed because they are capable of growing tall enough to grow into or fall onto the lines. In rare isolated instances, such as in steep ravines and on severe slopes, the electric lines are high enough off the ground so that mature trees will not interfere with the operation of the line and, therefore, trees may be left.

Except in no-spray sensitive areas (see Section 5), hardwoods over 12 feet tall are hand cut and the stumps treated with herbicides. Hardwoods less than 12 feet tall

and woody plant species that present safety problems are treated with herbicides using either low volume foliar or basal application methods. As mentioned above, Pitch Pine is the only conifer species treated with herbicides.

Trees that need to be removed will be identified visually by trained treatment crews and include, but are not limited to:

Ash	Cherry	Maple
Aspen	Hemlock	Oak
Beech	Pine	Willow
Birch	Poplar	

All woody vegetation (trees, shrubs, vines) on or encroaching upon existing roads or pathways or immediately adjacent to line structures or equipment will be treated by mechanical or herbicide control methods. If no access along the right-of-way exists, a pathway will be created and maintained in a suitable location by treating all woody vegetation within the selected route. Woody vegetation must be treated in these areas to ensure access to and along the right-of-way, and access to line structures for safe and efficient inspection, maintenance, and repair operations.

Other plant species to be controlled include shrub and vine species and vegetation that because of heavy thorn growth or dermal toxicity may be hazardous including, but not limited to:

Alder	Grapevines	Poison Ivy
Bittersweet	Greenbriar	Sumac (poison)
Blackberry	Hawthorne	Viburnums
Buckthorn	Japanese Knotweed	Virginia Creeper
Bush Honeysuckle	Multiflora Rose	Winterberry

Not all vegetation on the right-of-way are considered incompatible species, in fact, most species are compatible. Compatible plant species that provide the natural controls in our IVM program include, but are not limited to:

Azaleas	Mountain Holly	Spirea
Buttonbush	Mountain Laurel	Sumac
Chokeberry	Privet	Sweet Fern
Common Juniper	Rhododendron	Sweet Pepperbush
Dogwoods	Sedges	Viburnums
High & Low Bush Blueberries	Shadbush	Ferns
Huckleberry	Sheep Laurel	Grasses & Herbaceous sp.

For a complete list of compatible vegetation species and incompatible vegetation species refer to Appendix 7.

5. SENSITIVE AREAS

The general definition of sensitive areas regulated by 333 CMR 11.04 is as follows:

> *…any areas within Rights-of-way, including No-Spray and Limited-Spray Areas, in which public health, environmental or agricultural concerns warrant special protection to further minimize risks of unreasonable adverse effects.*

National Grid also has its own designated sensitive areas including landowner agreements and easement restrictions. Protecting these sites is accomplished by defining specific areas and establishing limited spray and no-spray areas and treatment restrictions within these borders based on the sensitivity of each site and the requirement to minimize any unreasonable adverse impacts within that area.

Sensitive areas regulated by 333 CMR 11.00 include the following:

Water Supplies:
- Zone I's
- Zone II's
- IWPA's (Interim Wellhead Protection Areas)
- Class A Surface Water Sources
- Tributaries to a Class A Surface Water Source
- Class B Drinking Water Intakes
- Private Wells

Surface Waters:
- Wetlands
- Water Over Wetlands
- The Mean Annual High Water Line of a River
- The Outer Boundary of a Riverfront Area
- Certified Vernal Pools

Cultural Sites:
- Agricultural Areas
- Inhabited Areas

Wildlife Areas:
- Certified Vernal Pool Habitat
- Priority Habitat

These sensitive areas consist of no-spray areas in which herbicide use is prohibited, larger limited spray areas where herbicide use is allowed under certain conditions, and/or areas that require special treatment recommendations. Appendix 6 includes diagrams and a table detailing these conditions. Treatment in limited spray areas requires the use of herbicides from the *Sensitive Area Materials List* and application restrictions in 333 CMR 11.04 or in the case of Priority Habitat of State-listed species, approval of the YOP by the Natural Heritage and Endangered Species Program (NHESP) of the Massachusetts Division of Fisheries & Wildlife.

For the purpose of identification, sensitive areas are also separated into readily identifiable in the field and not readily identifiable in the field designations:

1. Sensitive areas “readily identifiable in the field” will be treated and marked according to all applicable restrictions listed in 333 CMR 11.00 and National Grid’s VMP. These areas include but are not limited to rivers and streams, surface waters, wetlands, inhabited areas, agricultural areas and road buffers.

2. Sensitive areas “not readily identifiable in the field” are identified by the use of the data marked on our maps and additional data collected in the YOP and notification processes before the time of treatment. These areas include, but are not limited to public ground water supplies, public surface water supplies and tributaries, private wells, Priority Habitats, certified vernal pools, landowner agreements and easement restrictions.

Sensitive areas will be identified using the appropriate resources and methods from the following list (some of which are already included in National Grid’s records):

1. National Grid right-of-way maps, records and institutional knowledge,

2. Massachusetts Department of Environmental Protection water supply maps and/or GIS mapping layers available through MassGIS,

3. MDAR, Municipal Board of Health maps and lists, and National Grid records of identified private wells along the right-of-way,

4. Correspondence, meetings and input from municipalities within the 45 day YOP and 21 day municipal right-of-way notification letter review and comment periods and the 48 hour newspaper notification (under 333 CMR 11.06 & 11.07 and Chapter 85 of the Acts of 2000),

5. Correspondence and meetings resulting from National Grid's abutter notification procedure,

6. A point person who verifies identified sensitive areas and any additional areas that may require special precautions,

7. United States Geological Survey (USGS) topographical maps,

8. Information from contractor’s knowledge and records,

9. Information from MassGIS,

10. Confidential information from NHESP, and

11. A copy of the YOP and VMP.

As appropriate, sensitive areas will be identified and marked in the field by either National Grid personnel, trained and experienced vegetation management contract personnel, and/or by individuals trained in the identification of sensitive areas.

Priority Habitat of State-Listed Species

In compliance with 321 CMR 10.14, Massachusetts Endangered Species Act Regulations, Part II Exemptions, National Grid has submitted this YOP for approval by the NHESP.

Under the approval process, details about the Priority Habitat of State-listed species that our activities might affect and management recommendations are shared with National Grid under strict confidentiality agreements. Using this data and best management practices, National Grid and contract personnel will follow the appropriate vegetation management treatment methods within these sensitive areas. To identify Priority Habitats, National Grid and vegetation management contract personnel are trained to recognize Priority Habitats using one of the following tools: paper maps, GPS coordinates and/or GIS systems. Particularly sensitive State-listed species will be reviewed and identified in the field for protection by NHESP approved biologists.

Treatment of Wetlands

Pursuant to 333 CMR 11.04(4)(c) based upon the results of two right-of-way wetland impact studies, the Massachusetts Department of Food and Agriculture (now MDAR) in consultation with the Department of Environmental Protection and the Right-of-way Advisory Panel, made a determination that utilities may treat incompatible plant species, except pines, selectively with herbicides in wetlands, under the guidance of an IVM program and with sensitive area approved herbicides except within ten feet of standing or flowing water.

6. DESCRIPTION OF MAP(S) LOCATING THE RIGHTS-OF-WAY

YOP map(s) locating the right(s)-of-way and sensitive areas not readily identifiable in the field will be sent to the appropriate municipal officials.

The maps will include the most current data available at the time of printing. To ensure that applicable sensitive areas are identified on the maps, National Grid is requesting municipal verification of areas currently mapped and the identification of any areas not mapped.

The maps are resources and a tool for the public and vegetation management crews, therefore, they contain the data needed to identify, mark and treat sensitive areas appropriately. At the time of treatment, additional sensitive area information that is collected will be added to the information utilized by National Grid's vegetation management contractors. Please note that Zone II's are included on the maps, however, National Grid only uses herbicides approved for use within this type of limited spray sensitive area.

7. PROPOSED HERBICIDES, CARRIERS, ADJUVANTS and RATES

Only Commonwealth of Massachusetts recommended herbicides for use in sensitive areas will be used on the full length and width of National Grid's right-of-way corridors. National Grid may utilize any materials noted in the Rights of Way Sensitive Area Materials List (https://www.mass.gov/info-details/rights-of-way-sensitive-area-materials-list). Current proposed herbicide labels are in Appendix 8 and herbicide fact sheets developed and/or approved by MDAR are in Appendix 9.

The following tables outline the proposed herbicides, tank mixes, application methods and estimated application rates:

Table 1: Tank Mixes for Low Volume Foliar Applications				
Herbicides & Adjuvants	**Active Ingredient**	**EPA Registration Number(s)**	**Mix Concentration (per 100 gals. Water)**	**Estimated Application Rate of Active Ingredient Per Acre**
Krenite S*	Ammonium Salt of Fosamine	42750-247	6-10%	32-128 oz.
Escort XP or Patriot	Metsulfuron-Methyl	432-1549 or 228-391	2-4 oz.	0.125-0.8 oz.
Rodeo, Aquaneat, Roundup Pro, or Roundup Custom, Ranger Pro, GlyphoMax Plus	Glyphosate	62719-324, 228-365 524-475, 524-343, 524-517, 62719-322	3-5%	16-128 oz.
Arsenal Powerline, or Polaris**	Isopropylamine salt of Imazapyr	241-431 228-534	0.125%-1%	2-8 oz.
Milestone	Triisopropanolammonium salt of 2-pyridine carboxylic acid	62719-519	0.1-0.5%	4-7 oz.
Vastlan***	Triclopyr choline acetic acid, choline salt	62719-687	2-7%	16-128 oz.
Induce, Cleancut, or Aqua Fac or other equivalent surfactant****	not applicable	not applicable	0.125%-1%	1-16 oz.
Thinvert (carrier)*****	Mixed with:	62719-324	per label rate	5 gal.
	Rodeo (Glyphosate)			
	Polaris (Imazapyr)	228-534		
	Escort XP (Metsulfuron-Methyl)	352-439		
	Milestone	62719-519		
Point Blank or other drift retardant	not applicable	not applicable	6-16 oz.	1-2 oz.
Carrier: Water	not applicable	not applicable	not applicable	not applicable

* Rodeo or Krenite S are often applied in combination with Escort and Arsenal Powerline or Polaris.

** Imazapyr will not be applied on the same right-of-way in two consecutive years.

***Vastlan will only be utilized if the product is added in 2024 to the MA ROW Sensitive Area Materials List

**** Equivalent surfactants, drift retardants and basal oils will only be used in case those listed are no longer available or more effective alternatives become available.

***** Will be mixed in accordance with manufacturer's label.

Table 2: Tank Mixes for Cut Stump Treatment (CST) Applications

Herbicides & Adjuvants	Active Ingredient	EPA Registration Number(s)	Concentration (per 100 gals. Water)	Application Rate of Active Ingredient Per Acre
Rodeo, Aquaneat, Roundup Pro, or Roundup Custom	Glyphosate	62719-324, 228-365 524-475, 524-343	40%-50%	Per density of target stems
Garlon 4 Ultra	Triclopyr	62719-527	15%-30%	0.5-3 pints
Arsenal Powerline or Polaris**	Isopropylamine salt of Imazapyr	241-431 228-534	3%-5% (mixed with Rodeo)	Per density of target stems
Carriers: Water or Windshield Washing Fluid	not applicable	not applicable	not applicable	not applicable

** Imazapyr will not be applied on the same right-of-way in two consecutive years.

Table 3: Tank Mixes for Low Volume Basal Applications

Herbicides & Adjuvants	Active Ingredient	EPA Registration Number(s)	Mix Concentration (per 100 gals. Water)	Application Rate of Active Ingredient Per Acre
Garlon 4 Ultra	Triclopyr	62719-527	15%-30%	0.5-3 pints
Arsenal, Poweline or Polaris**	Isopropylamine salt of Imazapyr	241-431 228-534	3%-5%	Per density of target stems
Carrier: Arborchem's low odor basal oil or equivalent	not applicable	not applicable	70%-85%	24-144 oz.

Table 4: Tank Mixes for Dormant Stem Applications

Herbicides & Adjuvants	Active Ingredient	EPA Registration Number(s)	Mix Concentration (per 100 gals. Water)	Application Rate of Active Ingredient Per Acre
Garlon 4 Ultra	Triclopyr	62719-527	2%	Per density of target stems
Arsenal Powerline or Polaris	Isopropylamine salt of Imazapyr	241-431 228-534	0.5	6 pints per acre or less
Milestone	Triisopropanolammonium salt of 2-pyridine carboxylic acid	62719-519	0.33%	7 oz/acre or less
Carrier: Arborchem's low odor basal oil or equivalent	Not applicable	Not applicable	2-4%	Per density of target stems

Table 5: Tank Mixes for Tree Growth Regulator Applications

Herbicides & Adjuvants	Active Ingredient	EPA Registration Number(s)	Mix Concentration (per 100 gals. Water)
Cambistat	Paclobutrazol	74779-3	9.10%
Induce, Cleancut, or Aqua Fac or other equivalent surfactant****	not applicable	not applicable	.125-1%

8. PROCEDURES AND LOCATIONS FOR HANDLING, MIXING, AND LOADING HERBICIDE CONCENTRATES

National Grid retains independent contractors to accomplish all aspects of handling, mixing, and loading herbicide concentrates. As a contractual term, contractors are required to comply with all applicable laws, regulations, and rules pertaining to handling, mixing, and loading herbicide concentrates.

The majority of the handling, mixing, and loading of herbicide concentrates is done at the contractor's base location. If it is necessary to handle, mix, or load herbicide concentrates at any other location, the contractor is required to comply with herbicide label directions and existing regulations regarding setbacks from Sensitive Areas and safety precautions.

However, National Grid does expect that at a minimum, the following standards will be followed:

1. No handling, mixing, or loading of herbicide concentrates will be done on a right-of-way in the following situation:
    a. within the buffer zones adjacent to any drinking water supplies or surface water,
    b. within 100 feet of any other Sensitive Area.

2. All water to be used mixing herbicide solutions will be secured from a faucet or open bodies of water, that are not drinking water supplies.

3. If pumps are used they must be equipped with anti-siphoning devices.

4. Pumps and hoses used for water will not be used to pump or mix herbicides.

9. INDIVIDUALS SUPERVISING THE YOP

Overall supervision of the YOP will be performed by:

Mariclaire Rigby
Principal Specialist
939 Southbridge Street
Worcester, MA 01610
(781) 290-8310

The New England Lead Vegetation Strategy Specialist is ultimately responsible for the preparation and implementation of this YOP including: work scheduling, procurement of necessary permits, municipal notifications, local and state officials, or other interested parties, and for ensuring overall compliance with the VMP and this YOP.

Coordination of the field application of the YOP, including prescription of herbicides, general application methods for each right-of-way, and contractor selection will be performed by National Grid Vegetation Operations:

Seth Bernatchez
Director
164 Viscoloid Ave
Leominster, MA 01453
(978) 725-1493

Jonathan Duval
Forestry Supervisor
1250 Brayton Point Rd
Somerset, MA 02725
(978) 840-3816

Eric George
Forestry Supervisor
1101 Turnpike St
North Andover, MA 01845
(978) 725-1046

10. CONTRACTORS THAT WILL PERFORM HERBICIDE TREATMENTS

National Grid retains independent, professional, experienced contractors to perform the treatment applications. The contractor's supervisors and foremen are responsible for: field level implementation of this YOP, coordinating and observing the daily activities of the treatment crews, providing liaison between National Grid and landowners, local officials or other interested parties, and ensuring compliance with the VMP and YOP.

The following contractors may perform herbicide applications on National Grid's rights-of-way:

Lewis Tree Service, Inc.	**Stanley Tree**	**Vegetation Control Service, Inc.**
300 Lucius Gordon Drive	662 Great Road	2342 Main Street
West Henrietta, NY 14586	North Smithfield, RI 02896	Athol, MA 01331
(585) 436-3208	(401) 765-4677	(978) 249-5348
Lucas Tree Experts	**BluRoc**	**Davey Tree Expert Co.**
12 Northbrook Drive	15 Atwood Dr, Suite 301	1500 N Mantua St
Falmouth, ME 04105	Northampton, MA 01060	Kent, OH 44240
(800) 339-8873	(413) 887-3653	800-445-8733

11. REMEDIAL SPILL AND EMERGENCY PLAN

This section is offered as a general procedural guide for responding to chemical spills or related accidents (related accidents include, but are not limited to fire, poisoning and vehicle accidents). National Grid contracts with independent, professional, certified herbicide applicators that are responsible for the containment, clean up and reporting of chemical spills or accidents. The following is, therefore, only a guide to the minimum resources that shall be available to the treatment crew in the event of a chemical spill or emergency:

Types of Chemical Spills that Require Action

Chemicals include, but are not limited to the following:

- □□Herbicides
- □□Bar and Chain Oil
- □□Motor and Hydraulic Oil/Fluids
- □□Diesel Fuel
- □□Gasoline
- □□Title 3 Hazmat Materials

Required Spill Response Equipment

As a minimum, the treatment crew should have available on the job site:

- YOP with Emergency Contact List
- Safety Data Sheets (SDS)
- Product Label
- Product Fact Sheets (when applicable)
- Appropriate Absorbent Material
- Shovel
- Broom
- Flagging
- Leak Proof Container
- Heavy-duty Plastic Bags

Personal Contact

In the event of **Personal Contact** with hazardous chemicals:

- Wash affected area with plenty of soap and water
- Change clothing which has absorbed hazardous chemicals
- If necessary, contact a physician
- If necessary, contact the proper emergency services
- If necessary, follow the procedures for Reportable or Non-Reportable Spills as outlined below
- Avoid breathing the fumes of hazardous chemicals.

Clean-up Procedures

Education and attention will constantly be directed at accident and spill prevention, however, in the event of an unfortunate incident, a spill response check list is included below (Table 8) which can be filled out and used as a procedural guide.

Reference Tables (information subject to change as necessary)

Table 6: Herbicide Manufacturers

MANUFACTURER	PHONE NUMBER
Albaugh Inc.	800-247-8013
Bayer Environmental Science	800-334-7577
BASF Corporation	800-832-4357
Corteva	800-992-5994
Nufarm	877-325-1840
Rainbow Treecare	877-272-6747

Table 7: State Agencies

State Agency	Telephone Number	Special Instructions
MDAR, Pesticide Bureau	(617) 626-1700	A.S.A.P. (within 48 hours)
Massachusetts Department of Environmental Protection, Emergency Response Section	Emergency Response Coordinator: (617) 292-5507	For emergencies involving reportable quantities of hazardous materials, call within 2 hours. <u>Required info:</u> City/town, street address, site name (if applicable), material, quantity released, environment impact
	Southeast Region: (508) 946-2700	
	Northeast Region: (978) 694-3200	
	Central Region: 508) 792-7650	
	Western Region: (413) 784-1100	
Massachusetts Poison Information Centers	800-682-9211	For medical emergencies involving suspected or known pesticide poisoning symptoms

Table 8: Emergency Services

Emergency Service	Telephone Number	Special Instructions
Massachusetts State Police	(508) 820-2121	Framingham, after hours number
Local Police/Fire Dept	911	
ChemTrec	(800) 424-9300	
Clean Harbors	(800) OIL-TANK	
Pesticide Hotline	(800) 858-7378	PST: 5:30 am - 4:30 pm web:www.NPIC.orst.edu

Table 9: National Grid Contacts in the case of a spill or accident

Name	Telephone Number	Address
Jonathan Duval	(508) 730-4007	National Grid 1250 Brayton Point Rd Somerset, MA 02725
Eric George	(978) 725-1046	National Grid 1101 Turnpike Street North Andover, MA 01845
Seth Bernatchez	(978) 725-1493	National Grid 164 Viscoloid Ave Leominster, MA 01453

Table 10: Remedial Plan to Address Spills

REPORTABLE SPILLS

(Spills of a reportable quantity of material, in accordance with 310 CMR 40.0000):

FOLLOW STEPS 1-11 and contact the National Grid Transmission Forester

NON-REPORTABLE SPILLS

FOLLOW STEPS 1 - 4, 7 - 11 and contact the National Grid Transmission Forester

Order	ACTION		Done (√)
1	Use any and all PPE as directed by product label or SDS.		
2	Cordon-off spill area to unauthorized people and traffic to reduce the spread and exposure of the spill.		
3	Identify source of spill and apply corrective action, if possible stop or limit any additional amount of spilled product.		
4	Contain spill and confine the spread by damming or diking with soil, clay or other absorbent materials.		
5	Report spill of "reportable quantity" to the Massachusetts DEP and DAR:		
	Massachusetts MDAR, Pesticide Bureau	(617) 626-1700	
	Massachusetts Department of Environmental Protection, Emergency Response Section (appropriate region)	See Table 5	
6	If the spill cannot be contained or cleaned-up properly, or if there is a threat of contamination to any bodies of water, immediately contact any of the following applicable emergency response personnel:		
	Local fire, police, rescue	911	
	National Grid Transmission Forester	See Table 7	
	Product Manufacturer(s)	See Table 6 and/or Herbicide Label (Appendix 8)	
	ChemTrec	(800) 424-9300	
	Additional Emergency Personnel		
	If there is a doubt as to who should be notified, contact Massachusetts State Police.	(508) 820-2121 or 911	
7	Remain at the scene to provide information and assistance to responding emergency clean-up crews.		
8	Refer to the various sources of information relative to handling and clean up of spilled product.		
9	If possible, complete the process of "soaking up" with absorbent materials.		
10	Sweep or shovel contaminated products and soil into leak proof containers for proper disposal at approved location.		
11	Spread activated charcoal over spill area to inactivate any residual herbicide.		

APPENDIX 1

33 CMR 11.00 RIGHTS-OF-WAY MANAGEMENT

333 CMR 11.00: RIGHTS OF WAY MANAGEMENT

Section

11.01: Purpose

The purpose of 333 CMR 11.00 is to establish a statewide and uniform regulatory process which will minimize the uses of, and potential impacts from herbicides in rights-of-way on human health and the environment while allowing for the benefits to public safety provided by the selective use of herbicides. Specific goals of 333 CMR 11.00 are to:

1. Ensure that an Integrated Pest Management (IPM) approach to vegetation management is utilized on all rights-of-way covered by 333 CMR 11.00.
2. Establish standards, requirements and procedures necessary to prevent unreasonable risks to humans or the environment, taking into account the economic, social and environmental costs and benefits of the use of any pesticide.
3. Ensure ample opportunity for public and municipal agency input on potential impacts of herbicide application to rights-of-way in environmentally sensitive areas.
4. Establish a mechanism for public and municipal review of rights-of-way maintenance plans.

11.02: Definitions

For the purposes of 333 CMR 11.00, unless the context clearly requires otherwise, the following definitions shall apply:

Agricultural Area includes, but is not limited to, actively cultivated gardens, greenhouses, orchards, fields, pastures, and other areas under cultivation or agricultural management.

Applicant, any person representing any federal, state or local government or agency, utility, railroad or pipeline, that intends to maintain a right-of-way in the Commonwealth by application of herbicides.

Associated Surface Water Body, as identified on the most current available maps prepared by the Department of Environmental Protection, any body of water that is hydrologically connected to a Class A surface water source.

Ballast, the coarse gravel or crushed rock on which the ties, tracks and switching, signaling and communication devices of a railroad are laid.

Broadcast, any non-selective herbicide application technique which results in application to all vegetation within a target area.

Certified Vernal Pool, a confined basin depression, certified and mapped by NHESP pursuant to the provisions of 310 CMR 10.57(2)(a)5,6, which, at least in most years, holds water for a minimum of two continuous months during the spring and/or summer, and which is free of adult fish populations.

Certified Vernal Pool Habitat, that vernal pool habitat which has been certified and mapped by NHESP pursuant to the provisions of 310 CMR 10.57(2)(a)5,6 or, in the event that such habitat has not been mapped, the area extending 100 feet horizontally outward from the boundary of any Certified Vernal Pool.

Class A Waters, waters which are designated as a source of public water supply, as defined in 314 CMR 4.05(3)(a).

Class B Drinking Water Intakes, intakes to Class B waters suitable as sources of public water supply with appropriate treatment, as defined at 314 CMR 4.05(3)(b) and as identified on the most current available maps prepared by the Department of Environmental Protection.

Department, the Department of Agricultural Resources.

FIFRA, the Federal Insecticide, Fungicide and Rodenticide Act, Public Law 92- 516.

Foliar Treatment, any technique which applies herbicide to leaves of target vegetation.

Inhabited Area, any area where people generally live, work or gather, including, but not limited to, any residence, school, hospital, park or recreational facility.

Interim Wellhead Protection Area (IWPA), for public water systems using wells or well fields that lack a Department of Environmental Protection-approved Zone II, an interim wellhead protection area, as that term is defined in the Massachusetts drinking water regulations, 310 CMR 22.02, and as identified on the most current available maps prepared by the Department of Environmental Protection, shall apply. Generally, this is a 1/2- mile radius for sources whose approved pumping rate is 100,000 gallons per day or greater. For smaller sources, the radius in feet is determined by multiplying the approved pumping rate in gallons per minute by 32 and adding 400.

Limited Application Waiver, a waiver from the requirements of 333 CMR 11.05 and 11.06, granted at the Department's sole discretion pursuant to 333 CMR 11.03(14), when the reason for the application is emergency public health or safety or when the application is for one time only.

Limited Spray Area, any area that is both within a Right-of-Way and within:

(a) any Zone II or IWPA
(b) a distance of between 100 feet and 400 feet of any Class A Surface Water Source
(c) a distance of between 10 and 200 feet of any tributary or associated surface water body where the tributary or associated surface water body runs outside the Zone A for the Class A surface water source
(d) a lateral distance of between 100 and 200 feet for 400 feet upstream, on both sides of the river, of a Class B Drinking Water Intake
(e) a distance of between 50 and 100 feet of any identified Private Well
(f) a distance of between 10 and 100 feet of any Wetlands or Water Over Wetlands
(g) a distance of between 10 feet from the mean annual high water line of any river and the outer boundary of the Riverfront Area
(h) a distance of between ten feet from any Certified Vernal Pool and the outer boundary of any Certified Vernal Pool Habitat
(i) a distance of 100 feet of any Agricultural or Inhabited Area.

Low Pressure, pressure under 60 pounds per square inch (psi).

Maps, United States Geological Survey maps of scale 1:25,000 or other maps, as determined by the Department, which are of such accuracy and scale to provide sufficient detail so that sensitive areas can be delineated.

NHESP, the Natural Heritage and Endangered Species Program within the Massachusetts Division of Fisheries and Wildlife.

No-Spray Area, any area that is both within a Right-of-Way and within:

(a) any Zone I
(b) 100 feet of any Class A Surface Water Source
(c) 100 feet of any tributary or associated surface water body where the tributary or associated surface water body runs within 400 feet of a Class A surface water source
(d) 10 feet of any tributary or associated surface water body where the tributary or associated surface water body is at a distance greater than 400 feet from a Class A surface water source
(e) a lateral distance of 100 feet for 400 feet upstream, on both sides of the river, of a Class B Drinking Water Intake
(f) 50 feet of any identified Private Well
(g) 10 feet of any Wetlands or Water Over Wetlands
(h) 10 feet of the mean annual high-water line of any river
(i) 10 feet of any Certified Vernal Pool.

Person, an individual, association, partnership, corporation, company, business organization, trust, estate, the Commonwealth or its political subdivisions, administrative agencies, public or quasi-public corporation or body, or any other

legal entity or its legal representatives, agent or assignee, or a group of persons.

Person Aggrieved, any person who, because of an act or failure to act by the Department may suffer an injury in fact which is different either in kind or magnitude from that suffered by the general public and which is within the scope of the interests identified in 333 CMR 11.00. Such person must specify in writing sufficient facts to allow the Department to determine whether or not the person is in fact aggrieved.

Private Well, any private drinking water supply identified by the local Board of Health, the well owner or the Department of Agricultural Resources.

Private Well Registry, a registry of private wells located within 100 feet of a right-of-way which is maintained by the Department of Agricultural Resources. Homeowners must notify the Department by completing a registration form which is available directly from the Department or online at the Department website.

Public Ground Water Source, a source of water for a Public Water Supply System, as that term is defined in the Massachusetts drinking water regulations at 310 CMR 22.02.

Public Water Supplier, as defined at 310 CMR 22.02(1), any person who owns or operates a public water supply system.

Right(s)-of-Way (ROW), any roadway, or thoroughfare on which public passage is made and any corridor of land over which facilities such as railroads, powerlines, pipelines, conduits, channels or communication lines or bicycle paths are located.

Rights-of-Way Advisory Panel, a panel established to advise the Department on issues relating to 333 CMR 11.00 and to fulfill specific functions as detailed within 333 CMR 11.05 and 11.11.

River, a river as defined at 310 CMR 10.04 and as identified on the most current available maps prepared by the Department of Environmental Protection.

Riverfront Area, a riverfront area as defined at 310 CMR 10.58(2) and as identified on the most current available maps prepared by the Department of Environmental Protection. In general, this term shall mean the area between the mean annual high-water line of a perennially flowing river and a parallel line 200 feet away.

Selective Application, any application of herbicides, in such a manner that the delivery to the target vegetation is optimized and delivery to non-target vegetation and the environment is minimized.

Sensitive Areas, as defined in 333 CMR 11.04, any areas within Rights-of-Way, including No-Spray and Limited-Spray Areas, in which public health, environmental or agricultural concerns warrant special protection to further minimize risks of unreasonable adverse effects.

State-listed Species, any species on the Massachusetts list of Endangered, Threatened, and Special Concern Species as described in the Massachusetts Endangered Species Act (M.G.L. c. 131A; 321 CMR 10.02).

State-listed Species Habitat, the Estimated Habitats of Rare Wildlife (310 CMR 10.59 and 10.37) and the Priority Habitats for State-listed Species (321 CMR 10.02) as shown on the most recent edition of the Massachusetts Natural Heritage Atlas prepared by NHESP.

Stem Treatment, any technique including, but not limited to, stump, basal, stem, injection, banding, frill, or girdle and any other technique which delivers herbicide at low pressure to the stump, base or stem of the target vegetation.

Surface Water Source, any lake, pond, reservoir, river, stream or impoundment designated as a public water supply in the Massachusetts Surface Water Quality Standards, 314 CMR 4.00, as identified on the most current available maps prepared by the Department of Environmental Protection.

Target Vegetation, any plant species which has the potential to interfere with the operation and safety of the right-of-way.

Touch-up Application, any limited application of herbicides following an initial treatment, which is necessary to achieve the desired vegetation control.

Tributary, as identified on the most current available maps prepared by the Department of Environmental Protection, any body of running, or intermittently running, water which moves in a definite channel, naturally or artificially created, in the ground due to a hydraulic gradient, and which ultimately flows into a Class A surface water source, as defined in 314 CMR 4.05(3)(a).

Vegetation Management Plan (VMP), a long term management plan for the applicant's right-of-way system which describes the intended program for vegetation control over a five year period.

Vernal Pool, see Certified Vernal Pool.

Water Over Wetlands, the ocean or any estuary, lake or pond as defined at 310 CMR 10.04.

Wetland(s),
any of the following areas as defined in 310 CMR 10.02(1)(a), (b), (c) and (f):

(a) Any bank, any freshwater wetland, any coastal wetland, any beach, any dune, any flat, any marsh, or any swamp on the ocean any estuary any creek bordering any river any stream any pond or any lake

(b) Land under any of the water bodies listed above
(c) Land subject to tidal action
(f) Riverfront area.

Wetlands Determination, a written determination of the boundaries of Wetlands and boundaries of areas within 100 feet of Wetlands in accordance with the regulations of the Department of Environmental Protection (DEP) at 310 CMR 10.05(3)(a)1. and 2.. 310 CMR 10.03(6)(b) require applicants not eligible for a public utility exemption to submit these determinations with their VMPs if they will apply herbicides within 100 feet of wetlands and will not submit a Notice of Intent under M.G.L.c. 131, §40, the Wetlands Protection Act. In order to obtain a Wetlands Determination, the applicant should submit a request to the conservation commission on maps of a scale that will enable the conservation commission or Department of Environmental Protection to find and delineate the boundaries of Wetlands and buffer zones within the vicinity of the right-of-way herbicide management area. To be considered "valid", the Wetlands Determination should be made no sooner than six months immediately prior to the submission of the Vegetation Management Plan. The Wetlands Determination shall cover the period of the Vegetation Management Plan only and shall expire at the end of the five year period of that Vegetation Management Plan.

Yearly Operational Plan (YOP), the yearly operational plan which describes the detailed vegetation management operation for the calendar year consistent with the terms of the long term Vegetation Management Plan.

Zone A, as identified on the most current available maps prepared by the Department of Environmental Protection, the protective land area for a Surface Water Source, Class A water source, Tributary, or Associated Surface Water Body defined in 310 CMR 22.02 as:

(a) the land area between the Class A surface water source and the upper boundary of the bank;
(b) the land area within a 400 foot lateral distance from the upper boundary of the bank of a Class A surface water source, as defined in 314 CMR 4.05(3)(a); and
(c) the land area within a 200 foot lateral distance from the upper boundary of the bank of a Tributary or Associated Surface Water Body.

Zone I, as identified on the most current available maps prepared by the Department of Environmental Protection and as defined at 310 CMR 22.02, the protective radius required around a public water supply well or wellfield. For public water system wells with approved yields of 100,000 gallons per day (gpd) or greater, the protective radius is 400 feet. Tubular wellfields require a 250 foot protective radius. Protective radii for all other public water system wells are determined by the following equation: Zone I radius in feet = (150 x log of pumping rate in gpd) –350.

Zone II, as identified on the most current available maps prepared by the Department of Environmental Protection and as defined at 310 CMR 22.02, the aquifer recharge area for a public water supply well or wellfield.

11.03: General Provisions

(1) No person shall use an herbicide for the purpose of clearing or maintaining a right-of-way unless appropriately certified by the Department, or licensed by the Department and working under the on-site supervision of an appropriately certified applicator.

(2) No person shall use an herbicide for the purpose of clearing or maintaining a right-of-way except in accordance with a Vegetation Management Plan (VMP) and a Yearly Operational Plan (YOP) as approved by the Department. The YOP shall be available at the work site at all times during herbicide applications and be made available to the Department and municipal officials including the Conservation Commission and Board of Health upon reasonable request.

(3) No person shall handle, mix or load an herbicide concentrate on a right-of- way within 100 feet of a sensitive area.

(4) The perimeter of any sensitive areas which are not readily identifiable on the ROW shall be identified with a clearly visible marker system, consistent with the VMP, prior to any herbicide application.

(5) No foliar application of herbicides shall be used to control vegetation greater than 12 feet in height except for side trimming.

(6) No herbicide shall be applied when the wind velocity is such that there is a high propensity to drift off target and/or during measurable precipitation, and no person shall apply herbicides in such a manner that results in drift into any No-spray Area.

(7) No person shall apply herbicides by aircraft for the purpose of clearing or maintaining a right-of-way.

(8) No touch-up applications shall be carried out except under the following conditions:

(a) Touch-up applications must occur within 12 months of the initial application.
(b) All applicable public notification procedures of M.G.L. c. 132B, § 6B, as outlined in 333 CMR 11.07(1) and (3), are followed.
(c) No more than 10% of the initially identified target vegetation on the applicant's right-of-way in any municipality may be treated and the total amount of herbicide applied in any one year shall not exceed the limits specified by the label or Yearly Operational Plan.
(d) The Department may impose such additional restrictions or conditions on the use of herbicides as it deems necessary to protect public health and the environment.

(9) The Department will maintain mailing lists of individuals and groups desiring to obtain notices on various aspects of the Program.

(10) No person shall apply any herbicide identified as a Potential Ground Water Contaminant pursuant to 333 CMR 12.00 to a right-of-way.

(11) No person shall use an herbicide for the purpose of clearing or maintaining a right-of-way unless that person has obtained the most current available map of public ground water sources from the Department of Environmental Protection.

(12) No person shall use an herbicide for the purpose of clearing or maintaining a right-of-way unless that person has done one or more of the following:

(a) obtained a current list of identified Private Wells within 100 feet of the right-of-way from the Board of Health, or
(b) obtained a current list of all private wells, within 100 feet of the right of way from the Department of Agricultural Resources private well registry; or
(c) followed an alternative Private Well identification method outlined in an approved YOP.

(13) The applicator shall provide any employee of any state agency, or authority as defined in M.G.L. c. 3, § 39, when such employee is, within a right-of-way, using pesticides, supervising the use of pesticides, or present during the use of pesticides, with personal protective equipment and clothing. Applicators should note that other federal or state laws or regulations pertaining to pesticide applications may require this personal protective equipment to include protections according to Material Safety Data Sheets (MSDS's), the product label, and any other supporting technical data supplied by the manufacturer.

(14) Notwithstanding the provisions of 333 CMR 11.03(2) or other provisions of 333 CMR 11.00, the Department may, at its sole discretion, issue Limited Application Waivers to applicants wishing to apply herbicides to clear or maintain rights-of-way without VMPs or YOPs, but only under the following conditions:

(a) The applicant must demonstrate either:
    1. that the application will not occur more than once in a five-year period unless a VMP and a YOP are prepared and all other requirements of 333 CMR 11.00 are met; or
    2. that the application is necessary to protect public health or safety.
(b) The applicant must still adhere to all public notification requirements established at 333 CMR 11.07(1) and (3).
(c) The applicant must provide the Department with a letter establishing the concurrence of the chief elected official or board of selectmen of the municipality where the application is to be made.
(d) The applicant may only use herbicides on the Department's "Herbicides Recommended for Use in Sensitive Areas List."
(e) If the application could impact Wetlands, the Department recommends that the applicant send a copy of its application for a Limited Application Waiver to the Department of Environmental Protection's Division of Wetlands and Waterways no less than 21 days before the proposed application.
(f) It should be noted that, with certain exceptions for public utilities, wetlands regulations at 310 CMR 10.03(6)(b) currently require

Wetlands Determinations prior to any application within 100 feet of a Wetland.

Limited Application Waivers shall be issued solely at the Department's discretion, and the Department may impose such additional restrictions or conditions on the use of herbicides as it deems necessary to protect public health and the environment.

11.04: Sensitive Area Restrictions

(1) General

In any sensitive area:

(a) No more than the minimum labeled rate of herbicide for the appropriate site, pest, and application method shall be applied.

(b) Herbicides shall only be applied selectively by low pressure, using foliar techniques or basal or cut-stump applications, or other method approved for use by the Department.

(c) No person shall apply herbicides for the purpose of clearing or maintaining a right-of-way in such a manner that results in drift to any area within 10 feet of standing or flowing water in a wetland; or area within 400 feet of a public drinking water supply well; or area within 100 feet of any Class A surface water used as a public water supply; or area within 50 feet of a Private Well.

(d) Only herbicides specified by the Department as acceptable for use in sensitive areas pursuant to the Cooperative Agreement executed between the Department of Agricultural Resources and the Department of Environmental Protection on July 1-2, 1987, or future amendments thereto, shall be used in sensitive areas. Applicants proposing to use an herbicide which has been registered for use on rights-of-way but has not yet been evaluated pursuant to the provisions of the Cooperative Agreement may request that such herbicides be evaluated pursuant to said provisions. For an herbicide that has been evaluated pursuant to the provisions of the Cooperative Agreement, applicants proposing to use such herbicide in a manner inconsistent with the terms and conditions of use imposed in the guidelines may request a modification or waiver of such terms or conditions. A request for such modification or waiver shall provide a detailed rationale for use, with all relevant data including but not limited to environmental fate, efficacy and human health effects of the proposed herbicide. Such herbicides and/or uses shall be subject to the evaluation standards adopted by the Departments of Agricultural Resources and Environmental Protection in the Cooperative Agreement.

Commentary

Applicants not eligible for the public utilities exemption from the Wetlands Protection Act outlined at 310 CMR 10.03(6)(a), who wish to apply pesticides registered for use in Massachusetts to rights-of-way, may choose to apply herbicides determined to be suitable for use in sensitive areas in accordance with the provisions of the Cooperative Agreement mentioned above or, alternatively, such applicants may

proceed pursuant to the provisions of 310 CMR 10.00 as authorized by M.G.L. c. 131, § 40.

(e) The Department may impose such additional restrictions or conditions on the use of herbicides within or adjacent to sensitive areas as it determines necessary to protect human health or the environment. Such changes may be proposed by a municipal agency or individual during the public comment period.

(f) In the event of a question or dispute as to which setback applies to a sensitive area, the most restrictive setback shall apply.

(2) Water Supplies

(a) Public Ground Water Sources

1. No herbicides shall be applied within a Zone I.
2. No herbicides shall be applied within a Zone II or IWPA unless:
   a. A minimum of 24 months has elapsed since the last application to the site; and
   b. Herbicides are applied selectively by low pressure, using foliar techniques or basal or cut-stump applications.

(b) Class A Public Surface Water Sources, Associated Surface Water Bodies, Tributaries and Class B Drinking Water Intakes

1. No herbicides shall be applied within 100 feet of any Class A public surface water source.
2. No herbicides shall be applied within 100 feet of any tributary or associated surface water body located within the Zone A of a Class A public surface water source, or within 10 feet of any tributary or associated surface water body located outside of the Zone A of the Class A public surface water source.
3. No herbicides shall be applied within a lateral distance of 100 feet for 400 feet upstream of any Class B Drinking Water Intake.
4. No herbicides shall be applied within a distance of between 100 feet from any Class A surface water source and the outer boundary of any Zone A, or within a distance of between 10 feet and the outer boundary of the Zone A for any tributary or associated surface water body located outside of the Zone A of a Class A surface water source, or within a lateral distance of between 100 and 200 feet for 400 feet upstream of a Class B Drinking Water Intake, unless:

   a. A minimum of 24 months has elapsed since the last application to the site; and
   b. Herbicides are applied selectively by low pressure, using foliar techniques or basal or cut-stump applications.

(c) Private Wells

1. No herbicides shall be applied within 50 feet of an identified Private Well.

2. No herbicides shall be applied within a distance of between 50 feet and 100 feet of an identified Private Well, unless:
a. A minimum of 24 months has elapsed since the last application to the site; and
b. Herbicides are applied selectively by low pressure, using foliar techniques or basal or cut-stump applications.

(3) State-listed Species Habitat

(a) Any person proposing to apply an herbicide within any State-listed Species Habitat who does not have a current Yearly Operational Plan approved in writing by the Division of Fisheries and Wildlife pursuant to 321 CMR 10.14(12), shall submit all necessary materials required for review pursuant to 321 CMR 10.18.
(b)The management of vegetation within existing utility rights-of-way shall be exempt from the requirements of 321 CMR 10.18 through 10.23, provided that the management is carried out in accordance with a Yearly Operational Plan approved in writing by the Division of Fisheries and Wildlife, pursuant to 321 CMR 10.14(12).
(c) No person shall apply an herbicide within State-listed Species Habitat unless the application is approved by the Division of Fisheries and Wildlife pursuant to 333 CMR 11.04 (3a and 3b), and such approval is submitted to the Department.

(4) Wetlands, Waters Over Wetlands, Riverfront Areas, and Certified Vernal Pools

(a) No herbicide shall be applied on or within 10 feet of a Wetland or Water Over a Wetland, within 10 feet of the mean annual high-water line of any River, or within 10 feet of any Certified Vernal Pool.
(b) No herbicide shall be applied on or within a distance of between 10 feet and 100 feet of any Wetland or Water Over a Wetland, within a distance of 10 feet from the mean annual high-water line of any River and the outer boundary of any Riverfront Area, or within a distance of 10 feet from any Certified Vernal Pool and the outer boundary of any Certified Vernal Pool Habitat unless:
1. A minimum of 12 months has elapsed since the last application to the site; and
2. Herbicides are applied selectively by low pressure, using foliar techniques or basal or cut-stump applications.

(c) Notwithstanding 333 CMR 11.04(4) (a) –(b), public utilities providing electric, gas, water, telephone, telegraph and other telecommunication services (and other applicants, if consistent with all relevant provisions of the Massachusetts Wetlands Protection Act and its regulations in effect at the time of application) may apply herbicides on or within 10 feet of a Wetland in accordance with the following conditions:
1. Submission of a study, the design of which is subject to prior approval by the Departments of Agricultural Resources and Environmental Protection, evaluating impacts of the proposed vegetation management

program utilizing herbicides on or within 10 feet of Wetlands, and comparing those impacts to those which would result if only non-chemical control methods were used in these areas. The study must detail vegetation management practices and use patterns specific to those used by the type of entity submitting the study; and

2. A finding by the Department, after consultation with the Rights-of-Way Advisory Panel, that the proposed vegetation management program utilizing herbicides on or within 10 feet of Wetlands will result in less impacts to the Wetlands than mechanical control.

3. Notwithstanding the above, no herbicides shall be applied on or within ten feet of any standing or flowing water in a Wetland.

(5) Inhabited and Agricultural Areas

No foliar herbicide shall be applied within 100 feet of any Inhabited Area or any Agricultural Area unless:

1. A minimum of 12 months has elapsed since the last application to the site; and
2. Herbicides are applied selectively by low pressure, using foliar techniques or basal or cut-stump applications.

11.05: Vegetation Management Plan (VMP)

(1) General.

(a) Unless otherwise specified by the Department, all VMPs should be submitted by the applicant no later than September 1st prior to the calendar year of the proposed first year of maintenance. All approved VMPs shall be effective for a five year period unless otherwise modified, or revoked by the Department.

(b) The VMP shall be presented on forms and/or format approved by the Department.

(2) Requirements. The VMP shall include, but not be limited to, the following:

(a) General statement of goals and objectives of the VMP.
(b) Identification of target vegetation.
(c) Intended methods of vegetation management and rationale for use, including vegetation control techniques, equipment proposed for use, timing of applications and alternative control procedures.
(d) Discussion of justification for proposed herbicide applications, including a description of the alternative control methods considered and the reasons that they were rejected.
(e) Methods, references and sources for identifying sensitive areas and control strategies proposed for sensitive areas. Applicants should note that Department of Environmental Protection regulations at 310 CMR 10.03(6)(b) currently require Wetlands Determinations for applicants that are not eligible for a public utility exemption.
(f) Operational guidelines for applicators relative to herbicide use.

(g) Identification and qualifications of individuals developing and submitting a plan.
(h) A detailed description of the IPM Program, showing how it will minimize the amount and frequency of herbicide application.
(i) Description of alternative land use provisions or agreements that may be established with individuals, state, federal or municipal agencies that would minimize the need for herbicides, including the rationale for accepting or denying any reasonable request made by any individual.
(j) Description of a remedial plan to address spills and related accidents.
(k) For state agencies and authorities as defined in M.G.L. c. 3, § 39, a description of the applicant's policy to eliminate or, if necessary, reduce the use of pesticides for any vegetation management purpose along roadways, and a demonstration that, for the proposed application, the costs of non-chemical vegetation control significantly outweigh the benefits.

(3) Public Notice, Review and Comment.

(a) Upon receipt of the proposed VMP, the Department shall schedule and hold appropriate regional public hearings affording all interested parties the opportunity to comment, both at the hearings and in writing to the Department, on the proposed plan.
(b) At least 21 days prior to the public hearings, the Department shall publish notice of the hearings in the Environmental Monitor and regionally located newspapers, and send notice to municipalities covered by the plan and to the appropriate mailing list. The notice will include locations where copies of the VMP can be reviewed.
(c) The public shall have no less than 45 days, starting from publication of the Environmental Monitor notice, to comment upon proposed VMPs, unless the Department extends the comment period for good cause.
(d) Wherever a chief elected official, Board of Health or Conservation Commission in a municipality covered by the proposed VMP requests a copy of the proposed plan, the applicant shall, at least 21 days prior to the end of the public comment period, respond to this request. The response must either include a copy of the proposed VMP, or an Internet address where the VMP may be viewed and a note that a hard copy will be provided promptly upon further request.

(4) Disposition of VMP.

(a) 25 copies of the proposed VMP shall be submitted to the Department. The Department shall distribute copies of the proposed VMP to each member of the Rights-of-Way Advisory Panel. The Department may, at its sole discretion, allow electronic presentation of the VMP in lieu of some or all of the 25 copies that would otherwise be submitted pursuant to this subsection.
(b) Within 30 days of the end of the public comment period unless extended for good cause, the Rights-of-Way Advisory Panel shall review the VMPs and recommend in writing to the Department

approval, denial or modification of each VMP; if necessary, the Advisory Panel may request additional information from the applicant.

(c) Within 21 days of the end of the Rights-of-Way Advisory Panel review period, unless extended by the Department for good cause, the Department will notify the applicant and the Advisory Panel in writing one of the following:

1. request for additional information or modification; or
2. denial of VMP; or
3. approval of VMP.

(d) The VMP may be modified, withdrawn or amended by the applicant through a written request sent by certified mail to the Department.

(e) Resubmission of a denied VMP, updating of a VMP, or a significant amendment to an approved VMP shall be processed according to 333 CMR 11.05.

(f) The applicant must send a copy of the approved VMP, or an Internet address where the VMP may be viewed and a note that a hard copy will be provided promptly upon further request, to the chief elected official, Board of Health, and Conservation Commission in each municipality covered by the plan.

(5) Time for Action. Non-action by the Department on a VMP within the time specified herein does not constitute approval of the submitted plan. In the event that the Department fails to notify the applicant of a decision within the time specified above and upon written request from the applicant, the Commissioner must issue a finding within ten days of receipt stating the reason for the delay and providing an estimated completion date.

11.06: Yearly Operational Plan (YOP)

(1) General.

(a) The applicant is responsible for the accuracy and completeness of all information submitted with the YOP. The YOP shall be consistent with the objectives of the VMP and shall describe the intended operational program for that calendar year.

(b) The YOP shall be presented on forms and in a format approved by the Department.

(2) Requirements. The YOP shall include but not be limited to the following:

(a) Maps locating the rights-of-way and sensitive areas not readily identifiable in the field;

(b) Herbicides proposed including EPA Registration numbers, application rates, carriers and adjuvants;

(c) Herbicide application techniques and alternative control procedures proposed.

(d) The name, address and phone number of the company which will perform any herbicide treatment;

(e) Identification of target vegetation;

(f) The name, address and phone number of the individual representing the YOP applicant;

(g) Description of methods used to flag or otherwise designate sensitive areas on the right-of-way;
(h) Herbicide Fact Sheets as approved by the Department; and
(i) Procedures and locations for handling, mixing and loading of herbicide concentrates.

(3) Public Notice, Review and Comment.

(a) Upon submittal of the YOP for approval, the Department will publish a notice in the Environmental Monitor. Said notice shall be provided by the applicant and shall include the information on the municipalities through which the rights-of-way pass, a brief description of the intended program, and the procedure for public review and comment. The Department shall send notification of the publication to the applicant and the appropriate mailing list.
(b) Upon submittal of the YOP to the Department, the applicant shall provide by certified mail under separate cover to the Board of Health, Conservation Commission, chief elected municipal official, and where applicable, the Massachusetts Water Resources Authority and Massachusetts Department of Conservation and Recreation, a copy of the proposed YOP (or an Internet address where the proposed YOP may be viewed and a note that a hard copy will be provided promptly upon request) and the Environmental Monitor notice for the municipality or municipalities in which the herbicide treatment is proposed. Community water suppliers shall receive electronic information or a one page notification by mail which provides details about where to receive more information. The applicant shall maintain copies of the packet sent to municipalities and certified mail receipts. The applicant shall make copies of the packet, certified mail receipts, and any further correspondence regarding hard copies of YOPs in lieu of Internet viewing, available to the Department upon request.
(c) The Department shall allow a 45-day comment period on proposed YOPs, unless extended for good cause, commencing with the publication of the notice in the Environmental Monitor and receipt of the proposed YOP and Environmental Monitor notice by each municipality.
(d) The Department may approve, deny or modify YOPs after the 45-day comment period has expired.

(4) Disposition of YOP.

(a) The applicant shall submit the YOP to the Department at least 90 days prior to the proposed commencement of application to allow completion of the comment and review period.
(b) The Department shall review the YOP to ensure that the YOP is consistent with the approved VMP. Any inconsistencies or deficiencies will be noted by the Department and returned with the YOP to the applicant.

(c) Where practical, the Department shall approve or deny the YOP within 90 days of receipt. The Department will provide notice of the decision to the applicant, municipal agencies and commentators in writing.
(d) The approved YOP in conjunction with the VMP shall govern the application of herbicide for a period not to exceed 12 months in accordance with other laws and regulations of the State and Federal governments and impose such conditions as necessary to minimize the risk of adverse effects on human health and the environment.

(5) Time for Action. Non-action by the Department on a YOP within the time specified herein does not constitute approval of the submitted plan. In the event that the Department fails to notify the applicant of a decision within the time specified above and upon a written request from the applicant, the Commissioner must issue a finding within ten days of receipt stating the reason for the delay and providing an estimated completion date.

11.07: Public Notification

(1) At least 21 days in advance of application of herbicide to a right-of-way in any city or town, the applicant shall notify the Department, the board of health and the local public water supplier and, by registered mail, the mayor, city manager or chairman of the board of selectman, and the conservation commission in the municipality where the right-of-way lies. The notice shall include the following information: the approximate dates on which such herbicide application shall commence and conclude, provided however, that said application shall not commence more than ten days before nor conclude more than ten days after said approximate dates; the method and locations of application; a Department-approved Herbicide Fact Sheet on the active ingredient(s) of the herbicide(s) used; the EPA registration number(s) for the herbicide(s) used; the name, title, business address and phone number of the certified commercial applicator or licensed applicator, or the contractor, employer or employees responsible for carrying out the application. Where specific information required for this notice is already contained in the current YOP that is on file with the local official, the applicant may incorporate the appropriate pages of the YOP by reference in its notice to that official, indicating that these pages are also directly available from the applicant upon request.

(2) This public notice may run concurrently with the public notice and comment period in 333 CMR 11.06(3), provided that the notice is distributed at least 21 days prior to the herbicide application, and that, prior to the herbicide application, the public notice and comment period has closed and the Department has granted YOP approval without modifications. When the Department's final approval requires modifications or application dates are selected after YOP approval, separate notice under 333 CMR 11.07(a) is required.

(3) At least 48 hours prior to the application referred to in 11.07(a), the applicant must publish a conspicuous notice in at least one newspaper of general circulation in the city or town where the right-of-way lies. The notice must appear in the local section of the newspaper and measure at least four by five

inches in size. The notice shall contain the following information: the method and locations of pesticide application; the approximate dates on which the pesticide application shall commence and conclude, provided that the applications shall not commence more than ten days before nor conclude ten days after said approximate dates; a list of potential pesticides to be used; a description of the purpose of the application; and the name, title, business address and phone number of a designated contact person representing the applicant from whom any citizen may request further information. The notice should apply only to the calendar year in which the notice is published. Upon request the notice must be made available to the Department.

11.08: Notice of Modification and Revocation

(1) The Department may suspend approval of any VMP or YOP, by written notice to the applicant and applicator, halting the application of herbicide to that right-of-way of the above mentioned YOP. After 21 days if the applicant does not request a hearing, the Department may revoke or modify the VMP and YOP, if it finds:
   (a) that the terms, conditions of restrictions thereof, are being violated or are inadequate to avoid unreasonable adverse effects on the environment or on human health; or
   (b) that the applicant has made a false or misleading statement or has not provided information requested by the Department or Rights-of-Way Advisory Panel; or
   (c) that the applicant has violated any provision of the Massachusetts Pesticide Control Act or FIFRA, or any regulations, standards, orders or license issued under either.

(2) Upon notice of revocation or modification, the applicant may modify the YOP by written request to the Department. Applications to modify the YOP shall be submitted in the manner set forth in 333 CMR 11.06 and disposed of in the manner set forth in 333 CMR 11.06. The Department may waive all or part of the requirement if it determines that the proposed changes do not significantly change the terms of the approved YOP.

11.09: Rights of Appeal

Any person aggrieved by the decision of the Department to approve, deny, modify or revoke a VMP or YOP may request an adjudicatory hearing. The request for a hearing must be received by the Department within 21 calendar days after receipt of the decision. The request should state clearly and concisely the facts of the proceeding, the reasons the decision is alleged to be inconsistent with 333 CMR 11.00 and the relief sought by the adjudicatory hearing. The adjudicatory hearing before the Pesticide Board shall be conducted in accordance with the informal rules of adjudicatory proceeding as set forth in the regulations promulgated pursuant to M.G.L. c. 30A.

11.10: Penalties

Any person who violates any provision of 333 CMR 11.00 shall be subject to the criminal and civil penalties set forth in M.G.L. c. 132 B, § 14.

11.11: Rights-of-Way Advisory Panel

(1) A Rights-of-Way Advisory Panel shall be established to advise the Department on issues relating to 333 CMR 11.00 and to fulfill specific functions as detailed within 333 CMR 11.00.

(2) The Department shall request that the following members participate on the Rights-of-Way Advisory Panel: the Commissioners/Secretaries or his/her designee of the Department of Environmental Protection, the Department of Public Health, and the Executive Office of Transportation and Construction; and a representative of each of the following, all to be appointed by the Department Commissioner: the Massachusetts Association of Conservation Commissions, the Massachusetts Association of Health Boards, the Massachusetts Department of Conservation and Recreation, and an Environmental Advocacy Organization Representative, a member of the University of Massachusetts Extension who is well versed in weed science and Integrated Pest Management of weeds, a representative of the Massachusetts Railroad Association, a representative of a utility company, and a commercial pesticide applicator.

(3) Non-agency representatives shall remain on the panel for a term of five years. Any member absent from two or more consecutive meetings may be removed from the Advisory Panel at the discretion of the Commissioner of the Department, and a replacement requested from the representative agency, industry group, or association.

(4) The Advisory Panel shall meet at least once each year, and shall hold further meetings upon the request of the Department of Agricultural Resources or at the request of any two members of the Advisory Panel.

(5) All Advisory Panel members shall serve without compensation.

APPENDIX 2

RIGHTS-OF-WAY PROPOSED FOR TREATMENT IN 2025

ROW #	2025 Municipalities						
1207	North Attleborough	Plainville	Wrentham	Mansfield	Attleboro	Norton	
1251	Sterling	West Boylsto	Boylston	Shrewsbury	Grafton	Millbury	
1272	Methuen	Haverhill					
1335	Rowe						
1455	Winchendon	Ashburnham	Westminster	Fitchburg			
1457	Fitchburg	Leominster					
1479	Salem	Peabody	Lynn	Lynnfield	Wakefield		
1493	Southborough						
1605	Winchendon	Royalston	Warwick				
1607	Winchendon	Gardner	Westminster	Fitchburg	Leominster		
1609	Royalston	Athol					
1611	Winchendon	Templeton					
1613	Gardner						
1615	Westminster						
1645	West Brookfield	Ware	Palmer				
1647	East Longmeadow	Palmer	Wilbraham	Hampden	Monson		
1648	East Longmeadow						
2000	West Bridgewater	Bridgewater	Foxborough	Mansfield	Easton	Sharon	Walpole
2002	Bridgewater						
2032	Seekonk	Rehoboth	Swansea				
2034	Seekonk	Attleboro					
2036	North Attleborough	Attleboro					
4042	Avon	Brockton					
4054	East Bridgewater	Hanson					
4064	Hanover	Rockland					
4076	Norwell						
4078	Norwell	Scituate	Hingham	Cohasset			
4125	Marlborough						
4250	North Attleborough	Attleboro	Plainville				
4270	Mansfield	Attleboro	Norton				
4310	Plainville						
4330	Wrentham						
5110	Tewksbury						
5130	Groveland	Georgetown	Newbury	Newburyport			
5170	Haverhill	Methuen					
5280	Westford						
5282	Westford						
5290	Westford	Chelmsford					
5310	Billerica						
5320	Tyngsborough	Chelmsford					
6030	Rockport	Gloucester					
7320	Pepperell	Groton					
7420	Shirley	Groton	Ayer				
7520	Millbury	Sutton	Grafton				
7710	Wendell						
7810	Royalston	Templeton					
8030	Palmer	Monson					
8208	Northampton						
8370	Cheshire						
8380	Adams						
1108W1	Egremont	Sheffield					
607W1	Gardner						
607W2	Gardner						
607W3	Gardner	Winchendon					
911W57	Brockton						
69J1	Brockton						
2J1	Attleboro						
9L1	Attleboro						
IJ4	Attleboro						
115W42	Fall River						
1021W2	Adams	Cheshire					

APPENDIX 3

RIGHTS-OF-WAY TREATED IN 2024

ROW #	2024 Municipalities					
1205	Somerset	Swansea	Rehoboth	Dighton		
1231	Ayer	Littleton	Westford	Chelmsford	Tewksbury	Billerica
1245	North Reading	Reading	Lynnfield			
1271	Dracut	Methuen				
1332	Rowe	Heath	Colrain	Shelburne	Greenfield	Gill
1401	Adams	North Adams	Clarksburg			
1435	Adams	North Adams	Florida	Monroe		
1437	Florida	Rowe				
1443	Methuen					
1517	Tewksbury	Andover	Lawrence			
1519	Dracut					
1536	Monroe	Rowe				
1537	Greenfield	Montague				
1581	Seekonk	Swansea	Somerset			
1585	Seekonk	Attleboro				
1633	Spencer	Leicester	Auburn	Millbury		
1635	Florida	North Adams	Adams			
1671	Grafton	Millbury				
4003	Leominster	Sterling				
4008	Whitman	Abington	Brockton	Holbrook	Avon	Stoughton
4010	Brockton					
4011	West Bridgewater	Brockton	Whitman	Bridgewater		
4015	Stoughton	Easton	Brockton			
4018	Bridgewater	Raynham	Taunton	Berkley		
4019	West Bridgewater	Brockton				
4048	East Bridgewater	Brockton				
4050	East Bridgewater					
4062	East Bridgewater	Whitman				
4070	Hanover	Pembroke				
4072	Pembroke					
4440	Uxbridge	Mendon	Hopedale	Milford		
4450	Seekonk					
5160	Methuen					
5180	Haverhill					
5200	Haverhill	North Andover				
5270	Chelmsford	Lowell	Dracut			
5430	Tewksbury					
6011	Lynnfield					
6050	Swampscott	Salem				
6072	Melrose	Saugus				
7211	Sturbridge					

APPENDIX 4

LIST OF MUNICIPALITIES FOR NOTIFICATION IN 2025

(INCLUDES 2025 MUNICIPALITIES AND

2025 POTENTIAL “TOUCH UP” MUNICIPALITIES)

2025 Municipalities						
Adams	Cohasset	Groton	Methuen	Plainville	Shrewsbury	Wendell
Ashburnham	East Bridgewater	Groveland	Millbury	Rehoboth	Southborough	West Boylston
Athol	East Longmeadow	Hampden	Monson	Rockland	Sterling	West Bridgewater
Attleboro	Easton	Hanover	Newbury	Rockport	Sutton	West Brookfield
Avon	Egremont	Hanson	Newburyport	Rowe	Swansea	Westford
Ayer	Fall River	Haverhill	North Attleborough	Royalston	Templeton	Westminster
Billerica	Fitchburg	Hingham	Northampton	Salem	Tewksbury	Wilbraham
Boylston	Foxborough	Leominster	Norton	Scituate	Tyngsborough	Winchendon
Bridgewater	Gardner	Lynn	Norwell	Seekonk	Wakefield	Wrentham
Brockton	Georgetown	Lynnfield	Palmer	Sharon	Walpole	
Chelmsford	Gloucester	Mansfield	Peabody	Sheffield	Ware	
Cheshire	Grafton	Marlborough	Pepperell	Shirley	Warwick	

2024 "Touch Up" Municipalities						
Abington	Brockton	Grafton	Littleton	North Adams	Seekonk	Tewksbury
Adams	Chelmsford	Greenfield	Lowell	North Andover	Shelburne	Uxbridge
Andover	Clarksburg	Hanover	Lynnfield	North Reading	Somerset	West Bridgewater
Attleboro	Colrain	Haverhill	Melrose	Pembroke	Spencer	Westford
Auburn	Dighton	Heath	Mendon	Raynham	Sterling	Whitman
Avon	Dracut	Holbrook	Methuen	Reading	Stoughton	
Ayer	East Bridgewater	Hopedale	Milford	Rehoboth	Sturbridge	
Berkley	Easton	Lawrence	Millbury	Rowe	Swampscott	
Billerica	Florida	Leicester	Monroe	Salem	Swansea	
Bridgewater	Gill	Leominster	Montague	Saugus	Taunton	

APPENDIX 5

LIST OF COMMUNITY WATER SUPPLIERS

2025 MUNICIPALITIES

CITY/TOWN	PWS NAME	STREET ADDRESS	TOWN	STATE	ZIP
ADAMS	ADAMS FIRE DISTRICT	3 COLUMBIA ST	ADAMS	MA	01220
ADAMS	DCR MT GREYLOCK STATE RESERVATION	740 SOUTH STREET, PO BOX 1433	PITTSFIELD	MA	01202
ASHBURNHAM	ASHBURNHAM WATER DEPARTMENT	17 CENTRAL STREET	ASHBURNHAM	MA	01430
ASHBURNHAM	ASH/WIN JOINT WATER AUTHORITY	204 LAKE ROAD	ASHBURNHAM	MA	01430
ATHOL	ATHOL DPW WATER DIVISION	584 MAIN ST RM 24	ATHOL	MA	01331
ATTLEBORO	ATTLEBORO WATER DEPT	1296 WEST ST	ATTLEBORO	MA	02703
AVON	TOWN OF AVON	65 EAST MAIN STREET	AVON	MA	02322
AYER	AYER DPW WATER DIVISION	25 BROOK STREET	AYER	MA	01432
AYER	DEVENS MASSDEVELOPMENT	33 ANDREWS PKWY	DEVENS	MA	01434
BILLERICA	BILLERICA WATER WORKS	270 TREBLE COVE RD	BILLERICA	MA	01862
BOYLSTON	BOYLSTON WATER DISTRICT	74 MAIN ST	BOYLSTON	MA	01505
BRIDGEWATER	BRIDGEWATER WATER DEPARTMENT	25 SOUTH STREET	BRIDGEWATER	MA	02324
BRIDGEWATER	MCI BRIDGEWATER	50 MAPLE STREET	MILFORD	MA	01757
BROCKTON	BROCKTON WATER DEPARTMENT	45 SCHOOL ST	BROCKTON	MA	02301
CHELMSFORD	CHELMSFORD WATER DISTRICT	20 WATERSHED LN	CHELMSFORD	MA	01824
CHELMSFORD	EAST CHELMSFORD WATER DISTRICT	75 CANAL ST	CHELMSFORD	MA	01824
CHELMSFORD	NORTH CHELMSFORD WATER DIST	64 WASHINGTON ST	NORTH CHELMSFORD	MA	01863
CHESHIRE	CHESHIRE WATER DEPT	80 CHURCH ST	CHESHIRE	MA	01225
COHASSET	COHASSET WATER DEPT	339 KING ST	COHASSET	MA	02025
EAST BRIDGEWATE	EAST BRIDGEWATER WATER DEPT	49 DEAN PLACE	EAST BRIDGEWATER	MA	02333
EAST LONGMEADO	EAST LONGMEADOW DPW WATER DEPT	60 CENTER SQUARE	EAST LONGMEADOW	MA	01028
EASTON	EASTON WATER DIV	417 BAY RD	SOUTH EASTON	MA	02375
FITCHBURG	FITCHBURG DPW DIVISION OF WATER SUPPLY	1200 RINDGE ROAD	FITCHBURG	MA	01420
FOXBOROUGH	FOXBORO WATER DEPARTMENT	70 ELM STREET	FOXBOROUGH	MA	02035
GARDNER	GARDNER WATER DEPARTMENT	99 HEYWOOD ST	GARDNER	MA	01440
GARDNER	GARDNER MUNICIPAL GOLF COURSE	95 PLEASANT STREET	GARDNER	MA	01440
GEORGETOWN	GEORGETOWN WATER DEPARTMENT	1 MOULTON ST	GEORGETOWN	MA	01833
GLOUCESTER	GLOUCESTER PUBLIC UTILITY DIVISION	3 POND ROAD	GLOUCESTER	MA	01930
GRAFTON	GRAFTON WATER DISTRICT	44 MILLBURY ST. P.O. BOX 537	GRAFTON	MA	01519
GRAFTON	SOUTH GRAFTON WATER DISTRICT	370 PROVIDENCE ROAD	SOUTH GRAFTON	MA	01560
GROTON	GROTON WATER DEPARTMENT	173 MAIN ST	GROTON	MA	01450
GROTON	WEST GROTON WATER SUPPLY DISTRICT	305 TOWNSEND RD	GROTON	MA	01472
GROVELAND	GROVELAND WATER DEPARTMENT	23 SCHOOL STREET	GROVELAND	MA	01834
HAMPDEN	SCANTIC VALLEY WATER DISTRICT	625 MAIN ST, TOWN HOUSE	HAMPDEN	MA	01036
HANSON	HANSON WATER DEPARTMENT	1073 WEST WASHINGTON ST	HANSON	MA	02341
HAVERHILL	HAVERHILL WATER DEPT	131 AMESBURY ROAD	HAVERHILL	MA	01830
HINGHAM	WEIR RIVER WATER SYSTEM	25 BARE COVE PARK DRIVE	HINGHAM	MA	02043
LEOMINSTER	LEOMINSTER WATER DIVISION	109 GRAHAM ST	LEOMINSTER	MA	01453
LYNN	LYNN WATER AND SEWER COMM	390 PARKLAND AVE	LYNN	MA	01905
LYNNFIELD	LYNNFIELD CENTER WATER DISTRICT	83 PHILLIPS RD	LYNNFIELD	MA	01940
LYNNFIELD	LYNNFIELD WATER DIST. (MWRA)	842 SALEM ST	LYNNFIELD	MA	01940
MARLBOROUGH	MARLBOROUGH DPW WATER DIV. (MWRA)	135 NEIL STREET	MARLBOROUGH	MA	01752
METHUEN	METHUEN WATER DEPT	25 BURNHAM RD	METHUEN	MA	01844
MONSON	MONSON WATER AND SEWER DEPT	PO BOX 388	MONSON	MA	01057
NEWBURY	BYFIELD WATER DISTRICT	PO BOX 64	BYFIELD	MA	01922
NEWBURYPORT	NEWBURYPORT WATER DEPARTMENT	7 SPRING LN	NEWBURYPORT	MA	01950
NORTH ATTLEBOR	NORTH ATTLEBORO WATER DEPT	49 WHITING ST	NORTH ATTLEBOROUGH	MA	02760
NORTHAMPTON	NORTHAMPTON WATER DIVISION	125 LOCUST STREET	NORTHAMPTON	MA	01060
NORTON	NORTON WATER DEPARTMENT	P.O. BOX 1168	NORTON	MA	02766
NORWELL	NORWELL WATER DEPARTMENT	345 MAIN STREET	NORWELL	MA	02061
PALMER	PALMER WATER DISTRICT NO.1	10 WALNUT ST	PALMER	MA	01069
PALMER	THORNDIKE FIRE AND WATER DISTRICT	PO BOX 164	THORNDIKE	MA	01079
PALMER	BONDSVILLE FIRE AND WATER DISTRICT	PO BOX 179	BONDSVILLE	MA	01009
PALMER	THREE RIVERS FIRE DISTRICT	2031 MAIN ST PO BOX 182	THREE RIVERS	MA	01080
PEABODY	PEABODY WATER DEPT.	50 FARM AVE	PEABODY	MA	01960
PEPPERELL	PEPPERELL DPW WATER DIVISION	P.O. BOX 175	PEPPERELL	MA	01463
PLAINVILLE	PLAINVILLE WATER DEPARTMENT	P.O. BOX 1565	PLAINVILLE	MA	02762
ROCKPORT	ROCKPORT WATER DEPT	34 BROADWAY ST.	ROCKPORT	MA	01966
SALEM	SALEM WATER DEPARTMENT	98 WASHINGTON ST	SALEM	MA	01970
SALEM	Salem and Beverly Water Supply Board	50 Arlington Avenue	Beverly	MA	01915
SCITUATE	SCITUATE WATER DIVISION	4 OLD OAKEN BUCKET RD	SCITUATE	MA	02066
SEEKONK	SEEKONK WATER DISTRICT	P.O. BOX 97 50 WATER LANE	SEEKONK	MA	02771
SHARON	SHARON WATER DEPT	217 REAR SOUTH MAIN ST	SHARON	MA	02067
SHIRLEY	MCI SHIRLEY	50 MAPLE STREET	MILFORD	MA	01757
SHIRLEY	SHIRLEY WATER DISTRICT	124 AYER RD	SHIRLEY	MA	01464
SUTTON	MANCHAUG WATER DISTRICT OF SUTTON	P.O. BOX 173	MANCHAUG	MA	01526
SUTTON	WILKINSONVILLE WATER DISTRICT	P.O. BOX 173 13A PROVIDENCE ROAD	SUTTON	MA	01590
SWANSEA	SWANSEA WATER DISTRICT	700 WILBUR AVE	SWANSEA	MA	02777
TEMPLETON	TEMPLETON MUNIC. LIGHT AND WATER PLANT	P.O. BOX 20	BALDWINVILLE	MA	01436
TEWKSBURY	TEWKSBURY WATER DEPARTMENT	71 MERRIMACK DR	TEWKSBURY	MA	01876
TYNGSBOROUGH	TYNGSBOROUGH WATER DISTRICT	87 PROGRESS AVE UNIT 2 P O BOX 305	TYNGSBOROUGH	MA	01879
WAKEFIELD	WAKEFIELD WATER DEPT	1 LAFAYETTE ST	WAKEFIELD	MA	01880
WALPOLE	WALPOLE WATER DEPT	135 SCHOOL ST TOWN HALL	WALPOLE	MA	02081
WARE	WARE WATER DEPT	4 1/2 CHURCH ST P.O. BOX 89	WARE	MA	01082
WENHAM	WENHAM WATER DEPT.	91 GRAPEVINE RD	WENHAM	MA	01984
WEST BOYLSTON	WEST BOYLSTON WATER DISTRICT	183 WORCESTER ST	WEST BOYLSTON	MA	01583
WEST BRIDGEWAT	WEST BRIDGEWATER WATER DEPT	29 CYR ST	WEST BRIDGEWATER	MA	02379
WEST BROOKFIELD	WEST BROOKFIELD WATER DEPARTMENT	2 EAST MAIN ST P.O. BOX 9	WEST BROOKFIELD	MA	01585
WESTFORD	WESTFORD WATER DEPARTMENT	60 FORGE VILLAGE RD	WESTFORD	MA	01886
WESTMINSTER	WESTMINSTER DEPARTMENT OF PUBLIC WORKS	P.O. BOX 376	WESTMINSTER	MA	01473
WILBRAHAM	WILBRAHAM WATER DEPT (MWRA)	240 SPRINGFIELD ST	WILBRAHAM	MA	01095
WINCHENDON	WINCHENDON WATER DEPARTMENT	109 FRONT ST	WINCHENDON	MA	01475
WRENTHAM	WRENTHAM WATER DIVISION	P.O. BOX 658 360 TAUNTON STREET	WRENTHAM	MA	02093

APPENDIX 6

SENSITIVE AREAS: TABLE AND ILLUSTRATIONS OF LIMITED SPRAY AND NO SPRAY AREAS

CONTROL STRATEGIES FOR SENSITIVE AREAS[#]

Sensitive Area	No-Spray and Limited Spray Areas (feet)	Control Method	Restriction Code
Public Ground Water Supplies	400'	Mechanical Only	None
Primary Recharge Area	Designated buffer zone or 1/2 mile radius	Mechanical, Recommended Herbicides*	24 months
Public Surface Water Supplies (Class A & Class B)	100'	Mechanical Only	None
	100'-400'	Recommended Herbicides	24 months
Tributary to Class A Water Source, within 400' upstream of water source	100'	Mechanical Only	None
	100'-400'	Recommended Herbicides	24 months
Tributary to Class A Water Source, greater than 400' upstream of water source	10'	Mechanical Only	None
	10'-200'	Recommended Herbicides	24 months
Class B Drinking Water Intake, within 400' upstream of intake	100'	Mechanical Only	None
	100'-200'	Recommended Herbicides	24 months
Private Drinking Water Supplies	50'	Mechanical Only	None
	50'-100'	Recommended Herbicides	24 months
Surface Waters	10'	Mechanical Only	None
	10'-100'	Recommended Herbicides	12 months
Rivers	10' from mean annual high water line	Mechanical Only	None
	10'-200'	Recommended Herbicides	12 months
Wetlands	100' (treatment in wetlands permitted up to 10' of standing water)*[+]	Low-pressure Foliar, CST, Basal Recommended Herbicides	24 months
Inhabited Areas	100' (for high-pressure foliar only)	Recommended Herbicides	12 months
Agricultural Area (Crops, Fruits, Pastures)	100' (for high-pressure foliar only)	Recommended Herbicides	12 months
Certified Vernal Pools	10'	Mechanical Only when water is present	None
Certified Vernal Pool Habitat	10'-outer boundary of habitat	No treatment without written approval per 321 CMR 10.14(12)	
Priority Habitat	No treatment without written approval per 321 CMR 10.14(12)		

Restrictions "24 Months": A minimum of twenty-four months shall elapse between applications
"12 Months": A minimum of twelve months shall elapse between applications

*Massachusetts recommended herbicides for sensitive sites

[+]Per "Decision Concerning the Wetlands Impact Study"

[#]Table Compiled by Jeffrey M. Taylor, Vegetation Control Service, Inc.

Vegetation Control Strategies in Sensitive Areas

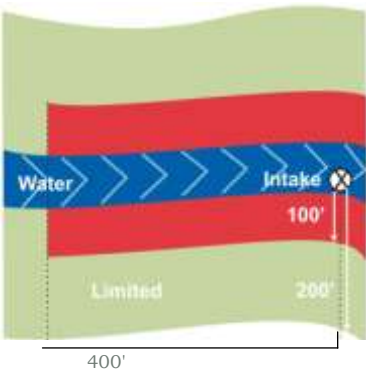
Required by 333 CMR 11.00 and/or approved Vegetation Management Program and Yearly Operational Plan.

Sensitive areas not readily identified in the field:

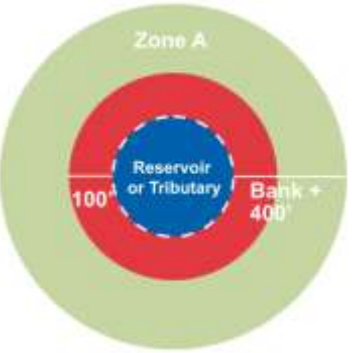
- Mapped on electronic USGS Topographic Maps.
- Contractor will be provided electronic and hard copy of maps with which to flag the boundaries of no-herbicide zones within the right-of-way (ROW) prior to herbicide application.

Public Ground Water Supply Well Zone I

Drinking Water Intake Class B



Public Surface Water Source Class A



Identified Private Drinking Water Well

Sensitive areas readily identifiable in the field:

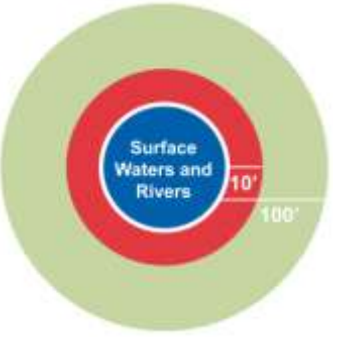
- Consult USGS Topographic Maps
- Contractor will be provided electronic and hard copy of maps with which to flag the boundaries of no-herbicide zones within the right-of-way (ROW) prior to herbicide application.
- Contractor will mark additional areas not found on maps

Wetlands

Defined by Chapter 131, Section 40

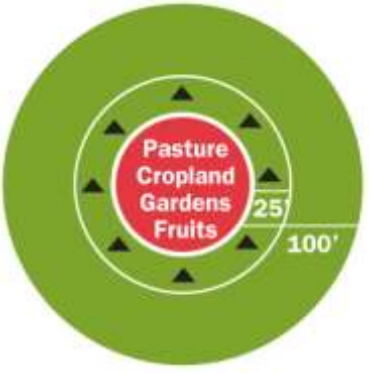
Surface Waters and Rivers

All surface water and water over wetlands. Mean high water for rivers.



Agricultural Areas

Active - Growing Season



Inactive Agricultural

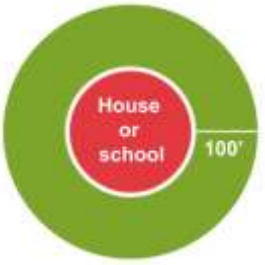
No Restrictions

Sensitive areas readily identifiable in the field: *continued*

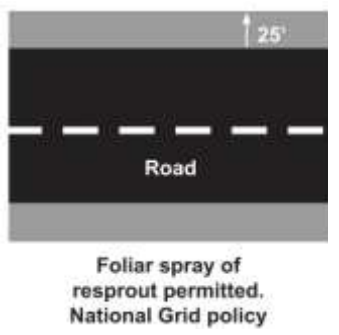
- Consult USGS Topographic Maps
- Contractor will be provided electronic and hard copy of maps with which to flag the boundaries of no-herbicide zones within the right-of-way (ROW) prior to herbicide application.
- Contractor will mark additional areas not found on maps

Inhabited Areas

Where people live, work, or gather



Road Crossings



Foliar spray of resprout permitted. National Grid policy

KEY

= No Herbicide Use

= Water

= Public Ground Water Supply Well or Private Well

= Limited Herbicide Use

1.) Herbicide recommended for use in sensitive area: per (333 CMR 11.04(1)(d)).

2.) Cut stump, basal and low pressure foliar.

3.) 24 months elapsed since previous treatment.
12 months elapsed since previous treatment.

4.) No herbicides applied to conifer species and carriers reviewed by DAR and DEP.

5.) Cut stump only.

6.) Cut stump and basal treatments. (Foliar application to resprouts is permitted.) No other conditions.

APPENDIX 7

LIST OF COMPATIBLE AND INCOMPATIBLE SPECIES

EXHIBIT A:

Incompatible Tall Growing Species

The following is a sample list of tall growing tree species that are considered incompatible in most right-of-way situations and MUST be removed from the right-of-way floor wherever practicable, to the extent permitted by landowner constraints and easement conditions. The primary objective of the Transmission Right-of-Way Management Program is to effectively remove and control the re-growth and reinvasion of these species.

Ash	Black Locust	Hickory	Sassafras
Autumn/Russian Olive	Black Walnut	Hophornbeam	Spruce
Balsam Fir	Butternut	Maple	Tamarack/Larch
Basswood	Catalpa	Oak	Tree-of-Heaven
Beech	Chestnut	Pear	Tulip/Yellow Poplar
Birch	Cucumber Tree	Pine	Willow
Cherry (Black, Choke, Domestic, Pin/Fire)	Elm	Poplar/Aspen	
Black Gum/Tupelo	Hemlock	Red Mulberry	

EXHIBIT B:

Border zone compatible species

The following is a list of small to medium trees that may be compatible along the edges of the right-of-way, except on narrower sub-transmission rights-of-way. They shall be removed within the wire zone except where the mature height would not invade the ATVM or local conditions do not warrant removal. Any plant on the right-of-way that invades the minimum clearance distance may be removed. These smaller tree species may be preferred for retention in buffer areas and other sensitive sites rather than taller growing tree species.

Apple	Cedars	Shadbush/Serviceberry	Witch Hazel
Buckthorn (Common, European)	American Hornbeam (Ironwood)	Shrub Willows	Shrub/Scrub Oak
Cedars	Hawthorne	Speckled Alder	
Dogwoods (Alternate leaf, Flowering, Kousa)	Mountain Maple	Staghorn Sumac	

EXHIBIT C:

Woody Shrubs

The following is a list of shrub species commonly found on rights-of-way across the service territory. While they are nearly always compatible in the border zone, several may grow tall enough to enter NGMVCD.

American Barberry	Gooseberry	New Jersey Tea	Sumac (Smooth, Winged)
Chokeberry (Black, Red)	Hazelnut (American, Beaked)	Northern Prickly Ash	Spicebush (Common)
Blueberry (low, Highbush)	Honeysuckle	Privet	Spirea (Sweetfern, Steeple Bush)
Button Bush	Huckleberry	Rose (Domestic, Multiflora)	Viburnum (Arrowwood, Highbush Cranberry, Mapleleaf, Nannyberry, Northern Wild Raisin, Hobblebush)
Dewberry	Juniper (Dwarf, Ground/Trailing)	Rubus (Blackberry, Raspberry)	Winterberry Holly
Dogwood (Red Osier, Stiff, Grey, Silky, Roundleaf)	Mountain Holly		American Yew
Elderberry	Mountain Laurel	Silverberry (American)	Vines (climbing)

Note that some of these species can be classified as either exotic or invasive. In addition, some of these species are noxious plants – particularly Multiflora Rose and Poison Sumac. In most situations management objectives within and adjacent to the right-of-way may warrant the removal or reduction of these species. Future discussions with State and Federal agencies to address invasive and exotic species on a landscape scale may require modifications of the current treatment course of action for some species.

APPENDIX 8

HERBICIDE LABELS

SPECIMEN LABEL

Krenite® S

Brush Control Agent

Water-Soluble Liquid

ACTIVE INGREDIENT:	BY WEIGHT
Ammonium salt of fosamine [ethyl hydrogen (aminocarbonyl) phosphonate]	41.5%
OTHER INGREDIENTS	58.5%
TOTAL	100.0%

Contains 4 Lbs. Active Ingredient per Gallon.

EPA Reg. No. 42750-247

KEEP OUT OF REACH OF CHILDREN

CAUTION

Si usted no entiende la etiqueta, busque a alguien para que se la explique a usted en detalle.
(If you do not understand the label, find someone to explain it to you in detail.)

FIRST AID

IF IN EYES:	• Hold eye open and rinse slowly and gently with water for 15-20 minutes. • Remove contact lenses, if present, after the first 5 minutes, then continue rinsing eye. • Call a poison control center or doctor for treatment advice.

Have the product container label with you when calling a poison control center or doctor, or going for treatment. You may also contact 1-800-424-9300 for medical emergencies involving this product.

See inside booklet for additional PRECAUTIONARY STATEMENTS.

Manufactured for:

ALBAUGH, INC.

1525 NE 36th Street
Ankeny, Iowa 50021

FOR CHEMICAL SPILL, LEAK, FIRE, OR EXPOSURE, CALL CHEMTREC (800) 424-9300

AD052510
PRODUCT OF CHINA

PRECAUTIONARY STATEMENTS

HAZARDS TO HUMANS AND DOMESTIC ANIMALS

CAUTION! Causes (moderate) eye injury (irritation). Avoid contact with eyes or clothing.

PERSONAL PROTECTIVE EQUIPMENT (PPE)

Applicators and other handlers must wear:

1. Long-sleeved shirt and long pants
2. Shoes plus socks

Follow manufacturer's instructions for cleaning/maintaining PPE. If no such instructions for washables, use detergent and hot water. Keep and wash PPE separately from other laundry.

USER SAFETY RECOMMENDATIONS

USERS SHOULD: Wash hands before eating, drinking, chewing gum, using tobacco or using the toilet.

ENVIRONMENTAL HAZARDS

Do not apply directly to water, or to areas where surface water is present, or to intertidal areas below the mean high water mark. Do not contaminate water by cleaning of equipment or disposal of equipment washwaters.

PRODUCT INFORMATION

KRENITE® S brush control agent is a water-soluble liquid to be diluted with water and applied as a foliar spray for control and/or suppression of many woody species.

KRENITE® S may be applied for use in pine plantations and non-crop sites, including highway rights-of-way, industrial sites, railroad rights-of-way, storage areas, utility and pipeline rights-of-way.

This product may be applied in pine plantations and non-crop sites that contain areas of temporary surface water caused by collection of water between planting beds, in equipment ruts, or in other depressions created by management activities. It is permissible to treat intermittent drainage, intermittently flooded low-lying sites, seasonally dry flood plains and transitional areas between upland and lowland sites when no water is present. It is also permissible to treat marshes, swamps and bogs after water has receded, as well as seasonally dry flood deltas. **DO NOT** make applications to natural or man-made bodies of water, such as lakes, reservoirs, ponds, streams and canals.

KRENITE® S is non-flammable and nonvolatile.

ENVIRONMENTAL CONDITIONS AND BIOLOGICAL ACTIVITY

A KRENITE® S spray directed to only part of susceptible brush species will provide control of the portion sprayed, resulting in a trimming effect. Treatment with KRENITE® S generally does not immediately affect deciduous woody plants; they retain normal foliage for the remainder of the growing season. Treated susceptible plants do not produce foliage or grow the following spring. Coniferous species treated with KRENITE® S generally displays visible symptoms following application.

Effectiveness may be reduced if, following treatment, rainfall occurs on the same day.

RESISTANCE

When herbicides that affect the same biological site of action are used repeatedly over several years to control the same weed species in the same field, naturally-occurring resistant biotypes may survive a correctly applied herbicide treatment, propagate, and become dominant in that field. Adequate control of these resistant weed biotypes cannot be expected. If weed control is unsatisfactory, it may be necessary to retreat the problem area using a product affecting a different site of action.

To better manage herbicide resistance through delaying the proliferation and possible dominance of herbicide resistant weed biotypes, it may be necessary to change cultural practices within and between crop seasons such as using a combination of tillage, retreatment, tank-mix partners and/or sequential herbicide applications that have a different site of action. Weed escapes that are allowed to go to seed will promote the spread of resistant biotypes.

It is advisable to keep accurate records of pesticides applied to individual fields to help obtain information on the spread and dispersal of resistant biotypes. Consult your agricultural dealer, consultant, applicator, and/or appropriate state agricultural extension service representative for specific alternative cultural practices or herbicide recommendations available in your area.

INTEGRATED PEST MANAGEMENT

This product may be used as part of an Integrated Pest Management (IPM) program that can include biological, cultural, and genetic practices aimed at preventing economic pest damage. IPM principles and practices include field scouting or other detection methods, correct target pest identification, population monitoring, and treating when target pest populations reach locally determined action thresholds. Consult your state cooperative extension service, professional consultants or other qualified authorities to determine appropriate action treatment threshold levels for treating specific pest/crop systems in your area.

TANK MIXES

KRENITE® S herbicide may be tank mixed with other herbicides and/or adjuvant registered for use in pine plantations and non-crop sites.

Follow all use directions, precautions, and restrictions on labels of tank-mixed products.

SPRAY EQUIPMENT

KRENITE® S may be applied using high volume or low volume ground sprayers as well as aircraft (helicopter only).

Application equipment must be calibrated before making applications of KRENITE® S.

SPRAY ADJUVANTS

A penetrating type oil-based adjuvant (surfactant or crop oil concentrate) may be used with KRENITE® S. The adjuvant should be mixed in the spray solution at a minimum concentration of 1/4% by volume (1 quart per 100 gallons of spray solution) or at the manufacturer's recommended dosage.

If foaming is a problem during mixing, an anti-foam agent may be added.

DIRECTIONS FOR USE

It is a violation of Federal law to use this product in a manner inconsistent with its labeling.

Do not apply this product in a way that will contact workers or other persons, either directly or through drift. Only protected handlers may be in the area during application. For any requirements specific to your State or Tribe, consult the agency responsible for pesticide regulation.

Do not apply this product through any type of irrigation system.

Do not use on food or feed crops.

KRENITE® S must be used only in accordance with the labeling, or in supplemental Albaugh, Inc. labeling.

AGRICULTURAL USES

AGRICULTURAL USE REQUIREMENTS

Use this product only in accordance with its labeling and with the Worker Protection Standard, 40 CFR Part 170. This Standard contains requirements for the protection of agricultural workers on farms, forests, nurseries, and greenhouses, and handlers of agricultural pesticides. It contains requirements for training, decontamination, notification, and emergency assistance. It also contains specific instructions and exceptions pertaining to the statements on this label about personal protective equipment (PPE) and restricted-entry interval. The requirements in this box only apply to uses of this product that are covered by the Worker Protection Standard.

Do not enter or allow worker entry into treated areas during the restricted-entry interval (REI) of 12 hours.

PPE required for early entry to treated areas that is permitted under the Worker Protection Standard and that involves contact with anything that has been treated, such as plants, soil, or water, is:

1. Coveralls
2. Shoes plus socks

PINE PLANTATIONS PREPARATION SITE

KRENITE® S may be applied for the post-harvest (pre-plant) control of undesirable pine and hardwood seedlings and saplings and suppression of brush and vines to aid site planting preparation for southern pines and/or genetically improved pines.

APPLICATION INFORMATION

Apply as a foliar spray from mid-summer to when the target tree pests begin defoliation in late summer or fall. Applications of KRENITE® S may be made by ground or air (helicopter only) equipment. Use sufficient water to ensure complete coverage of the vegetation, 20 to 50 gallons per acre by ground and 10 to 15 gallons per acre by air.

USE RATES AND PLANTS CONTROLLED

Pine Seedlings and Saplings

Apply 2 to 4 quarts of KRENITE® S per acre for the control of seedling and sapling pines when burning is allowed on the site.

Apply 4 to 6 quarts per acre of KRENITE® S to control seedling and sapling pines when burning is not allowed on the site.

Use the higher rate when either pine saplings predominate or when high infestations of seedling pines are in the area to be sprayed.

Combinations of Pine and Hardwood Seedlings and Saplings

To control a combination of pine and hardwood seedlings and saplings, apply a tank mixture of KRENITE® S at use rates indicated for spraying pine seedlings and saplings plus Imazapyr (4 pound active per gallon) at 8 to 20 ounces per acre. This tank mix may be applied for the control of Ash, Blackberry, Black gum, Black locust, Box elder, Cherry, Dogwood, Elms (winged, slippery), Oaks (red, white), Red maple, Sassafras, and Sourwood.

Follow all use directions, precautions and restrictions on Imazapyr product labels.

Brush and Vine Suppression

The application of KRENITE® S plus Imazapyr will also provide suppression of brush and vines, such as, American beautyberry (French mulberry), Baccharis (groundsel tree), Vaccinium (blueberry) species, Wax myrtle (bayberry) and Wild grape.

*Suppression – a visible reduction in plant population and/or plant vigor as compared to an untreated area and generally not accepted as control.

Do not apply more than 3 gallons of KRENITE® S per acre per year.

NON-AGRICULTURAL USES

NON-AGRICULTURAL USE REQUIREMENTS

The requirements in this box apply to uses of this product that are NOT within the scope of the Worker Protection Standard for agricultural pesticides (40 CFR Part 170). The WPS applies when this product is used to produce agricultural plants on farms, forests, nurseries, or greenhouses.

Do not enter or allow entry into treated areas until sprays have dried to perform hand tasks.

NON-CROP SITES

KRENITE® S may be applied for general weed control as follows: uncultivated non-agricultural areas (such as airports, highway, railroad and utility rights-of-way, sewage disposal areas); uncultivated agricultural areas (non-crop producing, which includes: farmyards, fuel storage areas, fence rows, barrier strips); industrial sites (outdoor, such as lumberyards, pipeline and tank farms).

APPLICATION INFORMATION

Make a foliar application of the recommended rate of KRENITE® S from full leaf expansion in the spring to the development of full canopy coloration in the fall for deciduous species to be controlled. Coniferous species, listed in the “USE RATES AND PLANTS CONTROLLED” chart below, may be treated at anytime during the growing season.

LOW- AND HIGH-VOLUME DIRECTED SPRAYS

Prepare either a low-volume or high-volume spray solution of KRENITE® S. For the low-volume directed spray application, do not exceed a spray concentration of 30% by volume. For the high-volume directed spray application, do not use a spray concentration of less than 1.5% by volume.

Prepare the desired volume of spray solution by mixing the amount of this product in water as shown in the Spray Solution Table. Apply a quantity of spray solution which will thoroughly and uniformly cover the target plant foliage (spray to wet for high-volume applications). Rate and volume per acre will depend on the plant species, the height and density of plant growth as well as the type of application equipment used. On tall or dense stands of brush it may be necessary to spray from opposite sides in order to obtain thorough coverage of the foliage. Use the higher rate range on stands where difficult-to-control species are dominant. See the “USE RATES AND PLANTS CONTROLLED” section of the label for use rates and a listing of **difficult-to-control species.

Do not apply more than 6 gallons of KRENITE® S per acre per year.

AERIAL and BROADCAST APPLICATIONS

Prepare a spray solution using 1-1/2 to 3 gallons of KRENITE® S in 10 to 40 gallons of water (see Spray Solution Table). For broadcast ground applications, use this product at the rate of 1.5 to 6 gallons per acre. Do not apply more than 6 gallons per acre when using ground equipment. For aerial applications, use this product at the rate of 1.5 to 3 gallons per acre. Do not apply more than 3 gallons of KRENITE® S per acre when using aerial equipment. Use sufficient spray volume to uniformly and thoroughly cover the foliage. Use the higher concentrations on stands in which difficult-to-control species are predominant (see "USE RATES AND PLANTS CONTROLLED" section for a listing of **difficult-to-control species).

SPRAY SOLUTION TABLE

Desired Volume	Amount of KRENITE® S						
	1.5%	2%	3%	4%	10%	20%	30%
5 Gal	**	**	**	0.8 qt	0.5 gal	1 gal	1.5 gal
10 Gal	0.6 qt	0.8 qt	1.2 qt	1.6 qt	1 gal	2 gal	3 gal
20 Gal	1.2 qt	1.6 qt	0.6 gal	0.8 gal	2 gal	4 gal	6 gal
30 Gal	0.45 gal	0.6 gal	0.9 gal	1.2 gal	3 gal	6 gal	**
40 Gal	0.6 gal	0.8 gal	1.2 gal	1.6 gal	4 gal	**	**
50 Gal	0.75 gal	1 gal	1.5 gal	2 gal	5 gal	**	**
100 Gal	1.5 gal	2 gal	3 gal	4 gal	**	**	**

USE RATES AND PLANTS CONTROLLED

KRENITE® S effectively controls or suppresses (**difficult-to-control listings) the following plants when applied at the use rates shown.

**Suppression – a visible reduction in plant population and/or plant vigor as compared to an untreated area and generally not accepted as control.

1-1/2 to 6 gal KRENITE® S per acre			
Alder, red	*Alnus rubra*	Oak, red	*Quercus rubra*
Ash, white	*Fraxinus Americana*	Oak, water	*Quercus arkansana*
Aspen, quaking	*Populus tremuloides*	Oak, white	*Quercus alba*
Birch	*Betula* sp.	Persimmon**	*Diospyros virginiana*
Blackberry	*Rubus* sp.	Pine, loblolly	*Pinus taeda*
Blackgum	*Nyssa sylvatica*	Pine, Virginia	*Pinus virginiana*
Cherry, black**	*Prunus serotina*	Poplar, yellow (tulip tree)**	*Liriodendron tulipifera*
Cherry, pin	*Prunus pensylvanica*	Salmonberry	*Rubus spectabilis*
Chokecherry, common**	*Prunus virginiana*	Sassafras**	*Sassafras sassafras*
Elm**	*Ulmus* sp.	Sourwood**	*Oxydendrum arboretum*
Fern, bracken	*Pteridium acquilinum*	Spurge, leafy***	*Euphoribia ésula*
Hawthorn**	*Crataegus* sp.	Sumac	*Rhus* sp.
Hickory**	*Carya* sp.	Sweetgum	*Liquidambar styraciflua*
Locust, black	*Robinia pseudoaccacia*	Tallow, Chinese	*Sapium Sebiferum*
Maple, bigleaf**	*Acer macrophyllum*	Thimbleberry	*Rubus parviflorus*
Maple, red**	*Acer rubrum*	Willow**	*Salix* sp.
Maple, vine	*Acer circinatum*		

2 to 6 gal KRENITE® S per acre			
Basswood, American**	*Tilia Americana*	Grape, wild	*Vitis* sp.
Bindweed, field***	*Convolvulus arvensis*	Pine, Eastern white	*Pinus strobes*
Cottonwood, Eastern	*Populus deltoids*	Plum, wild	*Prunus munsoniana*
Elder, American	*Sambucus canadenis*	Rose, multiflora	*Rosa multiflora*
Elm, slippery	*Ulmus rubra*	Sycamore	*Platanus occidentalis*
Elm, winged**	*Ulmus alata*	Tree-of-heaven	*Ailanthus altissima*

**Difficult-to-control or Suppression
Suppression – A visible reduction in plant population and/or plant vigor as compared to an untreated area and generally not accepted as control.

***Make applications after plants begin to bloom.

TANK MIXTURES

KRENITE® S plus ESCORT XP

KRENITE® S plus ESCORT XP may be applied for the control of Eastern red cedar and improved control of Ailanthus (tree of heaven), Ash, Cherry, Elm and Red maple.

Apply 1.5 to 3 gallons of KRENITE® S plus 1 to 2 ounces of ESCORT XP per acre. Apply a quantity of spray solution that will thoroughly and uniformly cover the target brush/trees without causing unnecessary run-off (spray to wet). If the site contains difficult-to-control species (see ** in "USE RATES AND PLANTS CONTROLLED" section), use the higher rates of both KRENITE® S and ESCORT XP.

Follow the use directions, precautions and restrictions on the ESCORT XP label.

KRENITE® S plus imazapyr

KRENITE® S plus imazapyr herbicide (2 pounds active ingredient per gallon) may be applied for the control of Box elder, Hackberry, Persimmon, Wild pecan and Dogwood and for improved control of Ash, Black Cherry, Elm, Maple, Sassafras and Willow.

Apply 1.5 to 3 gallons of KRENITE® S plus 8 to 20 ounces of imazapyr per acre. Apply a quantity of the spray solution that will thoroughly and uniformly cover the target brush without causing unnecessary run-off (spray to wet). If the site contains difficult-to-control species (see ** in "USE RATES AND PLANTS CONTROLLED" section), use the higher rates of both KRENITE® S and imazapyr.

Follow the use directions, precautions and restrictions on the Imazapyr label.

KRENITE® S plus picloram

KRENITE® S plus picloram (2 pound active per gallon) herbicide may be applied for the control of Hackberry, Persimmon, and Walnut for improved control of Cherry, Elm, Hickory, Locust, Oak, Poplar, Sassafras, Sumac, and Sweet gum.

Apply 1.5 to 3 gallons of KRENITE® S plus 1 to 2 pints of picloram per acre. Apply a quantity of the spray solution that will thoroughly and uniformly cover the target brush without causing unnecessary run-off (spray to wet). If the site contains difficult-to-control species (see ** in "USE RATES AND PLANTS CONTROLLED" section), use the higher rates of both KRENITE® S and picloram.

Follow the use directions, precautions and restrictions on the picloram label.

SIDE TRIMMING

For control of only a portion of a plant, direct the spray solution to thoroughly cover (spray to wet) only the portion of the plant to be controlled.

Do not apply more than 6 gallons of KRENITE® S per acre when side trimming.

CUT SURFACE APPLICATIONS

KRENITE® S may be used for controlling the re-sprouting of cut stumps of the plants listed in the "USE RATES AND PLANTS CONTROLLED" section. Control of re-sprouting in plants listed as "difficult to control" may not be as effective.

KRENITE® S may either be used undiluted or mixed with water. Use the method that is best suited for the particular application equipment. When mixing with water a ratio of no less than 1 part KRENITE® S to 1 part water on a volume basis must be used. Apply the undiluted or mixed solution to wet the area adjacent to the cambium and bark around the entire circumference and the sides of the cut stumps. The sides of the stumps should be wet down to the root collar area.

Apply with appropriate application equipment using low spray pressure. Applications can be made any time of the year, except during periods of heavy sap flow in the spring. Applications should be made soon after cutting, before the stump surface forms a layer of callous tissue (hardens off).

To prevent freezing of the spray solution, add ethylene glycol (commercial antifreeze) to the water used in preparing the spray solution. Add the antifreeze according to the manufacturer's label for preventing freezing of water at the lowest expected ambient temperature. KRENITE® S will freeze at -11°F. A 1:1 aqueous dilution of KRENITE® S will freeze at 21°F.

A spray pattern indicator may be used in the spray solution to facilitate application. The user should check the compatibility of the spray indicator with the spray solution prior to using large quantities.

ADDITIONAL USE INSTRUCTIONS – PINE PLANTATIONS AND NON-CROP SITES

MIXING INSTRUCTIONS

1. Fill spray tank 1/2 full of water.
2. With the agitator running, add the desired amount of KRENITE® S.
3. If using a tank mix partner, add the recommended amount. Follow the use precautions and directions on the tank mix partner label.
4. Add spray adjuvant as last ingredient prior to filling the spray tank with water.
5. Agitate the spray solution thoroughly.

After KRENITE® S has been thoroughly mixed in the spray tank, agitation of the spray solution is not required.

SPRAY CLEAN-UP

Thoroughly clean all mixing and spray equipment immediately following applications of KRENITE® S. Flush tank, pump, hoses and boom with several changes of water after removing the nozzle tips and screens (clean these parts separately).

Dispose of the rinsate on a labeled site or at an approved waste disposal facility.

SPRAY DRIFT MANAGEMENT

The interaction of many equipment- and weather-related factors determines the potential for spray drift. The applicator is responsible for considering all of these factors when making applications.

AVOIDING SPRAY DRIFT IS THE RESPONSIBILITY OF THE APPLICATOR.

IMPORTANCE OF DROPLET SIZE

The most effective way to reduce drift potential is to apply large droplets (>150–200 microns). The best drift management strategy is to apply the largest droplets that provide sufficient coverage and control. The presence of sensitive species nearby, the environmental conditions, and pest pressure may affect how an applicator balances drift control and coverage.

APPLYING LARGER DROPLETS REDUCES DRIFT POTENTIAL, BUT WILL NOT PREVENT DRIFT IF APPLICATIONS ARE MADE IMPROPERLY OR UNDER UNFAVORABLE ENVIRONMENTAL CONDITIONS!

See “Wind”, “Temperature and Humidity”, and “Temperature Inversions” sections of this label.

CONTROLLING DROPLET SIZE – GENERAL TECHNIQUES

- Volume – Use high flow rate nozzles to apply the highest practical spray volume. Nozzles with higher rated flows produce larger droplets.
- Pressure – Use the lower spray pressures recommended for the nozzle. Higher pressure reduces droplet size and does not improve canopy penetration. WHEN HIGHER FLOW RATES ARE NEEDED, USE A HIGHER CAPACITY NOZZLE INSTEAD OF INCREASING PRESSURE.
- Nozzle Type – Use a nozzle type that is designed for the intended application. With most nozzle types, narrower spray angles produce larger droplets. Consider using low-drift nozzles.

CONTROLLING DROPLET SIZE – AIRCRAFT (HELICOPTER)

- Number of Nozzles – Use the minimum number of nozzles with the highest flow rate that provide uniform coverage.
- Nozzle Orientation – Orienting nozzles so that the spray is emitted backwards, parallel to the airstream will produce larger droplets than other orientations.
- Nozzle Type – Solid stream nozzles (such as disc and core with swirl plate removed) oriented straight back produce larger droplets than other nozzle types.

BOOM LENGTH AND HEIGHT

- Boom Length (helicopter) – For helicopters use a boom length and position that prevents droplets from entering the rotor vortices.
- Boom Height (helicopter) – Application more than 10 feet above the canopy increases the potential for spray drift.
- Boom Height (ground) – Setting the boom at the lowest height which provides uniform coverage reduces the exposure of droplets to evaporation and wind. The boom should remain level with the crop and have minimal bounce.

WIND

Drift potential increases at wind speeds of less than 3 mph (due to inversion potential) or more than 10 mph. However, many factors, including droplet size and equipment type determine drift potential at any given wind speed. AVOID GUSTY OR WINDLESS CONDITIONS.

Note: Local terrain can influence wind patterns. Every applicator should be familiar with local wind patterns and how they affect spray drift.

TEMPERATURE AND HUMIDITY

When making applications in hot and dry conditions, set up equipment to produce larger droplets to reduce effects of evaporation.

TEMPERATURE INVERSIONS

Drift potential is high during a temperature inversion. Temperature inversions restrict vertical air mixing, which causes small suspended droplets to remain close to the ground and move laterally in a concentrated cloud. Temperature inversions are characterized by increasing temperature with altitude and are common on nights with limited cloud cover and light to no wind. They begin to form as the sun sets and often continue into the morning. Their presence can be indicated by ground fog; however, if fog is not present, inversions can also be identified by the movement of smoke from a ground source or an aircraft smoke generator. Smoke that layers in a concentrated cloud (under low wind conditions) indicates an inversion, while smoke that moves upward and rapidly dissipates indicates good vertical air mixing.

SHIELDED SPRAYERS

Shielding the boom or individual nozzles can reduce the effects of wind. However, it is the responsibility of the applicator to verify that the shields are preventing drift and not interfering with uniform deposition of the product.

IMPORTANT PRECAUTIONS – PINE PLANTATIONS AND NON-CROP SITES

- Cutting of treated stems of brush before they are completely dead may result in sprouting.
- Do not use for the control of woody plants on lawns, walks, driveways, tennis courts or similar areas.
- Drift or spray mist contact with desirable trees, shrubs, or other plants may result in injury.
- Not registered for sale or use in California or Arizona.

STORAGE AND DISPOSAL

Do not contaminate water, food or feed by storage or disposal.

PESTICIDE STORAGE: Do not store below 10°F. Store product in original container only. Store in a cool, dry place.

PESTICIDE DISPOSAL: Waste resulting from the use of this product may be disposed of on site or at an approved waste disposal facility.

CONTAINER HANDLING: Refer to the Net Contents section of this product's labeling for the applicable "Nonrefillable Container" or "Refillable Container" designation.

Nonrefillable Rigid Plastic and Metal Containers (Capacity Equal to or Less Than 5 Gallons):
Nonrefillable container. Do not reuse or refill this container. Triple rinse container (or equivalent) promptly after emptying.

Triple rinse as follows: Empty the remaining contents into application equipment or a mix tank and drain for 10 seconds after the flow begins to drip. Fill the container 1/4 full with water and recap. Shake for 10 seconds. Pour rinsate into application equipment or a mix tank or store rinsate for later use or disposal. Drain for 10 seconds after the flow begins to drip. Repeat this procedure two more times. Then, for Plastic Containers, offer for recycling if available or puncture and dispose of in a sanitary landfill, or by incineration. Do not burn, unless allowed by state and local ordinances. For Metal Containers, offer for recycling, if available, or reconditioning, if appropriate, or puncture and dispose of in a sanitary landfill, or by other procedures approved by state and local authorities.

Nonrefillable Rigid Plastic and Metal Containers (Capacity Greater Than 5 Gallons):
Nonrefillable container. Do not reuse or refill this container. Triple rinse container (or equivalent) promptly after emptying.

Triple rinse as follows: Empty the remaining contents into application equipment or a mix tank. Fill the container 1/4 full with water. Replace and tighten closures. Tip container on its side and roll it back and forth, ensuring at least one complete revolution, for 30 seconds. Stand the container on its end and tip it back and forth several times. Turn the container over onto its other end and tip it back and forth several times. Empty the rinsate into application equipment or a mix tank or store rinsate for later use or disposal. Repeat this procedure two more times. Then, for Plastic Containers, offer for recycling, if available, or puncture and dispose of in a sanitary landfill, or by incineration. Do not burn, unless allowed by state and local ordinances.

For Metal Containers, offer for recycling, if available, or reconditioning, if appropriate, or puncture and dispose of in a sanitary landfill, or by other procedures approved by state and local authorities.

Nonrefillable Rigid Plastic and Metal Containers, e.g., Intermediate Bulk Containers (IBC) [Size or Shape Too Large to be Tipped, Rolled or Turned Upside Down]:
Nonrefillable container. Do not reuse or refill this container. Clean container promptly after emptying the contents from this container into application equipment or mix tank and before final disposal using the following pressure rinsing procedure. Insert a lance fitted with a suitable tank cleaning nozzle into the container and ensure that the water spray thoroughly covers the top, bottom and all sides inside the container. The nozzle manufacturer generally provides instructions for the appropriate spray pressure, spray duration and/or spray volume. If the manufacturer's instructions are not available, pressure rinse the container for at least 60 seconds using a minimum pressure of 30 PSI with a minimum rinse volume of 10% of the container volume. Drain, pour or pump rinsate into application equipment or rinsate collection system. Repeat this pressure rinsing procedure two more times. Then, for Plastic Containers, offer for recycling, if available, or puncture and dispose of in a sanitary landfill, or by incineration. For Metal Containers, offer for recycling, if available, or reconditioning if appropriate, or puncture and dispose of in a sanitary landfill, or by other procedures approved by state and local authorities.

All Refillable Containers:
Refillable container.
Refilling Container: Refill this container with KRENITE® S containing ammonium salt of fosamine only. Do not reuse this container for any other purpose. Cleaning before refilling is the responsibility of the refiller. Prior to refilling, inspect carefully for damage such as cracks, punctures, abrasions, worn out threads and closure devices. If damage is found, do not use container, contact Albaugh, Inc. at the number below for instructions. Check for leaks after refilling and before transporting. If leaks are found, do not reuse or transport container; contact Albaugh, Inc. at the number below for instructions.

Disposing of Container: Do not reuse this container for any other purpose other than refilling (see proceeding). Cleaning the container before final disposal is the responsibility of the person disposing of the container. To clean the container before final disposal, use the following pressure rinsing procedure. Insert a lance fitted with a suitable tank cleaning nozzle into the container and ensure that the water spray thoroughly covers the top, bottom and all sides inside the container. The nozzle manufacturer generally provides instructions for the appropriate spray pressure, spray duration and/or spray volume. If the manufacturer's instructions are not available, pressure rinse the container for at least 60 seconds using a minimum pressure of 30 PSI with a minimum rinse volume of 10% of the container volume. Drain, pour or pump rinsate into application equipment or rinsate collection system. Repeat this pressure rinsing procedure two more times. Then, for Plastic Containers, offer for recycling, if available, or puncture and dispose of in a sanitary landfill, or by incineration. Do not burn, unless allowed by state and local ordinances. For Metal Containers, offer for recycling, if available, or reconditioning if appropriate, or puncture and dispose of in a sanitary landfill, or by other procedures approved by state and local authorities.

Do not transport if container is damaged or leaking. If the container is damaged, leaking or obsolete, or in the event of a major spill, fire or other emergency, contact Albaugh, Inc. at 1-800-424-9300, day or night.

NOTICE TO BUYER: Purchase of this material does not confer any rights under patents of countries outside of the United States.

LIMITATION OF WARRANTY AND LIABILITY

NOTICE: Read This Limitation of Warranty and Liability Before Buying or Using This Product. If the Terms Are Not Acceptable, Return the Product at Once, Unopened, and the Purchase Price Will Be Refunded.

It is impossible to eliminate all risks associated with the use of this product. Such risks arise from weather conditions, soil factors, off-target movement, unconventional fanning techniques, presence of other materials, the manner of use or application, or other unknown factors, all of which are beyond the control of Albaugh, Inc. These risks can cause: ineffectiveness of the product; crop injury, or; injury to non-target crops or plants.

Albaugh, Inc. does not agree to be an insurer of these risks. **TO THE EXTENT CONSISTENT WITH APPLICABLE LAW, WHEN YOU BUY OR USE THIS PRODUCT, YOU AGREE TO ACCEPT THESE RISKS.**

Albaugh, Inc. warrants that this product conforms to the chemical description on the label thereof and is reasonably fit for the purpose stated in the Directions for Use, subject to the inherent risks described above, when used in accordance with the Directions for Use under normal conditions.

ALBAUGH, INC. MAKES NO OTHER EXPRESS OR IMPLIED WARRANTY OF FITNESS OR OF MERCHANTABILITY OR ANY OTHER EXPRESS OR IMPLIED WARRANTY.

TO THE FULLEST EXTENT PERMITTED BY LAW, IN NO EVENT SHALL ALBAUGH, INC. OR SELLER BE LIABLE FOR ANY INCIDENTAL, CONSEQUENTIAL OR SPECIAL DAMAGES RESULTING FROM THE USE OR HANDLING OF THIS PRODUCT. BUYER'S OR USER'S BARGAINED-FOR EXPECTATION IS CROP PROTECTION. TO THE EXTENT CONSISTENT WITH APPLICABLE LAW THE EXCLUSIVE REMEDY OF THE USER OR BUYER AND THE EXCLUSIVE LIABILITY OF ALBAUGH, INC. OR SELLER, FOR ANY AND ALL CLAIMS, LOSSES, INJURIES OR DAMAGES (INCLUDING CLAIMS BASED ON BREACH OF WARRANTY OR CONTRACT, NEGLIGENCE, TORT OR STRICT LIABILITY), WHETHER FROM FAILURE TO PERFORM OR INJURY TO CROPS OR OTHER PLANTS, AND RESULTING FROM THE USE OR HANDLING OF THIS PRODUCT, SHALL BE THE RETURN OF THE PURCHASE PRICE OF THE PRODUCT, OR AT THE ELECTION OF ALBAUGH, INC. OR SELLER, THE REPLACEMENT OF THE PRODUCT.

Albaugh, Inc. or its Ag Retailer must have prompt notice of any claim so that an immediate inspection of buyer's or user's growing crops can be made. Buyer and all users shall promptly notify Albaugh, Inc. or an Albaugh, Inc. Ag Retailer of any claims, whether based on contract, negligence, strict liability, other tort or otherwise or be barred from any remedy.

This Limitation of Warranty and Liability may not be amended by any oral or written agreement.

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ESCORT® is a registered trademark of E.I. DuPont de Nemours and Company.

SAFETY DATA SHEET

Revision date 18-Feb-2021 **Revision Number** 1

1. Identification

Product identifier

Product Name Krenite S

Other means of identification

Product Code(s) 42750-247

Synonyms None

EPA Registration Number(s) 42750-247

Recommended use of the chemical and restrictions on use

Recommended use Herbicide

Restrictions on use Follow label instructions

Details of the supplier of the safety data sheet

Company Address
ALBAUGH LLC
1525 NE 36th St,
Ankeny, IA 50211

Emergency telephone number

For Chemical Emergency Spill, Leak, Fire, Exposure, or Accident Call
CHEMTREC Day or Night

- Within USA and Canada: 1-800-424-9300
- Outside USA and Canada: +1 703-741-5970 (collect calls accepted)

This product is an EPA FIFRA registered pesticide. Some classifications on this SDS are not the same as the FIFRA label. Certain sections of this SDS are superseded by federal law governed by US EPA for a registered pesticide. Please see Section 15. REGULATORY INFORMATION for explanation.

2. Hazard(s) identification

Classification

Acute toxicity - Oral	Category 4
Acute toxicity - Inhalation (Dusts/Mists)	Category 4
Serious eye damage/eye irritation	Category 2B

Hazards not otherwise classified (HNOC)
Not applicable

Label elements

Warning

Hazard statements
Harmful if swallowed
Harmful if inhaled
Causes eye irritation

Appearance No information available **Physical state** Liquid **Odor** Strong

Precautionary Statements - Prevention
Wash face, hands and any exposed skin thoroughly after handling
Do not eat, drink or smoke when using this product
Avoid breathing dust/fume/gas/mist/vapors/spray
Use only outdoors or in a well-ventilated area

Precautionary Statements - Response

IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing
If eye irritation persists: Get medical advice/attention
IF INHALED: Remove person to fresh air and keep comfortable for breathing
Call a POISON CENTER or doctor if you feel unwell
IF SWALLOWED: Call a POISON CENTER or doctor if you feel unwell
Rinse mouth

Precautionary Statements - Disposal
Dispose of contents/container to an approved waste disposal plant

Other information
Causes mild skin irritation.

3. Composition/information on ingredients

Substance

Not applicable.

Mixture

The product contains no substances which at their given concentration, are considered to be hazardous to health

Chemical name	CAS No	Weight-%	Trade secret	Active Ingredient
Ammonium Salt of Fosamine	25954-13-6	40.3-42.8	*	X
Ethanol	64-17-5	0-0.1	*	
Methanol	67-56-1	0-0.1	*	
Other Ingredients	PROPRIETARY	>60	*	

If CAS number is "proprietary", the specific chemical identity and percentage of composition has been withheld as a trade secret.

4. First-aid measures

Description of first aid measures

General advice	Show this safety data sheet to the doctor in attendance.
Inhalation	Remove to fresh air. If symptoms persist, call a physician. If breathing has stopped, give artificial respiration. Get medical attention immediately.
Eye contact	Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes. Keep eye wide open while rinsing. Get medical attention if irritation develops and persists. Remove contact lenses, if present and easy to do. Continue rinsing.
Skin contact	Wash skin with soap and water.
Ingestion	Do NOT induce vomiting. Clean mouth with water and drink afterwards plenty of water. Never give anything by mouth to an unconscious person. Get medical attention.
Self-protection of the first aider	Ensure that medical personnel are aware of the material(s) involved, take precautions to protect themselves and prevent spread of contamination. Avoid breathing vapors or mists. Use personal protective equipment as required. See section 8 for more information.

Most important symptoms and effects, both acute and delayed

Symptoms	Prolonged contact may cause redness and irritation. Coughing and/ or wheezing. Difficulty in breathing.

Indication of any immediate medical attention and special treatment needed

Note to physicians	Treat symptomatically.

5. Fire-fighting measures

Suitable Extinguishing Media	Use extinguishing measures that are appropriate to local circumstances and the surrounding environment.
Large Fire	CAUTION: Use of water spray when fighting fire may be inefficient.
Unsuitable extinguishing media	Do not scatter spilled material with high pressure water streams.
Specific hazards arising from the chemical	No information available.

Explosion data

Sensitivity to mechanical impact	None.
Sensitivity to static discharge	None.
Special protective equipment for fire-fighters	Firefighters should wear self-contained breathing apparatus and full firefighting turnout gear. Use personal protection equipment.

6. Accidental release measures

Personal precautions, protective equipment and emergency procedures

Personal precautions	Avoid contact with skin, eyes or clothing. Use personal protective equipment as required. Ensure adequate ventilation. Avoid breathing vapors or mists.
Other information	Refer to protective measures listed in Sections 7 and 8.

Methods and material for containment and cleaning up

Methods for containment Prevent further leakage or spillage if safe to do so.

Methods for cleaning up Pick up and transfer to properly labeled containers.

7. Handling and storage

Precautions for safe handling

Advice on safe handling Handle in accordance with good industrial hygiene and safety practice. Avoid breathing vapors or mists. Ensure adequate ventilation. In case of insufficient ventilation, wear suitable respiratory equipment. Do not eat, drink or smoke when using this product.

Conditions for safe storage, including any incompatibilities

Storage Conditions Keep containers tightly closed in a dry, cool and well-ventilated place. Keep out of the reach of children.

8. Exposure controls/personal protection

Control parameters

Exposure Limits This product, as supplied, does not contain any hazardous materials with occupational exposure limits established by the region specific regulatory bodies.

Chemical name	ACGIH TLV	OSHA PEL	NIOSH
Ethanol 64-17-5	STEL: 1000 ppm	TWA: 1000 ppm TWA: 1900 mg/m^3 (vacated) TWA: 1000 ppm (vacated) TWA: 1900 mg/m^3	IDLH: 3300 ppm TWA: 1000 ppm TWA: 1900 mg/m^3
Methanol 67-56-1	STEL: 250 ppm TWA: 200 ppm S*	TWA: 200 ppm TWA: 260 mg/m^3 (vacated) TWA: 200 ppm (vacated) TWA: 260 mg/m^3 (vacated) STEL: 250 ppm (vacated) STEL: 325 mg/m^3 (vacated) S*	IDLH: 6000 ppm TWA: 200 ppm TWA: 260 mg/m^3 STEL: 250 ppm STEL: 325 mg/m^3

Biological occupational exposure limits
This product, as supplied, does not contain any hazardous materials with biological limits established by the region specific regulatory bodies

Chemical name	ACGIH
Methanol 67-56-1	15 mg/L - urine (Methanol) - end of shift

Appropriate engineering controls

Engineering controls Showers
Eyewash stations
Ventilation systems.

Individual protection measures, such as personal protective equipment

Eye/face protection None required for consumer use. Wear safety glasses with side shields (or goggles).

Hand protection	Wear suitable gloves.
Skin and body protection	Wear suitable protective clothing.
Respiratory protection	No protective equipment is needed under normal use conditions. If exposure limits are exceeded or irritation is experienced, ventilation and evacuation may be required.
General hygiene considerations	Avoid contact with skin, eyes or clothing. Do not eat, drink or smoke when using this product.

9. Physical and chemical properties

Information on basic physical and chemical properties

Physical state	Liquid
Appearance	No information available
Color	colorless
Odor	Strong
Odor threshold	No information available

Property	**Values**	**Remarks • Method**
pH	5.2 6.2	@ 20 °C
Melting point / freezing point	No data available	
Boiling point / boiling range	No data available	
Flash point	No data available	
Evaporation rate	No data available	
Flammability (solid, gas)	No data available	
Flammability Limit in Air		
Upper flammability or explosive limits	No data available	
Lower flammability or explosive limits	No data available	
Vapor pressure	0.53 mPa (25C) (Fosamine Ammonium)	
Vapor density	No data available	
Relative density	No data available	
Water solubility	Immiscible in water	
Solubility(ies)	No data available	
Partition coefficient	log Pow=-2.9 (25C) (Fosamine Ammonium)	
Autoignition temperature	No data available	
Decomposition temperature		
Kinematic viscosity	6.0 mPa (20C) 2.8 mPa (40C)	
Dynamic viscosity	No data available	

Other information

Explosive properties	No information available
Oxidizing properties	No information available
Softening point	No information available
Molecular weight	No information available
VOC Content (%)	No information available
Liquid Density	1.15-1.19
Bulk density	No information available

10. Stability and reactivity

Reactivity	No information available.
Chemical stability	Stable under normal conditions.

Possibility of hazardous reactions None under normal processing.

Conditions to avoid Excessive heat.

Incompatible materials None known based on information supplied.

Hazardous decomposition products None known based on information supplied.

11. Toxicological information

Information on likely routes of exposure

Product Information

Inhalation Specific test data for the substance or mixture is not available. Harmful by inhalation. (based on components).

Eye contact Specific test data for the substance or mixture is not available. Causes eye irritation. May cause redness, itching, and pain.

Skin contact Specific test data for the substance or mixture is not available. Causes mild skin irritation.

Ingestion Specific test data for the substance or mixture is not available. Harmful if swallowed. (based on components).

Symptoms related to the physical, chemical and toxicological characteristics

Symptoms May cause redness and tearing of the eyes. Prolonged contact may cause redness and irritation. Coughing and/ or wheezing.

Acute toxicity

Numerical measures of toxicity

Oral LD50 >5,000 mg/kg
Dermal LD50 > 2,000 mg/kg
Inhalation LC50 > <4.1 mg/l

Component Information

Chemical name	Oral LD50	Dermal LD50	Inhalation LC50
Ammonium Salt of Fosamine 25954-13-6	= 11 g/kg (Rat)	> 1660 mg/kg (Rabbit)	> 57 g/m^3 (Rat) 1 h
Ethanol 64-17-5	= 7060 mg/kg (Rat)	-	= 124.7 mg/L (Rat) 4 h
Methanol 67-56-1	= 6200 mg/kg (Rat)	= 15840 mg/kg (Rabbit) = 15800 mg/kg (Rabbit)	= 22500 ppm (Rat) 8 h = 64000 ppm (Rat) 4 h

Delayed and immediate effects as well as chronic effects from short and long-term exposure

Skin corrosion/irritation May cause skin irritation. Classification based on data available for ingredients.

Serious eye damage/eye irritation Classification based on data available for ingredients. Irritating to eyes.

Respiratory or skin sensitization No information available.

Germ cell mutagenicity No information available.

Carcinogenicity No information available.

Chemical name	ACGIH	IARC	NTP	OSHA
Ethanol 64-17-5	A3	Group 1	Known	X

Reproductive toxicity No information available.

STOT - single exposure No information available.

STOT - repeated exposure No information available.

Aspiration hazard No information available.

Other adverse effects No information available.

Interactive effects No information available.

12. Ecological information

Ecotoxicity

Chemical name	Algae/aquatic plants	Fish	Toxicity to microorganisms	Crustacea
Ethanol 64-17-5	-	LC50: 12.0 - 16.0mL/L (96h, Oncorhynchus mykiss) LC50: >100mg/L (96h, Pimephales promelas) LC50: 13400 - 15100mg/L (96h, Pimephales promelas)	-	LC50: 9268 - 14221mg/L (48h, Daphnia magna) EC50: =2mg/L (48h, Daphnia magna) EC50: =10800mg/L (24h, Daphnia magna)
Methanol 67-56-1	-	LC50: =28200mg/L (96h, Pimephales promelas) LC50: >100mg/L (96h, Pimephales promelas) LC50: 19500 - 20700mg/L (96h, Oncorhynchus mykiss) LC50: 18 - 20mL/L (96h, Oncorhynchus mykiss) LC50: 13500 - 17600mg/L (96h, Lepomis macrochirus)	-	-

Persistence and degradability No information available.

Bioaccumulation There is no data for this product.

Chemical name	Partition coefficient
Ethanol 64-17-5	-0.32
Methanol 67-56-1	-0.77

Other adverse effects No information available.

13. Disposal considerations

Waste treatment methods

Waste from residues/unused products	Dispose of in accordance with local regulations. Dispose of waste in accordance with environmental legislation.
Contaminated packaging	Do not reuse empty containers.
US EPA Waste Number	U154

14. Transport information

DOT	Not regulated
TDG	Not regulated
MEX	Not regulated
ICAO (air)	Not regulated
IATA	Not regulated
IMDG	Not regulated
RID	Not regulated
ADR	Not regulated
ADN	Not regulated

15. Regulatory information

U.S. EPA Label Information

EPA Pesticide Registration Number	42750-247
EPA Pesticide Label	CAUTION! Causes moderate eye irritation. Avoid contact with eyes or clothing.

International Inventories

TSCA	Does not comply
DSL/NDSL	Does not comply
EINECS/ELINCS	Does not comply
ENCS	Does not comply
IECSC	Does not comply
KECL	Does not comply
PICCS	Does not comply
AICS	Does not comply

Legend:
TSCA - United States Toxic Substances Control Act Section 8(b) Inventory
DSL/NDSL - Canadian Domestic Substances List/Non-Domestic Substances List
EINECS/ELINCS - European Inventory of Existing Chemical Substances/European List of Notified Chemical Substances
ENCS - Japan Existing and New Chemical Substances
IECSC - China Inventory of Existing Chemical Substances
KECL - Korean Existing and Evaluated Chemical Substances
PICCS - Philippines Inventory of Chemicals and Chemical Substances
AICS - Australian Inventory of Chemical Substances

US Federal Regulations

SARA 313
Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 (SARA). This product does not contain any chemicals which are subject to the reporting requirements of the Act and Title 40 of the Code of Federal Regulations, Part 372.

Chemical name	SARA 313 - Threshold Values %
Methanol - 67-56-1	1.0

SARA 311/312 Hazard Categories
Should this product meet EPCRA 311/312 Tier reporting criteria at 40 CFR 370, refer to Section 2 of this SDS for appropriate classifications.

CWA (Clean Water Act)
This product does not contain any substances regulated as pollutants pursuant to the Clean Water Act (40 CFR 122.21 and 40 CFR 122.42).

CERCLA
This material, as supplied, does not contain any substances regulated as hazardous substances under the Comprehensive Environmental Response Compensation and Liability Act (CERCLA) (40 CFR 302) or the Superfund Amendments and Reauthorization Act (SARA) (40 CFR 355). There may be specific reporting requirements at the local, regional, or state level pertaining to releases of this material.

Chemical name	Hazardous Substances RQs	Extremely Hazardous Substances RQs
Methanol 67-56-1	5000 lb	-

US State Regulations

California Proposition 65
This product contains the following Proposition 65 chemicals:.

Chemical name	California Proposition 65
Ethanol - 64-17-5	Carcinogen Developmental
Methanol - 67-56-1	Developmental

U.S. State Right-to-Know Regulations

Chemical name	New Jersey	Massachusetts	Pennsylvania
Trade secret	-	-	X
Ethanol 64-17-5	X	X	X
Methanol 67-56-1	X	X	X

16. Other information

NFPA	**Health hazards**	2	**Flammability**	0	**Instability**	0	**Physical and chemical properties** -
HMIS	**Health hazards**	2 *	**Flammability**	0	**Physical hazards**	0	**Personal protection** X

Chronic Hazard Star Legend * = Chronic Health Hazard

Key or legend to abbreviations and acronyms used in the safety data sheet

Legend Section 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

TWA	TWA (time-weighted average)	STEL	STEL (Short Term Exposure Limit)
Ceiling	Maximum limit value	*	Skin designation

Key literature references and sources for data used to compile the SDS

Agency for Toxic Substances and Disease Registry (ATSDR)
U.S. Environmental Protection Agency ChemView Database
European Food Safety Authority (EFSA)
EPA (Environmental Protection Agency)
Acute Exposure Guideline Level(s) (AEGL(s))
U.S. Environmental Protection Agency Federal Insecticide, Fungicide, and Rodenticide Act
U.S. Environmental Protection Agency High Production Volume Chemicals
Food Research Journal
Hazardous Substance Database
International Uniform Chemical Information Database (IUCLID)
Japan GHS Classification
Australia National Industrial Chemicals Notification and Assessment Scheme (NICNAS)
NIOSH (National Institute for Occupational Safety and Health)
National Library of Medicine's ChemID Plus (NLM CIP)
National Library of Medicine's PubMed database (NLM PUBMED)
National Toxicology Program (NTP)
New Zealand's Chemical Classification and Information Database (CCID)
Organization for Economic Co-operation and Development Environment, Health, and Safety Publications
Organization for Economic Co-operation and Development High Production Volume Chemicals Program
Organization for Economic Co-operation and Development Screening Information Data Set
World Health Organization

Revision date 18-Feb-2021
Revision Note No information available.

Disclaimer

The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text.

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End of Safety Data Sheet

METSULFURON-METHYL | GROUP 2 | HERBICIDE

Escort® XP

HERBICIDE

77

Dry Flowable

Active Ingredient	By Weight
Metsulfuron methyl Methyl 2-[[[[(4-methoxy-6-methyl-1,3,5-triazin-2-yl)amino]-carbonyl]amino]sulfonyl]benzoate	60%
Other Ingredients	40%
TOTAL	100%

EPA Reg. No. 432-1549

KEEP OUT OF REACH OF CHILDREN

CAUTION

Si usted no entiende la etiqueta, busque a alguien para que se la explique a usted en detalle. (If you do not understand this label, find someone to explain it to you in detail.)

See Panel for First Aid Instructions and Booklet for Complete Precautionary Statements and Directions for Use.

FIRST AID

IF ON SKIN OR CLOTHING: Take off contaminated clothing. Rinse skin immediately with plenty of water for 15-20 minutes. Call a poison control center or doctor for further treatment advice.

IF IN EYES: Hold eye open and rinse slowly and gently with water for 15-20 minutes. Remove contact lenses, if present, after the first 5 minutes, then continue rinsing eye. Call a poison control center or doctor for further treatment advice.

Have the product container or label with you when calling a poison control center or doctor, or going for treatment. You may also contact 1-800-334-7577 for emergency medical treatment information.

Nonrefillable Container
Net Weight
1 Pound
85798669
85796941C 210224AV1

Bayer

Produced for:
Bayer Environmental Science
A Division of Bayer CropScience LP
5000 CentreGreen Way, Suite 400
Cary, NC 27513

PRECAUTIONARY STATEMENTS

HAZARDS TO HUMANS AND DOMESTIC ANIMALS

CAUTION! Causes eye irritation. Avoid contact with skin, eyes, or clothing. Avoid breathing dust or spray mist.

PERSONAL PROTECTIVE EQUIPMENT (PPE)

Applicators and other handlers must wear:

Long-sleeved shirt and long pants.
Shoes plus socks.

Follow manufacturer's instructions for cleaning/maintaining PPE. If no such instructions for washables exist, use detergent and hot water. Keep and wash PPE separately from other laundry.

USER SAFETY RECOMMENDATIONS

USERS SHOULD: Wash hands before eating, drinking, chewing gum, using tobacco or using the toilet.

ENVIRONMENTAL HAZARDS

Do not apply directly to water, or to areas where surface water is present, or to intertidal areas below the mean high water mark. Do not contaminate water when cleaning equipment or disposing of equipment washwaters or rinsate.

This herbicide is injurious to plants at extremely low concentrations. Nontarget plants may be adversely effected from drift and run-off.

GROUNDWATER ADVISORY

Metsulfuron-methyl is known to leach through soil into groundwater under certain conditions as a result of label use. This chemical may leach into groundwater if used in areas where soils are permeable, particularly where the water table is shallow.

SURFACE WATER ADVISORY

This product may impact surface water quality due to runoff of rain water. This is especially true for poorly draining soils and soils with shallow ground water. This product is classified as having high potential for reaching surface water via runoff for weeks after application. A level, well-maintained vegetative buffer strip between areas to which this product is applied and surface water features such as ponds, streams, and springs will reduce the potential loading of metsulfuron-methyl from runoff water and sediment. Runoff of this product will be greatly reduced by avoiding applications when rainfall or irrigation is expected to occur within 48 hours.

NON-TARGET ORGANISM ADVISORY

This product is toxic to plants and may adversely impact the forage and habitat of non-target organisms, including pollinators, in areas adjacent to the treated area. Protect the forage and habitat of non-target organisms by minimizing spray drift. For further guidance and instructions on how to minimize spray drift, refer to the Spray Drift Management section of this label.

WINDBLOWN SOIL PARTICLES

ESCORT® XP HERBICIDE has the potential to move off-site due to wind erosion. Soils that are subject to wind erosion usually have a high silt and/or fine to very fine sand fractions and low organic matter content. Other factors which can affect the movement of windblown soil include the intensity and direction of prevailing winds, vegetative cover, site slope, rainfall, and drainage patterns. Avoid applying ESCORT® XP HERBICIDE if prevailing local conditions may be expected to result in off-site movement.

DIRECTIONS FOR USE

It is a violation of Federal law to use this product in a manner inconsistent with its labeling.

ESCORT® XP Herbicide must be used only in accordance with instructions on this label or in separately published Bayer Cropscience LP instructions.

Bayer CropScience LP will not be responsible for losses or damages resulting from the use of this product in any manner not specified on this label. User assumes all risks associated with such non-specified use.

Do not apply more than 4 ounces of ESCORT® XP HERBICIDE (0.15 pounds of the active ingredient metsulfuron-methyl) per acre per year.

Do not use on food or feed crops except as specified by this label or supplemental labeling.

Do not apply this product in a way that will contact workers or other persons, either directly or through drift. Only protected handlers may be in the area during application.

For any requirements specific to your State or Tribe, consult the agency in your State responsible for pesticide regulation.

PRODUCT INFORMATION

ESCORT® XP HERBICIDE is a dispersible granule that is mixed in water and applied as a spray by ground or aerial application.

ESCORT® XP HERBICIDE is registered for the control of annual and perennial weeds and unwanted woody plants on private, public and military lands, on rights-of-way, industrial sites, non-crop areas, ditchbanks of dry drainage ditches, certain types of unimproved turf grass, and conifer and hardwood plantations, including grazed areas on these sites. Do not use on irrigation ditches.

ESCORT® XP HERBICIDE controls weeds and woody plants primarily by postemergent activity. Although ESCORT® XP HERBICIDE has preemergence activity, best results are generally obtained when ESCORT® XP HERBICIDE is applied to foliage after emergence or dormancy break. Generally, for the control of annual weeds, ESCORT® XP HERBICIDE provides the best results when applied to young, actively growing weeds. For the control of perennial weeds, applications made at the bud/bloom stage or while the target weeds are in the fall rosette stage may provide the best results. The use rate depends upon the weed species and size at the time of application.

The degree and duration of control may depend on the following:

- weed spectrum and infestation intensity
- weed size at application
- environmental conditions at and following treatment
- soil pH, soil moisture, and soil organic matter

ESCORT® XP HERBICIDE may be applied on conifer and hardwood plantations, and non-crop sites that contain areas of temporary surface water caused by the collection of water between planting beds, in equipment ruts, or in other depressions created by management activities. It is permissible to treat intermittently flooded low lying sites, seasonally dry flood plains and transitional areas between upland and lowland sites when no water is present. It is also permissible to treat marshes, swamps and bogs after water has receded as well as seasonally dry flood deltas. DO NOT make applications to natural or man-made bodies of water such as lakes, reservoirs, ponds, streams, and canals.

BIOLOGICAL ACTIVITY

ESCORT® XP HERBICIDE is absorbed primarily through the foliage of plants, and by the roots to a lesser degree. Plant cell division is generally inhibited in sensitive plants within a few hours following uptake. Two to 4 weeks after application, leaf growth slows followed by discoloration and tissue death. The final affects on annual weeds are evident about 4 to 6 weeks after application. The ultimate affect on perennial weeds and woody plants occurs in the growing season following application.

Warm, moist conditions following treatment promote the activity of ESCORT® XP HERBICIDE, while cold, dry conditions may reduce or delay activity. Weeds and brush hardened off by cold weather or drought stress may not be controlled. Weed and brush control may be reduced if rainfall occurs soon after application.

ADJUVANTS

The use of a surfactant is recommended to enhance the control of susceptible plants, except where noted. Apply at a minimum rate (concentration) of 1/4% volume/volume (1 quart per 100 gallons of spray solution), or at the manufacturer's recommended rate. Use only EPA approved surfactants containing at least 80% active ingredient. Certain types of surfactants, such as those incorporating acetic acid (i.e. LI-700), may not be compatible with ESCORT® XP HERBICIDE and may result in decreased performance. Certain surfactants may not be suitable for use on desirable plants, such as turf and conifers, listed on this label. Consult the surfactant manufacturer's label for appropriate uses.

INVASIVE SPECIES MANAGEMENT

This product may be considered for use on public, private, and tribal lands to treat certain weed species infestations that have been determined to be invasive, consistent with the Federal Interagency Committee for the Management of Noxious and Exotic Weeds (FICMNEW) National Early Detection and Rapid Response (EDRR) System for invasive plants.

Effective EDRR systems address invasions by eradicating the invader where possible, and controlling them when the invasive species is too established to be feasibly eradicated. Once an EDRR assessment has been completed and action is recommended, a Rapid Response needs to be taken to quickly contain, deny reproduction, and if possible eliminate the invader. Consult your appropriate state extension service, forest service, or regional multidisciplinary invasive species management coordination team to determine the appropriate Rapid Response.

WEED RESISTANCE MANAGEMENT

ESCORT® XP HERBICIDE contains the active ingredient metsulfuron-methyl which is a Group 2 HERBICIDE based on the mode of action classification system of the Weed Science Society of America. When herbicides that affect the same biological site of action are used repeatedly over several years to control the same weed species in the same field, naturally-occurring resistant biotypes may survive a correctly applied herbicide treatment, propagate, and become dominant in that field. Adequate control of these resistant weed biotypes cannot be expected.

Follow the best management practices listed below to delay the development of herbicide resistant weeds.

- Fields should be scouted prior to application to identify the weed species present and their growth stage to determine if the intended application will be effective. Fields should be scouted after application to verify that the treatment was effective.
- Identify weeds present in the field through scouting and field history and understand their biology. The weed-control program should consider all of the weeds present.
- Suspected herbicide-resistant weeds may be identified by these indicators:
  – Failure to control a weed species normally controlled by the herbicide at the dose applied, especially if control is achieved on adjacent weeds;
  – A spreading patch of non-controlled plants of a particular weed species; and
  – Surviving plants mixed with controlled individuals of the same species.
- Contact your local sales representative, crop advisor, or extension agent to find out if suspected resistant weeds to this MOA have been found in your region. If resistant biotypes of target weeds have been reported, use the application rates of this product specified for your local conditions. Tank mix products so that there are multiple effective mechanisms of actions for each target weed.
- Report any incidence of non-performance of this product against a particular weed species to your Bayer distributor, Bayer representative or call 1-800-331-2867.
- If resistance is suspected, treat weed escapes with an herbicide having a different mechanism of action and/or use non-chemical means to remove escapes, as practical, with the goal of preventing further seed production.
- Use a diversified approach toward weed management. Whenever possible incorporate multiple weed-control practices such as mechanical cultivation, biological management practices, and crop rotation.
- To the extent possible, do not allow weed escapes to produce seeds, roots, or tubers.
- Difficult to control weeds may require sequential applications of herbicides with differing mechanisms of action.

- Apply this herbicide at the correct timing and rate needed to control the most difficult weeds in the field.
- Use a broad spectrum soil-applied herbicide with a mechanism of action that differs from this product as a foundation in a weed-control program.
- Do not use more than two applications of this or any other herbicide with the same mechanism of action within a single growing season unless mixed with an herbicide with another mechanism of action with an overlapping spectrum for the difficult-to-control weeds.

INTEGRATED PEST MANAGEMENT

This product may be used as part of an Integrated Pest Management (IPM) program that can include biological, cultural, and genetic practices aimed at preventing economic pest damage. IPM principles and practices include field scouting or other detection methods, correct target pest identification, population monitoring, and treating when target pest populations reach locally determined action thresholds. Consult your state cooperative extension service, professional consultants, or other qualified authorities to determine appropriate action treatment threshold levels for treating specific pest/crop systems in your area.

PREPARING FOR USE - Site Specific Considerations

Understanding the risks associated with the application of ESCORT® XP Herbicide is essential to aid in preventing off-site injury to desirable vegetation and agricultural crops. The risk of off-site movement, both during and after application, may be affected by a number of site specific factors such as the nature, texture and stability of the soil, the intensity and direction of prevailing winds, vegetative cover, site slope, rainfall, drainage patterns, and other local physical and environmental conditions. A careful evaluation of the potential for off-site movement from the intended application site, including movement of treated soil by wind or water erosion, must be made prior to using ESCORT® XP HERBICIDE. This evaluation is particularly critical where desirable vegetation or crops are grown on neighboring land for which the use of ESCORT® XP HERBICIDE is not labeled. If prevailing local conditions may be expected to result in off-site movement and cause damage to neighboring desirable vegetation or agricultural crops, do not apply ESCORT® XP HERBICIDE.

Before applying ESCORT® XP HERBICIDE the user must read and understand all label directions, precautions and restrictions completely, including these requirements for a site specific evaluation. If you do not understand any of the instructions or precautions on the label, or are unable to make a site specific evaluation yourself, consult your local agricultural dealer, cooperative extension service, land managers, professional consultants, or other qualified authorities familiar with the area to be treated. If you still have questions regarding the need for site specific considerations, please call 1-800-331-2867.

TANK MIXES

ESCORT® XP HERBICIDE may be tank mixed with other herbicides registered for the use sites described in this label. Use only those tank mix partners which are labeled for the appropriate use site. When tank mixing, use the most restrictive label limitations for each of the products being used in the tank mix.

AGRICULTURAL USES

AGRICULTURAL USE REQUIREMENTS

Use this product only in accordance with its labeling and with the Worker Protection Standard, 40 CFR part 170. This Standard contains requirements for the protection of agricultural workers on farms, forests, nurseries, and greenhouses, and handlers of agricultural pesticides. It contains requirements for training, decontamination, notification, and emergency assistance. It also contains specific instructions and exceptions pertaining to the statements on this label about personal protective equipment (PPE) and restricted-entry interval. The requirements in this box only apply to uses of this product that are covered by the Worker Protection Standard.

Do not enter or allow worker entry into treated areas during the restricted-entry interval (REI) of 4 hours. PPE required for early entry to treated areas that is permitted under the Worker Protection Standard and that involves contact with anything that has been treated, such as plants, soil, or water is:

- Coveralls
- Shoes plus socks

CONIFER PLANTATIONS

Application Information

ESCORT® XP HERBICIDE is registered for the control of many species of weeds and deciduous trees on sites where conifers are growing or are to be planted. Apply by ground equipment or by air (helicopter only). Refer to the "Weeds Controlled" and "Brush Species Controlled" for a listing of susceptible species.

Application Timing

Apply ESCORT® XP HERBICIDE after weeds have emerged or after undesirable hardwoods have broken winter dormancy and have reached the point of full leaf expansion.

Conifer Site Preparation

--Application Before Transplanting

After consulting the "Weeds Controlled" and "Brush Species Controlled" tables, apply the rates of ESCORT® XP HERBICIDE specified for the most difficult to control species on the site.

Southeast—Apply up to 4 ounces per acre for loblolly and slash pines. Transplant the following planting season.

Northeast and Lake States—Apply up to 2 ounces per acre for red pine. Transplant the following planting season. Apply up to 2 ounces per acre for black, white and Norway spruce. Transplant the following spring.

West—Apply up to 2 ounces per acre prior to planting Douglas Fir, Sitka Spruce, Western Red Cedar, Western Hemlock, Ponderosa Pine, and Grand Fir in the Coast Rangeland and western slope of the Cascades in Oregon and Washington. These conifer species listed can be planted anytime after application. Other conifer species can be planted providing the user has prior experience indicating acceptable tolerance to ESCORT® XP HERBICIDE soil residues.

Without prior experience, it is recommended that other species be planted on a small scale to determine selectivity before large-scale plantings are made as unacceptable injury may occur. Bayer CropScience LP will not assume responsibility for injury to any conifer species not listed on this label.

Tank Mix Combinations—

For broader spectrum control, the following products may be used in combination with ESCORT® XP HERBICIDE.

Glyphosate (4 pound active per gallon)

Tank mix 1 to 2 ounces of ESCORT® XP HERBICIDE with 2 to 10 quarts of glyphosate per acre. Refer to the product container for a list of species controlled.

Imazapyr (4 pound active per gallon)

Tank mix 1 to 2 ounces of ESCORT® XP HERBICIDE with 10 to 24 fluid ounces of imazapyr per acre. Loblolly and slash pines may be transplanted the planting season following application. This combination controls ash, black gum, cherry, hawthorn, honeysuckle, hophornbeam, persimmon, oaks (red, white and water), sassafras, sweetgum, Vaccinium species, and suppresses blackberry, dogwood, elms, myrtle dahoon, hickories, and red maple.

Glyphosate (4 pound active per gallon) + Imazapyr (4 pound active per gallon)

Tank mix 1/2 to 1 ounce of ESCORT® XP HERBICIDE with 16 to 64 fluid ounces of glyphosate and 10 to 12 fluid ounces of imazapyr per acre. Slash and loblolly pines may be transplanted the planting season following application. This combination controls cherry, dogwood, elms, oaks (red and water), persimmon, sassafras, sweetgum and suppresses hickory.

VELPAR® L VU HERBICIDE OR VELPAR® DF VU HERBICIDE

Tank mix 1 to 2 ounces of ESCORT® XP HERBICIDE per acre with VELPAR® L VU HERBICIDE or VELPAR® DF VU HERBICIDE at the rates specified on the container for various soil textures. Loblolly and slash pines may be transplanted the planting season following application. Refer to the product container for a list of species controlled.

OUST® EXTRA HERBICIDE

Tank mix 1/2 to 1 1/2 ounces of ESCORT® XP HERBICIDE with 2 to 3 ounces of Oust® Extra HERBICIDE per acre for herbaceous weed control. Refer to the product container and the "Weeds Controlled" section of this label for a listing of the weeds controlled. Loblolly and slash pines may be transplanted the planting season following application. Tank mix 2 ounces of ESCORT® XP HERBICIDE with 3 ounces of Oust® Extra HERBICIDE per acre for herbaceous weed control and early spring suppression of bull thistle and Canada thistle in the Coast Rangeland and western slope of the Cascade Mountains. Douglas fir may be transplanted at least 90 days following application.

Release--Hardwood Control and Suppression

ESCORT® XP HERBICIDE may be used for application over the top of established slash and loblolly pine to control the species listed in "Weeds Controlled" and "Brush Species Controlled" section of this label. Apply 1 to 4 ounces per acre to control the species indicated, including kudzu.

Tank Mix Combinations—

For broader spectrum control the following products may be used in combination with ESCORT® XP HERBICIDE.

Imazapyr (4 pound active per gallon)

Tank mix 1 to 2 ounces of ESCORT® XP HERBICIDE with 8 to 16 fluid ounces of imazapyr per acre for application to loblolly pine. Refer to the imazapyr label regarding the use of surfactants and the appropriate application timing with respect to the age and development stage of the pines. This combination controls ash, black gum, cherry, hawthorn, honeysuckle, hophornbeam, oaks (red, white and water), sassafras, sweetgum, Vaccinium species, and suppresses blackberry, dogwood, elms, myrtle dahoon, hickories, persimmon, and red maple.

VELPAR® L VU HERBICIDE OR VELPAR® DF VU HERBICIDE

Tank mix 1 to 2 ounces of ESCORT® XP HERBICIDE with VELPAR® L VU HERBICIDE or VELPAR® DF VU HERBICIDE at the rates specified on the container for various soil textures. This combination may be applied to loblolly and slash pines.

Release--Herbaceous Weed Control

ESCORT® XP HERBICIDE may be applied to transplanted loblolly and slash pine for the control of herbaceous competition. Consult the "Weeds Controlled" for a listing of the susceptible species and application rates. Best results are obtained when ESCORT® XP HERBICIDE is applied just before weed emergence until shortly after weed emergence.

Tank Mix Combinations—

For broader spectrum control the following products may be used in combination with ESCORT® XP HERBICIDE.

Imazapyr (4 pound active per gallon)

Tank mix 1/2 to 1 ounce of ESCORT® XP HERBICIDE with 4 fluid ounces of imazapyr per acre. The tank mix may be used on loblolly pine.

VELPAR® L VU HERBICIDE OR VELPAR® DF VU HERBICIDE

Tank mix 1/2 to 1 ounce of ESCORT® XP HERBICIDE with VELPAR® L VU HERBICIDE or VELPAR® DF VU HERBICIDE at the rates specified on the container for various soil textures. This combination may be applied to loblolly and slash pines.

Release - Directed Spray in Conifers

Western US

To release conifers from competing brush species, such as, blackberry, salmonberry, snowberry, thimbleberry and wild roses, mix 2 to 4 ounces of ESCORT® XP HERBICIDE per 100 gallons of spray solution. Direct spray onto the foliage of competing brush species using a knapsack or backpack sprayer. For best results, apply any time after the brush species have reached full leaf stage but before autumn coloration. For best results at application, the majority of the brush must be less than six feet in height to help ensure adequate spray coverage. Thorough coverage of the target foliage is necessary to optimize results. Care must be taken to direct the ESCORT® XP HERBICIDE spray solution away from the conifer foliage.

NOTE:

ESCORT® XP HERBICIDE may cause temporary yellowing and or growth suppression when the spray solution contacts conifer foliage. The use of a surfactant with ESCORT® XP HERBICIDE may improve brush control results. When using a surfactant with ESCORT® XP HERBICIDE, extra precaution must be taken to avoid contact with conifer foliage. Excessive drift onto conifers may result in severe injury.

IMPORTANT PRECAUTIONS—CONIFER PLANTATIONS ONLY

- Applications of ESCORT® XP HERBICIDE made to conifers that are suffering from loss of vigor caused by insects, diseases, drought, winter damage,

animal damage, excessive soil moisture, planting shock, or other stresses may injure or kill the trees.

- Applications of ESCORT® XP HERBICIDE made for herbaceous release must only be made after adequate rainfall has closed the planting slit and settled the soil around the roots following transplanting.
- Do not apply ESCORT® XP HERBICIDE to conifers grown as ornamentals.
- ESCORT® XP HERBICIDE applications may result in damage and mortality to other species of conifers when they are present on sites with those listed in the preceding specifications for conifer plantations.

HARDWOOD PLANTATIONS

Application Information

ESCORT® XP HERBICIDE may be used at rates of up to 2 ounces per acre for the control of many weed species on sites where yellow poplar is growing or is to be planted, and on sites where red alder is to be planted. Apply by ground equipment or by air (helicopter only). Refer to the "Weeds Controlled" sections of this label for a listing of susceptible species.

Application Timing

ESCORT® XP HERBICIDE may be applied as a site preparation treatment prior to planting red alder or yellow poplar. As a prior to planting site preparation treatment for red alder, ESCORT® XP HERBICIDE may be tank mixed with other herbicides labeled for this use.

ESCORT® XP HERBICIDE may also be applied over-the-top of planted yellow poplar seedlings after the soil has settled around the root system, but before the seedlings have broken dormancy (prior to bud break).

Release--Herbaceous Weed Control

ESCORT® XP HERBICIDE may be applied to yellow poplar for the control of herbaceous competition. Consult the "Weeds Controlled" for a listing of the susceptible species and specified application rates. Best results are obtained when ESCORT® XP HERBICIDE is applied just before weed emergence until shortly after weed emergence.

Tank Mix Combinations—

Tank mix 1/2 ounce of ESCORT® XP HERBICIDE with 4 to 6 pints of VELPAR® L VU HERBICIDE as directed on the package label for "RELEASE--HERBACEOUS WEED CONTROL" in pine plantations in the eastern U.S. Follow the VELPAR® L VU Herbicide label directions regarding altering the application rate by soil texture.

IMPORTANT PRECAUTIONS—HARDWOOD PLANTATIONS ONLY

- Application of Velpar® L VU Herbicide and ESCORT® XP HERBICIDE made to yellow poplar that are suffering from loss of vigor caused by insects, disease, drought, winter damage, animal damage, excessive soil moisture, planting shock, or other stresses may injure or kill the seedlings.
- Applications of ESCORT® XP HERBICIDE made for release must only be made after adequate rainfall has closed the planting slit and settled the soil around the roots following transplanting.
  The use of surfactant is not recommended for applications made over the tops of trees.
- Careful consideration must be given by an experienced and knowledgeable forester to match the requirements of yellow poplar and/or red alder to the conditions of the site. Treatment of yellow poplar and/or red alder planted on a site inadequate to meet its requirements may injure or kill the seedlings.

PASTURE, RANGELAND, AND CONSERVATION RESERVE PROGRAM (CRP)

ESCORT® XP HERBICIDE is registered for the control of broadleaf weeds, brush and several woody vine species in the establishment, maintenance, and restoration of pasture, rangeland, and Conservation Reserve Program (CRP).

ESCORT® XP HERBICIDE may be tank mixed with other pesticides labeled for use in pasture, rangeland, and CRP. Read and follow the labels on all products used in the tank mix. Observe the most restrictive precautions on each of the product's labels. Application of ESCORT® XP HERBICIDE to pasture, rangeland and CRP may be made by ground or air. Use a sufficient volume of water to ensure thorough coverage of the targeted weeds with the equipment being used. In Idaho, Oregon and Washington use a minimum application volume of 3 gallons of spray solution per acre.

APPLICATION INFORMATION FOR GRASS ESTABLISHMENT IN PASTURE, RANGELAND, AND CONSERVATION RESERVE PROGRAM (CRP)

ESCORT® XP HERBICIDE is registered for the control or suppression of broadleaf weeds to aid in the establishment of the following perennial native or improved grasses planted in pasture, rangeland, and acres enrolled in the Conservation Reserve Program (CRP):

Blue Gramma
Bluestems-
- Big
- Little
- Plains
- Sand
- WW Spar

Buffalograss
Green sprangletop
Kleingrass
Lovegrasses-
- Atherstone
- Sand
- Weeping
- Wilman

Orchardgrass
Sideoats gramma
Switchgrass-
- Blackwell

Wheatgrasses-
- bluebunch
- crested
- intermediate
- pubescent
- Siberian
- slender
- steambank
- tall
- thickspike
- western

Wildrye grass-
- Russian

Maximize potential for grass establishment by consulting with the Natural Resource and Conservation Service of other government agencies or local experts concerning planting techniques and other cultural practices.

Performance from ESCORT® XP HERBICIDE may not always be satisfactory due to the inability of newly planted grass stands to sufficiently compete with weeds and the severity of weed pressure in new grass stands.

An additional HERBICIDE application or mowing may be needed.

Use Rates and Application Timing for Grass Establishment in Pasture, Rangeland and CRP Preplant (prior to planting) or Preemergence (after planting but before grass emergence)

Do not use more than 1/10 ounce/acre of ESCORT® XP HERBICIDE for grass establishment in pasture, rangeland, and CRP. Apply ESCORT® XP HERBICIDE at 1/10 ounce/acre on all labeled grasses except orchardgrass and Russian wildrye grass. Do not apply ESCORT® XP HERBICIDE preplant or preemergence to orchardgrass and Russian wildrye grass as severe crop injury may result.

Early postemergence to new plantings

Apply ESCORT® XP HERBICIDE at 1/10 ounce/acre, plus a non-ionic surfactant at the rate of 2 to 4 pints/100 gallons of spray solution on all labeled grasses anytime after grass emergence.

Do not use a spray adjuvant other than non-ionic surfactant. Because grass species differ in time of emergence, apply only after the majority of grasses are in the 3 to 4 leaf stage.

Postemergence to stands with 1 – 5 leaf grasses planted the previous season.

Apply ESCORT® XP HERBICIDE at 1/10 ounce/acre plus a non-ionic surfactant at the rate of 2 to 4 pints/100 gallons of spray solution on all labeled grasses when the majority of the grasses have one or more leaves.

Do not use a spray adjuvant other than non-ionic surfactant.

APPLICATION INFORMATION FOR ESTABLISHED GRASSES IN PASTURE, RANGELAND, AND CONSERVATION RESERVE PROGRAM (CRP)

Use Rates for Established Grasses in Pasture, Rangeland, and CRP

Apply up to 1 2/3 ounces ESCORT® XP HERBICIDE per acre as a broadcast application to established grasses in pasture, rangeland and CRP. For spot applications, use 1 ounce per 100 gallons of water. Do not apply more than 1 2/3 ounces of ESCORT® XP HERBICIDE per acre per year in pasture, rangeland, and CRP.

Refer to the Weeds Controlled section of the section 3 label for a listing of the weeds controlled by ESCORT® XP HERBICIDE and the appropriate use rate to obtain control.

Application Timing – Established Grasses in Pasture, Rangeland, and CRP

ESCORT® XP HERBICIDE may be applied to established native grasses such as bluestems and grama, and on other established grasses such as bermudagrass, bluegrass, orchardgrass, bromegrass, fescue and timothy that were planted the previous growing season (or earlier) and are fully tillered, unless otherwise directed on this label. Specific application timing information on several of these grass species follows:

Grass	Minimum time from Grass establishment ESCORT® XP HERBICIDE application
Bermudagrass	2 months
Bluegrass, bromegrass, Orchardgrass	6 months
Timothy	12 months
Fescue	24 months

Rotation Intervals in Pasture, Rangeland, and CRP for Overseeding and Renovation

Location	Crop or Grass Species	Maximum ESCORT® XP HERBICIDE Rate on Pasture, Rangeland, and CRP (oz per A)	Minimum Rotation Interval (months)
AL, AR, FL, GA, KY, LA, MS, NC, OK, SC, TN, TX, VA, WV	Alfalfa, red clover, white clover, sweet clover, bermudagrass, bluegrass, ryegrass, tall fescue	1/10 to 3/10	4
	Wheat (except durum)	1/10 to 3/10	1
	Durum, barley, oat	1/10 to 3/10	10
ALL STATES NOT INCLUDED ABOVE	Red clover, white clover, and sweet clover	1/10 to 2/10	12
	Bermudagrass, bluegrass, ryegrass	1/10 to 2/10	6
	Tall Fescue	1/10 to 2/10	18
	Wheat (except durum)	1/10 to 2/10	1
	Durum, barley, oat	1/10 to 2/10	10

(continued)

Rotation Intervals in Pasture, Rangeland, and CRP for Overseeding and Renovation *(continued)*

Location	Crop or Grass Species	Maximum ESCORT® XP HERBICIDE Rate on Pasture, Rangeland, and CRP (oz per A)	Minimum Rotation Interval (months)
ALL AREAS WITH SOIL PH OF 7.5 OR LESS	Russian wildrye	1/10 to 1/2	1
	Green needlegrass, switchgrass, sheep fescue	1/10 to 1	1
	Meadow brome, smooth brome, alta fescue, red fescue, meadow foxtail, orchardgrass, Russian wildrye, timothy	1/10 to 1	2
ALL AREAS WITH SOIL PH OF 7.9 OR LESS	Alkali sacoton, mountain brome, blue grama, thickspike wheatgrass	1/10 to 1	1
	Sideoats grama, switchgrass	1/10 to 1/2	2
	Western wheatgrass	1/10 to 1	2
	Sideoats grama, switchgrass, big bluestem	1/10 to 1	3

Fescue Precautions:
Note that ESCORT® XP HERBICIDE may temporarily stunt tall fescue, cause it to turn yellow, or cause seedhead suppression. To minimize these symptoms, take the following precautions:

- Do not use more than 4/10 ounce/acre of ESCORT® XP HERBICIDE.
- Tank mix ESCORT® XP HERBICIDE with 2,4-D.
- Use the lowest specified rate for target weeds.
- Use a non-ionic surfactant at 1/2 to 1 pint per 100 gallons of spray solution.
- Make application later in the spring after the new growth is 5 to 6 inches tall, or in the fall.
- Do not use surfactant when liquid nitrogen is used as a carrier.
- Do not use a spray adjuvant other than non-ionic surfactant.

The first cutting yields may be reduced due to seedhead suppression resulting from treatment with ESCORT® XP HERBICIDE.

Timothy Precautions:
Timothy should be at least 6 inches tall at application and be actively growing. Applications of ESCORT® XP HERBICIDE to timothy under any other conditions may cause crop yellowing and/or stunting. To minimize these symptoms, take the following precautions:

- Do not use more than 4/10 ounce/acre ESCORT® XP HERBICIDE.
- Tank mix ESCORT® XP HERBICIDE with 2, 4-D.
- Use the lowest specified rate for target weeds.
- Use a non-ionic surfactant at 1/2 pint per 100 gallons of spray solution (1/16%).
- Make applications in the late summer or fall.
- Do not use surfactant when liquid nitrogen is used as a carrier.
- Do not use spray adjuvant other than non-ionic surfactant.

Application of ESCORT® XP HERBICIDE to Pensacola bahiagrass, ryegrass (Italian or perennial) and Garrison's creeping foxtail may cause severe injury to and/or loss of forage.

Other Pasture and Rangeland Grasses
Varieties and species of forage grasses differ in their tolerance to herbicides. When using ESCORT® XP HERBICIDE on a particular grass for the first time, limit use to a small area. If no injury occurs throughout the season, larger acreage may be treated the following season.
Broadleaf forage species, such as alfalfa and clover, are highly sensitive to ESCORT® XP HERBICIDE and will be severely stunted or injured by ESCORT® XP HERBICIDE.

SPOT TREATMENTS
ESCORT® XP HERBICIDE may be used for use as spot treatment to control noxious and troublesome weeds on pasture, rangeland, and CRP.

Application Information
ESCORT® XP HERBICIDE may be used to control many species of weeds, including noxious weeds, in forage grasses growing on pasture, rangeland, and CRP. Refer to the "Weeds Controlled" section of the package label or supplemental labeling for a listing of susceptible weed species. If the sprayer is calibrated, consult the package label or other supplemental labeling to select the application rate per acre of ESCORT® XP HERBICIDE appropriate for the target weeds. Or mix one gram of ESCORT® XP HERBICIDE per one gallon of water along with a suitable surfactant. Spray to the point of wetting the entire surface of the target weeds, approximately 40 gallons of solution per acre. When applied in this manner there is no grazing restrictions following the use of ESCORT® XP HERBICIDE. Applications may be made at anytime of the year, except when the soil is frozen.

CROP ROTATION
Before using ESCORT® XP HERBICIDE, carefully consider your crop rotation plans and options. For rotational flexibility, do not treat all of your pasture, rangeland, or CRP acres at the same time.

Minimum Rotational Intervals
Minimum rotation intervals* are determined by the rate of breakdown of ESCORT® XP HERBICIDE applied. ESCORT® XP HERBICIDE breakdown in the soil is affected by soil pH, presence of soil microorganisms, soil temperature, and soil moisture. Low soil pH, high soil temperature, and high soil moisture increase ESCORT® XP HERBICIDE breakdown in soil, while high soil pH, low soil temperature, and low soil moisture slow ESCORT® XP HERBICIDE breakdown.
Of these 3 factors, only soil pH remains relatively constant. Soil temperature, and to a greater extent, soil moisture, can vary significantly from year to year and from area to area. For this reason, soil temperatures and soil moisture should be monitored regularly when considering crop rotations.
* The minimum rotation interval represents the period of time from the last application to the anticipated date of the next planting.

Soil pH Limitations
ESCORT® XP HERBICIDE should not be used on soils having a pH above 7.9, as extended soil residual activity could extend crop rotation intervals beyond normal. Under certain conditions, ESCORT® XP HERBICIDE could remain in the soil for 34 months or more, injuring wheat and barley. In addition, other crops planted in high-pH soils can be extremely sensitive to low concentrations of ESCORT® XP HERBICIDE.

Checking Soil pH
Before using ESCORT® XP HERBICIDE, determine the soil pH of the areas of intended use. To obtain a representative pH value for the test area, take several 0" to 4" samples from different areas of the field and analyze them separately. Consult local extension publications for additional information on recommended soil sampling procedures.

BIOASSAY
A field bioassay must be completed before rotating to any crop or grass species/variety not listed in the Rotation Intervals Table, or if the soil pH is not in the specified range, or if the use rate applied is not specified in the table.
To conduct a field bioassay, grow test strips of the crop(s) or grass(es) you plan to grow the following year in fields previously treated with ESCORT® XP HERBICIDE. Crop or grass response to the bioassay will indicate whether or not to rotate to the crop(s) or grass(es) grown in the test strips.
If a field bioassay is planned, check with your local Agricultural dealer or BAYER CROPSCIENCE LP representative for information detailing the field bioassay procedure.

GRAZING/HAYING
When used as directed, there is no grazing or haying restriction for use rates of 1 2/3 ounces per acre and less.
Coveralls, shoes plus socks must be worn if cutting within 4 hours of treatment.

IMPORTANT PRECAUTIONS

- Do not apply more than 1 2/3 ounces of ESCORT® XP HERBICIDE per acre per year on pasture, rangeland, or CRP.
- Grass species or varieties may differ in their response to various herbicides. BAYER CROPSCIENCE LP recommends that you first consult your state experiment station, university, or extension agent as to sensitivity to any herbicide. If no information is available, limit the initial use of ESCORT® XP HERBICIDE to a small area. Components in a grass seed mixture will vary in tolerance to ESCORT® XP HERBICIDE so the final stand may not reflect the seed ratio.
- Under certain conditions such as heavy rainfall, high pH, prolonged cold weather, or wide fluctuations in day/night temperatures prior to or soon after ESCORT® XP HERBICIDE application, temporary discoloration and/or grass injury may occur. ESCORT® XP HERBICIDE should not be applied to grass that is stressed by severe weather conditions, drought, low fertility, water-saturated soils, disease, or insect damage as grass injury may result. Severe winter stress, drought, disease, or insect damage before or following application also may result in grass injury.
- Applications of ESCORT® XP HERBICIDE to pasture, rangeland, and CRP undersown with legumes may cause injury to the legumes. Legumes in a seeding mixture may be severely injured or killed following an application of ESCORT® XP HERBICIDE.
- Applications made to some established grasses may cause temporary stunting, yellowing or seedhead suppression (i.e. fescue, timothy).
- Applications made to newly established grasses less than 2 years from seeding may result in injury or loss.
- Do not apply to forage grasses known to be sensitive to ESCORT® XP HERBICIDE such as ryegrass (Italian and perennial), bahia or Garrison's creeping foxtail.
- Broadleaf forage species, such as alfalfa and clover, are highly sensitive to ESCORT® XP HERBICIDE and will be severely injured or killed.
- The control of weeds in wheel track areas may be reduced if ground applications are made when dry, dusty field conditions exist. The addition of 2,4-D or MCPA should improve weed control under these conditions.

NON-AGRICULTURAL USES

NON-AGRICULTURAL USE REQUIREMENTS
The requirements in this box apply to uses of this product that are NOT within the scope of the Worker Protection Standard for agricultural pesticides (40 CFR Part 170). The WPS applies when this product is used to produce agricultural plants on farms, forests, nurseries, or greenhouses.
Do not enter or allow others to enter the treated area until sprays have dried.
Non-crop industrial weed control and selective weed control in turf (industrial, unimproved only) are not within the scope of the Worker Protection Standard.

NON-CROP SITES
Application Information
ESCORT® XP HERBICIDE is registered for weed control on private, public and military lands as follows: Uncultivated nonagricultural areas (including airports, highway, railroad and utility rights-of-way, sewage disposal areas); uncultivated agricultural areas non-crop producing (including farmyards, fuel storage

areas, fence rows, soil bank land, and barrier strips); industrial sites outdoor (including lumberyards, pipeline and tank farms) including grazed areas on these sites. It may also be used for the control of certain noxious and troublesome weeds.
Consult the "Weeds Controlled" and "Brush Species Controlled" tables to determine the appropriate application rate. ESCORT® XP HERBICIDE may be applied in tank mixture with other herbicides labeled for use on non-crop sites. Fully read the labels and follow all directions and restrictions on each label.
Applications may be made by ground or air. Use a sufficient volume of water to ensure thorough coverage of the target vegetation with the application equipment being used.

NATIVE GRASSES

ESCORT® XP HERBICIDE is registered for weed control and suppression in the establishment and maintenance of native grasses. It may be used where blue grama, bluestems (big, little, plains, sand, ww spar) bromegrasses (meadow), buffalograss, green sprangletop, indiangrass, kleingrass, lovegrasses (atherstone, sand, weeping, wilman), orchardgrass, sideoats grama, switchgrass (blackwell), wheatgrass (bluebunch, intermediate, pubescent, Siberian, slender, streambband, tall, thickspike, western), and Russian wildrye are established. It may also be applied over these species in the seedling stage, except for orchardgrass and Russian wildrye.
When used as directed, there are no grazing or haying restrictions for use rates of 1 2/3 ounces per acre or less. At use rates greater than 1 2/3 ounces per acre and up to 3 1/3 ounces per acre, forage grasses may be cut for hay, fodder or green forage and fed to livestock, including lactating animals, 3 days after treatment.

Rotation Intervals for Overseeding and Renovation

Location	Crop or Grass Species	Maximum ESCORT® XP HERBICIDE Rate (oz per A)	Minimum Rotation Interval (months)
AL, AR, FL, GA, KY, LA, MS, NC, OK, SC, TN, TX, VA, WV	Alfalfa, red clover, white clover, sweet clover, bermudagrass, bluegrass, ryegrass, tall fescue	1/10 to 3/10	4
	Wheat (except durum)	1/10 to 3/10	1
	Durum, barley, oat	1/10 to 3/10	10
ALL STATES NOT INCLUDED ABOVE	Red clover, white clover, and sweet clover	1/10 to 2/10	12
	Bermudagrass, bluegrass, ryegrass	1/10 to 2/10	6
	Tall Fescue	1/10 to 2/10	18
	Wheat (except durum)	1/10 to 2/10	1
	Durum, barley, oat	1/10 to 2/10	10
ALL AREAS WITH SOIL PH OF 7.5 OR LESS	Russian wildrye	1/10 to 1/2	1
	Green needlegrass, switchgrass, sheep fescue	1/10 to 1	1
	Meadow brome, smooth brome, alta fescue, red fescue, meadow foxtail, orchardgrass, Russian wildrye, timothy	1/10 to 1	2
ALL AREAS WITH SOIL PH OF 7.9 OR LESS	Alkali sacoton, mountain brome, blue grama, thickspike wheatgrass	1/10 to 1	1
	Sideoats grama, switchgrass	1/10 to 1/2	2
	Western wheatgrass	1/10 to 1	2
	Sideoats grama, switchgrass, big bluestem	1/10 to 1	3

Application Information

Apply ESCORT® XP HERBICIDE at the rate of 1/10 ounce per acre for the control and suppression* of bur buttercup (testiculate), common purslane, common sunflower*, cutleaf eveningprimrose*, flixweed*, lambsquarters* (common and slimleaf), marestail*, pigweed (redroot and tumble), snow speedwell, tansymustard* and tumble mustard (Jim Hill mustard).
*Suppression is a visual reduction in weed competition (reduced population or vigor) as compared to untreated areas.
Degree of suppression will vary with the size of weed and environmental conditions following treatment.

Application Timing

For established grasses, apply when weeds are in the seedling stage.
For grasses in the seedling stage, apply preplant or preemergence where the soil (seed bed) has been cultivated.

IMPORTANT PRECAUTIONS—NATIVE GRASSES

- Grass species or varieties may differ in their response to various herbicides. If no information is available, limit the initial use of ESCORT® XP HERBICIDE to a small area. Components in a grass seed mixture will vary in tolerance to ESCORT® XP HERBICIDE, so the final stand may not reflect the seed ratio.
- Under certain conditions such as heavy rainfall, high pH, prolonged cold weather, or wide fluctuations in day/night temperatures prior to or soon after ESCORT® XP HERBICIDE application, temporary discoloration and/or grass injury may occur. Injury may result when ESCORT® XP HERBICIDE is applied to grass that is stressed by severe weather conditions, drought, low fertility, water-saturated soils, disease, or insect damage. Severe winter stress, drought, disease, or insect damage before or following application also may result in grass injury.

GRASS REPLANT INTERVALS

Following an application of ESCORT® XP HERBICIDE to non-crop areas, the treated sites may be replanted with various species of grasses at the intervals listed below.

For soils with a pH of 7.5 or less, observe the following replant intervals:

Species	Rate (ounces per acre)	Replant Interval (months)
Brome, Meadow	1/2—1	2
	1—2	3
Brome, Smooth	1/2—1	2
	1—2	4
Fescue, Alta	1/2—1	2
	1—2	4
Fescue, Red	1/2—1	2
	1—2	4
Fescue, Sheep	1/2—1	1
	1—2	4
Foxtail, Meadow	1/2—1	2
	1—2	4
Green Needlegrass	1/2—2	1
Orchardgrass	1/2—1	2
	1—2	4
Russian wildrye	1/2—1	1
	1	2
	2	3
Switchgrass	1/2—1	1
	1—2	3
Timothy	1/2—1	2
	1—2	4
Wheatgrass, Western	1/2—1	2
	1—2	3

For soils with a pH of 7.5 or greater observe the following replant intervals:

Species	Rate (ounces per acre)	Replant Interval (months)
Alkali Sacaton	1/2—1	1
	1—2	3
Bluestem, Big	1/2—2	3
Brome, Mountain	1/2—1	1
	1—2	2
Grama, Blue	1/2—2	1
Grama, Sideoats	1/2	2
	>1/2	>3
Switchgrass	1/2	2
	>1/2	>3
Wheatgrass, Thickspike	1/2—2	1
Wheatgrass, Western	1—2	2
	1/2—1	3

The specified intervals are for applications made in the Spring to early Summer. Because ESCORT® XP HERBICIDE degradation is slowed by cold or frozen soils, applications made in the late Summer or Fall should consider the intervals as beginning in the Spring following treatment.
Testing has indicated that there is considerable variation in response among the species of grasses when seeded into areas treated with ESCORT® XP HERBICIDE. If species other than those listed above are to be planted into areas treated with ESCORT® XP HERBICIDE, a field bioassay must be performed, or previous experience may be used, to determine the feasibility of replanting treated sites.

ADDITIONAL GRASS INFORMATION

APPLICATION INFORMATION FOR GRASS ESTABLISHMENT

ESCORT® XP HERBICIDE may be used for the control or suppression of broadleaf weeds to aid in the establishment of the following perennial native or improved grasses:

Blue Grama	Buffalograss	Orchardgrass	Wheatgrasses –	Wildrye grass –
Bluestems –	Green sprangletop	Sideoats grama	bluebunch	Russian
big	Kleingrass	Switchgrass –	crested	
little	Lovegrassess –	Blackwell	intermediate	
plains	Atherstone		pubescent	
sand	sand		Siberian	
WW spar	weeping		slender	
	Wilman		steambank	
			tall	
			thickspike	
			western	

Maximize potential for grass establishment by consulting with the Natural Resource and Conservation Service of other government agencies or local experts concerning planting techniques and other cultural practices.

Performance from ESCORT® XP HERBICIDE may not always be satisfactory due to the inability of newly planted grass stands to sufficiently compete with weeds and the severity of weed pressure in new grass stands.

An additional herbicide application or mowing may be needed.

Use Rates and Application Timing for Grass Establishment Preplant (prior to planting) or Preemergence (after planting but before grass emergence)

Do not use more than 1/10 ounce per acre of ESCORT® XP HERBICIDE for grass establishment.

Apply ESCORT® XP HERBICIDE at 1/10 ounce per acre on all labeled grasses except orchardgrass and Russian wildrye grass. Do not apply ESCORT® XP HERBICIDE preplant or preemergence to orchardgrass and Russian wildrye grass as severe crop injury may result.

Early postemergence to new plantings

Apply ESCORT® XP HERBICIDE at 1/10 ounce per acre, plus a non-ionic surfactant at the rate of 2 to 4 pints per 100 gallons of spray solution on all labeled grasses anytime after grass emergence.

Do not use a spray adjuvant other than non-ionic surfactant.

Because grass species differ in time of emergence, apply only after the majority of grasses are in the 3 to 4 leaf stage.

Postemergence to stands with 1 – 5 leaf grasses planted the previous season

Apply ESCORT® XP HERBICIDE at 1/10 ounce per acre plus a non-ionic surfactant at the rate of 2 to 4 pints per 100 gallons of spray solution, on all labeled grasses when the majority of the grasses have one or more leaves.

Do not use a spray adjuvant other than non-ionic surfactant.

APPLICATION INFORMATION FOR ESTABLISHED GRASSES

Use Rates for Established Grasses

Apply up to 1 ounce ESCORT® XP HERBICIDE per acre as a broadcast application to established grasses. For spot applications, use 1 ounce per 100 gallons of water. Do not apply more than 1 2/3 ounces of ESCORT® XP HERBICIDE per acre per year.

Refer to the Weeds Controlled section of this label for a listing of the weeds controlled by ESCORT® XP HERBICIDE and the appropriate use rate to obtain control.

Application Timing – Established Grasses

ESCORT® XP HERBICIDE may be applied to established native grasses such as bluestems and grama, and on other established grasses such as bermudagrass, bluegrass, orchardgrass, bromegrass, fescue and timothy that were planted the previous growing season (or earlier) and are fully tillered, unless otherwise directed on this label. Specific application timing information on several of these grass species follows:

Grass	Minimum time from Grass establishment ESCORT® XP HERBICIDE application
Bermudagrass	2 months
Bluegrass, bromegrass, Orchardgrass	6 months
Timothy	12 months
Fescue	24 months

Fescue and Timothy Precautions

When used on fescue and timothy grasses, ESCORT® XP HERBICIDE may cause reduced first cutting yields due to temporary stunting, leaf yellowing, or seed head suppression. To help minimize these symptoms, follow the information below:

- Use the lowest labeled rate for the target weeds.
- Tank mix 2,4-D with ESCORT® XP HERBICIDEapplications.
- Apply ESCORT® XP HERBICIDE at no more than 4/10 ounce per acre.
- Make applications when the grasses are 5 to 6 inches tall in late summer or fall.
- Use only a non-ionic surfactant at 1/2 pint per 100 gallons of spray solution.
- When liquid nitrogen is the spray carrier, do not include the surfactant.

Other Grasses:

Application of ESCORT® XP HERBICIDE to Pensacola bahiagrass, ryegrass (Italian or perennial) and Garrison's creeping foxtail may cause severe injury to and/or loss of forage.

Varieties and species of forage grasses differ in their tolerance to herbicides. When using ESCORT® XP HERBICIDE on a particular grass for the first time, limit use to a small area. If no injury occurs throughout the season, larger acreage may be treated the following season.

Broadleaf forage species, such as alfalfa and clover, are highly sensitive to
ESCORT® XP Herbicide and will be severely stunted or injured by ESCORT® XP HERBICIDE.

CROP ROTATION

Before using ESCORT® XP Herbicide, carefully consider your crop rotation plans and options.

Minimum Rotational Intervals

Minimum rotation intervals* are determined by the rate of breakdown of ESCORT® XP HERBICIDE applied. ESCORT® XP HHERBICIDE breakdown in the soil is affected by soil pH, presence of soil microorganisms, soil temperature, and soil moisture. Low soil pH, high soil temperature, and high soil moisture increase ESCORT® XP HERBICIDE breakdown in soil, while high soil pH, low soil temperature, and low soil moisture slow ESCORT® XP HERBICIDE breakdown.

Of these 3 factors, only soil pH remains relatively constant. Soil temperature, and to a greater extent, soil moisture, can vary significantly from year to year and from area to area. For this reason, monitor soil temperature and soil moisture on a regular basis when considering any crop rotations.

* The minimum rotation interval represents the period of time from the last application to the anticipated date of the next planting.

Soil pH Limitations

ESCORT® XP HERBICIDE must not be used on soils having a pH above 7.9, as extended soil residual activity could extend crop rotation intervals beyond normal. Under certain conditions, ESCORT® XP HERBICIDEcould remain in the soil for 34 months or more, injuring wheat and barley. In addition, other crops planted in high-pH soils can be extremely sensitive to low concentrations of ESCORT® XP HERBICIDE.

Checking Soil pH

Before using ESCORT® XP Herbicide, determine the soil pH of the areas of intended use. To obtain a representative pH value for the test area, take several 0" to 4" samples from different areas of the field and analyze them separately. Consult local extension publications for additional information on recommended soil sampling procedures.

BIOASSAY

A field bioassay must be completed before rotating to any crop or grass species/variety not listed in the Rotation Intervals Table, or if the soil pH is not in the specified range, or if the use rate applied is not specified in the table.

To conduct a field bioassay, grow test strips of the crop(s) or grass(es) you plan to grow the following year in fields previously treated with ESCORT® XP HERBICIDE. Crop or grass response to the bioassay will indicate whether or not to rotate to the crop(s) or grass(es) grown in the test strips.

If a field bioassay is planned, check with your local Agricultural dealer or Bayer CropScience LP representative for information detailing the field bioassay procedure.

IMPORTANT PRECAUTIONS

- Grass species or varieties may differ in their response to various herbicides. If no information is available, limit the initial use of ESCORT® XP HERBICIDEto a small area.
- Components in a grass seed mixture will vary in tolerance to ESCORT® XP HERBICIDE so the final stand may not reflect the seed ratio.
- Under certain conditions, such as heavy rainfall, high pH, prolonged cold weather, or wide fluctuations in day/night temperatures, prior to or soon after ESCORT® XP HERBICIDE application, temporary discoloration and/or grass injury may occur. ESCORT® XP HERBICIDE applied to grass that is stressed by severe weather conditions, drought, low fertility, water-saturated soils, disease, or insect damage can result in grass injury. Severe winter stress, drought, disease, or insect damage before or following application also may result in grass injury.
- Applications of ESCORT® XP HERBICIDE to lands undersown with legumes may cause injury to the legumes. Legumes in a seeding mixture may be severely injured or killed following an application of ESCORT® XP HERBICIDE.
- The control of weeds in wheel track areas may be reduced if ground applications are made when dry, dusty field conditions exist. The addition of 2,4-D or MCPA may improve weed control under these conditions.

WEEDS CONTROLLED

1/3 to 1/2 ounce per acre

Annual sowthistle	Common groundsel	Goldenrod	Smallseed falseflax
Aster	Common purslane	Lambsquarters	Smooth pigweed
Bahiagrass	Common yarrow	Marestail/horseweed****	Sweet clover
Beebalm	Conical catchfly	Maximillion sunflower	Tansymustard
Bittercress	Corn cockle	Miners lettuce	Treacle mustard
Bitter sneezeweed	Cow cockle	Pennsylvania smartweed	Tumble mustard
Blackeyed-susan	Crown vetch	Plains coreopsis	Wild carrot
Blue mustard	Dandelion	Plantain	Wild garlic
Bur buttercup	Dogfennel	Redroot pigweed	Wild lettuce
Chicory	False chamomile	Redstem filaree	Wild mustard
Clover	Fiddleneck tarweed	Rough fleabane	Wooly croton
Cocklebur	Field pennycress	Shepherd's purse	Wood sorrel
Common chickweed	Flixweed	Silky crazyweed (locoweed)	Yankeweed

1/2 to 1 ounce per acre

Blackberry	Curly dock	Honeysuckle	Seaside arrowgrass
Black henbane	Dewberry	Multiflora rose and other wild roses	Sericea lespedeza
Broom snakeweed*	Dyer's woad	Musk thistle***	Tansy ragwort
Buckhorn plantain	Garlic mustard	Oxeye daisy	Teasel
Bull thistle	Gorse	Plumeless thistle	Wild caraway
Common crupina	Halogeton	Prostrate knotweed	
Common sunflower	Henbit	Rosering gaillardia	

1 to 2 ounces per acre

Common mullein	Lupine	Purple scabious	Sulphur cinquefoil
Common tansy	Old world climbing fern	Scotch thistle	Western salsify
Field bindweed**	(Lygodium)	Scouringrush	Whitetop (hoary cress)
Greasewood	Perennial pepperweed	Salsify	Wild Iris
Gumweed	Poison hemlock	Snowberry	
Houndstongue	Purple loosestrife	St. Johnswort	

1 1/2 to 2 ounces per acre

Canada thistle**	Duncecap larkspur	Tall larkspur	Yellow toadflax**
Dalmation toadflax**	Russian knapweed**	Wild parsnip	

2 ounces per acre

Onionweed

3 to 4 ounces per acre

Kudzu

* Apply fall through spring.

** Suppression, which is a visual reduction in weed competition (reduced population or vigor) as compared to untreated areas. Apply as a full coverage spray for best performance.

*** Certain biotypes of musk thistle are more sensitive to ESCORT® XP HERBICIDE and may be controlled with rates of 1/4 to 1/2 ounce per acre. Treatments of ESCORT® XP HERBICIDE may be applied from rosette through bloom stages of development.

**** Certain biotypes of marestail/horsetail are less sensitive to ESCORT® XP HERBICIDE and may be controlled by tank mixes with herbicides with a different mode of action.

Problem Weed Control

For broader spectrum control and for use on certain biotypes of broadleaf weeds which may be resistant to ESCORT® XP HERBICIDE and herbicides with the same mode of action, the following tank mixes may be used.

Dicamba + 2,4-D

Weed	Rate of ESCORT® XP HERBICIDE	Rate of dicamba (fluid ounces/acre)	Rate of 2,4-D (fluid ounces/acre)
Kochia control	1/2	8	16
Spotted knapweed control	1/2	8	16
Rush skeletonweed suppression	1	8	16

INDUSTRIAL TURFGRASS UNIMPROVED ONLY

Application Information

ESCORT® XP HERBICIDE is registered for selective weed control in unimproved industrial turfgrass where certain grasses are well established and desired as ground cover. ESCORT® XP HERBICIDE may also be used for the control of certain noxious and troublesome weeds in turfgrass.

In addition to conventional spray equipment, ESCORT® XP HERBICIDE may also be applied with invert emulsion equipment. When using an invert emulsion, mix the prescribed rate of ESCORT® XP HERBICIDE in the water phase.

Consult the "Weeds Controlled" table to determine which weeds will be controlled by the following application rates:

Turfgrass Type	Rate of ESCORT® XP HERBICIDE (ounces/acre)
Fescue and Bluegrass	¼ to ½
Crested Wheatgrass and Smooth Brome	¼ to 1
Bermudagrass	¼ to 2

Application Timing

Applications may be made at anytime of the year except when the soil is frozen.

When a spring application is made on fescue or bluegrass, a second application may be made during the summer after full seedhead maturation.

Growth Suppression and Seedhead Inhibition (Chemical Mowing)

Application Information

ESCORT® XP HERBICIDE may be used for growth suppression and seedhead inhibition in well established fescue and bluegrass turfgrass at the use rate of 1/4 to 1/2 ounce per acre.

Tank Mix Combination

ESCORT® XP HERBICIDE may be tank mixed with "Embark" for improved performance in the regulation of growth and seedhead suppression. Tank mix 1/4 to 1/2 ounce of ESCORT® XP HERBICIDE with 1/8 to 1/4 pint of "Embark".

Application Timing

Application may be made after at least 2 to 3 inches of new growth has emerged until the appearance of the seed stalk.

IMPORTANT PRECAUTIONS

—INDUSTRIAL TURFGRASS ONLY

- An application of ESCORT® XP HERBICIDE may cause temporary discoloration (chlorosis) or stunting of the turfgrasses. Use the lower specified rates for minimum discoloration or stunting.
- With fescue and bluegrass, sequential applications made during the same or consecutive growth periods (i.e. spring and fall) may result in excessive injury to turfgrass.
- Excessive injury may result when ESCORT® XP HERBICIDE is applied to turfgrass that is under stress from drought, insects, disease, cold temperatures (winter injury) or poor fertility.
- ESCORT® XP HERBICIDE is not recommended for use on bahiagrass.

BRUSH CONTROL

Application Information

ESCORT® XP HERBICIDE is registered for the control of undesirable brush growing in non-crop areas including grazed areas on these sites. Applications may be made by air, high volume ground application, low volume ground application and ultra-low volume ground application. Except as noted for multiflora rose, ESCORT® XP HERBICIDE must be applied as a spray to the foliage.

The application volume required will vary with the height and density of the brush and the application equipment used. Generally, aerial applications will require 15 to 25 gallons of water per acre; high volume ground application will require

100 to 400 gallons of water per acre; low volume ground application will require 20 to 50 gallons of water per acre; and ultra-low volume ground application will require 10 to 20 gallons of water per acre.

Regardless of the application volume and equipment used, thorough coverage of the foliage, particularly the terminal growing points, is necessary to optimize results.

BRUSH SPECIES CONTROLLED

Species	High Volume Rate (ounces/100 gallon)	Broadcast Rate (ounces/acre)
Ash	1—2	1—3
Aspen	1—2	1—3
Black locust	1—2	1—3
Blackberry	1—2	1—3
Camelthorn	1—2	1—3
Cherry	1—2	1—3
Cottonwood	1—2	2—3
Eastern red cedar	1—2	2—3
Elder	1—2	2—3
Elm	1—2	1—3
Firs	3	1—2
Hawthorn	1—2	1—3
Honeysuckle	1—2	1/2—1
Mulberry	1—2	2—3
Multiflora rose	1—2	1—3
Muscadine (wild grape)	1—2	2—3
Oaks	1—2	1—3
Ocean spray (Holodiscus)	1—2	2—3
Osage orange	1—2	2—3
Red maple	1—2	2—3
Salmonberry	1/2—1	1—3
Snowberry	1/2—1	1—3
Spruce (black and white)	3	2—3
Thimbleberry	1/2—1	1—3
Tree of heaven (Ailanthus)	1—2	1—2
Wild roses	1/2—1	1—3
Willow	1/2—1	1—3
Yellow poplar	1/2—1	1—3

For low volume and ultra-low volume ground applications, mix 4 to 8 ounces of ESCORT® XP HERBICIDE per 100 gallons of spray solution.

Application Timing

Make a foliar application of the specified rate of ESCORT® XP HERBICIDE during the period from full leaf expansion in the spring until the development of full fall coloration on deciduous species to be controlled. Coniferous species may be treated at anytime during the growing season.

Spot Treatment

ESCORT® XP HERBICIDE may be used for the control of many species of weeds including noxious/invasive weeds in certain established grasses growing on non-crop areas.

Refer to the "Weeds Controlled" section for a listing of susceptible weed species and the application rate per acre per the target weed.

Or, mix one gram of ESCORT® XP HERBICIDE per one gallon of water along with a surfactant. Spray to the point of wetting the entire surface of the target weeds, approximately 40 gallons of solution per acre.

Tank Mix Combinations—

ESCORT® XP HERBICIDE may be tank mixed with any product labeled for non-crop brush control at the application rates specified on the companion product's label for the pests specified on the product's companion label. Read and follow the label instructions of both products when tank mixing. Follow the most restrictive limitations of any of the product labels being tank mixed.

Low Rate Applications

Imazapyr (2 pound active per gallon)

Combine 1 to 2 ounces of ESCORT® XP HERBICIDE with 1 to 4 pints of imazapyr herbicide per acre and apply as a broadcast spray. For aerial applications use a minimum of 15 gallons per acre spray volume. In addition to species listed above controlled by ESCORT® XP HERBICIDE, this combination controls black gum, hophornbeam, sassafras, sweetgum, Vaccinium species, dogwood, myrtle dahoon, hickories, and persimmon.

Picloram* (2 pound active per gallon) + Imazapyr (2 pound active per gallon)

Combine 1 to 1 1/2 ounce of ESCORT® XP HERBICIDE with 2 to 8 fluid ounces of imazapyr and 1 to 2 pints of picloram per 100 gallons of water. Apply as a high volume spray. This tank mix controls cherry, elms, box elder, maples, hackberry, redbud, ash, oaks (including shingle oak), black locust, and sassafras.

*Picloram is a restricted use pesticide.

Spotgun Basal Soil Treatment

For control of multiflora rose, prepare a spray suspension of ESCORT® XP HERBICIDE by mixing 1 ounce per gallon of water. Mix vigorously until the ESCORT® XP HERBICIDE is dispersed and agitate periodically while applying the spray suspension.

Apply the spray preparation with an exact delivery handgun applicator. Apply at the rate of 4 milliliters for each 2 feet of rose canopy diameter. Direct the treatment to the soil within 2 feet of the stem union. When treating large plants and more than one delivery is required, make applications on opposite sides of the plant.

For best results, make applications from early spring to summer.

IMPORTANT PRECAUTIONS

—NON-CROP BRUSH ONLY

- When using tank mixtures of ESCORT® XP HERBICIDE with companion herbicides, read and follow all use instructions, application rates, warnings, and precautions appearing on the labels. Follow the most restrictive label instructions for each of the herbicides used.

SPRAY EQUIPMENT

Low rates of ESCORT® XP HERBICIDE can kill or severely injure most crops. Following an ESCORT® XP HERBICIDE application, the use of spray equipment to apply other pesticides to crops on which ESCORT® XP HERBICIDE is not registered may result in their damage. The most effective way to reduce this crop damage potential is to use dedicated mixing and application equipment.

MIXING INSTRUCTIONS

1. Fill the tank 1/4 to 1/3 full of water.
2. While agitating, add the required amount of ESCORT® XP HERBICIDE.
3. Continue agitation until the ESCORT® XP HERBICIDE is fully dispersed, at least 5 minutes.
4. Once the ESCORT® XP HERBICIDE is fully dispersed, maintain agitation and continue filling tank with water. ESCORT® XP HERBICIDE must be thoroughly mixed with water before adding any other material.
5. As the tank is filling, add tank mix partners (if desired) then add the necessary volume of nonionic surfactant. Always add surfactant last.
6. If the mixture is not continuously agitated, settling will occur. If settling occurs, thoroughly re-agitate before using.
7. ESCORT® XP HERBICIDE spray preparations are stable if they are pH neutral or alkaline and stored at or below 100° F.
8. If ESCORT® XP HERBICIDE and a tank mix partner are to be applied in multiple loads, pre-slurry the ESCORT® XP HERBICIDE in clean water prior to adding to the tank. This will prevent the tank mix partner from interfering with the dissolution of the ESCORT® XP HERBICIDE.

PRODUCT PRECAUTIONS

- When used as directed, there is no grazing or haying restriction for use rates of 1 2/3 ounces per acre or less. At use rates greater than 1 2/3 ounces per acre and up to 3 1/3 ounces per acre, forage grasses may be cut for hay, fodder or green forage and fed to livestock, including lactating animals, 3 days after treatment.
- Injury to or loss of desirable trees or other plants may result if spray equipment is drained or flushed on or near these trees or plants, or on areas where their roots may extend, or in locations where the product may be washed or moved into contact with their roots.
- Treatment of powdery, dry soil or light, sandy soil when there is little likelihood of rainfall soon after treatment may result in off target movement and possible damage to susceptible crops when soil particles are moved by wind or water. Injury to crops may result if treated soil is washed, blown, or moved onto land used to produce crops. Exposure to ESCORT® XP HERBICIDE may injure or kill most crops. Injury may be more severe when the crops are irrigated. Do not apply ESCORT® XP HERBICIDE when these conditions are identified and powdery, dry soil or light or sandy soils are known to be prevalent in the area being treated.
- Applications made where runoff water flows onto agricultural land may injure crops. Applications made during periods of intense rainfall, to soils saturated with water, to surfaces paved with materials such as asphalt or concrete, or to soils through which rainfall will not readily penetrate may result in runoff and movement of ESCORT® XP HERBICIDE.
- Do not treat frozen or snow covered soil.
- Leave treated soil undisturbed to reduce the potential for ESCORT® XP HERBICIDE movement by soil erosion due to wind or water.

PRODUCT RESTRICTIONS

- Do not use on lawns, walks, driveways, tennis courts, or similar areas.
- Do not apply through any type of irrigation system.
- Do not use this product in the following counties of Colorado: Saguache, Rio Grande, Alamosa, Costilla and Conejos.
- Do not use this product in California.

SPRAYER CLEANUP

Spray equipment must be cleaned before ESCORT® XP HERBICIDE is sprayed. Follow the cleanup procedures specified on the labels of previously applied products. If no directions are provided, follow the six steps outlined below.

When multiple loads of ESCORT® XP HERBICIDE are applied, it is recommended that at the end of each day of spraying, the interior of the tank be rinsed with fresh water and then partially filled, and the boom and hoses flushed. This will prevent the buildup of dried pesticide deposits that can accumulate in the application equipment.

1. Drain tank; thoroughly rinse spray tanks, boom, and hoses with clean water. Loosen and physically remove any visible deposits.
2. Fill the tank with clean water and 1 gallon of ammonia (contains 3% active minimum) for every 100 gallons of water. Flush the hoses, boom, and nozzles with the cleaning solution. Then add more water to completely fill the tank. Circulate the cleaning solution through the tank and hoses for at least 15 minutes. Flush the hoses, boom, and nozzles again with the cleaning solution, and then drain the tank.
3. Remove the nozzles and screens and clean separately in a bucket containing cleaning agent and water.
4. Repeat step 2.

5. Rinse the tank, boom, and hoses with clean water.
6. Dispose of the rinsate on a labeled site or at an approved waste disposal facility. If a commercial cleaner is used follow the commercial cleaner directions for rinsate disposal.

Notes:

1. Mixing chlorine bleach with ammonia can cause dangerous gases to form. Clean spray equipment outdoors.
2. Use steam cleaning or other commercial cleaners to facilitate the removal of any caked pesticide deposits.
3. When ESCORT® XP HERBICIDE is tank mixed with other pesticides, all cleanout procedures for each product must be examined and the most rigorous procedure must be followed.
4. In addition to this cleanout procedure, all pre-cleanout guidelines on subsequently applied products must be followed as per the individual product labels.

SPRAY DRIFT MANAGEMENT

Aerial Applications:

- Do not release spray at a height greater than 10 ft above the vegetative canopy, unless a greater application height is necessary for pilot safety.
- For applications prior to the emergence of crops and target weeds, applicators are required to use a Coarse or coarser droplet size (ASABE S572.1).
- For all other applications, applicators are required to use a Medium or coarser droplet size (ASABE S572.1).
- The boom length must not exceed 65% of the wingspan for airplanes or 75% of the rotor blade diameter for helicopters.
- Applicators must use ½ swath displacement upwind at the downwind edge of the field.
- Nozzles must be oriented so the spray is directed toward the back of the aircraft.
- Do not apply when wind speeds exceed 10 miles per hour at the application site.
- Do not apply during temperature inversions.

Ground Boom Applications:

- Apply with the nozzle height recommended by the manufacturer, but no more than 3 feet above the ground or target vegetation unless making an industrial turf, pasture and rangeland applications, in which case applicators may apply with a nozzle height no more than 4 feet above the crop or target vegetation.
- For applications prior to the emergence of crops and target weeds, applicators are required to use a Coarse or coarser droplet size (ASABE S572.1).
- For all other applications, applicators are required to use a Medium or coarser droplet size (ASABE S572.1).
- Do not apply when wind speeds exceed 10 miles per hour at the application site.
- Do not apply during temperature inversions.

Boom-less Ground Applications:

- Applicators are required to use a Medium or coarser droplet size (ASABE S572.1) for all applications.
- Do not apply when wind speeds exceed 10 miles per hour at the application site.
- Do not apply during temperature inversions.

SPRAY DRIFT ADVISORIES

Boom-less Ground Applications:

- Setting nozzles at the lowest effective height will help to reduce the potential for spray drift.

Handheld Technology Applications:

- Take precautions to minimize spray drift.

THE APPLICATOR IS RESPONSIBLE FOR AVOIDING OFF-SITE SPRAY DRIFT. BE AWARE OF NEARBY NON-TARGET SITES AND ENVIRONMENTAL CONDITIONS.

IMPORTANCE OF DROPLET SIZE

An effective way to reduce spray drift is to apply large droplets. Use the largest droplets that provide target pest control. While applying larger droplets will reduce spray drift, the potential for drift will be greater if applications are made improperly or under unfavorable environmental conditions.

Controlling Droplet Size – Ground Boom

- Volume - Increasing the spray volume so that larger droplets are produced will reduce spray drift. Use the highest practical spray volume for the application. If a greater spray volume is needed, consider using a nozzle with a higher flow rate.
- Pressure - Use the lowest spray pressure recommended for the nozzle to produce the target spray volume and droplet size.
- Spray Nozzle - Use a spray nozzle that is designed for the intended application. Consider using nozzles designed to reduce drift.

Controlling Droplet Size – Aircraft

- Adjust Nozzles - Follow nozzle manufacturers recommendations for setting up nozzles. Generally, to reduce fine droplets, nozzles should be oriented parallel with the airflow in flight.

BOOM HEIGHT – Ground Boom

Use the lowest boom height that is compatible with the spray nozzles that will provide uniform coverage. For ground equipment, the boom should remain level with the crop and have minimal bounce.

RELEASE HEIGHT - Aircraft

Higher release heights increase the potential for spray drift. When applying aerially to crops, do not release spray at a height greater than 10 ft above the crop canopy, unless a greater application height is necessary for pilot safety.

SHIELDED SPRAYERS

Shielding the boom or individual nozzles can reduce spray drift. Consider using shielded sprayers. Verify that the shields are not interfering with the uniform deposition of the spray on the target area.

TEMPERATURE AND HUMIDITY

When making applications in hot and dry conditions, use larger droplets to reduce effects of evaporation.

TEMPERATURE INVERSIONS

Drift potential is high during a temperature inversion. Temperature inversions are characterized by increasing temperature with altitude and are common on nights with limited cloud cover and light to no wind. The presence of an inversion can be indicated by ground fog or by the movement of smoke from a ground source or an aircraft smoke generator. Smoke that layers and moves laterally in a concentrated cloud (under low wind conditions) indicates an inversion, while smoke that moves upward and rapidly dissipates indicates good vertical air mixing. Avoid applications during temperature inversions.

WIND

Drift potential generally increases with wind speed. AVOID APPLICATIONS DURING GUSTY WIND CONDITIONS. Applicators need to be familiar with local wind patterns and terrain that could affect spray drift.

AIR ASSISTED (AIR BLAST) FIELD CROP SPRAYERS

Air assisted field crop sprayers carry droplets to the target via a downward directed air stream. Some may reduce the potential for drift, but if a sprayer is unsuitable for the application and/or set up improperly, high drift potential can result. It is the responsibility of the applicator to determine that a sprayer is suitable for the intended application, that it is configured properly, and that drift potential has been minimized.

Note: Air assisted field sprayers can affect product performance by affecting spray coverage and canopy penetration. Read the specific crop use and application equipment instructions to determine if an air assisted field crop sprayer can be used.

SENSITIVE AREAS

Making applications when there is a sustained wind moving away from adjacent sensitive areas (e.g., residential areas, bodies of water, known habitat for threatened or endangered species, non-target crops) is an effective way to minimize the effect of spray drift.

DRIFT CONTROL ADDITIVES

Using product compatible drift control additives can reduce drift potential. When a drift control additive is used, read and carefully observe cautionary statements and all other information on the additive's label. If using an additive that increases viscosity, ensure that the nozzles and other application equipment will function properly with a viscous spray solution. Preferred drift control additives have been certified by the Chemical Producers and Distributors Association (CPDA).

STORAGE AND DISPOSAL

Do not contaminate water, food, or feed by storage and disposal.

Pesticide Storage: Store product in original container only. Store in a cool, dry place.

Pesticide Disposal: Waste resulting from the use of this product must be disposed of on site or at an approved waste disposal facility.

Container Handling:

Refer to the Net Contents section of this product's labeling for the applicable "Nonrefillable Container" or "Refillable Container" designation.

Nonrefillable Plastic and Metal Containers (Capacity Equal to or Less Than 50 Pounds): Nonrefillable container. Do not reuse or refill this container. Triple rinse container (or equivalent) promptly after emptying. Triple rinse as follows: Empty the remaining contents into application equipment or a mix tank. Fill the container 1/4 full with water and recap. Shake for 10 seconds. Pour rinsate into application equipment or a mix tank or store rinsate for later use or disposal. Drain for 10 seconds after the flow begins to drip. Repeat this procedure two more times. Then, for Plastic Containers, offer for recycling if available or puncture and dispose of in a sanitary landfill, or by incineration. Do not burn, unless allowed by state and local ordinances. For Metal Containers, offer for recycling if available or reconditioning if appropriate, or puncture and dispose of in a sanitary landfill, or by other procedures approved by state and local authorities.

Nonrefillable Plastic and Metal Containers (Capacity Greater Than 50 Pounds): Nonrefillable container. Do not reuse or refill this container. Triple rinse container (or equivalent) promptly after emptying. Triple rinse as follows: Empty the remaining contents into application equipment or a mix tank. Fill the container 1/4 full with water. Replace and tighten closures. Tip container on its side and roll it back and forth, ensuring at least one complete revolution, for 30 seconds. Stand the container on its end and tip it back and forth several times. Turn the container over onto its other end and tip it back and forth several times. Empty the rinsate into application equipment or a mix tank or store rinsate for later use or disposal. Repeat this procedure two more times. Then, for Plastic Containers,
offer for recycling if available or puncture and dispose of in a sanitary landfill, or by incineration. Do not burn, unless allowed by state and local ordinances. For Metal Containers, offer for recycling if available or reconditioning if appropriate, or puncture and dispose of in a sanitary landfill, or by other procedures approved by state and local authorities.

Nonrefillable Plastic and Metal Containers, e.g., Intermediate Bulk Containers [IBC] (Size or Shape Too Large to be Tipped, Rolled or Turned Upside Down): Nonrefillable container. Do not reuse or refill this container. Clean container promptly after emptying the contents from this container into application equipment or mix tank and before final disposal using the following pressure rinsing procedure. Insert a lance fitted with a suitable tank cleaning nozzle into the container and ensure that the water spray thoroughly covers the top, bottom, and all sides inside the container. The nozzle manufacturer generally provides instructions for the appropriate spray pressure, spray duration and/or spray volume. If the manufacturer's instructions

(continued)

STORAGE AND DISPOSAL *(continued)*

are not available, pressure rinse the container for at least 60 seconds using a minimum pressure of 30 PSI with a minimum rinse volume of 10% of the container volume. Drain, pour or pump rinsate into application equipment or rinsate collection system. Repeat this pressure rinsing procedure two more times. Then, for Plastic Containers, offer for recycling if available or puncture and dispose of in a sanitary landfill, or by incineration. For Metal Containers, offer for recycling if available or reconditioning if appropriate, or puncture and dispose of in a sanitary landfill, or by other procedures approved by state and local authorities.

Nonrefillable Paper or Plastic Bags, Fiber Sacks including Flexible Intermediate Bulk Containers (FIBC) or Fiber Drums With Liners: Nonrefillable container. Do not reuse or refill this container. Completely empty paper or plastic bag, fiber sack or drum liner by shaking and tapping sides and bottom to loosen clinging particles. Empty residue into application or manufacturing equipment. Then offer for recycling if available or dispose of empty paper or plastic bag, fiber sack or fiber drum and liner in a sanitary landfill, or by incineration. Do not burn, unless allowed by state and local ordinances.

Refillable Fiber Drums With Liners: Refillable container (fiber drum only). Refilling Fiber Drum: Refill this fiber drum with ESCORT® XP HERBICIDE containing metsulfuron methyl only. Do not reuse this fiber drum for any other purpose. Cleaning before refilling is the responsibility of the refiller. Completely empty liner by shaking and tapping sides and bottom to loosen clinging particles. Empty residue into application or manufacturing equipment. Disposing of Fiber Drum and/or Liner: Do not reuse this fiber drum for any other purpose other than refilling (see preceding). Cleaning the container (liner and/or fiber drum) before final disposal is the responsibility of the person disposing of the container. Offer the liner for recycling if available or dispose of liner in a sanitary landfill, or by incineration. Do not burn, unless allowed by state and local ordinances. If drum is contaminated and cannot be reused, dispose of it in the manner required for its liner. To clean the fiber drum before final disposal, completely empty the fiber drum by shaking and tapping sides and bottom to loosen clinging particles. Empty residue into application or manufacturing equipment. Then offer the fiber drum for recycling if available or dispose of in a sanitary landfill, or by incineration. Do not burn, unless allowed by state and local ordinances.

All Other Refillable Containers: Refillable container. Refilling Container: Refill this container with ESCORT® XP HERBICIDE containing metsulfuron methyl only. Do not reuse this container for any other purpose. Cleaning before refilling is the responsibility of the refiller. Prior to refilling, inspect carefully for damage such as cracks, punctures, abrasions, worn out threads and closure devices. If damage is found, do not use the container, contact BAYER CROPSCIENCE LP at the number below for instructions. Check for leaks after refilling and before transporting. If leaks are found, do not reuse or transport container, contact BAYER CROPSCIENCE LP at the number below for instructions. Disposing of Container: Do not reuse this container for any other purpose other than refilling (see preceding). Cleaning the container before final disposal is the responsibility of the person disposing of the container. To clean the container before final disposal, use the following pressure rinsing procedure. Insert a lance fitted with a suitable tank cleaning nozzle into the container and ensure that the water spray thoroughly covers the top, bottom, and all sides inside the container. The nozzle manufacturer generally provides instructions for the appropriate spray pressure, spray duration and/or spray volume. If the manufacturer's instructions are not available, pressure rinse the container for at least 60 seconds using a minimum pressure of 30 PSI with a minimum rinse volume of 10% of the container volume. Drain, pour, or pump rinsate into application equipment or rinsate collection system. Repeat this pressure rinsing procedure two more times. Then, for Plastic Containers, offer for recycling if available or puncture and dispose of in a sanitary landfill, or by incineration. Do not burn, unless allowed by state and local ordinances. For Metal Containers, offer for recycling if available or reconditioning if appropriate, or puncture and dispose of in a sanitary landfill, or by other procedures approved by state and local authorities.

Outer Foil Pouches of Water Soluble Packets (WSP): Nonrefillable container. Do not reuse or refill this container. Offer for recycling if available or, dispose of the empty outer foil pouch in the trash as long as WSP is unbroken. If the outer pouch contacts the formulated product in any way, the pouch must be triple rinsed with clean water. Add the rinsate to the spray tank and dispose of the outer pouch as described previously.

Do not transport if this container is damaged or leaking. If the container is damaged, leaking or obsolete, or in the event of a major spill, fire or other emergency, contact BAYER CROPSCIENCE LP at 1-800-334-7577, day or night.

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CONDITIONS OF SALE AND LIMITATIONS OF WARRANTY AND LIABILITY

Read the entire Directions for Use, Conditions, Disclaimer of Warranties and Limitations of Liability before using this product. If terms are not acceptable, return the unopened product container at once.

By using this product, user or buyer accepts the following Conditions, Disclaimer of Warranties and Limitations of Liability.

CONDITIONS: The directions for use of this product are believed to be adequate and must be followed carefully. However, it is impossible to eliminate all risks associated with the use of this product. Ineffectiveness, plant injury, other property damage, as well as other unintended consequences may result because of factors beyond the control of Bayer CropScience LP. Those factors include, but are not limited to, weather conditions, presence of other materials or the manner of use or application. All such risks shall be assumed by the user or buyer.

DISCLAIMER OF WARRANTIES: TO THE EXTENT CONSISTENT WITH APPLICABLE LAW, BAYER CROPSCIENCE LP MAKES NO OTHER WARRANTIES, EXPRESS OR IMPLIED, OF MERCHANTABILITY OR OF FITNESS FOR A PARTICULAR PURPOSE OR OTHERWISE, THAT EXTEND BEYOND THE STATEMENTS MADE ON THIS LABEL. No agent of Bayer CropScience LP is authorized to make any warranties beyond those contained herein or to modify the warranties contained herein. TO THE EXTENT CONSISTENT WITH APPLICABLE LAW, BAYER CROPSCIENCE LP DISCLAIMS ANY LIABILITY WHATSOEVER FOR SPECIAL, INCIDENTAL OR CONSEQUENTIAL DAMAGES RESULTING FROM THE USE OR HANDLING OF THIS PRODUCT.

LIMITATIONS OF LIABILITY: TO THE EXTENT CONSISTENT WITH APPLICABLE LAW THE EXCLUSIVE REMEDY OF THE USER OR BUYER FOR ANY AND ALL LOSSES, INJURIES OR DAMAGES RESULTING FROM THE USE OR HANDLING OF THIS PRODUCT, WHETHER IN CONTRACT, WARRANTY, TORT, NEGLIGENCE, STRICT LIABILITY OR OTHERWISE, SHALL NOT EXCEED THE PURCHASE PRICE PAID, OR AT BAYER CROPSCIENCE LP'S ELECTION, THE REPLACEMENT OF PRODUCT.

For product information call: 1-800-331-2867

12

.625

9"
Book Placement

.375

5.5"

10"

68

METSULFURON-METHYL | GROUP 2 | HERBICIDE

Escort® XP

HERBICIDE

Dry Flowable Active Ingredient	By Weight
Metsulfuron methyl Methyl 2-[[[[(4-methoxy-6-methyl-1,3,5-triazin-2-yl)amino]-carbonyl]amino]sulfonyl]benzoate	60%
Other Ingredients	40%
TOTAL	100%

EPA Reg. No. 432-1549

Nonrefillable Container
Net Weight
1 Pound
85798669
85796941C 210224AV1

(01)10785740212001

KEEP OUT OF REACH OF CHILDREN
CAUTION

Si usted no entiende la etiqueta, busque a alguien para que se la explique a usted en detalle. (If you do not understand this label, find someone to explain it to you in detail.)

See Panel for First Aid Instructions and Booklet for Complete Precautionary Statements and Directions for Use.

FIRST AID

IF ON SKIN OR CLOTHING: Take off contaminated clothing. Rinse skin immediately with plenty of water for 15-20 minutes. Call a poison control center or doctor for further treatment advice.

IF IN EYES: Hold eye open and rinse slowly and gently with water for 15-20 minutes. Remove contact lenses, if present, after the first 5 minutes, then continue rinsing eye. Call a poison control center or doctor for further treatment advice.

Have the product container or label with you when calling a poison control center or doctor, or going for treatment. You may also contact 1-800-334-7577 for emergency medical treatment information.

PRECAUTIONARY STATEMENTS
HAZARDS TO HUMANS AND DOMESTIC ANIMALS

CAUTION! Causes eye irritation. Avoid contact with skin, eyes, or clothing. Avoid breathing dust or spray mist.

PERSONAL PROTECTIVE EQUIPMENT (PPE)

Applicators and other handlers must wear:

Long-sleeved shirt and long pants.
Shoes plus socks.

Follow manufacturer's instructions for cleaning/maintaining PPE. If no such instructions for washables exist, use detergent and hot water. Keep and wash PPE separately from other laundry.

USER SAFETY RECOMMENDATIONS

USERS SHOULD: Wash hands before eating, drinking, chewing gum, using tobacco or using the toilet.

ENVIRONMENTAL HAZARDS

Do not apply directly to water, or to areas where surface water is present, or to intertidal areas below the mean high water mark. Do not contaminate water when cleaning equipment or disposing of equipment washwaters or rinsate.

This herbicide is injurious to plants at extremely low concentrations. Nontarget plants may be adversely effected from drift and run-off.

STORAGE AND DISPOSAL

Do not contaminate water, food, or feed by storage and disposal.

Pesticide Storage: Store product in original container only. Store in a cool, dry place.

Pesticide Disposal: Waste resulting from the use of this product must be disposed of on site or at an approved waste disposal facility.

Container Handling:

Refer to the Net Contents section of this product's labeling for the applicable "Nonrefillable Container" or "Refillable Container" designation.

Nonrefillable Plastic and Metal Containers (Capacity Equal to or Less Than 50 Pounds): Nonrefillable container. Do not reuse or refill this container. Triple rinse container (or equivalent) promptly after emptying. Triple rinse as follows: Empty the remaining contents into application equipment or a mix tank. Fill the container 1/4 full with water and recap. Shake for 10 seconds. Pour rinsate into application equipment or a mix tank or store rinsate for later use or disposal. Drain for 10 seconds after the flow begins to drip. Repeat this procedure two more times. Then, for Plastic Containers, offer for recycling if available or puncture and dispose of in a sanitary landfill, or by incineration. Do not burn, unless allowed by state and local ordinances. For Metal Containers, offer for recycling if available or reconditioning if appropriate, or puncture and dispose of in a sanitary landfill, or by other procedures approved by state and local authorities.

Do not transport if this container is damaged or leaking. If the container is damaged, leaking or obsolete, or in the event of a major spill, fire or other emergency, contact BAYER CROPSCIENCE LP at 1-800-334-7577, day or night.

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Bayer

Produced for:
Bayer Environmental Science
A Division of Bayer CropScience LP
5000 CentreGreen Way, Suite 400
Cary, NC 27513

PULL HERE TO OPEN

Product of China

SECTION 1: IDENTIFICATION OF THE SUBSTANCE/MIXTURE AND OF THE COMPANY/UNDERTAKING

Product identifier

Trade name	ESCORT® XP HERBICIDE
Product code (UVP)	84100846, 85792385
SDS Number	102000030324
EPA Registration No.	432-1549

Relevant identified uses of the substance or mixture and uses advised against

Use	Herbicide
Restrictions on use	See product label for restrictions.

Information on supplier

Supplier	Bayer Environmental Science A division of Bayer CropScience LP 500 Centregreen Way, Suite 400 Cary, NC 27513 USA
Responsible Department	Email: SDSINFO.BCS-NA@bayer.com

Emergency telephone no.

Emergency Telephone Number (24hr/ 7 days)	1-800-334-7577
Product Information Telephone Number	1-800-331-2867

SECTION 2: HAZARDS IDENTIFICATION

Classification in accordance with regulation HCS 29CFR §1910.1200
This material is not hazardous under the criteria of the Federal OSHA Hazard Communication Standard 29CFR 1910.1200.

Hazards Not Otherwise Classified (HNOC)
No physical hazards not otherwise classified.
No health hazards not otherwise classified.

SECTION 3: COMPOSITION/INFORMATION ON INGREDIENTS

Hazardous Component Name	CAS-No.	Concentration % by weight
Metsulfuron-methyl	74223-64-6	60.0
Sulfonated aromatic polymer, sodium salt	68425-94-5	3.6
Trisodium orthophosphate	7601-54-9	1.5

SECTION 4: FIRST AID MEASURES

Description of first aid measures

General advice When possible, have the product container or label with you when calling a poison control center or doctor or going for treatment.

Inhalation Move to fresh air. If person is not breathing, call 911 or an ambulance, then give artificial respiration, preferably mouth-to-mouth if possible. Call a physician or poison control center immediately.

Skin contact Take off contaminated clothing and shoes immediately. Wash off immediately with plenty of water for at least 15 minutes. Call a physician or poison control center immediately.

Eye contact Hold eye open and rinse slowly and gently with water for 15-20 minutes. Remove contact lenses, if present, after the first 5 minutes, then continue rinsing eye. Call a physician or poison control center immediately.

Ingestion Call a physician or poison control center immediately. Rinse out mouth and give water in small sips to drink. DO NOT induce vomiting unless directed to do so by a physician or poison control center. Never give anything by mouth to an unconscious person. Do not leave victim unattended.

Most important symptoms and effects, both acute and delayed

Symptoms To date no symptoms are known.

Indication of any immediate medical attention and special treatment needed

Risks Watch victim for at least 48 hours because of possible delayed signs of poisoning.

Treatment Appropriate supportive and symptomatic treatment as indicated by the patient's condition is recommended.

SECTION 5: FIREFIGHTING MEASURES

Extinguishing media

Suitable Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide.

Unsuitable High volume water jet

Special hazards arising from the substance or mixture	In the event of fire the following may be released:, Carbon monoxide (CO), Carbon dioxide (CO2), Nitrogen oxides (NOx), Sulphur oxides
Advice for firefighters	
Special protective equipment for firefighters	Firefighters should wear NIOSH approved self-contained breathing apparatus and full protective clothing.
Further information	Keep out of smoke. Fight fire from upwind position. Cool closed containers exposed to fire with water spray. Contain the spread of the fire-fighting media. Do not allow run-off from fire fighting to enter drains or water courses.
Flash point	Not applicable
Auto-ignition temperature	> 400 °C / > 752 °F
Lower explosion limit	Not applicable
Upper explosion limit	Not applicable
Explosivity	No data available

SECTION 6: ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures

Precautions	Keep unauthorized people away. Isolate hazard area. Avoid contact with spilled product or contaminated surfaces.

Methods and materials for containment and cleaning up

Methods for cleaning up	Sweep up or vacuum up spillage and collect in suitable container for disposal. Keep in suitable, closed containers for disposal. Clean contaminated floors and objects thoroughly, observing environmental regulations.
Additional advice	Use personal protective equipment. If the product is accidentally spilled, do not allow to enter soil, waterways or waste water canal. Do not allow product to contact non-target plants.
Reference to other sections	Information regarding safe handling, see section 7. Information regarding personal protective equipment, see section 8. Information regarding waste disposal, see section 13.

SECTION 7: HANDLING AND STORAGE

Precautions for safe handling

Advice on safe handling	Use only in area provided with appropriate exhaust ventilation.
Hygiene measures	Wash hands thoroughly with soap and water after handling and before eating, drinking, chewing gum, using tobacco, using the toilet or

applying cosmetics.
Remove Personal Protective Equipment (PPE) immediately after handling this product. Remove soiled clothing immediately and clean thoroughly before using again. Wash thoroughly and put on clean clothing.

Conditions for safe storage, including any incompatibilities

Requirements for storage areas and containers Store in original container and out of the reach of children, preferably in a locked storage area. Keep containers tightly closed in a dry, cool and well-ventilated place.

SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

Control parameters

Components	CAS-No.	Control parameters	Update	Basis
Trisodium orthophosphate	7601-54-9	5 mg/m3 (STEL)	2012	WEEL

Exposure controls

Personal protective equipment
In normal use and handling conditions please refer to the label and/or leaflet. In all other cases the following recommendations would apply.

Respiratory protection When respirators are required, select NIOSH approved equipment based on actual or potential airborne concentrations and in accordance with the appropriate regulatory standards and/or industry recommendations.

Hand protection Chemical resistant nitrile rubber gloves

Eye protection Safety glasses with side-shields

Skin and body protection Wear long-sleeved shirt and long pants and shoes plus socks.

General protective measures Follow manufacturer's instructions for cleaning/maintaining PPE. If no such instructions for washables, use detergent and warm/tepid water.
Keep and wash PPE separately from other laundry.

SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

Information on basic physical and chemical properties

Form small rod

Colour light brown

Odour slight

Odour Threshold No data available

pH ca. 5.0 (1 %)

	(as aqueous solution)
Melting point/range	No data available
Boiling Point	Not applicable
Flash point	Not applicable
Flammability	No data available
Auto-ignition temperature	> 400 °C
Minimum ignition energy	No data available
Self-accelarating decomposition temperature (SADT)	No data available
Upper explosion limit	Not applicable
Lower explosion limit	Not applicable
Vapour pressure	No data available
Evaporation rate	Not applicable
Relative vapour density	No data available
Relative density	No data available
Density	No data available
Bulk density	690 kg/m3 (bulk density tapped)
Water solubility	dispersible
Partition coefficient: n-octanol/water	Metsulfuron-methyl: No data available
Viscosity, dynamic	No data available
Viscosity, kinematic	No data available
Oxidizing properties	No data available
Explosivity	No data available
Other information	Further safety related physical-chemical data are not known.

SECTION 10: STABILITY AND REACTIVITY

Reactivity	
Thermal decomposition	Stable under normal conditions.
Chemical stability	Stable under recommended storage conditions.

Possibility of hazardous reactions	No hazardous reactions when stored and handled according to prescribed instructions.
Conditions to avoid	Extremes of temperature and direct sunlight.
Incompatible materials	Strong oxidizing agents, Strong reducing agents
Hazardous decomposition products	No decomposition products expected under normal conditions of use.

SECTION 11: TOXICOLOGICAL INFORMATION

Exposure routes	Eye contact, Inhalation, Ingestion, Skin contact
Immediate Effects **Eye**	Causes eye irritation.

Information on toxicological effects

Acute oral toxicity	LD50 (Rat) > 5,000 mg/kg
Acute inhalation toxicity	LC50 (Rat) > 5.0 mg/l Exposure time: 4 h The value mentioned relates to the active ingredient metsulfuron methyl.
Acute dermal toxicity	LD50 (Rabbit) > 5,000 mg/kg
Skin corrosion/irritation	No skin irritation (Rabbit)
Serious eye damage/eye irritation	Slight irritant effect - does not require labelling. (Rabbit)
Respiratory or skin sensitisation	Skin: Non-sensitizing. (Guinea pig) OECD Test Guideline 406, Buehler test

Assessment STOT Specific target organ toxicity – single exposure

Metsulfuron-methyl: Based on available data, the classification criteria are not met.

Assessment STOT Specific target organ toxicity – repeated exposure

Metsulfuron-methyl: Based on available data, the classification criteria are not met.

Assessment mutagenicity

Metsulfuron-methyl: Based on available data, the classification criteria are not met. Not mutagenic in Ames Test.

Assessment carcinogenicity

Metsulfuron-methyl is not considered carcinogenic.

ACGIH

None.

NTP

None.

IARC

None.

OSHA

None.

Assessment toxicity to reproduction

Metsulfuron-methyl did not cause reproductive toxicity in laboratory animals.

Assessment developmental toxicity

Metsulfuron-methyl is not considered a developmental toxicant.

Aspiration hazard

Based on available data, the classification criteria are not met.

Further information

Only acute toxicity studies have been performed on the formulated product.
The non-acute information pertains to the active ingredient(s).

SECTION 12: ECOLOGICAL INFORMATION

Toxicity to fish	LC50 (Oncorhynchus mykiss (rainbow trout)) > 150 mg/l Exposure time: 96 h The value mentioned relates to the active ingredient metsulfuron methyl. LC50 (Lepomis macrochirus (Bluegill sunfish)) > 150 mg/l Exposure time: 96 h The value mentioned relates to the active ingredient metsulfuron methyl.
Toxicity to aquatic invertebrates	EC50 (Daphnia (water flea)) > 120 mg/l Exposure time: 48 h The value mentioned relates to the active ingredient metsulfuron methyl.
Toxicity to aquatic plants	EC50 (Anabaena flos-aquae (cyanobacterium)) 0.066 mg/l Exposure time: 72 h The value mentioned relates to the active ingredient metsulfuron methyl. EC50 (Lemna minor (common duckweed)) 0.00036 mg/l Exposure time: 14 d The value mentioned relates to the active ingredient metsulfuron methyl.
Biodegradability	Metsulfuron-methyl: No data available
Koc	Metsulfuron-methyl:No data available
Bioaccumulation	Metsulfuron-methyl: No data available

Mobility in soil	Metsulfuron-methyl: No data available

Results of PBT and vPvB assessment

PBT and vPvB assessment	Metsulfuron-methyl: This substance is not considered to be persistent, bioaccumulative and toxic (PBT). This substance is not considered to be very persistent and very bioaccumulative (vPvB).
Additional ecological information	No further ecological information is available.
Environmental precautions	Do not apply directly to water, to areas where surface water is present or to intertidal areas below the mean high water mark. Do not contaminate surface or ground water by cleaning equipment or disposal of wastes, including equipment wash water. Drift or runoff from treated areas may adversely affect non-target plants. Apply this product as specified on the label.

SECTION 13: DISPOSAL CONSIDERATIONS

Waste treatment methods

Product	Dispose in accordance with all local, state/provincial and federal regulations.
Contaminated packaging	Consult state and local regulations regarding the proper disposal of container. Follow advice on product label and/or leaflet.
RCRA Information	Characterization and proper disposal of this material as a special or hazardous waste is dependent upon Federal, State and local laws and are the user's responsibility. RCRA classification may apply.

SECTION 14: TRANSPORT INFORMATION

49CFR	Not dangerous goods / not hazardous material

IMDG

UN number	**3077**
Class	9
Packaging group	III
Marine pollutant	YES
Proper shipping name	ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S. (METSULFURON-METHYL MIXTURE)

IATA

UN number	**3077**
Class	9
Packaging group	III
Environm. Hazardous Mark	YES

Proper shipping name	ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S. (METSULFURON-METHYL MIXTURE)

This transportation information is not intended to convey all specific regulatory information relating to this product. It does not address regulatory variations due to package size or special transportation requirements.

Freight Classification:	COMPOUNDS, TREE OR WEED KILLING, N.O.I. other than poison, HAVING A DENSITY OF 20 LBS OR GREATER PER CUBIC FOOT

SECTION 15: REGULATORY INFORMATION

EPA Registration No. 432-1549
US Federal Regulations
TSCA list

Sulfonated aromatic polymer, sodium salt	68425-94-5
Sucrose	57-50-1
Trisodium orthophosphate	7601-54-9

US. Toxic Substances Control Act (TSCA) Section 12(b) Export Notification (40 CFR 707, Subpt D)
No export notification needs to be made.
SARA Title III - Section 302 - Notification and Information
Not applicable.
SARA Title III - Section 313 - Toxic Chemical Release Reporting
None.

US States Regulatory Reporting
CA Prop65
This product does not contain any substances known to the State of California to cause cancer.

This product does not contain any substances known to the State of California to cause reproductive harm.

US State Right-To-Know Ingredients

Sucrose	57-50-1	MN, RI
Trisodium orthophosphate	7601-54-9	CA, CT, IL, MN, NJ

Environmental
CERCLA
Yes
Trisodium orthophosphate 7601-54-9
Listed
Clean Water Section 307(a)(1)
None.
Safe Drinking Water Act Maximum Contaminant Levels
None.

EPA/FIFRA Information:
This chemical is a pesticide product registered by the Environmental Protection Agency and is subject to certain labeling requirements under federal pesticide law. These requirements differ from the classification criteria and hazard information required for safety data sheets, and for workplace labels of non-pesticide chemicals. Following is the hazard information required on the pesticide label:

Signal word: Caution!

Hazard statements: Causes moderate eye irritation.

SECTION 16: OTHER INFORMATION

Abbreviations and acronyms

49CFR	Code of Federal Regulations, Title 49
ACGIH	US. ACGIH Threshold Limit Values
ATE	Acute toxicity estimate
CAS-Nr.	Chemical Abstracts Service number
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
EINECS	European inventory of existing commercial substances
ELINCS	European list of notified chemical substances
IARC	International Agency for Research on Cancer
IATA	International Air Transport Association
IMDG	International Maritime Dangerous Goods
N.O.S.	Not otherwise specified
NTP	US. National Toxicology Program (NTP) Report on Carcinogens
OECD	Organization for Economic Co-operation and Development
TDG	Transportation of Dangerous Goods
TWA	Time weighted average
UN	United Nations
WHO	World health organisation

NFPA 704 (National Fire Protection Association):

Health - 1	Flammability - 1	Instability - 0	Others - none

HMIS (Hazardous Materials Identification System, based on the Third Edition Ratings Guide)

Health - 1	Flammability - 1	Physical Hazard - 0	PPE -

0 = minimal hazard, 1 = slight hazard, 2 = moderate hazard, 3 = severe hazard, 4 = extreme hazard

Reason for Revision: The following sections have been revised: Section 3: Composition / Information on Ingredients. Section 8: Exposure Controls / Personal Protection. Section 15: Regulatory information. Reviewed and updated for general editorial purposes.

Revision Date: 07/31/2020

This information is provided in good faith but without express or implied warranty. The customer assumes all responsibility for safety and use not in accordance with label instructions. The product names are

registered trademarks of Bayer.

GROUP 2 HERBICIDE

Patriot®

Selective Herbicide

ACTIVE INGREDIENT:

Metsulfuron Methyl: Methyl 2-[[[[(4-methoxy-6-methyl-1,3,5-triazin-2yl)amino] Carbonyl]amino]sulfonyl]benzoate	60.0%
OTHER INGREDIENTS:	40.0%
TOTAL:	100.0%

KEEP OUT OF REACH OF CHILDREN

CAUTION / PRECAUCION

Si usted no entiende la etiqueta, busque a alguien para que se la explique a usted en detalle.
(If you do not understand this label, find someone to explain it to you in detail.)

SEE INSIDE BOOKLET FOR ADDITIONAL PRECAUTIONARY STATEMENTS AND FIRST AID

For Chemical Spill, Leak, Fire, or Exposure, Call CHEMTREC (800) 424-9300

For Medical Emergencies Only, Call (877) 325-1840

EPA Reg. No 228-391

Manufactured for
Nufarm Americas Inc.
11901 S. Austin Avenue
Alsip, IL 60803

Nufarm Grow a better tomorrow.

SPECIMEN

FIRST AID	
IF SWALLOWED	• Call a doctor or poison control center immediately for treatment advice. • Have person sip a glass of water if able to swallow. • Do not induce vomiting unless told to do so by a poison control center or doctor. • Do not give anything by mouth to an unconscious person.
IF ON SKIN OR CLOTHING	• Take off contaminated clothing. • Rinse skin immediately with plenty of water for 15 to 20 minutes. • Call a poison control center or doctor for treatment for advice.
IF IN EYES	• Hold eye open and rinse slowly and gently with water for 15 to 20 minutes. • Remove contact lenses, if present, after first 5 minutes, rinsing eye. • Call a poison control center or doctor for treatment advice.
IF INHALED	• Move person to fresh air. • If person is not breathing, call 911 or an ambulance, then give artificial respiration, preferably by mouth-to-mouth, if possible. • Call a poison control center or doctor for further treatment advice.
HOTLINE NUMBER Have the product container or label with you when calling a poison control center or doctor, or going for treatment. You may also contact (877) 325-1840 for emergency medical treatment information.	

PRECAUTIONARY STATEMENTS
HAZARDS TO HUMANS AND DOMESTIC ANIMALS
CAUTION / PRECAUCION

Causes eye irritation. Avoid contact with skin, eyes or clothing. Avoid breathing dust or spray mist.

PERSONAL PROTECTIVE EQUIPMENT (PPE)

Applicators and other handlers who handle this pesticide for any use covered by the Worker Protection Standard [(40 CFR Part 170)] must wear:

- Long-sleeved shirt and long pants.
- Shoes plus socks.

Follow manufacturer's instructions for cleaning/maintaining PPE. Discard clothing and other absorbent materials that have been drenched or heavily contaminated with this product's concentrate. Do not reuse them. Follow manufacturer's instructions for cleaning/maintaining PPE, if no such instructions for washables, use detergent and hot water. Keep and wash PPE separately from other laundry.

Engineering Control Statements:

When handlers use closed systems, enclosed cabs, or aircraft in a manner that meets the requirements listed in the Worker Protection Standard (WPS) for agricultural pesticides (40CFR 170.240 (d) (4-6), the handler PPE requirements may be reduced or modified as specified in the WPS.

IMPORTANT: When reduced PPE is worn because a closed system is being used, handlers must be provided all PPE specified above for "applicators and other handlers" and have such PPE immediately available for use in a emergency, such as a spill or equipment break-down.

USER SAFETY RECOMMENDATIONS

Users should:

- Wash hands before eating, drinking, chewing gum, using tobacco or using the toilet.
- Remove clothing/PPE immediately if pesticide gets inside. Then wash thoroughly and put on clean clothing.
- Remove PPE immediately after handling this product. Wash the outside of gloves before removing. As soon as possible, wash thoroughly and change into clean clothing.

ENVIRONMENTAL HAZARDS

Do not apply directly to water, or to areas where surface water is present, or to intertidal areas below the mean high water mark. Do not contaminate water when cleaning equipment or disposing of equipment washwaters.

This herbicide is injurious to plants at extremely low concentrations. Nontarget plants may be adversely affected from drift and run-off.

SPECIMEN

DIRECTIONS FOR USE

It is a violation of Federal law to use this product in a manner inconsistent with its labeling. Do not apply this product in a way that will contact workers or other persons, either directly or through drift. Only protected handlers may be in the area during application. For any requirements specific to your State or Tribe, consult the agency in your State responsible for pesticide regulation.

This product must be used only in accordance with the instructions on this label.

Nufarm will not be responsible for losses or damages resulting from the use of this product in any manner not specified by Nufarm. User assumes all risks associated with such uses not on this label.

For tank mixes, use the most restrictive limitations from the labeling of the products being mixed. Use only those tank mix partners which are labeled for the appropriate use site. Do not use on food or feed crops except as specified by this label or supplemental labeling.

TANK MIXES

This product may be tank mixed with other herbicides registered for the use sites described in this label. Use only those tank mix partners which are labeled for the appropriate use site. When tank mixing, use the most restrictive label limitations for each of the products being used in the tank mix.

AGRICULTURAL USE REQUIREMENTS

Use this product only in accordance with its labeling and with the Worker Protection Standard, 40 CFR Part 170. This Standard contains requirements for the protection of agricultural workers on farms, forests, nurseries, and greenhouses, and handlers of agricultural pesticides. It contains requirements for training, decontamination, notification, and emergency assistance. It also contains specific instructions and exceptions pertaining to the statements on this label about personal protective equipment (PPE) and restricted entry interval. The requirements in this box only apply to uses of this product that are covered by the Worker Protection Standard.

Do not enter or allow worker entry into treated areas during the restricted entry interval (REI) of 4 hours.

PPE required for early entry to treated areas that is permitted under the Worker Protection Standard and that involves contact with anything that has been treated, such as plants, soil, or water, is:

- Coveralls, and
- Shoes plus socks.

NON-AGRICULTURAL USE REQUIREMENTS

The requirements in this box apply to uses of this product that are NOT within the scope of the Worker Protection Standard for agricultural pesticides (40 CFR Part 170). The WPS applies when this product is used to produce agricultural plants on farms, forests, nurseries or greenhouses.

Keep people and pets off treated areas until sprays have dried.

Non-crop industrial weed control, selective weed control in turf (industrial, unimproved only), and weed control in pastures and rangeland are not within the scope of the Worker Protection Standard.

Keep unprotected persons out of treated areas until sprays have dried.

IMPORTANT

DO NOT USE ON FOOD OR FEED CROPS EXCEPT AS SPECIFIED BY THIS LABEL OR SUPPLEMENTAL LABELING. Injury to or loss of desirable trees or other plants may result from failure to observe the following: Do not apply Patriot (except as directed), or drain or flush equipment on or near desirable trees or other plants, or on areas where their roots may extend or in locations where the chemical may be washed or moved into contact with their roots. Do not use on lawns, walks, driveways, tennis courts, or similar areas. Prevent drift of spray to desirable plants. Do not contaminate any body of water, including irrigation water. Keep from contact with fertilizers, insecticides, fungicides and seeds. Following a Patriot application, do not use sprayer for application to food or feed crops other than as directed by EPA registered label instructions. This is extremely important, as low rates of Patriot can kill or severely injure most crops (except small grains).

PRODUCT INFORMATION

Patriot is a water dispersible granule (WDG) that is mixed in water and applied as a spray. Patriot controls many annual and perennial weeds and woody plants in noncrop areas, conifer and hardwood plantations.

Patriot is mixed in water or can be preslurried in water and added to liquid nitrogen carrier solutions and applied as a uniform broadcast spray.

Patriot is noncorrosive, nonflammable, nonvolatile, and does not freeze.

Patriot controls many annual and perennial weeds and unwanted woody plants on private, public and military lands, on rights-of-way, industrial sites, non-crop areas, ditchbanks of dry drainage ditches, certain types of unimproved turf grass, and conifer and hardwood plantations, including grazed areas on these sites. Do not use on irrigation ditches.

SPECIMEN

Patriot may also be used for controlling and suppressing undesirable weeds and hardwoods in conifer plantations, on land primarily dedicated to the production of wheat (including durum), barley, triticale, fallow lands, pasture, and rangeland, CRP land and on irrigated or dry land grain sorghum in Colorado, Kansas, Nebraska, Oklahoma, and Texas (north of Interstate 20), as well as selected uncultivated agricultural areas (fence rows, farmyards, and rights-of-way). Patriot may also be used for controlling and suppressing undesirable weeds and hardwoods directly adjacent to treated pastures or rangeland, where grazing or harvesting for animal feed may occur.

Patriot controls weeds and woody plants primarily by postemergent activity. For best results, apply Patriot to young, actively growing weeds. Although Patriot has preemergence activity at the higher use rates, best results are generally obtained when Patriot is applied to foliage after emergence or dormancy break. Generally, for the control of annual weeds, Patriot provides best results when applied to young, actively growing weeds. For the control of perennial weeds, applications made at the bud/bloom stage or while the target weeds are in the fall rosette stage may provide the best results. The use rate depends upon the weed species and size at the time of application.

The degree and duration of control may depend on the following:

- Weed spectrum and infestation intensity
- Weed size at application
- Environmental conditions at and following treatment
- Soil pH, soil moisture, and soil organic matter.

Patriot may be applied on conifer and hardwood plantations and noncrop sites that contain areas of temporary surface water caused by the collection of water between planting beds, in equipment ruts, or in other depressions created by management activities. It is permissible to treat intermittently flooded low lying sites when no water is present. It is also permissible to treat marshes, swamps, and bogs after water has receded as well as seasonally dry floodplains where surface water is not present, terrestrial areas of deltas and low lying areas where water is drained but may be isolated in pockets due to uneven or unlevel conditions. Do not make applications to natural or man-made bodies of water such as lakes, reservoirs, ponds, streams and canals.

IMPORTANT INFORMATION
PESTICIDE HANDLING

- Calibrate sprayers only with clean water away from the well site.
- Make scheduled checks of spray equipment.
- Assure accurate measurement of pesticides by all operation employees.
- Mix only enough product for the job at hand.
- Avoid overfilling of spray tank.
- Do not discharge excess material on the soil at a single spot in the field or mixing/loading station.
- Dilute and agitate excess solution and apply at labeled rates/uses.
- Avoid storage of pesticides near well sites.
- When triple rinsing the pesticide container, be sure to add the rinsate to the spray mix.

USE RESTRICTIONS

Injury to or loss of desirable trees or other plants may result from failure to observe the following.

- Do not drain or flush equipment on or near desirable trees or other plants, or on areas where their roots may extend, or in locations where the product may be washed or moved into contact with their roots.
- Treatment of powdery, dry soil or light, sandy soil when there is little likelihood of rainfall soon after treatment may result in off target movement and possible damage to susceptible crops when soil particles are moved by wind or water. Injury to crops may result if treated soil is washed, blown, or moved onto land used to produce crops. Exposure to this product may injure or kill most crops. Injury may be more severe when crops are irrigated. Do not apply this product when these conditions are identified and powdery, dry soil or light, and sandy soils are known to be prevalent in the area being treated.
- Do not apply to frozen ground as surface runoff may occur.
- Do not apply to snow-covered ground.
- Do not apply through any type of irrigation system.
- Do not apply to irrigated land where the tailwater will be used to irrigate crops.
- Do not contaminate any body of water, including irrigation water.
- Spraying and mixing equipment used with this product must not be used for subsequent application without adequately being cleaned to food or feed crops with the exception of pastures, rangeland, wheat, barley, grain sorghum, triticale, fallow and CRP lands as low rates of this product can kill or severely injure most food or feed crops.
- Do not apply to wheat, barley or pastures undersown with legumes, as injury to the forage may result.
- Do not use this product in the following counties of Colorado: Saguache, Rio Grande, Alamosa, Costilla and Conejos
- [Do not use this product in California.]
- Do not use on grasses grown for seed.
- Do not use on lawns, walks, driveways, tennis courts, or similar areas.
- When this product is used at rates of 1-2/3 ounce per acre or less, there are no grazing or haying restrictions on this product.

SPECIMEN

USE PRECAUTIONS

Injury to or loss of desirable trees or other plants may result from failure to observe the following.

- Prevent drift of spray to desirable plants.
- Applications made where runoff water flows onto agricultural land may injure crops. Applications made during periods of intense rainfall, to soils saturated with water, to surfaces paved with materials such as asphalt or concrete, or to soils through which rainfall will not readily penetrate may result in runoff and movement of this product. Treated soil should be left undisturbed to reduce the potential for this product movement by soil erosion due to wind or water.
- Applications of this product to pastures, rangeland or CRP undersown with legumes may cause injury to the legumes. Legumes in a seeding mixture may be severely injured or killed following an application of this product.
- Wheat and barley varieties may differ in their response to various herbicides. Nufarm recommends that you first consult your state experiment station, university, or extension agent as to sensitivity to any herbicide. If no information is available, limit the initial use of this product to a small area.
- Under certain conditions such as heavy rainfall, prolonged cold weather, or wide fluctuations in day/night temperatures prior to or soon after application of this product, temporary discoloration and/or crop injury may occur. This product should not be applied to wheat or barley that is stressed by severe weather conditions, drought, low fertility, water-saturated soil, disease, or insect damage, as crop injury may result. Risk of injury is greatest when crop is in the 2 to 5-leaf stage. Severe winter stress, drought, disease, or insect damage following application also may result in crop injury.
- To reduce the potential for movement of treated soil due to wind erosion, do not apply to powdery dry or fight sandy soils until they have been stabilized by rainfall, trashy mulch, reduced tillage, or other cultural practices. Injury to immediately adjacent crops may occur when treated soil is blown onto land used to produce crops other than cereal grains or pasture/rangeland.
- For ground applications applied to weeds when dry, dusty field conditions exist, control of weeds in wheel track areas may be reduced. The addition of 2,4-D or MCPA should improve weed control under these conditions.
- Preplant or preemergence applications of 2,4-D or herbicides containing 2,4-D made within 2 weeks of planting spring cereals may cause crop injury when used in conjunction with early postemergence applications of this product. For increased crop safety, delay treatment of this product until crop tillering has begun.
- The combined treatment effects of this product postemergence preceded by preemergence wild oat herbicides may cause crop injury to spring wheat when crop stress (soil crusting, planting too deep, prolonged cold weather, or drought) causes poor seedling vigor.
- In the Pacific Northwest, to prevent cold weather-related crop injury, avoid making applications during winter months when weather conditions are unpredictable and can be severe.

ENVIRONMENTAL CONDITIONS AND BIOLOGICAL ACTIVITY

Patriot is absorbed primarily through the foliage of plants, and by the roots to a lesser degree. Plant cell division is generally inhibited in sensitive plants within a few hours following uptake. Two to 4 weeks after application, leaf growth slows followed by discoloration and tissue death. The final effects on annual weeds are evident about 4 to 6 weeks after application. The ultimate effect on perennial weeds and woody plants occurs in the growing season following application.

Warm, moist conditions following treatment promote the activity of Patriot while cold dry conditions may reduce or delay activity. Weeds and brush hardened off by cold weather or drought stress may not be controlled.

One to two inches of rainfall or sprinkler irrigation (enough to wet the top 2-3 inches of soil profile) may be needed to move this product into the weed root zone before the next flush of weeds emerge. The amount of moisture required for sufficient activation increases with crop or weed residue and for finer textured soils. Without sufficient rainfall or sprinkler irrigation to move this product into the weed root zone, weeds that germinate after treatment will not be controlled.

Application of this product provides the best control in vigorously growing grasses that shade competitive weeds. Weed control in areas of thin grass may not be as satisfactory. However, a grass canopy that is too dense at application can intercept a spray and reduce weed control.

This product is safe to grasses under normal conditions. However, grasses that are stressed from adverse environmental conditions (such as extreme temperatures or moisture), abnormal soil conditions, or cultural practices may be injured by applications of this product. In addition, different species of grass may be sensitive to treatment with this product under otherwise normal conditions. Application of this product to these species may result in injury.

The use of a surfactant can enhance the control of susceptible plants, except where noted. Apply at a minimum rate (concentration) of 1/4% volume/volume (1 quart per 100 gallons of spray solution) or at the manufacturer's specified rate. Use only EPA approved surfactants containing at least 80% active ingredient. Certain types of surfactants, such as those incorporating acetic acid (i.e. LI-700), may not be compatible with this product and may result in decreased performance. Certain surfactants may not be suitable for use on desirable plants such as turf and conifers, listed on this label. Consult the surfactant manufacturer's label for appropriate uses.

Weed and brush control may be reduced if rainfall, snowfall or sprinkler irrigation occurs within 4 hours following application.

SPECIMEN

RESISTANCE MANAGEMENT

This product contains the active ingredient metsulfuron methyl which is a Group 2 herbicide based on the mode of action classification system of the Weed Science Society of America.

When herbicides that affect the same biological site of action are used repeatedly over several years to control the same weed species in the same field, naturally-occurring resistant biotypes may survive a correctly applied herbicide treatment, propagate, and become dominant in that field. Adequate control of these resistant weed biotypes cannot be expected. If weed control is unsatisfactory, it may be necessary to retreat the problem area using a product affecting a different site of action.

To better manage herbicide resistance through delaying the proliferation and possible dominance of herbicide resistance weed biotypes, it may be necessary to change cultural practices within and between crop seasons such as using a combination of tillage, retreatment, tank-mix partners and/or sequential herbicide applications that have a different site of action. Weed escapes that are allowed to go to seed will promote the spread of resistant biotypes.

It is advisable to keep accurate records of pesticides applied to individual fields to help obtain information on the spread and dispersal of resistant biotypes. Consult your agricultural dealer, consultant, applicator, and/or appropriate state agricultural extension service representative for specific alternative cultural practices or herbicide guidance available in your area.

INTEGRATED PEST MANAGEMENT

This product may be used as a part of an Integrated Pest Management (IPM) program that can include biological, cultural, and genetic practices aimed at preventing economic pest damage. IPM principles and practices include field scouting or other detection methods, correct target pest identification, population monitoring and treating when target pest populations reach locally determined action thresholds. Consult your state cooperative extension service, professional consultants or other qualified authorities to determine appropriate action treatment threshold levels for treating specific pest/crop systems in your area.

SPRAY EQUIPMENT

For specific application equipment refer to the manufacturer s recommendations for additional information on GPA, pressure, speed, nozzle types and arrangements, nozzle heights above the target canopy etc.

Be sure to calibrate air or ground equipment properly before application Select a spray volume and delivery system that will ensure thorough coverage and a uniform spray pattern with minimum drift. Use higher spray volumes to obtain better coverage when the crop canopy is dense. Avoid swath overlapping and shut off spray booms while starting, turning, slowing or stopping to avoid crop injury.

Do not make applications using equipment and/or spray volumes or under weather conditions that might cause spray to drift onto nontarget sites. For additional information on spray drift refer to the **Spray Drift Management** section of the label. Continuous agitation is required to keep this product in suspension.

Low rates of this product can kill or severely injure most crops. Following an application of this product, the use of the same spray equipment to apply other pesticides to crops on which this product is not registered may result in undesirable damage. The most effective way to reduce this crop damage potential is to use dedicated mixing and application equipment.

SPRAYER CLEANUP

Spray equipment must be cleaned before this product is sprayed. Follow the cleanup procedures specified on the labels of previously applied products. If no directions are provided, follow the six steps outlined below.

At the End of the Day

When multiple loads of this product are applied, it is advised that at the end of each day of spraying the interior of the tank be rinsed with fresh water then partially filled, and the boom and hoses flushed. This will prevent the buildup of dried pesticide deposits that can accumulate in the application equipment.

Before Spraying Crops Other than Wheat, Barley, Triticale, Grain Sorghum, Fallow, Pasture or Rangeland:

To avoid subsequent injury to desirable crops, thoroughly clean all mixing and spray equipment immediately following applications of this product as follows:

1. Drain tank; thoroughly rinse spray tanks, boom, and hoses with clean water. Loosen and physically remove any visible deposits.
2. Fill the tank with clean water and 1 gallon of household ammonia* (contains 3% active) for every 100 gallons of water. Flush the hoses, boom, and nozzles with the cleaning solution. Then add more water to completely fill the tank. Circulate the cleaning solution through the tank and hoses for at least 15 minutes. Flush the hoses, boom, and nozzles again with the cleaning solution, and then drain the tank.
3. Remove the nozzles and screens and clean separately in a bucket containing cleaning agent and water.
4. Repeat step 2.
5. Rinse tank, boom, and hoses with clean water.
6. If only ammonia is used as a cleaner, the rinsate solution may be applied back to use sites listed on this label. Do not exceed the maximum labeled use rate. If other cleaners are used, consult the cleaner label for rinsate disposal instructions. If no instructions are given, dispose of the rinsate on site or at an approved waste disposal facility.

SPECIMEN

Equivalent amounts of an alternate-strength ammonia solution or a Nufarm-approved cleaner can be used in the cleanout procedure. Carefully read and follow the individual cleaner instructions. Consult your agricultural dealer, applicator, or Nufarm representative for a listing of approved cleaners.

Notes:

1. **ATTENTION:** Do not use chlorine bleach with ammonia, as dangerous gases will form. Do not clean equipment in an enclosed area.
2. Steam-cleaning aerial spray tanks prior to performing the above cleanout procedure to facilitate the removal of any caked deposits.
3. When this product is tank mixed with other pesticides, all required cleanout procedures should be examined and the most rigorous procedure should be followed.
4. In addition to the cleanout procedure for this product, all pre-cleanout guidelines on subsequently applied products should be followed as per the individual labels.
5. Where spray equipment is frequently used for applications of this product and subsequent applications of other pesticides to sensitive crops during the same spray season, dedicate a sprayer to use only this product to further reduce the chance of crop injury.

SPRAY DRIFT MANAGEMENT

The interaction of many equipment and weather-related factors determines the potential for spray drift. The applicator is responsible for considering all of these factors when making applications.

AVOIDING SPRAY DRIFT IS THE RESPONSIBILITY OF THE APPLICATOR.

IMPORTANCE OF DROPLET SIZE

The most effective way to reduce drift potential is to apply large droplets (>150-200 microns). The best drift management strategy is to apply the largest droplets that provide sufficient coverage and control. The presence of sensitive species nearby, the environmental conditions, and pest pressure may affect how an applicator balances drift control and coverage. APPLYING LARGER DROPLETS REDUCES DRIFT POTENTIAL, BUT WILL NOT PREVENT DRIFT IF APPLICATIONS ARE MADE IMPROPERLY OR UNDER UNFAVORABLE ENVIRONMENTAL CONDITIONS! See, **Wind, Temperature and Humidity, and Temperature Inversions** sections of this label.

Controlling Droplet Size- General Techniques

- **Volume-** Use high flow rate nozzles to apply the highest practical spray volume. Nozzles with higher rate flows produce larger droplets.
- **Pressure-** Use the lower spray pressures specified for the nozzle. Higher pressure reduces droplet size and does not improve canopy penetration. WHEN HIGHER FLOW RATES ARE NEEDED, USE A HIGHER-CAPACITY NOZZLE INSTEAD OF INCREASING PRESSURE.
- **Nozzle Type-** Use a nozzle type that is designed for the intended application. With most nozzle types, narrower spray angles produce larger droplets. Consider using low-drift nozzles.

Controlling Droplet Size- Aircraft

- **Number of Nozzles-** Use the minimum number of nozzles with the highest flow rate that provides uniform coverage.
- **Nozzle Orientation-** Orienting nozzles so that the spray is emitted backwards, parallel to the air stream will produce larger droplets than other orientations.
- **Nozzle Type-** Solid stream nozzles (such as disc and core with swirl plate removed) oriented straight back produce larger droplets than other nozzle types.
- **Boom Length-** The boom length should not exceed 3/4 of the wing or rotor length- longer booms increase drift potential.
- **Application Height-** Application more than 10 ft above the canopy increases the potential for spray drift.

BOOM HEIGHT

Setting the boom at the lowest labeled height (if specified) which provides uniform coverage reduces the exposure of droplets to evaporation and wind. For ground equipment, the boom should remain level with the crop and have minimal bounce.

WIND

Drift potential is lowest when applications are made in light to gentle sustained winds (2 to 10 mph) which are blowing in a constant direction. However, many factors, including droplet size and equipment type determine drift potential at any given wind speed. AVOID GUSTY OR WINDLESS CONDITIONS.

Note: Local terrain can influence wind patterns. Every applicator should be familiar with local wind patterns and how they affect spray drift.

TEMPERATURE AND HUMIDITY

Setting up equipment to produce larger droplets to compensate for droplet evaporation can reduce spray drift potential. Droplet evaporation is most severe when conditions are both hot and dry.

TEMPERATURE INVERSIONS

Drift potential is high during a temperature inversion. Temperature inversions restrict vertical air mixing, which causes small suspended droplets to remain close to the ground and move laterally in a concentrated cloud. Temperature inversions are characterized by increasing temperature with altitude and are common on nights with limited cloud cover and light to no wind. They begin to form as the sun sets and often continue into the morning. Their presence can be indicated by ground fog; however, if fog is not present, inversions can also be identified by the movement of smoke from the ground source or an aircraft smoke generator. Smoke that layers and moves laterally in a concentrated cloud (under low wind conditions) indicates an inversion, while smoke that moves upward and rapidly dissipates indicates good vertical air mixing.

SPECIMEN

SHIELDED SPRAYERS
Shielding the boom or individual nozzles can reduce the effects of wind. However, it is the responsibility of the applicator to verify that the shields are preventing drift and not interfering with uniform deposition of the product.

AIR ASSISTED (AIR BLAST) FIELD CROP SPRAYERS
Air assisted field crop sprayers carry droplets to the target via a downward directed air stream. Some may reduce the potential for drift, but if a sprayer is unsuitable for the application and/or set up improperly, high drift potential can result. It is the responsibility of the applicator to determine that a sprayer is suitable for the intended application, is configured properly, and that drift is not occurring.

Note: Air assisted field sprayers can affect product performance by affecting spray coverage and canopy penetration. Consult the application equipment section of this label to determine if use of an air assisted sprayer is specified.

SENSITIVE AREAS
Making applications when there is a sustained wind moving away from adjacent sensitive areas (e.g. residential areas, bodies of water, known habitat for threatened or endangered species, non target crops) is an effective way to minimize the effect of spray drift.

DRIFT CONTROL ADDITIVES
Using product compatible drift control additives can reduce drift potential. When a drift control additive is used, read and carefully observe cautionary statements and all other information on the additive's label. If using an additive that increases viscosity, ensure that the nozzles and other application equipment will function properly with a viscous spray solution.

INVASIVE SPECIES MANAGEMENT
This product may be considered for use on public, private, and tribal lands to treat certain weed species infestations that have been determined to be invasive, consistent with the Federal Interagency Committee for the Management of Noxious and Exotic Weeds (FICMNEW) National Early Detection and Rapid Response (EDRR) System for invasive plants.

Effective EDRR systems address invasions by eradicating the invader where possible, and controlling them when the invasive species is too established to be feasibly eradicated. Once an EDRR assessment has been completed and action is recommended, a Rapid Response needs to be taken to quickly contain, deny reproduction, and if possible eliminate the invader. Consult your appropriate state extension service, forest service, or regional multidisciplinary invasive species management coordination team to determine the appropriate Rapid Response.

PREPARING FOR USE – SITE SPECIFIC CONSIDERATIONS
Understanding the risks associated with the application of this product is essential to aid in preventing off-site injury to desirable vegetation and agricultural crops. The risk of off-site movement both during and after application may be affected by a number of site specific factors such as the nature, texture and stability of the soil, the intensity and direction of prevailing winds, vegetative cover, site slope, rainfall, drainage patterns, and other local physical and environmental conditions. A careful evaluation of the potential for off-site movement from the intended application site, including movement of treated soil by wind or water erosion, must be made prior to using this product. This evaluation is particularly critical where desirable vegetation or crops are grown on neighboring land for which the use of this product is not labeled. If prevailing local conditions may be expected to result in off-site movement and cause damage to neighboring desirable vegetation or agricultural crops, do not apply this product.

Before applying this product, the user must read and understand all label directions, precautions and restrictions completely, including these requirements for a site specific evaluation. If you do not understand any of the instructions or precautions on the label, or are unable to make a site specific evaluation yourself, consult your local agricultural dealer, cooperative extension service, land managers, professional consultants, or other qualified authorities familiar with the area to be treated. If you still have questions regarding the need for site specific considerations, please call your local Nufarm representative.

TANK MIXES

This product may be tank mixed with other herbicides registered for the use sites described in this label. Use only those tank mix partners which are labeled for the appropriate use site. When tank mixing, use the most restrictive label limitations for each of the products being used in the tank mix.

CONIFER PLANTATIONS

Application Information
Apply Patriot to control many species of weeds and deciduous trees on sites where conifers are growing or are to be planted. Apply by ground equipment or by air (helicopter only). Refer to the **WEEDS CONTROLLED** and **BRUSH SPECIES CONTROLLED** for a listing of susceptible species.

Application Timing
Apply Patriot after weeds have emerged or after undesirable hardwoods have broken winter dormancy and have reached the point of full leaf expansion.

Conifer Site Preparation

Application Before Transplanting
After consulting the **WEEDS CONTROLLED** and **BRUSH SPECIES CONTROLLED** tables apply the rates of Patriot listed for the most difficult to control species on the site.

SPECIMEN

Southeast - Apply up to 4 ounce per acre for loblolly and slash pines. Transplant the following planting season.

Northeast and Lake States - Apply up to 2 ounce per acre for red pine. Transplant the following planting season. Apply up to 2 ounces per acre for black, white and Norway spruce. Transplant the following spring.

West - Apply up to 2 ounce per acre prior to planting Douglas fir, Sitka Spruce, Western Red Cedar, Western Hemlock, Ponderosa Pine, and Grand Fir in the Coast Rangeland and western slope of the Cascades in Oregon and Washington. These conifer species listed can be planted any time after application. Other conifer species can be planted providing the user has prior experience indicating acceptable tolerance to soil residues of this product.

Without prior experience, plant other species on a small scale to determine selectivity before large-scale plantings are made as unacceptable injury may occur. Nufarm will not assume responsibility for injury to any conifer species not listed on this label.

Tank Mix Combinations

For broader spectrum control, use the following products in combination with Patriot.

With Razor Pro or Credit 41 Extra or Credit Xtreme (Glyphosate)

Tank mix 1 to 2 ounces of this product with 10 to 24 fluid ounces of Razor Pro / Credit 41 Extra or 7 to 16 fluid ounces of Credit Xtreme per acre. Refer to the product container for a list of species controlled.

With Nufarm Polaris® AC Complete Herbicide (4 pounds per gallon active ingredient imazapyr)

Tank mix 1 to 2 ounces per acre of Patriot with labeled rate of Polaris AC Complete. Loblolly and slash pines may be transplanted the planting season following application. The combination controls ash, black gum, cherry, hawthorn, honeysuckle, hophorn beam, persimmon, oaks (red, white and water), sassafras, sweetgum, Vaccinium species, and suppresses blackberry, dogwood, elms, myrtle dahoon, hickories, and red maple.

With Razor Pro or Credit 41 Extra or Credit Xtreme + Polaris AC Complete

Tank mix 1/2 to 1 ounce per acre of Patriot with labeled rate Razor Pro / Credit 41 Extra / Credit Xtreme + Polaris AC Complete. Slash and loblolly pines may be transplanted the planting season following application. The combination controls cherry, dog-wood, elms, oaks (red and water), persimmon, sassafras, sweetgum and suppresses hickory.

With Razor Pro or Credit 41 Extra or Credit Xtreme (Glyphosate) + Nufarm Polaris AC Complete Herbicide (4 pounds per gallon active ingredient imazapyr)

Tank mix 1/2 to 1 ounce of this product with 16 to 64 fluid ounces of Razor Pro / Credit 41 Extra or 7 to 16 fluid ounces of Credit Xtreme and 10 to 12 fluid ounces of Polaris AC Complete per acre. Slash and loblolly pines may be transplanted the planting season following application. This combinations controls cherry, dogwood, elms, oaks (red and water), persimmon, sassafras, sweetgum and suppresses hickory.

With Spyder Extra (sulfometuron)

Tank mix 1/2 to 1-1/2 ounces of Patriot per acre with labeled rate of Spyder Extra for herbaceous weed control. Refer to the product container and the “Weeds Controlled” section of this label for a listing of the weeds controlled. Loblolly and slash pines may be transplanted the planting season following application.

Tank mix 2 ounces of Patriot per with labeled rate of Spyder Extra for herbaceous weed control and early spring suppression of bull thistle and Canada thistle in the Coast Rangeland and western slope of the Cascade Mountains. Douglas fir may be transplanted at least 90 days following application.

VELPAR L or VELPAR DF

Tank mix 1 to 2 ounces of Patriot per acre with VELPAR L or VELPAR DF at the rates listed on the container for various soil textures. Loblolly and slash pines may be transplanted the planting season following application. Refer to the product container for a list of species controlled.

Release - Hardwood Control and Suppression

Use Patriot for application over the top of established slash and loblolly pine to control the species listed in **WEEDS CONTROLLED** and **BRUSH SPECIES CONTROLLED** section of this label. Apply 1 to 4 ounces per acre to control the species indicated, including kudzu.

Tank Mix Combinations

For broader spectrum control in Hardwood Control and Suppression use the following products in combination with Patriot: Arsenal Applicator’s Concentrate / Polaris or VELPAR L / VELPAR DF.

Nufarm Polaris AC Complete

A tank mix of 1 to 2 ounces of Patriot per acre with labeled rate of Polaris AC Complete may be applied to loblolly pine. Refer to the Polaris AC Complete label regarding the use of surfactants and the appropriate application timing with respect to the age and development stage of the pines. The combination controls ash, black gum, cherry, hawthorn, honeysuckle, hophornbeam, oaks (red, white and water), sassafras, sweetgum, Vaccinium species, and suppresses blackberry, dogwood, elms, myrtle dahoon, hickories, persimmon, and red maple.

VELPAR L or VELPAR DF

Tank mix 1 to 2 ounces of Patriot per acre with VELPAR L OR VELPAR DF at the rates listed on the container for various soil textures. The combination may be applied to loblolly and slash pines.

SPECIMEN

Release - Herbaceous Weed Control

Patriot may be applied to transplanted loblolly and slash pine for the control of herbaceous competition. Consult the "Weeds Controlled" section for a listing of the susceptible species and specific application rates. Best results are obtained when Patriot is applied just before weed emergence until shortly after weed emergence.

Tank Mix Combinations

For broader spectrum control in Herbaceous Weed Control use the following products in combination Patriot: Polaris AC Complete or Spyder Extra or VELPAR L / VELPAR.

With Nufarm Polaris AC Complete

Tank mix 1/2 to 1 ounce of Patriot per acre with labeled rate Polaris AC Complete. The tank mix may be used on loblolly pine.

With Spyder Extra

Tank mix 1/2 to 1-1/2 ounces of Patriot per acre with labeled rate Spyder Extra. Best results are obtained when Patriot is applied just before weed emergence until shortly after weed emergence. The tank mix may be used on loblolly and slash pine.

VELPAR L or VELPAR DF

Tank mix 1/2 to 1 ounce of Patriot per acre with VELPAR L or VELPAR DF at the rates listed on the container for various soil textures. The combination may be applied to loblolly and slash pines.

Release- Directed Spray in Conifers

Western US

To release conifers from competing brush species, such as, blackberry, salmonberry, snowberry, thimbleberry and wild roses, mix 2 to 4 ounces of Patriot per 100 gallons of spray solution. Direct spray onto the foliage of competing brush species using a knapsack or backpack sprayer. For best results, apply any time after the brush species have reached full leaf stage but before autumn coloration. For best results at application, the majority of the brush must be less than six feet in height to help ensure adequate spray coverage. Thorough coverage of the target foliage is necessary to optimize results. Care must be taken to direct the Patriot spray solution away from the conifer foliage.

NOTE: Patriot may cause temporary yellowing and or growth suppression when the spray solution contacts conifer foliage. The use of a surfactant with Patriot may improve brush control results. When using a surfactant with Patriot, extra precaution must be taken to avoid contact with conifer foliage. Excessive drift onto conifers may result in severe injury.

IMPORTANT RESTRICTIONS—CONIFER PLANTATIONS ONLY

- Do not apply Patriot to conifers grown as ornamentals.

IMPORTANT PRECAUTIONS—CONIFER PLANTATIONS ONLY

- Applications of Patriot made to conifers that are suffering from loss of vigor caused by insects, diseases, drought, winter damage, animal damage, excessive soil moisture, planting shock, or other stresses may injure or kill the trees.
- Applications of Patriot made for herbaceous release should only be made after adequate rainfall has closed the planting slit and settled the soil around the roots following transplanting.
- Patriot applications may result in damage and mortality to other species of conifers when they are present on sites with those listed in the preceding directions for conifer plantations.

HARDWOOD PLANTATIONS

Application Information

Apply Patriot to control many species of weeds on sites where yellow poplar is growing or is to be planted, and on sites where red alder is to be planted. Apply at up to 2 ounces per acre by ground equipment or by air (helicopter only). Refer to the "Weeds Controlled" sections of this label for a listing of susceptible species.

Application Timing

This product may be applied as a site preparation treatment prior to planting red alder or yellow poplar, and may also be applied as a pre-planting site preparation treatment for red alder in tank mixes with other herbicides labeled for this use.

Patriot may also be applied over the top of planted yellow poplar seedlings after the soil has settled around the root systems but before the seedlings have broken dormancy (prior to bud break).

Hardwood Release

Herbaceous Weed Control

Patriot may be applied to yellow poplar for the control of herbaceous competition. Consult the "Weeds Controlled" for a listing of the susceptible species and specific application rates. Best results are obtained when Patriot is applied just before weed emergence until shortly after weed emergence.

Tank Mix Combinations

Tank mix 1/2 ounce of Patriot per acre with labeled rates of VELPAR L as specified on the package label for "RELEASE-HERBACEOUS WEED CONTROL" in pine plantations in the eastern U.S. Follow the VELPAR L label directions regarding altering the application rate by soil texture.

SPECIMEN

IMPORTANT PRECAUTIONS—HARDWOOD PLANTATIONS ONLY

- Application of VELPAR L and Patriot made to yellow poplar that are suffering from loss of vigor caused by insects, disease, drought, winter damage, animal damage, excessive soil moisture, planting shock or other stresses may injure or kill the seedlings.
- Applications of Patriot made for release should only be made after adequate rain-fall has closed the planting slit and settled the soil *around the roots following transplanting.*
- Do not use a surfactant for applications made over the tops of trees.
- Careful consideration must be given by an experienced and knowledgeable forester to match the requirements of yellow poplar to the conditions of the site. Treatment of yellow poplar planted on a site inadequate to meet its requirements may injure or kill the seedlings.

GRAIN SORGHUM, WHEAT (including durum), BARLEY, TRITICALE, PASTURE, RANGELAND GRASSES, AND FALLOW

APPLICATION INFORMATION

Use Rates

Wheat (including durum), Barley and Triticale
1/10 ounce Patriot per acre.

Grain Sorghum (Irrigated or dry land, in Colorado, Kansas, Nebraska, Oklahoma, and Texas [north of Interstate 20] only)
1/20 ounce Patriot per acre, plus labeled rate 2,4-D amine. Do not use surfactant or crop oil when applying to grain sorghum.

Pasture and Rangeland
1/10 to 4/10 ounce Patriot per acre as a broadcast treatment. For spot treatments, use up to 1 ounce per 100 gallons of water. Do not exceed 1-2/3 ounces of Patriot per acre per year.

Harvest aid (Wheat, Barley and Triticale)
1/10 ounce Patriot per acre in combination with 2,4-D or Credit 41 Extra / Credit Xtreme / Razor Pro aids in dry down of many broadleaf weeds.

Fallow
1/10 ounce Patriot per acre.

Application Timing-Wheat, Barley and Triticale)

Dryland Wheat, Barley and Triticale
(Except Durum or Wampum Variety) and Triticale
Apply after the crop is in the 2-leaf stage but before boot.

Durum and Wampum
Variety Spring Wheat
Apply after the crop is tillering but before boot. For durum and wampum varieties, use in combination with 2,4-D.

Irrigated Wheat, Barley and Triticale
Apply after the crop begins tillering but before boot. For best results, delay post-treatment irrigation for at least 3 days after treatment and do not exceed 1 inch of water.

Wheat, Barley and Triticale - Harvest Aid
Apply after reaching the hard dough stage, but no later than 10 days before harvest. See section of Harvest Aid Tank Mixtures.

Fallow
This product may be used as a fallow treatment in the spring or fall after weeds have emerged and are actively growing.

Do not apply during boot or early heading as crop injury may result.

Application Timing-Grain Sorghum

Crop Growth Stage: Apply with 2,4-D amine when grain sorghum is from 3 to 15 inches tall. If grain sorghum is taller than 10 inches to the top of the canopy, apply with drop nozzles and keep spray off of foliage. Apply before boot stage only. Read and follow all other use instructions and precautions provided on companion herbicide labels.

NOTE: Sorghum varieties can vary in sensitivity to 2,4-D amine. Spray only those varieties that are known to be tolerant to 2,4-D amine. Contact the seed company of your Local County Extension Service for additional information.

Weed Growth Stage: Apply with 2,4-D amine when all or a majority of the weeds have germinated and emerged. Spray when weeds are a maximum of 6 inches tall for best results. Review the **WEEDS CONTROLLED** section below for specific weeds controlled.

Grain Sorghum Precautions:

Temporary growth stunting and/or crop yellowing may occur soon after application, especially when crops are under stress conditions. Do not use this product on grain sorghum that is grown for seed production or for syrup. Do not use on forage sorghum. Wait a minimum of 30 days before using for silage or forage. Do not include surfactant or crop oil when preparing tankmixes. Do not apply under cold, wet weather conditions or to grain sorghum that is under stress caused by weather, insects, or disease as crop injury may result. Do not apply to long season grain sorghum varieties. Do not apply to grain sorghum that is planted after July 1- crop injury or delayed maturity may occur. Do not apply to grain sorghum more than once per year. This product must be used in combination with 2,4-D on grain sorghum. If using in areas where 2,4-D is restricted, follow all applicable restrictions. Do not use this product on grain sorghum in areas where 2,4-D use is prohibited.

SPECIMEN

ADDITIONAL GRASS INFORMATION
APPLICATION INFORMATION FOR GRASS ESTABLISHMENT

This product may be used for the control or suppression of broadleaf weeds to aid in the establishment of the following perennial native or improved grasses:

Blue grama
Bluestems – big, little, plains, sand, WW spar
Buffalograss
Green sprangletop
Kleingrass
Lovegrasses – atherstone, sand, weeping, wilman
Orchardgrass
Sideoats grama
Switchgrass – Blackwell
Wheatgrasses – bluebunch, crested, intermediate, pubescent, Siberian, slender, streambank, tall, thickspike, western
Wildrye grass – Russian

Maximize potential for grass establishment by consulting with the Natural Resource and Conservation Service of other government agencies or local experts concerning planting techniques and other cultural practices.

Performance from this product may not always be satisfactory due to the inability of newly planted grass stands to sufficiently compete with weeds, and the severity of weed pressure in new grass stands.

An additional herbicide application or mowing may be needed.

Use Rates and Application Timing for Grass Establishment in Pasture, Rangeland and CRP
Preplant (prior to planting) or Preemergence (after planting but before grass emergence)

Do not use more than 1/10 ounce per acre of this product for grass establishment.

Apply this product at 1/10 ounce per acre on all labeled grasses except orchardgrass and Russian wildrye grass. Do not apply this product preplant or preemergence to orchardgrass and Russian wildrye grass as severe crop injury may result.

Early postemergence to new plantings

Apply this product at 1/10 ounce per acre, plus a non-ionic surfactant at the rate of 2 to 4 pints per 100 gallons of spray solution on all labeled grasses anytime after grass emergence.

Do not use a spray adjuvant other than non-ionic surfactant.

Because grass species differ in time of emergence, apply only after the majority of grasses are in the 3 to 4 leaf stage.

Postemergence to stands with 1-5 leaf grasses planted the previous season

Apply this product at 1/10 ounce per acre plus a non-ionic surfactant at the rate of 2 to 4 pints per 100 gallons of spray solution, on all labeled grasses when the majority of the grasses have one or more leaves.

Do not use a spray adjuvant other than non-ionic surfactant.

APPLICATION INFORMATION FOR ESTABLISHED GRASSES
Use Rates for Established Grasses

Apply up to 1 ounce of this product per acre as a broadcast application to established grasses. For spot applications, use 1 ounce per 100 gallons of water. Do not apply more than 1-2/3 ounces of this product per acre per year.

Refer to the “Weeds Controlled” section of this label for a listing of the weeds controlled by this product and the appropriate use rate to obtain control.

Application Timing – Established Grasses in Pastures, Rangeland and CRP

This product may be used on some native grasses such as bluestems and grama, and on other established grasses such as bermudagrass, bluegrass, orchardgrass, bromegrass, fescue and timothy that were planted the previous growing season (or earlier) and are fully tillered, unless otherwise directed on this label. Specific application information on several of these grass species follows:

Grass	Minimum Time from Grass Establishment to Patriot Application
Bermudagrass	2 months
Bluegrass, bromegrass, and orchardgrass	6 months
Timothy	12 months
Fescue	24 months

SPECIMEN

Fescue Precautions:
When used on fescue, this product may cause reduced first cutting yields due to temporary stunting, leaf yellowing, or seed head suppression. To help minimize these symptoms, follow the information below:
- Use the lowest labeled rate for the target weeds
- Tank mix this product with 2,4-D for applications
- Apply late in the spring or after the new growth is 5 to 6 inches tall, or in the fall
- Use only a non-ionic surfactant at 1/2 to 1 pint per 100 gallons of spray solution 91/16 to 1/8% v/v)
- When liquid nitrogen is the spray carrier, do not include the surfactant

Timothy Precautions:
Timothy should be actively growing and at least 6" tall at application. Application under any other conditions may cause crop yellowing and/or stunting. To help minimize these symptoms, follow the information below:
- Use the lowest labeled rate for the target weeds
- Tank mix this product with 2,4-D for applications
- Apply in the late summer or fall
- Use only a non-ionic surfactant at 1/2 pint per 100 gallons of spray solution
- When liquid nitrogen is the spray carrier, do not include the surfactant

Ryegrass Pastures (Italian or perennial): Do not apply this product to ryegrass pasture as injury to or loss of the pasture may result.

Precautions for Sensitive Grasses:
Application of this product to Pensacola bahiagrass, ryegrass (Italian or perennial) and Garrison's creeping foxtail may cause severe injury to and/or loss of forage.

Varieties and species of forage grasses differ in their tolerance to herbicides. When using this product on a particular grass for the first time, limit use to a small area. In no injury occurs throughout the season, larger acreage may be treated the following season.

Broadleaf forage species, such as alfalfa and clover, are highly sensitive to this product and will be severely stunted or injured by use of this product.

WEEDS CONTROLLED

Apply when weeds are less than 4" tall or in diameter and are actively growing. See specific directions for each weed type.

Effectiveness may be reduced if rainfall occurs within 4 hrs after application.

Grain Sorghum 1/20 oz. per acre, plus 1/4 lb. active ingredient 2,4-D amine per acre		
Pigweed species	Puncture vine	Velvetleaf

Cereals, Pasture, Rangeland and Fallow 1/10 oz. per acre		
Blue/purple mustard*	Groundsel (common)	Smallseed falseflax
Bur buttercup (testiculate)	Henbit	Smartweed (green, ladysthumb, pale)
Coast fiddleneck (tarweed)	Kochia*	Snow speedwell
Common chickweed	Lambsquarters (common slimleaf)	Tansymustard*
Common purslane	Mayweed chamomile	Treacle mustard (Bushy Wallflower)
Conical catchfly	Miners lettuce	Tumble/Jim Hill mustard
Cowcockle	Pigweed (redroot, smooth, tumble)	Volunteer sunflower
False chamomile	Plains coreopsis	Waterpod
Field pennycress (fanweed)	Prickly lettuce*	Wild mustard
Filaree	Russian thistle*	
Flixweed*	Shepherd's purse	

SPECIMEN

Additional Weeds in Pasture/Rangeland Only 1/10 to 2/10 oz. per acre		
Bitter sneezeweed	Common mullein	Plantain
Buttercup	Curly dock	Wild garlic*
Carolina geranium	Dandelion	Woolly croton*
Common Broomweed	Marestail	
2/10 to 3/10 oz. per acre		
Annual Marshelder	Common yarrow	Pensacola bahiagrass*
Blackeyed-Susan	Dogfennel	Purple scabious
Buckbrush**	Horsemint (beebalm)	Western Snowberry**
Burclover	Musk thistle*	Wild carrot
4/10 oz. per acre		
Sericea lespedeza*		

Weed Suppressed** Wheat, Barley, Pasture, Rangeland and Fallow 1/10 oz. per acre		
Canada thistle*	Corn gromwell*	Sowthistle (annual)*
Common sunflower*	Knotweed (prostrate)*	Wild buckwheat*

Brush Suppressed (Pasture and Rangeland Only)** 3/10 oz. per acre		
Blackberry	Dewberry	Multiflora rose*

Weeds/Brush Suppressed with Spot Application (Pasture/Rangeland only) 1 oz. per 100 Gallons of water		
Blackberry	Dewberry	Multiflora rose*
Canada thistle*		

* See the Specific Weed Problems section.
**Weed suppression is a reduction in weed population and/or vigor as visually compared to an untreated area. The degree of suppression varies with the rate used, the size of the weeds, and the environmental conditions following treatment.

SPECIFIC WEED PROBLEMS

Note: Thorough spray coverage is very important.

Blue Mustard, Flixweed, and Tansy mustard: For best results, apply this product in tank mixtures with 2,4-D or MCPA postemergence to mustards before bloom.

Canada Thistle and Sowthistle: Apply this product with a surfactant, 2,4-D or MCPA in the spring after the majority of thistles have emerged while still small (rosette stage to 6" elongated stems) and actively growing to reduce the ability of emerged thistles to compete with the crop.

For spot applications to Canada thistle in pasture and rangeland, apply as foliar spray once plant is fully leafed. Apply to runoff and include a surfactant in the spray mix at 1 to 2 quarts, per 100 gallons of spray solution. Complete coverage of all foliage and stems is required for control. On tall, dense stands, it may be necessary to spray from both sides to obtain adequate coverage.

Corn Gromwell and Prostrate Knotweed: Apply this product with a surfactant when weeds are actively growing, are not larger than 2" tall and when crop canopy will allow thorough coverage. Tank mixing with 2,4-D or MCPA can improve results.

Kochia, Russian thistle, Prickly lettuce: Resistant biotypes of these weeds are known to occur. For best results, use in a tank mix with Banvel/Banvel SGF and 2,4-D or bromoxynil and 2,4-D (such as 3/4-1 pint. Buctril + 1/4 - 3/8 lb. active 2,4-D ester). Apply in the spring when kochia, Russian thistle, and prickly lettuce are less than 2" tall or 2" across and are actively growing. Refer to the Tank Mixtures section of this label for additional details.

Sunflower (common/volunteer): Apply with a surfactant, 2,4-D or MCPA after the majority of sunflowers have emerged, are 2" to 4" tall and are actively growing. Use spray volumes of at least 3 gallons per acre by air or 5 gallons per acre by ground (10 gallons per acre by ground in pastures).

SPECIMEN

Wild Buckwheat: For best results, apply in a tank mix with MCPA when plants have no more than 3 true leaves (not counting the cotyledons). If plants are not actively growing, delay treatment until environmental conditions favor active weed growth.

Musk Thistle: Apply at 2/10 to 3/10 ounce per acre in the spring or early summer prior to flowering or in the fall after newly emerged plants have reached the rosette stage of growth. Fall applications should be made before the soil freezes.

Multiflora Rose: For best control, apply as a broadcast application when multiflora rose is less than 3" tall. Application should be made in the spring, soon after multiflora rose is fully leafed. For spot application in pasture and rangeland, apply as a foliar spray once plant is fully leafed. Apply to runoff. Include a surfactant in the spray mix at 1 to 2 quarts per 100 gallons, of spray solution. Complete coverage of all foliage and stems is required for control. On tall, dense stands, it may be necessary to spray from both sides to obtain adequate coverage.

Blackberry and Dewberry: For spot applications in pasture and rangeland, apply as a foliar spray once plant is fully leafed. Apply to runoff and include a surfactant in the spray mix at 1 to 2 quarts per 100 gallons, of spray solution. Complete coverage of all foliage and stems is required for control. On tall, dense stands, it may be necessary to spray from both sides to obtain adequate coverage.

Pensacola bahiagrass control in established Bermudagrass pasture: Apply at 3/10 ounce per acre plus surfactant after green-up in the spring but before bahiagrass seedhead formation. Apply when moisture is sufficient to enhance grass growth.

This product effectively removes bahiagrass from bermudagrass pastures. In highly infested pastures, Patriot clears the areas of useful forage until the bermudagrass has time to cover the area. Therefore, do not apply to an entire farm or ranch in one year. Treatments should be made to different areas of a farm over a period of years. Pastures may be reestablished more quickly by fertilization (particularly with nitrogen and potassium) and/or replanting.

Under heavy bahiagrass pressure, grazing pressure, or adverse weather conditions (heat and drought), some regrowth of weeds may occur.

Note: Do not use this product for the control of common or Argentine bahiagrass. Do not apply this product in liquid fertilizer solutions for Pensacola bahiagrass control, as poor control and/or regrowth may occur.

Sericea lespedeza: Apply at 4/10 ounce per acre with a surfactant at 1 to 2 quarts per 100 gallons, of total spray solution. For best results, make applications to sericea lespedeza beginning at flower bud initiation through the full bloom stage of growth.

Note: Do not use if drought conditions exist at intended time of applications.

Wild Garlic: Apply 1/10 to 2/10 ounce per acre in early spring when wild garlic is less than 12" tall with 2" to 4" of new growth.

Wooly Croton: Apply 1/10 to 2/10 ounce per acre in late spring or early summer at preemergence through 2 true leaf stage.

SURFACTANTS

SPRAY ADJUVANTS

Applications of this product must include either a nonionic surfactant or a crop oil concentrate **except for grain sorghum**. In addition an ammonium nitrogen fertilizer may be used. Consult local Nufarm fact sheets, technical bulletins and service policies prior to using other adjuvant systems. If another herbicide is tank mixed with this product select adjuvants authorized for use with both products. Products must contain only EPA exempt ingredients.

Antifoaming agents may be needed. Consult your Ag dealer applicator or Nufarm representative for a listing of recommended surfactants.

Nonionic Surfactant (NIS)

Apply 0.06 to 0.50% v/v (1/2 to 4 pints per 100 gallons of spray solution). See **Tank Mixtures** section for additional information.

Surfactant products must contain at least 60% nonionic surfactant with a hydrophilic/lipophilic balance (HLB) greater than 12.

Surfactant Rate Exceptions:

(1) On all spring wheat and spring or winter barley use 1/2 to 1 quart per 100 gallons;
(2) On Fescue pastures use 1/4 to 1/2 quart per 100 gallons;
(3) On Timothy pastures use 1/4 quart per 100 gallons.

Consult your agricultural dealer, applicator, or extension agent for a listing of approved surfactants.

Petroleum Crop Oil Concentrate (COC) or Modified Seed Oil (MSO)

Apply at 1% v/v (1 gallon per 100 gallons spray solution) or 2% under arid conditions.

Oil adjuvants must contain at least 80% high quality petroleum (mineral) or modified vegetable seed oil with at least 15%surfactant emulsifiers.

Ammonium Nitrogen Fertilizer

Use 2 quarts per acre of a high quality urea ammonium nitrate (UAN) such as 28%N or 32%N or 2 pounds/acre of a spray grade ammonium sulfate (AMS). Use 4 quarts per acre UAN or 4 pounds per acre AMS under arid conditions.

Do not use liquid nitrogen fertilizer as the total carrier solution.

Special Adjuvant Types

Combination adjuvant products may be used at doses that provide the required amount of NIS COC MSO and/or ammonium nitrogen fertilizer. Consult product literature for use rates and restrictions.

In addition to the adjuvants specified above other adjuvant types may be used if they provide the same functionality and have been evaluated and approved by Nufarm product management.

Antifoaming agent may be used if needed.

Do not use low rates of liquid fertilizer as a substitute for surfactant.

SPECIMEN

GROUND APPLICATION

For optimum spray coverage, use flat-fan or low volume flood nozzles.

For flood nozzles on 30" spacing, use at least 10 gallons spray solution per acre (GPA), nozzles no larger than TK 10 (or equivalent), and at least 30 pounds per square inch (psi). For 40" nozzle spacing, use at least 13 GPA; for 60" spacing, use at least 20 GPA. Overlap nozzles100% for all spacings.

With Raindrop RA nozzles, use at least 30 GPA and ensure that nozzle spray patterns overlap100%.

For flat-fan nozzles, use at least 3 GPA for applications to wheat or barley. Use at least 10 GPA for applications to pasture or rangeland. For grain sorghum, use 10-30 GPA and apply uniformly at 20-40 PSI with a properly calibrated low pressure boom sprayer using flat-fan nozzles. If applying to irrigated sorghum, delay first post-treatment irrigation for a minimum of 3 days after treatment. For the first post-treatment irrigation, do not exceed 1". Cultivate prior to treatment to cover exposed brace roots on grain sorghum. This will minimize injury from 2,4-D amine.

Use 50-mesh screens or larger.

AERIAL APPLICATION

Use nozzle types and arrangements that provide optimum spray distribution and maximum coverage.

Wheat, Barley, Triticale and Fallow
Use 1 to 5 GPA, use at least 3 GPA in Idaho, Oregon, or Utah. For Pasture and Rangeland – Use 2 to 5 GPA.

Grain Sorghum
Apply at the rate of 2-5 GPA. If applying to irrigated sorghum, delay first post-treatment irrigation for a minimum of 3 days after treatment. For the first post- treatment irrigation, do not exceed 1". Cultivate prior to treatment to cover exposed brace roots of grain sorghum. This will minimize injury from 2,4-D amine.

Pasture and Rangeland
Use 2 to 5 GPA. When applying this product by air in areas adjacent to sensitive crops, use solid stream nozzles oriented straight back. Adjust the swath to avoid spray drift damage to sensitive crops downwind and/or use ground equipment to treat the border edge of fields.

See the **SPRAY DRIFT MANAGEMENT** section of this label.

PRODUCT MEASUREMENT

Measure precisely using scales calibrated in ounces.

TANK MIXTURES

This product may be tank mixed with other suitable registered herbicides to control weeds listed under **WEEDS SUPPRESSED**, weeds resistant to this product, or weeds not listed under **WEEDS CONTROLLED**. Read and follow all manufacturer's label instructions for the companion herbicide. If those instructions conflict with this label, do not tank mix with this product.

Patriot Tank Mixtures in Cereals (Wheat, Barley and Triticale)

With 2,4-D (amine or ester) or MCPA (amine or ester)
Tank-mix with 2,4-D or MCPA (ester formulations provide best results, use 1/10 ounce of this product per acre; add 2,4-D or MCPA herbicides to the tank at 1/4 to 1/2 lb. active ingredient.
Surfactant may be added to the mixture at 1/2 to 1 quart per 100 gallons, of spray solution; however, adding surfactant may increase the potential for crop injury.

Apply with MCPA after the 3 to 5 leaf stage but before boot (with Durum and Wampam varieties, do not apply before tillering). Apply with 2,4-D after tillering (refer to appropriate 2,4-D manufacturer's label), but before boot.

With Diablo or Clash (dicamba)
For best results, apply this product at 1/10 ounce per acre; add 1/16 to 1/8 lb. Diablo / Clash, active ingredient Dicamba. Surfactant may be added to the mixture at 1/2 to 1 quart per 100 gallons, of spray solution; however, adding surfactant may increase the potential for crop injury. Also refer to Diablo / Clash labeling for application timing and restrictions.

With 2,4-D (amine or ester) and Diablo or Clash (dicamba)
Apply in a 3-way tank mix with formulations of Diablo / Clash and 2,4-D. Observe all applicable directions, restrictions and precautions on labels of all products used.

Use 1/10 ounce of this product + 0.063 to 0.083 pounds ai Dicamba (Diablo / Clash) + 4-6 ounce active 2,4-D ester or amine per acre. Use higher rates when weed infestation is heavy. Add 1-2 pint. of surfactant to the 3-way mixture if needed. Surfactant may not be needed with the higher phenoxy rates and ester phenoxy formulations. Consult the specific 2,4-D or Diablo / Clash label, or local recommendations for more information.

Apply this 3-way combination to winter wheat after the crop is tillering and prior to jointing (first node). In Spring wheat (including Durum wheat) apply after crop is tillering and before it exceeds the 5-leaf stage.

Do not apply this 3-way mixture at high rates more than once a year or more than twice per year at the low rates.

SPECIMEN

With Maestro (bromoxynil)
Apply with bromoxynil containing herbicides registered for use on wheat, barley, or fallow. For best results, add bromoxynil containing herbicides to the tank at 3 to 6 ounce active ingredient per acre (such Maestro 2EC at 3/4 - 1-1/2 pints per acre).

Read and follow all label instructions on timing and precautions for these herbicides before using these tank mixtures. Follow the most restrictive labeling.

With grass control products
Tank mixtures with grass control products may result in poor grass control. Consult your state experiment station, university or extension agent, agricultural dealer, or crop consultant as potential for antagonism before using the mixture. If no information is available, limit the initial use of this product and the grass product to a small area.

Do not mix with Hoelon SEC, as grass control may be reduced.

To control wild oat, tank mix with Avenge or Assert
When tank mixing with Assert, always include 2,4-D ester, MCPA ester, or bromoxynil containing products (such as Maestro). Tank-mixed applications of this product plus Assert may cause temporary crop discoloration, stunting or injury when heavy rainfall occurs shortly after application.

With Victory (tribenuron methyl)
This product may be tank mixed with Victory based on local recommendations. Read and follow all label instructions on timing, precautions, and warning for these herbicides before using this tank mixture.

With Treaty Extra (thifensulfuron 50% & tribenuron 25%)
This product may be tank mixed with Treaty Extra based on local recommendations. Read and follow all label instructions on timing and precautions for these herbicides before using this tank mixture.

With Insecticides and Fungicides
This product may be tank mixed or used sequentially with insecticides and fungicides registered for use on cereal grains.

However, under certain conditions (drought stress, cold weather, or if the crop is in the 2-4 leaf stage), tank mixes or sequential applications with organophosphate insecticides (such as parathion, Di-Syston) may product temporary crop yellowing or, in severe cases, crop injury.

The potential for crop injury is greatest when wide fluctuations in day/night temperatures occur just prior to or soon after application.

Test these mixtures in a small area before treating large areas.

Do not apply this product within 60 days of crop emergence where an organophosphate insecticide (such as Di-Syston) has been applied as an in-furrow treatment as crop injury may result.

Do not use with Malathion, as crop injury will result.

With Liquid Nitrogen Solution Fertilizer
Liquid nitrogen fertilizer solutions may be used as a carrier in place of water. Run a tank mix compatibility test before mixing this product in fertilizer solution.

This product must first be slurried with water and then added to liquid nitrogen solutions (e.g. 28-0-0, 32-0-0). Be sure agitator is running while this product is added. This mixture may result in temporary crop yellowing and stunting.

When using low rates of liquid nitrogen fertilizer in the spray solution (less than 50% of the spray solution volume), the addition of a surfactant is necessary. Add surfactant at 1/2 pint to 1 quart per 100 gallons, of spray solution (0.06-0.25% v/v) based on local recommendations.

When using high rates of liquid nitrogen fertilizer in the spray solution, adding surfactant increases the risk of crop injury. Consult your agricultural dealer, consultant, fieldman, or extension agent for specific instructions before adding an adjuvant to these tank mixtures.

When 2,4-D or MCPA is included with a fertilizer/Patriot mixture, ester formulations of 2,4-D or MCPA tend to be more compatible in combinations with this product (see manufacturer's label). Do not add surfactant when using this product in tank mix with 2,4-D ester or MCPA ester and liquid nitrogen fertilizer solutions.

Note: In certain areas east of the Mississippi river unacceptable crop response may occur with use of straight or dilute nitrogen fertilizer carrier solutions where cold temperatures or widely fluctuating day/night temperatures exist. In these areas consult your agricultural dealer, consultant, field advisor, or Nufarm representative for a specific guidance before using nitrogen fertilizer carrier solutions.

Liquid nitrogen fertilizer solutions that contain sulfur can increase crop response.

Do not use low rates of liquid fertilizer as a substitute for a surfactant.

Do not use with liquid fertilizer solutions with a pH less than 3.0.

Tank Mixtures in Harvest Aid
A tank mix of this product plus 2,4-D and surfactant, or Credit 41 Extra / Credit Xtreme (glyphosate), will typically aid in dry down of many broadleaved weeds, thereby aiding grain harvest. Postemergence application should be made to actively growing weeds after the crop is in the hard dough stage. If weeds are not dry within 10 days after application, delay harvest until weeds are dry.

See weeds listed in the **WEEDS CONTROLLED** chart of this label.

SPECIMEN

With 2,4-D

Mix 1/10 ounce this product plus 1/4 to 1/2 pounds active ingredient 2,4-D per acre on moderate weed infestations; higher rates of 2,4-D may be used on large weeds if permitted by the 2,4-D product labeling. Include 1 to 2 quarts surfactant per 100 gallons, spray solution.

In addition to the weeds listed in the **WEEDS CONTROLLED** chart of this label, the 2,4-D combination will also dry down common cocklebur, marestail, puncturevine and common and wild sunflower. In areas where 2,4-D use is restricted, apply this product with surfactant only; however, this treatment may be less effective.

With Credit 41 Extra or Credit Xtreme (glyphosate)

Use 1/10 ounce Patriot plus the labeled rate of Credit 41 Extra / Credit Xtreme / Razor Pro (see Credit 41 Extra / Credit Xtreme / Razor Pro label for maximum season rate). Use an adjuvant for optimum activity - consult the Credit 41 Extra / Credit Xtreme / Razor Pro label or local recommendations for the amount of adjuvant to include.

Tank Mixtures in Fallow

This product may be used as a fallow treatment and may be tank mixed with other herbicides that are registered for use in fallow. If the label instructions conflict with this label do not tank mix that product with this product. Read and follow all label instructions on timing precautions, restrictions and warnings for any companion products before using these tank mixtures. Follow the most restrictive labeling.

Tank Mixtures in Pasture or Rangeland

Apply a tank-mix combination with Trooper P+D, Trooper 22K, 2,4-D, Credit 41 Extra / Credit Xtreme or Weedmaster in states where these products are labeled for postemergence control of the following weeds:

Annual marshelder	Carolina Horsenettle	Giant ragweed
Burclover	Common milkweed	Prickly lettuce
Common cocklebur	Common ragweed	Western ragweed

For best results, apply this product at 1/10 to 2/10 ounce per acre with one of the following products.

Product	**Rate (oz product/A)**
Trooper P&D	8 to 32
Trooper 22K	4 to 16
Diablo	4 to 32
Weedmaster	8 to 32
Remedy	8
Amber	0.35*
2,4-D	8 to 16 (oz ai/A)

*For suppression of Ragweed in Phenoxy Restricted and Herbicide Regulated Counties.

With Liquid Nitrogen Solution Fertilizer

Liquid nitrogen fertilizer solutions may be used, as a carrier in place of water. Run a tank mix compatibility test before mixing in fertilizer solution.

First, slurry this product with water and then add to liquid nitrogen solutions (e.g., 28-0-0, 32-0-0). Make sure agitator is running while this product is added. This mixture may result in temporary crop yellowing and stunting.

When using low rates of liquid nitrogen fertilizer in the spray solution (less than 50% of the spray solution volume), the addition of surfactant is necessary. Add surfactant at 1/4 pint per 100 gals, of spray solution (0.03% v/v).

When using high rates of liquid nitrogen fertilizer in the spray solution, adding surfactant increases the risk of crop injury. Consult your agricultural dealer, consultant, fieldman, or extension agent for specific instructions before adding an adjuvant to these tank mixtures.

When 2,4-D or MCPA is included with a fertilizer/Patriot mixture, ester formulations tend to be more compatible (see manufacturer's label). Do not add surfactant when using this product in tank mix with 2,4-D ester and liquid nitrogen fertilizer solutions.

Do not use low rates of liquid fertilizer as a substitute for a surfactant.

Do not use with liquid fertilizer solutions having a pH less than 3.0.

Tank Mixtures with MCPA, 2,4-D and/or Dicamba for Suppression of Winter Annual Broadleaf Weeds in Winter Wheat to be Grazed Out in the States of Texas, Oklahoma, New Mexico and Kansas

PRODUCT INFORMATION

Patriot may be tank mixed with MCPA, 2,4-D and/or dicamba for suppression of winter annual broadleaf weeds in winter wheat to be grazed out and not harvested for grain in the States of Texas, Oklahoma, New Mexico and Kansas.

SPECIMEN

DIRECTIONS FOR USE

For the suppression of winter annual broadleaf weeds (such as henbit and mustards) in winter wheat in the states of Texas, Oklahoma, New Mexico and Kansas, this product at 1/20 ounce per acre should be tank mixed with MCPA, 2,4-D and/or dicamba at label rates. Winter annual broadleaf weeds should be less than 1" tall or in the rosette stage for suppression. Add a Nufarm specified nonionic surfactant having at least 80% active ingredient at 1 to 2 quarts per 100 gallons of spray solution (0.25 to 0.5% v/v).

Rotational Intervals For Crops in Non-Irrigated Land Following Use of Patriot at 1/20 oz./A on Wheat That Will be Grazed Out

Crop	Soil pH	Minimum Cumulative Precipitation (inches)	Minimum Rotation Interval (months)
Sorghum, Grain	7.9 or lower	No restrictions	4
Cotton	7.9 or lower	No restrictions	10
Alfalfa	6.8 or lower 6.9 to 7.9	No restrictions No restrictions	10 22
Beans, Dry	6.8 or lower 6.9 to 7.9	No restrictions No restrictions	10 22

Rotation Intervals for crops not covered above following the use of this product at 1/20 ounce per acre on wheat that will be grazed out.

The minimum rotation interval is 22 months with at least 18" of cumulative precipitation during the period:

- To any crop not listed in the Rotation Intervals table above,
- If the soil pH is not in the specified range.

To rotate to a crop at an interval shorter than specified, a field bioassay must be successfully completed to rotate to that crop. See section on **Field Bioassay** for further information.

IMPORTANT RESTRICTIONS

This treatment is for use on winter wheat that will be grazed out and will not be harvested for grain.

IMPORTANT PRECAUTIONS

This product suppresses weeds by postemergence activity. For best results apply this product to young actively growing weeds. The degree and duration of suppression at 1/20 ounce per acre may depend upon the following factors:

- Weed spectrum and infestation,
- Intensity weed size at application, and
- Environmental condition at and following treatment.

CROP ROTATION

Before using this product, carefully consider your crop rotation plans and options. For rotational flexibility, do not treat all of your wheat, barley, triticale, fallow, pasture or rangeland acres at the same time.

Minimum Rotation Intervals Minimum rotation intervals* are determined by the rate of breakdown of Patriot. Breakdown in the soil is affected by soil pH, soil microorganisms, soil temperature, and soil moisture. Low soil pH, high soil temperature, and high soil moisture speed breakdown in soil, with high soil pH, low soil temperature, and low soil moisture slow breakdown.

Of these 3 factors, only soil pH remains relatively constant. Soil temperature and soil moisture can vary significantly from year to year and from area to area. For this reason, soil temperatures and soil moisture should be monitored closely when considering crop rotations.

*The minimum rotation interval represents the period of time from the last application to the earliest date of the next planting.

Soil pH Limitations

Do not use this product on soils having a pH above 7.9 as extended soil residual activity could require longer crop rotation intervals than normal. Under certain conditions, this product could remain in the soil for 34 months or more, injuring wheat and barley. In addition, other crops planted in high pH soil can be extremely sensitive to low concentrations of Patriot.

Checking Soil pH

Before using this product, determine the soil pH of the areas of intended use. To obtain are representative pH value for the test area, take several 0" to 4" samples from different areas of the field and analyze them separately. Consult local extension publications for additional information on recommended soil sampling procedures.

SPECIMEN

Rotation Intervals for Cereals
All Areas-Following Use of Patriot at 1/10 oz. per Acre

Crop	Soil pH	Minimum Cumulative Precipitation (inches)	Minimum Rotation Interval (months)
Winter and spring wheat	7.9 or lower	No restrictions	**1**
Durum wheat, barley, spring/winter oat	7.9 or lower	No restrictions	**10**

Rotation Intervals For Crops in Non-Irrigated Land
Following Use of Patriot at 1/10 oz. per Acre on Wheat, Barley, Triticale or Pasture

Geographic Location		Crop	Soil pH	Minimum Cumulative Precipitation (inches)	Minimum Rotation Interval (months)
State	County or Area				
Colorado	Statewide	Grain sorghum, Proso millet	7.9 or lower	No restrictions	**10**
		Flax, Sunflower, safflower	7.9 or lower	No restrictions	**22**
		Field Corn	7.9 or lower	No restrictions	**12**
		STS Soybeans	7.9 or lower	No restrictions	**4**
Idaho	Southern Idaho	Flax, Safflower, Sunflower	7.9 or lower	No restrictions	**22**
	Statewide	Peas, Lentils, Canola	6.8 or lower	18	**10**
		Peas	6.9 to 7.9	18	**15**
		Lentils	6.9 to 7.9	18	**34**
		Canola	6.9 to 7.9	18	**22**
		Condiment mustard	7.3 or lower	10	**10**
		Condiment mustard	7.4 or higher	28	**34**
		Chickpeas	7.3 or lower	10	**10**
		Chickpeas	7.4 or higher	28	**34**

(continued)

SPECIMEN

Rotation Intervals For Crops in Non-Irrigated Land *(continued)*
Following Use of Patriot at 1/10 oz. per Acre on Wheat, Barley, Triticale or Pasture

Geographic Location		Crop	Soil pH	Minimum Cumulative Precipitation (inches)	Minimum Rotation Interval (months)
State	**County or Area**				
Kansas	Statewide	Grain sorghum, Proso millet	7.9 or lower	No restrictions	**10**
		Flax, Safflower, Sunflower	7.9 or lower	No restrictions	**22**
	Central and Western Kansas (W. of the Flinthills)	Field Corn	7.9 or lower	15	**12**
	Western Kansas W. of Hwy. 183	Soybeans	7.5 or lower	22	**22**
			7.6 to 7.9	33	**34**
	Central Kansas- Generally E. of Hwy 183 and W. of the Flinthills	Soybeans	7.5 or lower	22	**22**
		STS Soybeans	7.9 or lower	15	**4**
Montana	Statewide	Grain sorghum, Proso Millet, Field Corn	7.9 or lower	22	**22**
		Alfalfa Hay Only	7.6 to 7.9	No restrictions	**34**
			7.5 or lower	No restrictions	**22**
		Flax, Safflower, Sunflower	7.9 or lower	No restrictions	**22**
Nebraska	Statewide	Grain sorghum, Proso millet	7.9 or lower	No restrictions	**10**
		Flax, Safflower, Sunflower	7.9 or lower	No restrictions	**22**
		STS Soybeans	7.9 or lower	No restrictions	**4**
	Generally W. of Hwy. 77 and E. of the Panhandle	Field corn	7.9 or lower	15	**22**
		Soybeans	7.5 or lower	22	**22**
			7.6 to 7.9	33	**34**
New Mexico	Statewide	Grain sorghum, Proso millet	7.9 or lower	No restrictions	**10**
		Flax, Safflower, Sunflower	7.9 or lower	No restrictions	**22**
		Cotton (dryland only)	7.9 or lower	30	**22**

(continued)

SPECIMEN

Rotation Intervals For Crops in Non-Irrigated Land *(continued)*
Following Use of Patriot at 1/10 oz. per Acre on Wheat, Barley, Triticale or Pasture

Geographic Location		Crop	Soil pH	Minimum Cumulative Precipitation (inches)	Minimum Rotation Interval (months)
State	**County or Area**				
North Dakota	W. of Hwy. 1	Grain sorghum, Proso millet, Field corn, Dry Beans, Flax, Safflower, Soybean, Sunflower	7.9 or lower	22	**22**
	E. of Hwy. 1	Grain sorghum, Proso millet, Field corn, Dry Beans, Flax, Safflower, Soybean, Sunflower	7.9 or lower	34	**34**
Oklahoma	Statewide	Grain sorghum, Proso millet	7.9 or lower	No restrictions	**10**
		Flax, Safflower, Sunflower	7.9 or lower	No restrictions	**22**
		Field corn	7.9 or lower	15	**12**
		STS Soybeans	7.9 or lower	No restrictions	**4**
Oregon	Statewide	Peas, Lentils, Canola	6.8 or lower	18	**10**
		Peas	6.9 to 7.9	18	**15**
		Lentils	6.9 to 7.9	18	**34**
		Canola	6.9 to 7.9	18	**22**
		Condiment mustard	7.3 or lower	10	**10**
		Condiment mustard	7.4 or higher	28	**34**
		Chickpeas	7.3 or lower	10	**10**
		Chickpeas	7.4 or higher	28	**34**
South Dakota	Statewide	Flax, Safflower, Soybean, Sunflower	7.9 or lower	No restrictions	**22**
	S. of Hwy. 212 & E. of Missouri River, & S. of Hwy. 34 & W. of Missouri River	Grain sorghum, Proso millet	7.9 or lower	13	**12**
	Generally E. of Missouri River, & S. of Hwy. 14 & W. of Missouri River	Field Corn	7.9 or lower	15	**12**

(continued)

SPECIMEN

Rotation Intervals For Crops in Non-Irrigated Land *(continued)*
Following Use of Patriot at 1/10 oz. per Acre on Wheat, Barley, Triticale or Pasture

Geographic Location		Crop	Soil pH	Minimum Cumulative Precipitation (inches)	Minimum Rotation Interval (months)
State	**County or Area**				
Texas	Statewide	Grain sorghum, Proso millet	7.9 or lower	No restrictions	**10**
		Flax, Safflower, Soybean, Sunflower	7.9 or lower	No restrictions	**22**
	Panhandle	Field corn	7.9 or lower	15	**12**
		Cotton (dryland only)	7.9 or lower	30	**22**
	N. Central Texas*	Field corn	7.9 or lower	15	**12**
		Cotton (dryland only)	7.9 or lower	25	**14**
	*The counties of N. Central Texas are: Archer, Baylor, Bell, Bosque, Bowie, Callahan, Camp, Cass, Clay Collin, Cooke, Coryell, Dallas, Delta, Denton, Eastland, Ellis, Falls, Fannin, Foard, Franklin, Grayson, Hardeman, Haskell, Hill, Hood, Hopkins, Hunt, Jack, Johnson, Kaufman, Knox, Lamar, Limestone, McLennan, Milam, Montague, Morris, Navarro, Palo Pinto, Parker, Rains, Red River, Robertson, Rockwall, Shackelford, Somervell, Stephens, Tarrent, Throckmorton, Titus, Upshur, Van Zandt, Wilbarger, Wichita, Williamson, Wise, Wood, Young.				
Utah	Statewide	Flax, Safflower, Sunflower	7.9 or lower	No restrictions	**22**
Washington	Statewide	Peas, Lentils, Canola	6.8 or lower	18	**10**
		Peas	6.9 to 7.9	18	**15**
		Lentils	6.9 to 7.9	18	**34**
		Canola	6.9 to 7.9	18	**22**
Wyoming	Statewide	Flax, Safflower, Sunflower	7.9 or lower	No restrictions	**22**
	Southern Wyoming	Grain sorghum, Proso millet	7.9 or lower	No restrictions	**10**
	Southern Wyoming (Goshen, Laramie and Platte counties only)	Field corn	7.9 or lower	15	**12**
	Northern Wyoming	Grain sorghum, Proso Millet, Field Corn	7.9 or lower	22	**22**

Rotation Intervals not covered above - The minimum rotation interval is 34 months with at least 28" of cumulative precipitation during the period:
-for any major field crop not listed (see the **Rotation Intervals** table);
-if the soil pH is not in the specified range;
-if the use rate applied is not specified in the table;
-or if the minimum cumulative precipitation has not occurred since application.

Before rotation to a major field crop at an interval shorter than specified, a field bioassay is required for that crop. A field bioassay is required before rotation to any minor crops (as determined by the USDA criteria). See section on **Field Bioassay** for further information.

SPECIMEN

Rotation Intervals in Pasture, Rangeland or CRP for Overseeding and Renovation
Minimum Rotation Intervals

Geographic Location	Crop / Grass	Maximum Rate Used (oz./A)	Minimum Rotation Interval (months)
AL, AR, FL, GA, KY, LA, MS, NC, OK, SC, TN, TX, VA, WV	Alfalfa, red clover, white clover, sweet clover, bermudagrass, bluegrass, ryegrass, tall fescue	1/10 to 3/10	**4**
	Wheat (except durum)	1/10 to 3/10	**1**
	Durum, barley, oats	1/10 to 3/10	**10**
All Other States	Red clover, white clover, sweet clover	1/10 to 2/10	**12**
	Bermudagrass, bluegrass, ryegrass	1/10 to 2/10	**6**
	Tall fescue	1/10 to 2/10	**18**
	Wheat (except durum)	1/10 to 2/10	**1**
	Durum, barley, oats	1/10 to 2/10	**10**
All Areas with Soil pH of 7.5 or Less	Russian wildrye	1/10 to 1/2	**1**
	Green needlegrass, switchgrass, sheep fescue	1/10 to 1	**1**
	Meadow brome, smooth brome, alta fescue, red fescue, meadow foxtail, orchardgrass, Russian wildrye, timothy	1/10 to 1	**2**
All Areas with Soil pH of 7.9 or Less	Alkali sacaton, mountain brome, blue grass thickspike wheatgrass	1/10 to 1	**1**
	Sideoats grama, switchgrass	1/10 to 1/2	**2**
	Western wheatgrass	1/10 to 1	**2**
	Sideoats grama, Switchgrass, big bluestem	1/10 to 1	**3**

Rotation Intervals not covered above - The minimum rotation interval for crops not listed is at least 34 months with at least 28" of cumulative precipitation during the period:
-for any major field crop not listed (see the **Rotation Intervals** table);
-if the soil pH is not in the specified range;
-if the use rate applied is not specified in the table

Before rotation to a major field crop at an interval shorter than specified, a field bioassay is required for that crop. A field bioassay is required to any minor crops (as determined by the USDA criteria). See section on **Field Bioassay** for further information.

BIOASSAY

A field bioassay is required before rotating to any crop not listed (see the **Rotation Intervals** table), or if the soil pH is outside the specified range, or if the use rate is outside those in the table, or if the minimum cumulative precipitation has not occurred since application.

Field Bioassay

To conduct a field bioassay, grow test strips of the crop(s) you plan to grow following treatment with this product. Crop response to the bioassay will indicate whether or not rotation to the crop(s) grown in the test strips is advisable.
If a field bioassay is planned, check with your local experts for information detailing the field bioassay procedure.

GRAZING

When Patriot is used at rates of 1-2/3 ounce per acre or less, there are no grazing or haying restrictions on this product.

Treated vegetation may be cut for forage or hay.

SPECIMEN

NON-AGRICULTURAL USES

WEEDS CONTROLLED

1/3 TO 1/2 OUNCE PER ACRE

Annual sowthistle	Common groundsel	Goldenrod	Smallseed falseflax
Aster	Common purslane	Lambsquarters	Smooth pigweed
Bahiagrass	Common yarrow	Marestail/horseweed ****	Sweet clover
Beebalm	Conical catchfly	Maximillion sunflower	Tansymustard
Bittercress	Corn cockle	Miners lettuce	Treacle mustard
Bitter sneezeweed	Cow cockle	Pennsylvania smartweed	Tumble mustard
Blackeyed-susan	Crown vetch	Plains coreopsis	Wild carrot
Blue mustard	Dandelion	Plantain	Wild garlic
Bur buttercup	Dogfennel	Redroot pigweed	Wild lettuce
Chicory	False chamomile	Redstem filaree	Wild mustard
Clover	Fiddleneck tarweed	Rough fleabane	Wooly croton
Cocklebur	Field pennycress	Shepherd's purse	Wood sorrel
Common chickweed	Flixweed	Silky crazyweed (locoweed)	Yankeweed

1/2 TO 1 OUNCE PER ACRE

Blackberry	Curly dock	Multiflora rose and	Seaside arrowgrass
Black henbane	Dewberry	other wild roses	Sericea lespedeza
Broom snakeweed*	Dyer's woad	Musk thistle***	Tansy ragwort
Buckhorn plantain	Gorse	Oxeye daisy	Teasel
Bull thistle	Halogeton	Plumeless thistle	Wild caraway
Common crupina	Henbit	Prostrate knotweed	
Common sunflower	Honeysuckle	Rosering gaillardia	

1 TO 2 OUNCES PER ACRE

Common mullein	Lupine	Purple scabious	Sulphur cinquefoil
Common tansy	Old world climbing fern	Scotch thistle	Western salsify
Field bindweed**	(Lygodium)	Scouringrush	Whitetop (hoary cress)
Greasewood	Perennial pepperwood	Salsify	Wild iris
Gumweed	Poison hemlock	Snowberry	
Houndstongue	Purple loosestrife	St. Johnswort	

1 1/2 TO 2 OUNCES PER ACRE

Canada thistle**	Duncecap larkspur	Tall larkspur	Yellow toadflax**
Dalmation toadflax**	Russian knapweed**	Wild parsnip	

2 OUNCES PER ACRE

Onionweed

3 TO 4 OUNCES PER ACRE

Kudzu

* Apply fall through spring

** Suppression, which is a visual reduction in weed competition (reduced population or vigor) as compared to untreated areas. Apply as a full coverage spray for best performance.

*** Certain biotypes of musk thistle are more sensitive to this product and may be controlled with rates of 1/4 to 1/2 ounce per acre. Treatments of this product may be applied from rosette through bloom stages of development.

**** Certain biotypes of marestail/horsetail are less sensitive to this product and may be controlled by tank mixes with herbicides with a different mode of action.

Tank Mix Combinations for Problem Weed Control

For broader spectrum control and for use on certain biotypes of broadleaf weeds which may be resistant to this product and herbicides with the same mode of action, use the following tank mixes.

Diablo (dicamba) + 2,4-D

Kochia -

Combine 1/2 ounce of Patriot with 8 fluid ounces of dicamba and 16 fluid ounces of 2,4-D for the control of kochia.

Spotted knapweed -

Combine 1/2 ounce of Patriot with 8 ounces of dicamba and 16 fluid ounces of 2,4-D for the control of spotted knapweed.

Skeletonweed -

Combine 1 ounce of Patriot with 8 fluid ounces of dicamba and 16 fluid ounces of 2,4-D for the suppression of rush skeletonweed.

SPECIMEN

NONCROP (INDUSTRIAL) SITES

Application Information

Apply Patriot for general weed control on private, public and military lands as follows: Uncultivated areas (including airports, highway, railroad and utility rights-of-way, sewage disposal areas, etc.); uncultivated agricultural areas- noncrop producing (including farmyards, fuel storage areas, fence rows, soil bank land, barrier strips, etc.); industrial sites- outdoor (including lumberyards, pipeline and tank farms, etc.). It can also be used for the control of certain noxious and troublesome weeds.

Consult the **WEEDS CONTROLLED** Weeds Controlled and **BRUSH SPECIES CONTROLLED** tables to determine the appropriate application rate. Patriot may be applied in tank mixture with other herbicides labeled for use on non-crop sites. Fully read the labels and follow all directions and restrictions on each label.

This product may be applied in tank mixture with other herbicides labeled for use on non-crop sites. Fully read the labels and follow all the directions and restrictions on each label.

Applications may be made by ground or air. Use a sufficient volume of water to ensure thorough coverage of the target vegetation with the application equipment being used.

Application Timing

For best results, Patriot should be applied postemergence to young, actively growing weeds. Application may be made at any time of the year, except when the ground is frozen.

GRASS REPLANT INTERVALS

Following an application of Patriot to non-crop areas, the treated sites may be replanted with various species of grasses at the intervals listed below.

For soils with a pH of 7.5 or less, observe the following replant intervals:

Species	Rate (ounces per acre)	Replant Interval (months)
Brome, Meadow	1/2 - 1 1 - 2	2 3
Brome, Smooth	1/2 - 1 1 - 2	2 4
Fescue, Alta	1/2 - 1 1 - 2	2 4
Fescue, Red	1/2 - 1 1 - 2	2 4
Fescue, Sheep	1/2 - 1 1 - 2	1 4
Foxtail, Meadow	1/2 - 1 1 - 2	2 4
Green Needlegrass	1/2 - 2	1
Orchardgrass	1/2 - 1 1 - 2	2 4
Russian wildrye	1/2 - 1 1 2	1 2 3
Switchgrass	1/2 - 1 1 - 2	1 3
Timothy	1/2 - 1 1 - 2	2 4
Wheatgrass, Western	1/2 - 1 1 - 2	2 3

SPECIMEN

For soils with a pH of 7.5 or greater, observe the following replant intervals:

Species	Rate (ounces per acre)	Replant Interval (months)
Alkali Sacaton	1/2 - 1 1 - 2	1 3
Bluestem, Big	1/2 - 2	3
Brome, Mountain	1/2 - 1 1 - 2	1 2
Grama, Blue	1/2 - 2	1
Grama, Sideoats	1/2 >1/2	2 >3
Switchgrass	1/2 >1/2	2 >3
Wheatgrass, Thickspike	1/2 - 2	1
Wheatgrass, Western	1/2 - 1 1 - 2	2 3

The specified intervals are for applications made in the Spring to early Summer. Because this product degrades slowly in cold or frozen soils, applications made in the late Summer or Fall should consider the intervals as beginning in the Spring following treatment.

Testing has indicated that there is considerable variation in response among the species of grasses when seeded into areas treated with this product. If species other than those listed above are to be planted into areas treated with this product, a field bioassay should be performed, or previous experience may be used, to determine the feasibility of replanting treated sites.

TURFGRASS, INDUSTRIAL (UNIMPROVED ONLY)

Application Information

Apply Patriot for selective weed control in unimproved industrial turfgrass where certain grasses are well established and desired as ground cover. Patriot also be used for the control of certain noxious and troublesome weeds in turfgrass.

In addition to conventional spray equipment, Patriot may also be applied with invert emulsion equipment. When using an invert emulsion, mix the prescribed rate of Patriot in the water phase.

Consult the **WEEDS CONTROLLED** table to determine which weeds will be controlled by the following rates:

Turfgrass type	Rate of Patriot (ounces/acre)
Fescue and Bluegrass	1/4 to 4/10
Crested Wheatgrass and Smooth Brome	1/4 to 1
Bermudagrass	1/4 to 2

Application Timing

Applications may be made at any time of the year, except when the soil is frozen.

When a spring application is made on fescue or bluegrass, a second application may be made during the summer after full seedhead maturation.

Growth Suppression and Seedhead Inhibition (Chemical Mowing)

Application Information

Apply Patriot for growth suppression and seedhead inhibition in well-established fescue and bluegrass turf at the use rate of 1/4 to 1/2 ounce per acre.

Tank Mix Combination

Patriot may be tank mixed with Nufarm T-Pac MEC Plant Growth Regulator or Embark for improved performance in the regulation of growth and seedhead suppression. Tank mix 1/4 to 1/2 ounce of Patriot with 2 to 4 ounces of Nufarm T-Pac MEC Plant Growth Regulator or Embark.

Application Timing

Application may be made after at least 2 to 3 inches of new growth has emerged until the appearance of the seed stalk.

Fescue Restrictions:

- Do not use more than 4/10 ounce of Patriot per acre
- Do not use a surfactant if liquid nitrogen is used as a carrier
- Do not use a spray adjuvant unless it is a non-ionic surfactant

SPECIMEN

Fescue Precautions:
This product may temporarily stunt tall fescue, cause it to turn yellow, or cause seedhead suppression. To minimize these symptoms, take the following precautions:

- Use a tank mix with 2,4-D
- Use the lowest specified rate for the target weeds
- Use a non-ionic surfactant at % to 1 pint per 100 gallons of spray solution
- Make application later in the spring after the new growth is 5 to 6 inches tall, or in the fall

Yields from the first cutting may be reduced.

IMPORTANT RESTRICTION-INDUSTRIAL TURF ONLY

- Do not use Patriot on bahiagrass.

IMPORTANT PRECAUTIONS-INDUSTRIAL TURF ONLY

- An application of Patriot may cause temporary discoloration (chlorosis) of the grasses. Use the lower specified rates for minimum discoloration.
- With fescue and bluegrass, sequential applications made during the same or consecutive growth periods (i.e. spring and fall) may result in excessive injury to turf.
- Excessive injury may result when Patriot is applied to turf that is under stress from drought, insects, disease, cold temperatures (winter injury) or poor fertility.

NATIVE GRASSES

Apply Patriot for weed control and suppression in the establishment and maintenance of native grasses. It may be used where blue grama, bluestems (big, little, plains, sand, ww spar) bromegrasses (meadow), buffalograss, green sprangletop, Indiangrass, kleingrass, lovegrasses (atherstone, sand, weeping, wilman), orchardgrass, sideoats grama, switchgrass (Blackwell), wheatgrass (bluebunch, intermediate, pubescent Siberian, slender, streamband, tall, thickspike, western), and Russian wildrye are established. It may also be applied over these species in the seedling stage, except for orchardgrass and Russian wildrye.

Application Information
Apply Patriot at the rate of 1/10 ounce per acre for the control and suppression* of bur buttercup (testiculate), common purslane, common sunflower*, cutleaf eveningprimrose*, flixweed*, lambsquarters* (common and slimleaf), marestail*, pigweed (redroot and tumble), snow speedwell, tansymustard* and tumble mustard (Jim Hill mustard).

*Suppression is a visual reduction in weed competition (reduced population or vigor) as compared to untreated areas. Degree of suppression will vary with the size of weed and environmental conditions following treatment.

Application Timing
For established grasses, apply when weeds are in the seedling stage. For grasses in the seedling stage, apply preplant or preemergence where the soil (seed bed) has been cultivated.

IMPORTANT RESTRICTIONS - NATIVE GRASSES

- Do not apply to grass that is stressed by severe weather conditions, drought, low fertility, water-saturated soils, disease or insect damage as grass injury may result.
- For application to Native Grasses- there are no grazing or haying restrictions on this product.

IMPORTANT PRECAUTIONS - NATIVE GRASSES

- Grass species or varieties may differ in their response to this herbicide. Consult with your state experiment station, university, or extension agent or other local experts as to sensitivity to this herbicide. If inadequate information is available, limit the initial use of this product to a small area. The types of grass in a grass seed mixture will vary in tolerance to this product, so the grasses in the final stand may not reflect the same ratio as in the seed mix.
- Under certain conditions such as heavy rainfall, high pH, prolonged cold weather, or wide fluctuations in day/night temperatures prior to or soon after this product application, temporary discoloration and/or grass injury may occur. Injury may result when this product is applied to grass that is stressed to grass that is stressed by severe weather conditions, drought, low fertility, water-saturated soils, disease, or insect damage as grass injury may result. Severe winter stress, drought, disease, or insect damage before or following application also may result in grass injury.

BRUSH CONTROL

Application Information
Apply Patriot for the control of undesirable brush growing in non-crop areas including grazed areas on these sites. Applications may be made by air, high volume ground application, low volume ground application and ultra-low volume ground application. Except as noted for multiflora rose, Patriot must be applied as a spray to the foliage.

The application volume required will vary with the height and density of the brush and the application equipment used. Generally, aerial applications will require 15 to 25 gallons of water per acre; high volume ground application will require 100 to 400 gallons of water per acre; low volume ground application will require 20 to 50 gallons of water per acre; and ultra-low volume ground application will require 10 to 20 gallons of water per acre.

Regardless of the application volume and equipment used, thorough coverage of the foliage is necessary to optimize results.

SPECIMEN

BRUSH SPECIES CONTROLLED

Species	High Volume Patriot Rate (ounces per 100 gallons)	Broadcast Patriot Rate (ounces per acre)
Ash	1 - 2	1 - 3
Aspen	1 - 2	1 - 3
Black locust	1 - 2	1 - 3
Blackberry	1 - 2	1 - 3
Camelthorn	1 - 2	1 - 3
Cherry	1 - 2	1 - 3
Cottonwood	1 - 2	2 - 3
Eastern red cedar	1 - 2	2 - 3
Elder	1 - 2	2 - 3
Elm	1 - 2	1 - 3
Firs	3	1 - 2
Hawthorn	1 - 2	1 - 3
Honeysuckle	1 - 2	1/2 - 1
Mulberry	1 - 2	2 - 3
Multiflora rose	1 - 2	1 - 3
Muscadine (wild grape)	1 - 2	2 - 3
Oaks	1 - 2	1 - 3
Ocean spray (*Holodiscus*)	1 - 2	2 - 3
Osage orange	1 - 2	2 - 3
Red maple	1 - 2	2 - 3
Salmonberry	1/2 - 1	1 - 3
Snowberry	1/2 - 1	1 - 3
Spruce (black and white)	3	2 - 3
Thimbleberry	1/2 - 1	1 - 3
Tree of heaven (*Ailanthus*)	1 - 2	1 - 2
Tulip tree (yellow poplar)	1/2 - 1	1 - 3
Wild roses	1/2 - 1	1 - 3
Willow	1/2 - 1	1 - 3

For low volume and ultra-low volume ground applications, mix 4 to 8 ounces of this product per 75 gallons of spray solution.

Application Timing

Make a foliar application of the specified rate of this product during the period of full leaf expansion in the spring until the development of full fall coloration on deciduous species to be controlled. Coniferous species may be treated at anytime during the growing season.

Spot Treatment

This product may be used for the control of many species of weeds including noxious/invasive weeds in certain established grasses growing on non-crop areas.

Refer to the **WEEDS CONTROLLED** section for a listing of susceptible weed species and the application rate per acre per the target weed.

Or, mix one gram of this product per one gallon of water along with a surfactant. Spray to the point of wetting the entire surface of the target weeds, approximately 40 gallons of solution per acre.

Tank Mix Combinations

This product may be tank mixed with any product labeled for non-crop brush control at the application rates specified on the companion product's label for the species specified on the product's companion label. Read and follow the label instructions of both products when tank mixing. Follow the most restrictive limitations of the products labels being tank mixed.

Accord

After consulting **BRUSH SPECIES CONTROLLED** table, tank mix the prescribed rate of Patriot with the rate of Accord indicated for the various application methods on the Accord label. Refer to the Accord label for list of species controlled.

Nufarm Polaris Herbicide (2 pounds per gallon active ingredient imazapyr)

Combine 1 to 2 ounces of this product with 1 to 4 pints of Nufarm Polaris (2 pounds per gallon imazapyr) per acre and apply as a broadcast spray. Aerial applications should use a minimum of 15 gallons per acre spray volume. In addition to species listed above controlled by this product, this combination controls black gum, hophornbeam, sassafras, sweetgum, Vaccinium species, dogwood, myrtle dahoon, hickories, and persimmon.

Tahoe 3A or Relegate (triclopyr)

After consulting the **BRUSH SPECIES CONTROLLED** table, tank mix the prescribed rate of Patriot with the rate of Tahoe 3A or Relegate indicated for the various application methods on the Tahoe 3A / Relegate label. Refer to the Tahoe 3A / Relegate label for list of species controlled.

SPECIMEN

KRENITE S
After consulting the **BRUSH SPECIES CONTROLLED** table, tank mix the prescribed rate of Patriot with the rate of KRENITE S indicated for the various application methods on the KRENITE S label. Refer to the KRENITE S label for list of species controlled.

Trooper 22K (picloram)
After consulting the **BRUSH SPECIES CONTROLLED** table, tank mix the prescribed rate of Patriot with the rate of Trooper 22K indicated for the various application methods on the Trooper 22K label. Refer to the Trooper 22K label for list of species controlled.

Trooper 22K is a restricted use pesticide.

Trooper 22K (2 pounds per gallon active ingredient picloram) + Nufarm Polaris Herbicide (2 pounds per gallon active ingredient imazapyr)
Combine 1 to 1-1/2 ounce of this product with 2 to 8 fluid ounces of Nufarm Polaris (2 pounds per gallon imazapyr) and 1 to 2 pints of Trooper 22K (2 pounds per gallon picloram) per 100 gallons of water. Apply as a high volume spray. This tank mix controls cherry, elms, box elder, maples, hackberry, redbud, ash, oaks (including shingle oak), black locust and sassafras.

Trooper 22K is a restricted use pesticide.

Spotgun Basal Soil Treatment
For control of multiflora rose, prepare a spray suspension of this product by mixing 1 ounce per gallon of water. Mix vigorously until this product is dispersed and agitate periodically while applying the spray suspension.

Apply the spray preparation with an exact delivery handgun applicator. Apply at the rate of 4 milliliters for each 2 feet of rose canopy diameter. Direct the treatment to the soil within 2 feet of stem union. When treating large plants and more than one delivery is required, make applications on opposite sides of the plant.

Applications should be made from early spring to summer.

IMPORTANT RESTRICTONS - NON-CROP BRUSH ONLY

- When using tank mixtures of this product with companion herbicides, read and follow all the use instructions, application rates, warnings and precautions appearing on the labels. Follow the most restrictive label instruction for each of the herbicides used.

STORAGE AND DISPOSAL

Do not contaminate water, food or feed by storage or disposal.

STORAGE AND SPILL PROCEDURES: Store upright at room temperature. Avoid exposure to extreme temperatures. In case of spillage or leakages, soak up with an absorbent material such as sand, sawdust, earth, Fuller's earth, etc. Dispose of with chemical waste.

PESTICIDE DISPOSAL: Pesticide, spray mixture or rinse water that cannot be used according to label instructions must be disposed of at or by an approved waste disposal facility.

CONTAINER HANDLING:
Nonrefillable Plastic and Metal Containers (Capacity Equal to or Less Than 50 Pounds): Nonrefillable container. Do not reuse or refill this container. Triple rinse container (or equivalent) promptly after emptying. **Triple rinse as follows:** Empty the remaining contents into application equipment or a mix tank. Fill the container 1/4 full with water and recap. Shake for 10 seconds. Pour rinsate into application equipment or a mix tank or store rinsate for later use or disposal. Drain for 10 seconds after the flow begins to drip. Repeat this procedure two more times. Then, for Plastic Containers, offer for recycling if available or puncture and dispose of in a sanitary landfill, or by incineration. Do not burn, unless allowed by state and local ordinances. For Metal Containers, offer for recycling if available or reconditioning if appropriate, or puncture and dispose of in a sanitary landfill, or by other procedures approved by state and local authorities.

Nonrefillable Plastic and Metal Containers (Capacity Greater Than 50 Pounds): Nonrefillable container. Do not reuse or refill this container. Triple rinse container (or equivalent) promptly after emptying. **Triple rinse as follows:** Empty the remaining contents into application equipment or a mix tank. Fill the container 1/4 full with water. Replace and tighten closures. Tip container on its side and roll it back and forth, ensuring at least one complete revolution, for 30 seconds. Stand the container on its end and tip it back and forth several times. Turn the container over onto its other end and tip it back and forth several times. Empty the rinsate into application equipment or a mix tank or store rinsate for later use or disposal. Repeat this procedure two more times. Then, for Plastic Containers, offer for recycling if available or puncture and dispose of in a sanitary landfill, or by incineration. Do not burn, unless allowed by state and local ordinances. For Metal Containers, offer for recycling if available or reconditioning if appropriate, or puncture and dispose of in a sanitary landfill, or by other procedures approved by state and local authorities.

SPECIMEN

WARRANTY DISCLAIMER

The directions for use of this product must be followed carefully. TO THE EXTENT CONSISTENT WITH APPLICABLE LAW, (1) THE GOODS DELIVERED TO YOU ARE FURNISHED "AS IS" BY MANUFACTURER OR SELLER AND (2) MANUFACTURER AND SELLER MAKE NO WARRANTIES, GUARANTEES, OR REPRESENTATIONS OF ANY KIND TO BUYER OR USER, EITHER EXPRESS OR IMPLIED, OR BY USAGE OF TRADE, STATUTORY OR OTHERWISE, WITH REGARD TO THE PRODUCT SOLD, INCLUDING, BUT NOT LIMITED TO MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE, USE, OR ELIGIBILITY OF THE PRODUCT FOR ANY PARTICULAR TRADE USAGE. UNINTENDED CONSEQUENCES, INCLUDING BUT NOT LIMITED TO INEFFECTIVENESS, MAY RESULT BECAUSE OF SUCH FACTORS AS THE PRESENCE OR ABSENCE OF OTHER MATERIALS USED IN COMBINATION WITH THE GOODS, OR THE MANNER OF USE OR APPLICATION, INCLUDING WEATHER, ALL OF WHICH ARE BEYOND THE CONTROL OF MANUFACTURER OR SELLER AND ASSUMED BY BUYER OR USER. THIS WRITING CONTAINS ALL OF THE REPRESENTATIONS AND AGREEMENTS BETWEEN BUYER, MANUFACTURER AND SELLER, AND NO PERSON OR AGENT OF MANUFACTURER OR SELLER HAS ANY AUTHORITY TO MAKE ANY REPRESENTATION OR WARRANTY OR AGREEMENT RELATING IN ANY WAY TO THESE GOODS.

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TO THE EXTENT CONSISTENT WITH APPLICABLE LAW, IN NO EVENT SHALL MANUFACTURER OR SELLER BE LIABLE FOR SPECIAL, INCIDENTAL, OR CONSEQUENTIAL DAMAGES, OR FOR DAMAGES IN THEIR NATURE OF PENALTIES RELATING TO THE GOODS SOLD, INCLUDING USE, APPLICATION, HANDLING, AND DISPOSAL. TO THE EXTENT CONSISTENT WITH APPLICABLE LAW, MANUFACTURER OR SELLER SHALL NOT BE LIABLE TO BUYER OR USER BY WAY OF INDEMNIFICATION TO BUYER OR TO CUSTOMERS OF BUYER, IF ANY, OR FOR ANY DAMAGES OR SUMS OF MONEY, CLAIMS OR DEMANDS WHATSOEVER, RESULTING FROM OR BY REASON OF, OR RISING OUT OF THE MISUSE, OR FAILURE TO FOLLOW LABEL WARNINGS OR INSTRUCTIONS FOR USE, OF THE GOODS SOLD BY MANUFACTURER OR SELLER TO BUYER. TO THE EXTENT CONSISTENT WITH APPLICABLE LAW, ALL SUCH RISKS SHALL BE ASSUMED BY THE BUYER, USER, OR ITS CUSTOMERS. TO THE EXTENT CONSISTENT WITH APPLICABLE LAW, BUYER'S OR USER'S EXCLUSIVE REMEDY, AND MANUFACTURER'S OR SELLER'S TOTAL LIABILITY SHALL BE FOR DAMAGES NOT EXCEEDING THE COST OF THE PRODUCT.

If you do not agree with or do not accept any of the directions for use, the warranty disclaimers, or limitations on liability, do not use the product, and return it unopened to the Seller, and the purchase price will be refunded.

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Nufarm

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

Product Name: **Patriot Selective Herbicide**
EPA Reg. No.: 228-391
Product Type: Herbicide

Company Name: Nufarm Americas Inc
11901 S. Austin Avenue
Alsip, IL 60803
1-800-345-3330

Telephone Numbers: **For Chemical Emergency, Spill, Leak, Fire, Exposure, or Accident,**
Call CHEMTREC Day or Night: 1-800-424-9300
For Medical Emergencies Only, Call 1-877-325-1840

This product is an EPA FIFRA registered pesticide. Some classifications on this SDS are not exactly the same as on the FIFRA label. Certain sections are superseded by federal law governed by EPA for a registered pesticide. Please see Section 15. REGULATORY INFORMATION for explanation.

2. HAZARDS IDENTIFICATION

PHYSICAL HAZARDS:
Not hazardous

HEALTH HAZARDS:

Carcinogen	Category 1A
Specific Target Organ Toxicity – Repeat Exposure	Category 1

ENVIRONMENTAL HAZARDS:

Hazardous to aquatic environment, acute	Category 1
Hazardous to aquatic environment, chronic	Category 1

SIGNAL WORD:
DANGER

HAZARD STATEMENTS:
May cause cancer by inhalation. Causes damage to lungs through prolonged or repeated exposure. Very toxic to aquatic life with long lasting effects.

PRECAUTIONARY STATEMENTS
Obtain special instructions before use. Do not handle until all safety precautions have been read and understood. Do not breathe dust. Wash thoroughly after handling. Do not eat, drink, or smoke when using this product. Use personal protective equipment as required. Avoid release to the environment.

IF exposed or concerned: Get medical advice. Get medical advice if you feel unwell. Collect spillage.

Store locked up.

Dispose of contents in accordance with local, state, and federal regulations.

3. COMPOSITION / INFORMATION ON INGREDIENTS

COMPONENTS	CAS NO.	% BY WEIGHT
Metsulfuron-methyl	74223-64-6	58.2 – 61.8
Kaolin	1332-58-7	13.3 – 14.7
Crystalline Silica (quartz)	14808-60-7	< 0.2
Titanium dioxide	13463-67-7	< 0.3
Other Ingredients	Trade Secret	Trade Secret

Synonyms: Mixture containing Metsulfuron methyl (Methyl 2-[[[[(4-methoxy-6-methyl-1,3,5-triazin-2-ly) amino]carbonyl]amino] sulfonyl]benzoate)

Ingredients not precisely identified are proprietary or non-hazardous. Values are not product specifications.

4. FIRST AID MEASURES

If on Skin or Clothing: Take off contaminated clothing. Wash with soap and water. Get medical attention if irritation develops and persists.
If in Eyes: Hold eye open and rinse slowly and gently with water for several minutes. Remove contact lenses, if present, then continue rinsing eye. Get medical attention if irritation occurs and persists.
If Swallowed: Have person sip a glass of water if able to swallow. Do not induce vomiting unless told to do so by the poison control center or doctor. If symptoms develop, get medical advice.
If Inhaled: Move person to fresh air. If symptoms develop, get medical advice.
Most Important symptoms/effects, acute and delayed: May cause mild eye irritation. Prolonged or repeated inhalation may cause lung damage or cancer.
Indication of Immediate medical attention and special treatment if needed: For ingestion there is no specific antidote available. Treat symptomatically.

5. FIRE FIGHTING MEASURES

Extinguishing Media: Use extinguishing media suitable for surrounding materials. Dry chemical, carbon dioxide, foam, water spray or fog.
Special Fire Fighting Procedures: Firefighters should wear NIOSH approved self-contained breathing apparatus and full fire-fighting turn out gear. Dike area to prevent runoff and contamination of water sources. Dispose of fire control water later.
Unusual Fire and Explosion Hazards: Avoid generating dust; fine dust dispersed in air in sufficient concentrations, and in the presence of an ignition source, is a potential dust explosion hazard. If water is used to fight fire, contain runoff, using dikes to prevent contamination of water supplies. Dispose of fire control water later. Decontaminate tools and equipment following cleanup.
Hazardous Decomposition Materials (Under Fire Conditions): May produce gases such as oxides of carbon, hydrogen, nitrogen and sulfur.

6. ACCIDENTAL RELEASE MEASURES

Personal Precautions: Wear appropriate protective gear for the situation. See Personal Protection information in Section 8.
Environmental Precautions: Prevent material from entering public sewer systems or any waterways. Do not flush to drain. Large spills to soil or similar surfaces may necessitate removal of topsoil. The affected area should be removed and placed in an appropriate container for disposal.
Methods for Containment: Dike spill using absorbent or impervious materials such as earth, sand or clay. Collect and contain contaminated absorbent and dike material for disposal.
Methods for Cleanup and Disposal: Avoid creation of dusty conditions. If dry, sweep or scoop up material and place into container for disposal. If wet, pump any free liquid into an appropriate closed container. Decontaminate tools and equipment following cleanup. See Section 13: DISPOSAL CONSIDERATIONS for more information.
Other Information: Large spills may be reportable to the National Response Center (800-424-8802) and to state and/or local agencies.

7. HANDLING AND STORAGE

HANDLING:
Avoid contact with eyes or clothing. Users should wash hands before eating, drinking, chewing gum, using tobacco, or using the toilet. Remove clothing/Personal Protective Equipment (PPE) immediately if pesticide gets inside. Then wash thoroughly and put on clean clothing. If pesticide gets on skin, wash immediately with soap and

water. Remove PPE immediately after handling this product. Wash the outside of gloves before removing. As soon as possible, wash thoroughly and change into clean clothing.

STORAGE:
Store product in original container only. Do not contaminate water, other pesticides, fertilizer, food or feed in storage. Store in a cool, dry place. Do not contaminate water, food or feed by storage or disposal.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Engineering Controls:
Where engineering controls are indicated by specific use conditions or a potential for excessive exposure, use local exhaust ventilation at the point of generation. Ensure that dust-handling systems (such as exhaust ducts, dust collectors, vessels, and processing equipment) are designed in a manner to prevent the escape of dust into the work area (i.e., there is no leakage from the equipment).

Personal Protective Equipment:
Eye/Face Protection: To avoid contact with eyes, wear chemical goggles. An emergency eyewash or water supply should be readily accessible to the work area.
Skin Protection: To avoid contact with skin, wear long-sleeved shirt and long pants, shoes, socks, and chemical-resistant gloves. Washing facilities should be readily accessible to the work area.
Respiratory Protection: Not normally required. If vapors or mists exceed acceptable levels, wear NIOSH approved air-purifying respirator with cartridges/canisters approved for use against pesticides.
General Hygiene Considerations: Personal hygiene is an important work practice exposure control measure and the following general measures should be taken when working with or handling this material: 1) do not store, use and/or consume foods, beverages, tobacco products, or cosmetics in areas where this material is stored; 2) wash hands and face carefully before eating, drinking, using tobacco, applying cosmetics or using the toilet.

Exposure Guidelines:

	OSHA		ACGIH		
Component	**TWA**	**STEL**	**TWA**	**STEL**	**Unit**
Metsulfuron-methyl	NE	NE	NE	NE	
Kaolin	15 (T) 5 (R)	NE	2.0 (R)	NE	mg/m^3
Crystalline Silica (quartz)	30 / %SiO_2+2 (T) 10 / %SiO_2+2 (R)	NE	0.025 (R)	NE	mg/m^3
Titanium dioxide	15 (T)	NE	10	NE	mg/m^3
Other Ingredients	NE	NE	NE	NE	

NE = Not Established
T= Total Dust
R= Respirable Fraction

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance:	Light brown granular solid
Odor:	Mild
Odor threshold:	No data available
pH:	4.01 (1% w/w dispersion in DIW)
Melting point/freezing point:	No data available
Initial boiling point and boiling range	No data available
Flash point:	No data available
Evaporation rate:	No data available
Flammability (solid, gas):	No data available
Upper/lower flammability or explosive limits:	No data available
Vapor pressure:	No data available
Vapor density:	Not applicable
Relative density:	1.3976 g/cc
Solubility(ies):	No data available
Partition coefficient: n-octanol/water:	No data available
Autoignition temperature:	No data available
Decomposition temperature:	No data available

Viscosity: Not applicable due to product form (solid)

Note: Physical data are typical values, but may vary from sample to sample. A typical value should not be construed as a guaranteed analysis or as a specification.

10. STABILITY AND REACTIVITY

Reactivity: Not reactive.
Chemical Stability: This material is stable under normal handling and storage conditions.
Possibility of Hazardous Reactions: Will not occur.
Conditions to Avoid: Excessive heat. Do not store near heat or flame.
Incompatible Materials: Strong oxidizing agents: bases and acids.
Hazardous Decomposition Products: Under fire conditions may produce gases such as oxides of carbon, hydrogen, nitrogen and sulfur.

11. TOXICOLOGICAL INFORMATION

Likely Routes of Exposure: Inhalation, eye and skin contact.
Symptoms of Exposure:
Eye Contact: Slightly irritating based on toxicity studies.
Skin Contact: Mildly toxic and non-irritating based on toxicity studies.
Ingestion: Slightly toxic based on toxicity studies.
Inhalation: Low inhalation toxicity. May cause cancer or lung damage through prolonged or repeated exposure.
Delayed, immediate and chronic effects of exposure: None expected.

Toxicological Data:
Data from laboratory studies on a substantially similar product are summarized below:

Oral: Rat LD_{50}: >5,000 mg/kg
Dermal: Rat LD_{50}: >5,000 mg/kg
Inhalation: Rat 4-hr LC_{50}: >5 mg/L (based on data for Metsulfuron methyl)
Eye Irritation: Rabbit: Slight irritation
Skin Irritation: Rabbit: Mildly irritating
Skin Sensitization: Not a contact sensitizer in guinea pigs following repeated skin exposure.

Subchronic (Target Organ) Effects: Repeated overexposure to metsulfuron-methyl may cause decreased body weight gain and decreased liver weights. Prolonged or repeated inhalation may cause cancer or lung damage.
Carcinogenicity / Chronic Health Effects: There was no evidence of carcinogenicity in animal studies using metsulfuron-methyl.
Reproductive Toxicity: Animal tests with metsulfuron-methyl have not demonstrated reproductive effects.
Developmental Toxicity: Animal tests with metsulfuron-methyl have not demonstrated developmental effects.
Genotoxicity: There have been some positive and negative studies, but the weight of evidence is that metsulfuron-methyl is not mutagenic.

Assessment Carcinogenicity:
This product contains substances that are considered to be probable or suspected human carcinogens as follows:

	Regulatory Agency Listing As Carcinogen			
Component	**ACGIH**	**IARC**	**NTP**	**OSHA**
Metsulfuron Methyl	No	No	No	No
Kaolin	A4	No	No	No
Crystalline Silica (quartz)	A2	1	Known	No
Titanium dioxide	A4	2B	No	No
Other Ingredients	No	No	No	No

12. ECOLOGICAL INFORMATION

Ecotoxicity:
Data on Metsulfuron-methyl technical:

Bluegill 96-hour LC_{50}: >150 mg/l
Rainbow Trout 96-hour EC_{50}: >150 mg/l
Daphnia 48-hour EC_{50}: >150 mg/l
Green Algae 72-hour EC_{50}: 0.045 mg/l
Bobwhite Quail 8-day Dietary LC_{50}: >5,620 ppm
Mallard Duck 8-day Dietary LC_{50}: >5,620 ppm
Mallard Duck Oral LD_{50}: >2,510 mg/kg
Honey Bee Contact LD_{50}: >25 ug/bee

Environmental Fate:
Metsulfuron-methyl is relatively mobile in most soils, but will be retained longer in soils with higher percentages of organic matter. It is more mobile in alkaline soils than in acidic soils. Metsulfuron-methyl will degrade faster under acidic conditions, and in soils with higher moisture contents and higher temperature. Metsulfuron-methyl is stable to photolysis, but will break down in ultraviolet light. Half-life estimates in soil range from 14 to 180 days, with an average of 30 days. Metsulfuron-methyl is stable to hydrolysis at neutral and alkaline pHs. The estimated half-life in acidic water is 3 weeks.

13. DISPOSAL CONSIDERATIONS

Waste Disposal Method:
Wastes resulting from the use of this product may be disposed of on site or at an approved waste disposal facility. Contact your State Pesticide or Environmental Control Agency, or the Hazardous Waste Representative at the nearest EPA Regional Office for guidance.

Container Handling and Disposal:
Non-refillable container. Do not reuse or refill this container. Offer for recycling, if available. Triple rinse container (or equivalent) promptly after emptying. Triple rinse as follows: Empty the remaining contents into application equipment or mix tank. Fill the container half full with water and recap. Shake for 10 seconds. Pour rinsate into application equipment or a mix tank or store rinsate for later use or disposal. Drain for 10 seconds after the flow begins to drip. Repeat this procedure two more times.

14. TRANSPORTATION INFORMATION

Follow the precautions indicated in Section 7: HANDLING AND STORAGE of this SDS.

DOT
Non Regulated

IMDG
UN 3077, Environmentally hazardous substance, solid, nos, (Metsulfuron-methyl), 9, III, Marine Pollutant

IATA
UN 3077, Environmentally hazardous substance, solid, nos, (Metsulfuron-methyl), 9, III,

15. REGULATORY INFORMATION

EPA FIFRA INFORMATION

This chemical is a pesticide product registered by the United States Environmental Protection Agency and is subject to certain labeling requirements under federal pesticide law. These requirements differ from the classification criteria and hazard information required for safety data sheets (SDS), and for workplace labels of non-pesticide chemicals. The hazard information required on the pesticide label is reproduced below. The pesticide label also includes other important information, including directions for use.

CAUTION. Harmful if absorbed through skin. Causes moderate eye irritation. Avoid contact with skin, eyes or clothing.

U.S. FEDERAL REGULATIONS

TSCA Inventory: This product is exempted from TSCA because it is solely for FIFRA regulated use.

SARA Hazard Notification/Reporting:
Hazard Categories Under Criteria of SARA Title III Rules (40 CFR Part 370):
Chronic Health

Section 313 Toxic Chemical(s):
None

Reportable Quantity (RQ) under U.S. CERCLA:
None

RCRA Waste Code:
Under RCRA, it is the responsibility of the product user to determine at the time of disposal, whether a material containing the product or derived from the product should be classified as a hazardous waste.

State Information:
Other state regulations may apply. Check individual state requirements.

California Proposition 65: **ATTENTION.** This product can expose you to chemicals including silica, crystalline and titanium dioxide which are known to the State of California to cause cancer. For more information go to www.P65Warnings.ca.gov.

16. OTHER INFORMATION

National Fire Protection Association (NFPA) Hazard Rating:
Rating for this product: Health: 1 **Flammability:** 1 **Reactivity:** 0
Hazards Scale: 0 = Minimal 1 = Slight 2 = Moderate 3 = Serious 4 = Severe

This Safety Data Sheet (SDS) serves different purposes than and DOES NOT REPLACE OR MODIFY THE EPA-ACCEPTED PRODUCT LABELING (attached to and accompanying the product container). This SDS provides important health, safety and environmental information for employers, employees, emergency responders and others handling large quantities of the product in activities generally other than product use, while the labeling provides that information specifically for product use in the ordinary course.

Use, storage and disposal of pesticide products are regulated by the EPA under the authority of the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) through the product labeling, and all necessary and appropriate precautionary, use, storage, and disposal information is set forth on that labeling. It is a violation of Federal law to use a pesticide product in any manner not prescribed on the EPA-accepted label.

Although the information and recommendations set forth herein (hereinafter "Information") are presented in good faith and believed to be correct as of the date hereof, Nufarm Americas Inc. makes no representations as to the completeness or accuracy thereof. Information is supplied upon the condition that the persons receiving same will make their own determination as to its suitability for their purposes prior to use. In no event will Nufarm Americas Inc. be responsible for damages of any nature whatsoever resulting from the use of or reliance upon Information. NO REPRESENTATIONS OR WARRANTIES, EITHER EXPRESS OR IMPLIED, OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE OR OF ANY OTHER NATURE ARE MADE HEREUNDER WITH RESPECT TO INFORMATION OR THE PRODUCT TO WHICH INFORMATION REFERS AND ALL SUCH WARRANTIES ARE HEREBY SPECIFICALLY DISCLAIMED.

Date of Issue: January 25, 2018 **Supersedes:** May 15, 2015

Specimen Label

GLYPHOSATE	GROUP	9	HERBICIDE

CORTEVA™ agriscience

Rodeo®

HERBICIDE

® ™ Trademarks of Dow AgroSciences, DuPont or Pioneer and their affiliated companies or respective owners

For control of annual and perennial weeds and woody plants in natural and production (plantations), forests for site preparation, mid-rotation release treatments, timber stand improvement activities, noncrop sites including industrial sites, rights-of-way (including roadsides, electric utility and communication transmission lines, pipelines, railroads, airports), irrigation and drainage ditches, canals, reservoirs, natural areas (including wildlife management areas, wildlife openings, wildlife habitats and refuges, parks and recreational areas, campgrounds, trailheads and trails), rangeland, and in and around aquatic sites and wetlands; also for perennial grass release, and grass growth suppression and grazed areas on these sites.

Avoid contact of herbicide with foliage, green stems, exposed non-woody roots or fruit of crops, desirable plants and trees, because severe injury or destruction may result.

Active Ingredient:	
glyphosate† N-(phosphonomethyl)glycine, isopropylamine salt	53.8%
Other Ingredients	46.2%
Total	100.0%

†Contains 5.4 lb per gallon glyphosate, isopropylamine salt (4 lb per gallon glyphosate acid).

Precautionary Statements

Hazards to Humans and Domestic Animals

EPA Reg. No. 62719-324

Keep Out of Reach of Children

CAUTION

Harmful If Inhaled • Avoid breathing spray mist. Remove contaminated clothing and wash before reuse. Wash thoroughly with soap and water after handling.

Personal Protective Equipment (PPE)

Applicators and other handlers must wear:

- Long-sleeved shirt and long pants
- Shoes plus socks.

Follow manufacturer's instructions for cleaning/maintaining PPE. If no such instructions for washables, use detergent and hot water. Keep and wash PPE separately from other laundry.

Engineering Controls

When handlers use closed systems, enclosed cabs, or aircraft in a manner that meets the requirements listed in Worker Protection Standard (WPS) for agricultural pesticides [40 CFR 170.240 (d)(4-6)], the handler PPE requirements may be reduced or modified as specified in the WPS.

User Safety Recommendations

Users should:

- Wash hands before eating, drinking, chewing gum, using tobacco, or using the toilet.
- Remove clothing immediately if pesticide gets inside. Then wash thoroughly and put on clean clothing.

First Aid

If inhaled: Move person to fresh air. If person is not breathing, call 911 or an ambulance, then give artificial respiration, preferably mouth-to-mouth if possible. Call a poison control center or doctor for further treatment advice.

Have the product container or label with you when calling a poison control center or doctor, or going for treatment. You may also contact 1-800-992-5994 for emergency medical treatment information.

Environmental Hazards

Do not contaminate water when cleaning equipment or disposing of equipment washwaters. Treatment of aquatic weeds can result in oxygen depletion or loss due to decomposition of dead plants. This oxygen loss can cause fish suffocation.

In case of leak or spill, soak up and remove to a landfill.

Physical or Chemical Hazards

Spray solutions of this product should be mixed, stored and applied using only stainless steel, aluminum, fiberglass, plastic or plastic-lined steel containers.

Do not mix, store or apply this product or spray solutions of this product in galvanized steel or unlined steel (except stainless steel) containers or spray tanks. This product or spray solutions of this product react with such containers and tanks to produce hydrogen gas, which may form a highly combustible gas mixture. This gas mixture could flash or explode, causing serious personal injury, if ignited by open flame, spark, welder's torch, lighted cigarette or other ignition source.

Directions for Use

It is a violation of Federal law to use this product in a manner inconsistent with its labeling.
Read all Directions for Use carefully before applying.

This is an end-use product. Dow AgroSciences does not intend and has not registered it for reformulation.

Do not apply this product in a way that will contact workers or other persons, either directly or through drift. Only protected handlers may be in the area during application. For any requirements specific to your state or tribe, consult the agency responsible for pesticide regulation.

Agricultural Use Requirements

Use this product only in accordance with its labeling and with the Worker Protection Standard, 40 CFR Part 170. This Standard contains requirements for the protection of agricultural workers on farms, forests, nurseries, and greenhouses, and handlers of agricultural pesticides. It contains requirements for training, decontamination, notification, and emergency assistance. It also contains specific instructions and exceptions pertaining to the statements on this label about personal protective equipment (PPE), and restricted entry interval. The requirements in this box only apply to uses of this product that are covered by the Worker Protection Standard.

Do not enter or allow worker entry into treated areas during the restricted entry interval (REI) of 4 hours.

PPE required for early entry to treated areas that is permitted under the Worker Protection Standard and that involves contact with anything that has been treated, such as plants, soil, or water, is:

- Coveralls
- Chemical-resistant gloves made of any waterproof material
- Shoes plus socks

Non-Agricultural Use Requirements

The requirements in this box apply to uses of this product that are NOT within the scope of the Worker Protection Standard for agricultural pesticides (40 CFR Part 170). The WPS applies when this product is used to produce agricultural plants on farms, forests, nurseries or greenhouses.

Keep people and pets off treated areas until spray solution has dried.

Storage and Disposal

Do not contaminate water, food, feed or seed by storage or disposal.
Pesticide Storage: Store above 10°F (-12°C) to keep product from crystallizing. Crystals will settle to the bottom. If allowed to crystallize, place in a warm room 68°F (20°C) for several days to redissolve and roll or shake container or recirculate in mini-bulk containers to mix well before using.
Pesticide Disposal: Wastes resulting from use of this product that cannot be used or chemically reprocessed should be disposed of in a landfill approved for pesticide disposal or in accordance with applicable Federal, state or local procedures.

Nonrefillable containers 5 gallons or less:
Container Handling: Nonrefillable container. Do not reuse or refill this container.
Triple rinse or pressure rinse container (or equivalent) promptly after emptying. **Triple rinse** as follows: Empty the remaining contents into application equipment or a mix tank and drain for 10 seconds after the flow begins to drip. Fill the container 1/4 full with water and recap. Shake for 10 seconds. Pour rinsate into application equipment or a mix tank or store rinsate for later use or disposal. Drain for 10 seconds after the flow begins to drip. Repeat this procedure two more times. **Pressure rinse** as follows: Empty the remaining contents into application equipment or a mix tank and continue to drain for 10 seconds after the flow begins to drip. Hold container upside down over application equipment or mix tank or collect rinsate for later use or disposal. Insert pressure rinsing nozzle in the side of the container, and rinse at about 40 psi for at least 30 seconds. Drain for 10 seconds after the flow begins to drip. Then offer for recycling if available or puncture and dispose of in a sanitary landfill, or by incineration, or by other procedures allowed by state and local authorities.

Refillable containers larger than 5 gallons:
Container Handling: Refillable container. Refill this container with pesticide only. Do not reuse this container for any other purpose. Cleaning the container before final disposal is the responsibility of the person disposing of the container. Cleaning before refilling is the responsibility of the refiller. To clean the container before final disposal, empty the remaining contents from this container into application equipment or a mix tank. Fill the container about 10% full with water and, if possible, spray all sides while adding water. If practical, agitate vigorously or recirculate water with the pump for two minutes. Pour or pump rinsate into application equipment or rinsate collection system. Repeat this rinsing procedure two more times. Then offer for recycling if available, or puncture and dispose of in a sanitary landfill, or by incineration, or by other procedures allowed by state and local authorities.

Nonrefillable containers 5 gallons or larger:
Container Handling: Nonrefillable container. Do not reuse or refill this container.
Triple rinse or pressure rinse container (or equivalent) promptly after emptying. **Triple rinse** as follows: Empty the remaining contents into application equipment or a mix tank. Fill the container 1/4 full with water. Replace and tighten closures. Tip container on its side and roll it back and forth, ensuring at least one complete revolution, for 30 seconds. Stand the container on its end and tip it back and forth several times. Turn the container over onto its other end and tip it back and forth several times. Empty the rinsate into application equipment or a mix tank or store rinsate for later use or disposal. Repeat this procedure two more times. **Pressure rinse** as follows: Empty the remaining contents into application equipment or a mix tank and continue to drain for 10 seconds after the flow begins to drip. Hold container upside down over application equipment or mix tank or collect rinsate for later use or disposal. Insert pressure rinsing nozzle in the side of the container, and rinse at about 40 psi for at least 30 seconds. Drain for 10 seconds after the flow begins to drip. Then offer for recycling if available, or puncture and dispose of in a sanitary landfill, or by incineration, or by other procedures allowed by state and local authorities.

Product Information

This product is a broad spectrum, systemic, postemergent herbicide with no soil residual activity. It is intended for control of annual and perennial weeds and woody plants and brush. It is formulated as a water soluble liquid.

Time to Symptoms: The active ingredient in this product moves through the plant from the point of foliage contact to and into the root system. Visible effects are a gradual wilting and yellowing of the plant that advances to complete browning of above ground growth and deterioration of underground plant parts. Visible effects on most annual weeds occur within two to four days, but on most perennial weeds visible effects may not occur for seven days or more. Extremely cool or cloudy weather following treatment may slow the activity of this product and delay development of visual symptoms.

Stage of Weeds: Annual weeds are easiest to control when they are small. Best control of most perennial weeds is obtained when treatment is made at late growth stages approaching maturity. Refer to the annual, perennial and woody brush and trees rate tables for specific weeds. Always use the higher rate within the rate range for heavy or dense weed growth or when weeds are growing in an undisturbed (noncultivated) area. When treating weeds with disease or insect damage, weeds heavily covered with dust, or weeds under poor growing conditions, reduced weed control may result.

Cultural Considerations: Reduced control may result when applications are made to annual or perennial weeds that have been mowed, grazed, or cut, and have not been allowed to regrow to the specified stage for treatment.

Rainfastness: Heavy rainfall soon after application may wash off this product from the foliage and a repeat application up to the labled rate may be required for adequate control.

Spray Coverage: For best results, spray coverage should be uniform and complete.

Mode of Action: The active ingredient in this product inhibits an enzyme. This enzyme is found only in plants and microorganisms that are essential to forming specific amino acids.

No Soil Activity: Weeds must be emerged at the time of application to be controlled by this product. Weeds germinating from seed after application will not be controlled. Unemerged plants arising from unattached underground rhizomes or rootstocks of perennials will not be affected by the herbicide and will continue to grow.

Biological Degradation: Degradation of this product is primarily a biological process carried out by soil microbes.

Maximum Application Rates: The maximum application rates specified in this label are given in units of volume, either fluid ounces, pints or quarts, of this product per acre. The maximum allowed application rates apply to this product combined with the use of any and all other glyphosate- or sulfosate-containing herbicides, either applied separately or in a tank mix, on the basis of total pounds of glyphosate (acid equivalents) per acre. If more than one glyphosate- or sulfosate-containing product is applied to the same site within the same year, ensure that the total of pounds acid equivalent glyphosate does not exceed the maximum allowed.

Do not apply more than 8 quarts of this product (8 lb glyphosate acid) per acre per year for all use sites listed on this label.

IMPORTANT: When using this product, unless otherwise specified, mix with a surfactant, such as a nonionic surfactant containing 80% or greater active ingredient. For conifer release (pine release) use only surfactants that are approved for conifer release and specified on the surfactant label as safe for use in conifer release (pine release). Use of this product without surfactant will result in reduced herbicide performance. Ammonium sulfate, drift control additives, or dyes and colorants may be used. See Mixing Directions and the surfactant manufacturer's label for more information.

Grazing Restrictions: This product may be used to treat undesirable vegetation in utility rights-of-way that pass through pastures, rangeland, and forestry sites that are being grazed. For tank mix applications, comply with all restrictions appearing on the tank mix product label.

Except for lactating dairy animals there are no grazing restrictions following the labeled applications of this product.

For lactating dairy animals there are no grazing restrictions for the following labeled applications of this product:
- Where the spray can be directed onto undesirable woody brush and trees, including in handgun spray to wet or low volume directed spray treatments.
- For tree injection of frill applications and for cut stump treatments.

For broadcast applications, observe the following restrictions for lactating dairy animals:
- For application rates between 4.5 and 7.5 quarts per acre, no more than 15 percent of the available grazing area may be treated.
- For application rates less than 4.5 quarts per acre, no more than 25 percent of the available grazing area may be treated.

These restrictions do not apply to pastures, rangeland or forestry sites outside of utility rights-of-way.

Herbicide Resistance Management

Glyphosate, the active ingredient in this product, is a group 9 herbicide (inhibitor of EPSP synthase). Some naturally occurring weed biotypes that are tolerant (resistant) to glyphosate may exist due to genetic variability in a weed population. Where resistant biotypes exist, the repeated use

of herbicides with the same mode of action can lead to the selection for resistant weeds. Certain agronomic practices reduce the likelihood that resistant weed populations will develop, and can be utilized to manage weed resistance once it occurs.

To delay the selection for glyphosate resistant weeds, use the following practices:

- Scout fields before and after application to detect weed escapes or shifts in weed species.
- Start with a clean field by applying a burndown herbicide or by tillage.
- Control weeds early when they are small.
- Add other herbicides, including a selective and/or a residual herbicide, and cultural practices, including tillage or crop rotation, where appropriate.
- Use the application rate for the most difficult to control weed in the field. Do not tank mix with other herbicides that reduce this product's efficacy through antagonism or with ones that encourage application rates of this product below those specified on this label.
- Control weed escapes and prevent weeds from setting seeds.
- In situations where resistant weeds are a problem, before moving from one site to another, clean equipment to minimize the spread of weed seeds or plant parts.
- Use new commercial seed that is as free of weed seed as possible.
- Report any incidence of repeated non-performance of this product against a particular weed species to the local retailer, county extension agent, or Dow AgroSciences representative.

The following good agronomic practices are recommended to reduce the spread of confirmed glyphosate-resistant biotypes:

- Tank mix this product or apply it sequentially with an appropriately labeled herbicide with a different mode of action to achieve control if a naturally occurring resistant biotype is present in the site.
- Cultural and mechanical control practices, including crop rotation or tillage, may also be used.
- To control weed escapes, including resistant biotypes, before they set seed, scout treated sites after applying this product.
- Thoroughly clean equipment before leaving any site known to contain resistant biotypes.

Because the presence of glyphosate resistance in weed populations is difficult to detect prior to use, Dow AgroSciences accepts no liability for any losses that may result from the failure of this product to control glyphosate-resistant weeds.

Attention

Avoid contact of herbicide with foliage, green stems, exposed non-woody roots or fruit of crops, desirable plants and trees, because severe injury or destruction may result.

AVOID DRIFT. Use extreme care when applying this product to prevent injury to desirable plants and crops.

Do not allow the herbicide solution to mist, drip, drift or splash onto desirable vegetation since minute quantities of this product can cause severe damage or destruction to the crop, plants or other areas on which treatment was not intended. The likelihood of injury occurring from the use of this product increases when winds are gusty, as wind velocity increases, when wind direction is constantly changing, or when there are other meteorological conditions that favor spray drift. When spraying, avoid combinations of pressure and nozzle type that will result in splatter or fine particles (mist) which are likely to drift. **Avoid applying at excessive speed or pressure.**

NOTE: Use of this product in any manner not consistent with this label may result in injury to persons, animals or crops, or other unintended consequences. Keep container closed to prevent spills and contamination.

Spray Drift Management

Avoiding spray drift at the application site is the responsibility of the applicator. The interaction of many equipment- and-weather-related factors determine the potential for spray drift. The applicator and the grower are responsible for considering all these factors when making decisions. The following drift management requirements must be followed to avoid off-target drift movement from aerial applications to agricultural field crops. These requirements do not apply to forestry applications, public health uses or to applications using dry formulations.

- The distance of the outermost nozzles on the boom must not exceed 3/4 the length of the wingspan or rotor.
- Nozzles must always point backward parallel with the air stream and never be pointed downwards more than 45 degrees.

Where states have more stringent regulations, they must be observed.

The applicator must be familiar with and take into account the information covered in the Aerial Drift Reduction Advisory.

Aerial Drift Reduction Advisory
This section is advisory in nature and does not supersede the mandatory label requirements.

Importance of Droplet Size: The most effective way to reduce drift potential is to apply large droplets. The best drift management strategy is to apply the largest droplets that provide sufficient coverage and control. Applying larger droplets reduces drift potential, but will not prevent adverse effects from drift if applications are made improperly, or under unfavorable environmental conditions (see Wind, Temperature and Humidity, and Temperature Inversions).

Controlling Droplet Size:

- **Volume** - Use high flow rate nozzles to apply the highest practical spray volume. Nozzles with higher rated flows product larger droplets.
- **Pressure** - Do not exceed the nozzle manufacturer's recommended pressures. Use the lower spray pressures for the nozzle. Higher pressure reduces droplet size and does not improve canopy penetration. When higher flow rates are needed, use higher flow rate nozzles instead of increasing pressure.
- **Number of Nozzles** - Use the minimum number of nozzles that provide uniform coverage.
- **Nozzle Orientation** - Orienting nozzles so that the spray is parallel to the airstream produces larger droplets than other orientations and is the recommended practice. Significant deflection from horizontal will reduce droplet size and increase drift potential.
- **Nozzle Type** - Use a nozzle type that is designed for the intended application. With most nozzle types, narrower spray angles produce larger droplets. Consider using low-drift nozzles. Solid stream nozzles oriented straight back produce the largest droplets and the lowest drift.

Boom Length: For some use patterns, reducing the effective boom length to less than 3/4 of the wingspan or rotor length may further reduce drift without reducing swath width.

Application Height: Applications must not be made at a height greater than 10 feet above the top of the largest plants unless a greater height is required for aircraft safety. Making applications at the lowest height that is safe reduces exposure of droplets to evaporation and wind.

Swath Adjustment: When applications are made with a crosswind, the swath will be displaced downwind. Therefore, on the up and downwind edges of the field, the applicator must compensate for this displacement by adjusting the path of the aircraft upwind. Swath adjustment distance must increase with increasing drift potential (higher wind, smaller drops, etc.).

Wind: Drift potential is lowest between wind speeds of 2 to 10 mph. However, many factors, including droplet size and equipment type, determine drift potential at any given speed. Do not apply this product when wind speed is below 2 mph due to variable wind direction and high inversion potential. **Note:** Local terrain can influence wind patterns. Every applicator should be familiar with local wind patterns and how they affect spray drift.

Temperature and Humidity: When making applications in low relative humidity, set up equipment to produce larger droplets to compensate for evaporation. Droplet evaporation is most severe when conditions are both hot and dry.

Temperature Inversions: Do not apply this product during a temperature inversion because drift potential is high. Temperature inversions restrict vertical air mixing, which causes small suspended droplets to remain in a concentrated cloud. This cloud can move in unpredictable directions due to the light variable winds common during inversions. Temperature inversions are characterized by increasing temperatures with altitude and are common on nights with limited cloud cover and light to no wind. They begin to form as the sun sets and often continue into the morning. Their presence can be indicated by ground fog; however, if fog is not present, inversions can also be identified by the movement of smoke from a ground source or an aircraft smoke generator. Smoke that layers and moves laterally in a connected cloud (under low wind conditions) indicates an inversion, while smoke that moves upwards and rapidly dissipates indicates good vertical air mixing.

Sensitive Areas: Apply this pesticide only when the potential for drift to adjacent sensitive areas (e.g., residential areas, bodies of water, known habitat for threatened or endangered species, non-target crops) is minimal (e.g., when wind is blowing away from the sensitive areas).

Mixing Directions

Use only clean, stainless steel, fiberglass, plastic or plastic-lined steel containers to mix, store and apply spray solutions of this product. Do not mix, store or apply this product or spray solutions of this product in galvanized steel or unlined steel, except stainless steel, containers or spray tanks.

Eliminate any risk of siphoning the contents of the tank mix back into the carrier source while mixing. Use approved anti-back-siphoning devices where required by state or local regulations.

Note: Reduced results may occur if water containing soil is used, including visibly muddy water or water from ponds and ditches that is not clear.

Rodeo – Alone
This product mixes readily with water. Mix spray solutions of this product as follows:

1. Fill the mixing or spray tank with the required amount of clean water.
2. Add the specified amount of this product and nonionic surfactant near the end of the filling process and mix well.
3. During mixing and application, foaming of the spray solution may occur. To prevent or minimize foaming, avoid the use of mechanical agitators, terminate by-pass and return lines at the bottom of the tank and, if needed, use an approved anti-foam or defoaming agent.

Rodeo – Tank Mix
This product does not provide residual weed control. For residual weed control or an alternate mode of action, tank mix this product with other herbicides. It is the pesticide user's responsibility to ensure that all products in the listed mixtures are registered for the intended use. Users must follow the most restrictive directions for use and precautionary statements of each product in the tank mixture..

Under certain conditions, at certain growth stages, and/or under other circumstances, some tank mix products have the potential to cause injury. Read all labels for products used in the tank mix prior to using them to determine the potential for crop injury.

Tank mixing with other herbicides, insecticides, fungicides, micronutrients or foliar fertilizers may result in reduced weed control or injury. Do not use these products in applications with this product unless otherwise noted in this label. To the extent consistent with applicable law, buyer and all users are responsible for all loss or damage in connection with the use or handling of mixtures of this product with herbicides or other materials that are not expressly specified in this labeling. Mixing this product with herbicides or other materials not specified on this label may result in reduced performance.

The user is responsible for ensuring that the specific application being made is included on the label of the product used in the tank mix when a tank mixture with a generic active ingredient, including 2,4-D, atrazine, dicamba, diuron, or pendimethalin, is used.

Read all individual product labels for all products in the tank mix and observe all precautions and restrictions on the label. Use according to the most restrictive directions for each product in the tank mix. Always predetermine the compatibility of all tank mix products, together in the carrier, by mixing small proportional quantities in advance of mixing and applying them to the use site. Add the tank mix product to the tank as directed by the label. Maintain agitation and add the required amount of this product.

Maintain good agitation at all times until the contents in the tank are sprayed. If the mixture is allowed to settle, thorough agitation is required to resuspend the mixture before spraying resumes. Keep the bypass line on or near the bottom of the tank to minimize foaming. The screen size in the nozzle or line strainers must be no finer than 50 mesh.

Note: If tank mixing with Garlon® 3A herbicide, ensure that Garlon 3A is well mixed with at least 75 percent of the total spray volume before adding this product to the spray tank to avoid incompatibility.

Hand-Held Sprayers
Prepare the desired volume of spray solution by mixing the amount of this product in water as shown in the following table:

Spray Concentration (percent)	Amount of this Product for Desired Volume:		
	1 gal	25 gal	100 gal
0.5	2/3 fl oz	1 pt	2 qt
0.75	1 fl oz	1 1/2 pt	3 qt
1	1 1/3 fl oz	1 qt	1 gal
1.5	2 fl oz	1 1/2 qt	1 1/2 gal
2	2 2/3 fl oz	2 qt	2 gal
3.75	5 fl oz	3 3/4 qt	3 3/4 gal
5	6 1/2 fl oz	1 1/4 gal	5 gal
10	13 fl oz	2 1/2 gal	10 gal

Nonionic Surfactant
When using this product, unless otherwise specified, mix with a surfactant, including a nonionic surfactant containing 80% or more active ingredient. For conifer release (pine release), use only surfactants that are approved for conifer release and specified on the surfactant label as safe for use in conifer release. Using this product without surfactant will result in reduced herbicide performance.

Colorants or Dyes
Agriculturally-approved colorants or marking dyes may be added to this product. Colorants or dyes used in spray solutions of this product may reduce performance, especially at lower rates or dilutions. Use colorants or dyes according to the manufacturer's directions.

Drift Control Additives
Drift control additives may be used with all equipment types except wiper applicators, sponge bars and CDA equipment. When a drift control additive is used, it is the pesticide user's responsibility to ensure that all products in the listed mixtures are registered for the intended use. Users must follow the most restrictive directions for use and precautionary statements of each product in the tank mixture..

Application Equipment and Application Methods

Chemigation: Do not apply this product through any type of irrigation system.

Apply spray solutions in properly maintained and calibrated equipment capable of delivering desired volumes.

This product may be applied with the following application equipment and application methods.

Aerial Application
Equipment: Fixed wing and helicopter

Do not apply this product using aerial spray equipment except under conditions as specified within this label.

Avoid drift. Do not apply when winds are gusty or under any other condition which favors drift. Drift may cause damage to any vegetation contacted to which treatment is not intended. To prevent injury to adjacent desirable vegetation, maintain appropriate buffer zones.

Do not directly apply to any body of water.

Use the specified rates of this herbicide in 3 to 25 gallons of water per acre unless otherwise specified on this label. Refer to the specific use directions of this label for volumes and application rates.

Coarse sprays are less likely to drift; therefore, do not use nozzles or nozzle configurations that dispense spray as fine spray droplets. Do not angle nozzles forward into the airstream and do not increase spray volume by increasing nozzle pressure. A drift control additive may be used. When a drift control additive is used, carefully read and observe the precautionary statements and all other information specified on the additive label.

Ensure uniform application. To avoid streaked, uneven or overlapped application, use appropriate marking devices.

Aerial Application Restrictions in California Only

AVOID DRIFT: Do not apply when winds are gusty or under any other condition which favors drift. Drift may cause damage to any vegetation contacted to which treatment is not intended. To prevent injury to adjacent desirable vegetation, appropriate buffer zones must be maintained.

Do not aerially apply this product in a tank mix with dicamba in California.

Make aerial applications with helicopter only. To ensure uniform application, avoid streaking, uneven, or overlapped application, and use appropriate marking devices.

Use the following guidelines when aerial applications are made near crops or desirable perennial vegetation after budbreak and before total leaf drop, and/or near other desirable vegetation or annual crops:

- Do not apply this product using aerial equipment in residential areas.
- Do not apply within 100 feet of all desirable vegetation or crop(s).
- If wind up to 5 miles per hour is blowing toward desirable vegetation or crop(s), do not apply within 500 feet of the desirable vegetation or crop(s).
- Winds blowing from 5 to 10 miles per hour toward desirable vegetation or crop(s) may require buffer zones in excess of the 500-foot minimum buffer.
- Do not apply when winds are in excess of 10 miles per hour or when inversion conditions exist.

Use only coarse sprays to minimize drift. Do not use nozzles or nozzle configurations that dispense spray as fine spray droplets. Do not angle nozzles forward into the airstream and do not increase spray volume by increasing nozzle pressure above the manufacturer's directions.

Thoroughly wash aircraft, especially landing gear, after each day of spraying to remove residues of this product accumulated during spraying or from spills. Prolonged exposure of this product to uncoated steel surfaces may result in corrosion and possible failure of the part. Landing gear is most susceptible. The maintenance of an organic coating (paint) which meets aerospace specification MIL-C-38413 may prevent corrosion.

ADDITIONAL LIMITATIONS FOR AERIAL APPLICATION IN FRESNO COUNTY, CALIFORNIA ONLY

Always read and follow the label directions and precautionary statements for all products used in the aerial application.
The following information applies only from February 15 through March 31 within the following boundaries of Fresno County, California:
North: Fresno County line
South: Fresno County line
East: State Highway 99 West

Observe the following directions to minimize off-site movement during aerial application of this product. Minimization of off-site movement is the responsibility of the grower, Pest Control Advisor and aerial applicator.

Written Directions

Written directions MUST be submitted by or on behalf of the applicator to the Fresno County Agricultural Commissioner 24 hours prior to the application. These written directions MUST state the proximity of surrounding crops and that conditions of each manufacturer's product label and this label have been satisfied.

Aerial Applicator Training and Equipment

Aerial application of this product is limited to pilots who have successfully completed a Fresno County Agricultural Commissioner and California Department of Pesticide Regulation approved training program for aerial application of herbicides. All aircraft must be inspected, critiqued in flight and certified at a Fresno County Agricultural Commissioner approved fly-in. Test and calibrate spray equipment at intervals sufficient to insure that proper rates of herbicides and adjuvants are being applied during commercial use. Applicator must document such calibrations and testing. Demonstration of performance at Fresno County Agricultural Commissioner approved fly-ins constitutes such documentation, or other written records showing calculations and measurements of flight and spray parameters acceptable to the Fresno County Agricultural Commissioner.

Applications at Night – Do not apply this product by air earlier than 30 minutes prior to sunrise and/or later than 30 minutes after sunset without prior permission from the Fresno County Agricultural Commissioner.

To report known or suspected misuse of this product, call 1-800-332-3111.

For additional information on the proper aerial application of this product in Fresno County, call 916-784-1718.

Aquatic and Noncrop Sites

When this product is applied under the conditions described, it controls or partially controls the labeled weeds growing in the following industrial, recreational, and public areas or other similar sites.

Aquatic sites includes all bodies of fresh and brackish water that may be flowing, nonflowing, or transient-including lakes, rivers, streams, ponds, seeps, irrigation and drainage ditches, canals, reservoirs, estuaries and similar sites.

If aquatic sites are present in the noncrop area and are part of the intended treatment, read and observe the following directions:

- This product does not control plants that are completely submerged or have a majority of their foliage under water.
- There is no restriction on the use of treated water for irrigation, recreation, or domestic purposes.
- Consult local and state fish and game agency and water control authorities before applying this product to public water. Permits may be required to treat such water.
- To make aquatic applications around and within 1/2 mile of active potable water intakes, the water intake must be turned off for a minimum period of 48 hours after the application. The water intake may be turned on prior to 48 hours if the glyphosate level in the intake water is below 0.7 parts per million as determined by laboratory analysis. These aquatic applications may be made only in those cases where there are alternative water sources or holding ponds that would permit the turning off of an active potable water intake for a minimum period of 48 hours after the application.

Restrictions:

- Do not apply this product within 1/2 mile upstream of an active potable water intake in flowing water (i.e., river stream, etc.), or within 1/2 mile of an active potable water intake in a standing body of water, such as a lake, pond, or reservoir.

Ground Application

Equipment: Boom or boomless systems, pull-type sprayer, floaters, pick-up sprayers, spray coupes and other ground broadcast equipment.

Use the specified rates of this product in 3 to 40 gallons of water per acre as a broadcast spray unless otherwise specified on this label. As density of weeds increases, increase the spray volume within the rate range to ensure complete coverage. Carefully select proper nozzles to avoid spraying a fine mist. For best results with ground application equipment, use flat fan nozzles. Check for even distribution of spray droplets.

Hand-Held and High-Volume Including Backpack Application

Equipment: Knapsack and backpack sprayers, pump up pressure sprayers, handguns, hand wands, mistblowers, lances, and other hand-held and motorized spray equipment used to direct the spray onto weed foliage. **Note:** This product is not registered in Arizona or California for use in mistblowers.

Apply to foliage of vegetation to be controlled. Do not spray to the point of runoff for applications made on a spray to wet basis. Use coarse sprays only. For best results, cover the top half of the plant and at least half of the total foliage. To ensure adequate spray coverage, spray both sides of large or tall woody brush and trees, when foliage is thick and dense, or where there are multiple sprouts.

High Volume Sprays: Prepare a 3/4 to 2 percent solution of this product in water, add a nonionic surfactant and apply to foliage of vegetation to be controlled. For specific rates of application and instructions for control of various annual and perennial weeds, see the Weeds Controlled section.

Make applications on a spray to wet basis with uniform and complete spray coverage. Do not spray to point of runoff.

Low Volume Directed Sprays: This product may be used as a 5 to 10 percent solution in low volume directed sprays for spot treatment of trees and brush. This treatment method is most effective in areas where there is a low density of undesirable trees or brush. If a straight stream nozzle is used, start the application at the top of the targeted vegetation and spray from top to bottom in a lateral zigzag motion. Ensure that at least 50 percent of the leaves are contacted by the spray solution. For flat fan and cone nozzles and with hand-directed mist blowers, mist the application over the foliage of the targeted vegetation. Treat small, open-branched trees only from one side. If the foliage is thick or there are multiple root sprouts, apply from several sides to ensure adequate spray coverage. Prepare the desired volume of spray solution by mixing the amount of this product in water as shown in the following table.

Spray Solution:

Desired Volume	Amount of This Product								
	0.5	**0.75**	**1**	**1.25**	**1.5**	**2**	**5**	**8**	**10**
1 gal	2/3 fl oz	1 fl oz	1 1/3 fl oz	1 2/3 fl oz	2 fl oz	2 2/3 fl oz	6 1/2 fl oz	10 1/4 fl oz	13 fl oz
25 gal	1 pt	1 1/2 pt	1 qt	1 1/4 qt	1 1/2 qt	2 qt	1 1/4 gal	2 gal	2 1/2 gal
100 gal	2 qt	3 qt	1 gal	1 1/4 gal	1 1/2 gal	2 gal	5 gal	8 gal	10 gal

2 Tablespoons = 1 fl oz

For best results when using knapsack sprayers, mix the specified amount of product with water in a larger container. Fill the knapsack sprayer with the solution and add the correct amount of surfactant.

Selective Equipment

Equipment: Recirculating sprayers, shielded and hooded sprayers, wiper applicators and sponge bars.

Do not contact desirable vegetation with herbicide. Droplets, mist, foam, or splatter of the herbicide settling on desirable vegetation is likely to result in discoloration, stunting or destruction.

Better results are obtained when more of the weed is exposed to the herbicide solution. Weeds not contacted by the herbicide solution will not be affected. This may occur in dense clumps, severe infestations, or when the height of weeds varies so that not all weeds are contacted. If this occurs, repeat treatment up to the labled rate may be necessary.

Shielded and Hooded Applicators: A shielded or hooded applicator directs the herbicide solution onto weeds while shielding desirable vegetation from the herbicide. Use nozzles that provide uniform coverage within the treated area. Keep shields on these sprayers adjusted to protect desirable vegetation. **Exercise extreme care to avoid contact of the herbicide with desirable vegetation.**

Wiper Applicators: Wiper applicators are devices that physically wipe appropriate amounts of this product directly onto the weed. Equipment must be designed, maintained and operated to prevent the herbicide solution from contacting desirable vegetation.

Adjust wiper applicators used over the top of desirable vegetation so that the wiper contact point is at least 2 inches above the desirable vegetation. Better results are obtained when more of the weed is exposed to the herbicide solution. Weeds should be a minimum of 6 inches above the desirable vegetation. Adjust the applicator height to ensure adequate contact with weeds as weeds not contacted by the herbicide solution will not be affected. Poor contact may occur when weeds are growing in dense clumps, in severe weed infestations, or when weed height varies dramatically. If this occurs, repeat treatment up to the labeled rate may be necessary.

Operate this equipment at ground speeds no more than 5 mph. Performance may be improved by reducing speed in areas of heavy weed infestations to ensure adequate wiper saturation. Better results may be obtained if two applications are made in opposite directions.

Droplets, mist, foam, or splatter of the herbicide settling onto desirable vegetation may result in discoloration, stunting or destruction. Avoid leakage or dripping onto desirable vegetation. Adjust height of applicator to ensure adequate contact with weeds. Keep wiping surfaces clean. Be aware that on sloping ground the herbicide solution may migrate, causing dripping on the lower end and drying of the wicks on the upper end of a wiper applicator.

Do not use wiper equipment when weeds are wet.

Mix only the amount of solution to be used during a one-day period as reduced activity may result from use of leftover solutions. Clean wiper parts by thoroughly flushing with water immediately after using this product.

For best results, use a nonionic surfactant at a rate of 10 percent by volume of total herbicide solution for all wiper applications.
Rope or Sponge Wick Applicators: Use solutions of 33 to 75 percent of this product in water.
Panel Applicator: Use solutions of 33 to 100 percent of this product in water.

Injection Systems
Equipment: Aerial or ground injection sprayers.

This product may be used in aerial or ground injection spray systems. It may be used as a liquid concentrate or diluted prior to injecting into the spray stream. Do not mix this product with the concentrate of other products when using injection systems.

Controlled Droplet Applicator (CDA)
Equipment: Hand-held or boom-mounted applicators that produce a spray consisting of a narrow range of droplet sizes.

The rate of this product applied per acre by vehicle-mounted CDA equipment must not be less than the amount specified on this label when applied by conventional broadcast equipment. For vehicle-mounted CDA equipment, apply 3 to 15 gallons of water per acre.

For the control of annual weeds with hand-held CDA units, apply a 20 percent solution of this product at a flow rate of 2 fl oz per minute and a walking speed of 1.5 mph (1 1/2 pints of product per acre). For control of perennial weeds, apply a 20 to 40 percent solution of this product at a flow rate of 2 fl oz per minute and a walking speed of 0.75 mph (3 to 6 pints of product per acre).

CDA equipment produces a spray pattern that is not easily visible. Exercise extreme care to avoid spray or drift contacting the foliage or any other green tissue of desirable vegetation as damage or destruction may result.

Use Sites

Use this product in noncrop areas, including airports, apartment complexes, aquatic sites, Christmas tree farms, commercial sites, Conservation Reserve Program (CRP) areas, ditch banks, driveways, dry ditches, dry canals, fencerows, golf courses, greenhouses, habitat management, industrial areas, lumber yards, manufacturing sites, municipal sites, natural areas, office complexes, ornamentals, parking areas, parks, pastures, petroleum tank farms and pumping installations, plant nurseries, public areas, railroads, rangeland, recreation areas, utility rights-of-way, roadsides, shadehouses, sod or turf seed farms, sports complexes, storage areas, substations, turfgrass areas, utility sites, warehouse areas, wildlife habitat management areas, and in grazed areas on these sites.

Aquatic Sites

This product may be applied to emerged weeds in all bodies of fresh and brackish water that may be flowing, nonflowing or transient including lakes, rivers, streams, ponds, estuaries, rice levees, seeps, irrigation and drainage ditches, canals, reservoirs, wastewater treatment facilities, wildlife habitat restoration and management areas and similar sites.

If aquatic sites are present in the noncrop area and are part of the intended treatment, read and observe the following directions:

- This product does not control plants that are completely submerged or have a majority of their foliage under water.
- There is no restriction on the use of treated water for irrigation, recreation or domestic purposes.
- Consult local and state fish and game agency and water control authorities before applying this product to public water. Permits may be required to treat such water.
- To make aquatic applications around and within 1/2 mile of active potable water intakes, the water intake must be turned off for a minimum period of 48 hours after the application. The water intake may be turned on prior to 48 hours if the glyphosate level in the intake water is below 0.7 parts per million as determined by laboratory analysis. These aquatic applications may be made **only** in those cases where there are alternative water sources or holding ponds which would permit the turning off of an active potable water intake for a minimum period of 48 hours after the application.
- For treatments after draw down of water or in dry ditches, allow 7 days or more after treatment before reintroduction of water to achieve maximum weed control. Apply this product within 1 day after draw down to ensure application to actively growing weeds.
- Floating mats of vegetation may require retreatment up to the labeled rate. Avoid wash off of sprayed foliage by spray boat or recreational boat backwash or by rainfall within 6 hours of application. Do not re-treat within 24 hours following the initial treatment.
- Applications made to moving bodies of water must be made while traveling upstream to prevent concentration of this herbicide in water. When making any bankside applications, do not overlap more than 1 foot into open water. Do not spray in bodies of water where weeds do not exist. The maximum application rate of 7 1/2 pints per acre must not be exceeded in any single broadcast application that is being made over water.
- When emerged infestations require treatment of the total surface area of impounded water, treating the area in strips may avoid oxygen depletion due to decaying vegetation. Oxygen depletion may result in fish kill.

Restrictions:
- Do not apply this product directly to water within 1/2 mile upstream of an active potable water intake in flowing water (i.e., river, stream, etc.), or within 1/2 mile of an active potable water intake in a standing body of water, such as a lake, pond or reservoir. This restriction does not apply to intermittent inadvertent overspray of water in terrestrial use sites.

Wetland Sites

This product may be applied to undesirable vegetation in and around water (aquatic areas) and wetlands found in forestry, utility rights-of-way sites or other site listed on the label, including where these sites are adjacent to or surrounding domestic water supply reservoirs, supply streams, lakes and ponds.

If wetland sites are present, read and observe the following directions:

- There is no restriction on the use of treated water for irrigation, recreation or domestic purposes.
- Consult local public water control authorities before applying this product in and around public water. Permits may be required to treat in such areas.

Restrictions:
- Do not apply this product directly to water within 1/2 mile upstream of an active potable water intake in flowing water (i.e., river, stream, etc.), or within 1/2 mile of an active potable water intake in a standing body of water, such as a lake, pond or reservoir. This restriction does not apply to intermittent inadvertent overspray of water in terrestrial use sites.
- Do not spray open bodies of water where woody brush, trees and herbaceous weeds do not exist. Do not apply more than 3 3/4 quarts per acre in a single over water broadcast application except in stream crossings in utility right-of-way or where applications will result in less than 20 percent of the total water area being treated. In either of these locations, any specified rate may be applied:

Christmas Tree Plantations

Broadcast Application (Oregon and Washington Only)
Broadcast apply this product over the established Christmas tree species Douglas fir (*Pseudotsuga menziesii*), fir species (*Abies* spp.), and pine species (*Pinus* spp.) (except eastern white, loblolly, longleaf, shortleaf, slash), and spruce species (*Picea* spp.). Use 1 quart of this product per acre in 5 to 30 gallons of water per acre. For best results, add up to 10 fl oz of Entry II surfactant per acre. If using a different surfactant, follow the manufacturer's directions for use and ensure conifer safety has been adequately tested for that surfactant. Apply after trees have completed at least a full growing season since planting or transplanting.

Apply only in the fall after the formation of the final conifer resting buds or in the spring prior to initial bud swell. Final resting buds must be fully hardened and in the dormant stage. Applying this product at any other time may result in unacceptable injury to the Christmas trees. Avoid spray pattern overlap as injury may occur.

In some areas, 1 to 2 quarts of this product per acre may be used. Consult your local representative for specific use instructions if rates greater than 1 quart per acre are required.

For best results, do not use drift control additives as they may increase injury to Christmas trees.

Precautions:
- Ensure that adequate buffers are maintained to prevent drift onto nearby desirable crops or vegetation.

Restrictions:
- **Preharvest Interval:** Do not apply within 1 full year prior to tree harvest.

Cut Stump

Treat cut stumps in any noncrop site listed on this label. This product will control regrowth of freshly cut stumps and resprouts of many types of woody brush and tree species, some of which are listed below. Apply this product using suitable equipment to ensure coverage of the entire cambium. Cut trees or resprouts close to the soil surface. Apply a 50 to 100 percent solution of this product to freshly cut surface immediately after cutting. Delays in application may result in reduced performance. For best results, make applications during periods of active growth and full leaf expansion.

When used according to directions for cut stump application, this product will control, partially control or suppress most woody brush and tree species, some of which are listed below:

Common Name	Scientific Name
alder	*Alnus* spp.
coyotebrush[1]	*Baccharis pilularis*
dogwood[1]	*Cornus* spp.
eucalyptus	*Eucalyptus* spp.
hickory[1]	*Carya* spp.
madrone, Pacific	*Arbutus menziesii*
maple[1]	*Acer* spp.
oak	*Quercus* spp.
peppertree, Brazilian	*Schinus terebinthifolius*
Australian-pine,	*Casuarina equisetifolia*
poplar[1]	*Populus* spp.
reed, giant	*Arundo donax*
saltcedar	*Tamarix ramosissima*
sweetgum[1]	*Liquidambar styraciflua*
sycamore[1]	*Platanus occidentalis*
tan oak	*Lithocarpus densiflorus*
willow	*Salix* spp.

[1]Do not use this product on these species in the state of California.

Precautions:
- Adjacent trees that are of a similar age, height and spacing may indicate shared roots.
- Injury is likely to occur to non-treated stems or trees when one tree or more that shares a common root is treated.

Restrictions:
- Do not make cut stump applications when the roots of desirable woody brush or trees may be grafted to the roots of the cut stump. Some sprouts, stems, or trees may share the same root system.

Injection and Frill (Woody Brush and Trees)

Woody vegetation may be controlled by injection or frill application of this product. Apply this product using suitable equipment that penetrates into the living tissue. Apply the equivalent of 1 mL of this product per each two to three inches of trunk diameter at breast height (DBH). This is best achieved by applying 50 to 100 percent concentration of this product either to a continuous frill around the tree or as cuts evenly spaced around the tree below all branches. As tree diameter increases in size, better results are achieved by applying diluted material to a continuous frill or more closely spaced cuttings. Do not make any applications that allow runoff to occur from frilled or cut areas in species that exude sap freely. In species such as this, make frill or cuts at an oblique angle to produce a cupping effect and use a 100 percent undiluted concentration of this product. For best results, apply during periods of active growth and full leaf expansion.

This product controls the following woody species:

Common Name	Scientific Name
oak	*Quercus* spp.
poplar	*Populus spp.*
sweetgum	*Liquidambar styraciflua*
sycamore	*Platanus occidentalis*

This product suppresses the following woody species:

Common Name	Scientific Name
blackgum[1]	*Nyssa sylvatica*
dogwood	*Cornus* spp.
hickory	*Carya* spp.
maple, red	*Acer rubrum*

[1]Do not use this product on these species in the state of California.

Forestry Site Preparation

This product is for the control or partial control of woody brush, trees, and herbaceous weeds in forestry. This product is also for use in preparing or establishing wildlife openings within these sites and maintaining logging roads.

In forestry sites, use this product in site preparation prior to planting any tree species including Christmas trees, eucalyptus, hybrid tree cultivars and silvicultural nursery sites. Unless otherwise specified, make applications of this product for control or partial control of herbaceous weeds, woody brush and trees listed in the Weeds Controlled section.

Application Rates

Method of Application	Rate	Spray Volume (gal/acre)
Broadcast		
aerial	1.5 - 7.5 qt/acre	5 - 30
ground		10 - 60
Spray to Wet		
handgun, backpack	0.75 - 2%	spray to wet
mistblower	by volume	
Low Volume Directed Spray[1]		
handgun, backpack	5 - 10%	partial coverage
mistblower	by volume	

[1] For low volume directed spray applications, coverage should be uniform with at least 50% of the foliage contacted. For best results, coverage of the top one-half of the plant, including the growing tip, is important (over the top and down coverage) To ensure adequate spray coverage, spray all sides of large or tall woody brush and trees, when foliage is thick and dense, or where there are multiple sense or tall sprouts.

Use a higher rate in the rate range for control or partial control of woody brush, trees and hard to control perennial herbaceous weeds. For best results, apply to actively growing woody brush and trees after full leaf expansion and before leaf drop. Use increased rates within the rate range to control perennial herbaceous weeds from emergence up to the appearance of seedheads, flowers or berries. Use a lower rate in the rate range to control annual herbaceous weeds and actively growing perennial herbaceous weeds after seedheads, flowers or berries appear. Apply to foliage of actively growing annual herbaceous weeds anytime after emergence.

This product has no herbicidal or residual activity in the soil. Where repeat applications up to the labled rate are necessary, do not apply more than 8 quarts of product per acre per year.

Tank Mixes

This product may be used in tank mix combination with other herbicide products to broaden the spectrum of vegetation controlled. When tank mixing, read and observe applicable use directions, precautions and limitations on the respective product labels. Use according to the most restrictive precautionary statements for each product in the mixture. Any specified rate of this product may be used in a tank mix.

Note: For forestry site preparation, make sure the tank mix product is approved for use prior to planting the desired species. Observe planting interval restrictions.

Any specified rate of this product may be used in a tank mix with the following products for forestry site preparation:

Product
Milestone VM
Garlon 3A
Garlon 4
Arsenal Applicators Concentrate
Escort
Chopper
Oust XP
Arsenal Applicators Concentrate
Arsenal Applicators Concentrate

For control of herbaceous weeds, use the lower specified tank mixture rates. For control of dense stands or difficult to control woody brush and trees, use the higher specified rates.

Aerial Application
Aerially apply this product by helicopter only in forestry sites. See Aerial Application in Application Equipment and Application Methods for more details.

Ground Application
Apply this product using suitable ground equipment for broadcast applications in forestry sites. See Ground Application in Application Equipment and Application Methods for more details. Unless otherwise specified, apply the specified rates of this product as a broadcast spray in sufficient spray volume to provide complete and uniform coverage of plant foliage. Check for even distribution throughout the spray pattern.

Hand-Held and Backpack Application
Apply this product using handgun and backpack equipment in forestry sites. See Hand-Held and Backpack Application in Application Equipment and Application Methods for more details. For spray to wet applications, coverage should be uniform and complete, but not to the point of runoff.

This product may be used for low volume directed sprays for spot treatment of trees and brush. It is most effective in areas where there is a low density of undesirable trees or brush. For flat fan and cone nozzles, spray the foliage of the targeted vegetation. Small, open branched trees need only be treated from one side. If the foliage is thick or there are multiple root sprouts, apply from several sides to ensure adequate spray coverage.

Forestry Conifer and Hardwood Release

Directed Sprays and Selective Equipment
Apply this product as a directed spray or with selective equipment in forestry conifer and hardwood sites, including Christmas tree plantations and silvicultural nurseries. A surfactant must be used with this product. Use only surfactants approved for conifer release and specified on the surfactant label as safe for use in conifer release (pine release). Using this product without a surfactant will result in reduced herbicide performance. See Mixing Directions and Application Equipment and Application Methods sections.

Avoid contact of spray drift, mist or drips with foliage, green bark or non-woody surface roots of desirable plant species.

Tank Mixes: When tank mixing, read and observe applicable use directions, precautions and limitations on the respective product labels. Use according to the most restrictive precautionary statements for each product in the mixture.

Broadcast Application Outside Area of Southeastern United States
Apply this product as a broadcast application for release of Douglas fir (*Pseudotsuga menziesii*), fir (*Abies* species), hemlock (*Tsuga* species), pines (*Pinus* species) (includes all species except loblolly, longleaf, shortleaf, or slash), and California redwood (*Sequoia* species) outside the area of the southeastern United States. Apply this product as a broadcast application only after formation of final conifer resting buds in the fall or prior to initial bud swelling in the spring. Note: Except where specified, make broadcast applications of this product only where conifers have been established for more than one year.

Injury may occur to conifers treated for release, especially where spray patterns overlap or the higher labeled rate is applied. Damage can be accentuated if applications are made when conifers are actively growing, are under stress from drought, flood water, improper planting, insects, animal damage or diseases.

Apply 3/4 to 1 1/2 quarts per acre as a broadcast spray. Apply 3/4 to 1 1/8 quarts of this product per acre to release Douglas fir, pine and spruce species at the end of the first growing season (except California). Ensure all conifers are well hardened off.

A surfactant must be used with this product for optimum weed control. Use only surfactants approved for use in over the top release applications. Using this product without a surfactant will result in reduced herbicide performance. For best results, do not use a surfactant for release of hemlock species or California redwood. In mixed conifer stands, injury to these species may result if a surfactant is used. See Mixing Directions and Application Equipment and Application Methods sections.

For release of Douglas fir, a nonionic surfactant for over the top foliar spray may be used. To avoid possible conifer injury, use nonionic surfactants at 2 fl oz per acre at elevations above 1500 feet, or 1 fl oz per acre in the coastal range or at elevations below 1500 feet. Using a higher rate of surfactant may result in unacceptable conifer injury. Ensure the nonionic surfactant has been adequately tested for safety to Douglas fir before using.

Tank Mixes with Oust XP: Apply 3/4 to 1 1/2 quarts of this product with the labeled rate of Oust XP per acre to release jack pine and white. Use the labeled rate of Oust XP per acre with this product to release white pine. Make applications to actively growing weeds as a broadcast spray over the top of established conifers. Make applications after formation of conifer resting buds in the late summer or fall.

Tank Mixes with Arsenal Applicators Concentrate: Apply 3/4 to 1 1/8 quarts of this product with the labeled rate of Arsenal Applicators Concentrate per acre to release Douglas fir. Apply 1 1/2 quarts of this product with the labeled rate of Arsenal Applicators Concentrate per acre to release balsam fir and red spruce.

In **Maine** and **New Hampshire**, apply up to 2 1/4 quarts of this product per acre to control or suppress difficult to control hardwood species. For the release of red pine, balsam fir, red spruce, white spruce, Norway spruce, and black spruce with dense tough to control brush, and where maples make up a large component of the undesirable trees, this product may be tank mixed with the labeled rate of Arsenal Applicators Concentrate and the labeled rate of Oust XP per acre. Apply this mix as a broadcast spray.

Broadcast Application in Southeastern United States
Apply this product as a broadcast application for release of loblolly pine (*Pinus taeda*), eastern white pine (*Pinus strobus*), shortleaf pine (*Pinus echinata*), slash pine (*Pinus elliottii*), Virginia pine (*Pinus virginiana*), and longleaf pine (*Pinus palustris*) in the southeastern United States.

Apply 1 1/8 to 1 7/8 quarts of this product per acre as a broadcast spray during late summer or early fall after the conifers have hardened off. For applications at the end of the first growing season, use 3/4 quart of this product alone or in a tank mix.

Tank Mixes with Arsenal Applicators Concentrate: For conifer release, apply 3/4 to 1 1/2 quarts of this product with the labeled rate of Arsenal Applicators Concentrate per acre as a broadcast spray. Use only on conifer species that are labeled for over the top spray for both products. Use the higher specified rates for dense tough to control wood brush and trees.

Herbaceous Release
When applied as directed, this product plus listed residual herbicides provide postemergence control of the annual weeds and control or suppression of the perennial weeds listed in this label, and residual control of the weeds listed in the residual herbicide label. Make applications to actively growing weeds as a broadcast spray over the top of labeled conifers.

Use a surfactant labeled for use in over the top herbaceous release applications. Using this product without a surfactant will result in reduced herbicide performance. See Mixing Directions and Application Equipment and Application Methods sections on this label.

Weed control may be reduced if spray solution water volumes exceed 25 gallons per acre for these treatments.

Tank Mixes with Oust XP: Apply 12 to 18 fl oz of this product with the labeled rate of Oust XP per acre to release loblolly pines. Apply 9 to 12 fl oz of this product with the labled rate of Oust XP per acre to release slash pines.

Tank Mix with Atrazine: Apply 3/4 quarts of this product with 4 lb ai of atrazine per acre to release Douglas fir. Apply only over Douglas fir that has been established for at least one full growing season. Apply in the early spring, usually mid-March through early April. Injury will occur if applications are made after bud swell in the spring. For this use, do not add surfactant to the tank mix.

In **Maine** and **New Hampshire**, for release of red pine, balsam fir, red spruce, white spruce, Norway spruce, and black spruce with heavy grass and herbaceous weeds infesting the site, up to 2 1/4 quarts of this product per acre may be tank mixed with the labled rate of Oust XP to control grass, herbaceous weeds and woody brush. Apply this mix as a broadcast spray.

Mid-Rotation Conifer Release and Spot Treatments for Crop Tree Release and Timber Stand Improvement

This product is applied as a ground broadcast or directed spray application for mid-rotation release applications under the canopy of pines (and other conifers) and hardwoods. Make applications using application techniques that prevent or minimize direct contact to the foliage of crop trees (including in stands of pine, other conifers, or hardwood). This may be accomplished using directed sprays and ground equipment with nozzles oriented to target only undesirable understory vegetation below the crop tree canopy. This product is applied as a spot, individual plant treatment for woody and herbaceous weeds (see Hand-Held and Backpack Application in Application Equipment and Application Methods section). When making spot applications, do not allow spray to contact the foliage of desirable crop trees.

Broadcast Application for Control of Undesirable Competitive Vegetation in Larch (*Larix* spp.) Plantations in Maine

Apply this product to control or reduce competition from undesirable vegetation in Larch (*Larix* spp.) plantations in the state of Maine.

Application Timing
Apply only after lignification has occurred in 50% or more of the current year's terminal growth.

Application Directions
Broadcast Spray: Use 1 to 3 quarts of this product per acre. Apply in a total spray volume of 10 to 60 gallons per acre using ground equipment or 5 to 15 gallons per acre if applied aerially. Up to 30 fl oz of Entry II surfactant may be added.

Directed Sprays: This product may be applied as a directed spray for competitive release of larch. Avoid contact of spray drift, mist or drips with foliage, green bark or non-woody surface roots of desirable plants. See Application Equipment and Application Methods of the product label.

Injury to larch may occur, especially where spray patterns overlap or higher labeled rates of this product or surfactant were applied. Damage can be accentuated if application is made when larch is actively growing or is under stress. Make applications only if some level of injury to larch is acceptable.

Noncrop Areas and Industrial Sites

See the rate tables in the Annual Weeds, Perennial Weeds, and Woody Brush and Trees sections for specific application rates. This product has no herbicidal or residual activity in the soil. Where repeat applications up to the labeled rate are necessary, do not apply more than 8 quarts of this product per acre per year.

Use a higher rate in the rate range for control or partial control of woody brush, trees, and hard to control perennial herbaceous weeds. For best results, apply to actively growing woody brush and trees after full leaf expansion and before fall color and leaf drop. Use increased rates within the rate range for difficult to control species, where dense stands occur, or where conditions for control are not ideal and to control perennial herbaceous weeds from emergence up to the appearance of seedheads, flowers or berries. Use a lower rate in the rate range to control annual herbaceous weeds and actively growing perennial herbaceous weeds after seedheads, flowers or berries appear. Apply to foliage of actively growing annual herbaceous weeds anytime after emergence.

Tank Mixing for Noncrop Areas
This product may be used in tank mix combination with other herbicide products to broaden the spectrum of vegetation controlled. When tank mixing, read and observe applicable use directions, precautions and limitations on the respective product labels. Use according to the most restrictive precautionary statements for each product in the mixture. Any specified rate of this product may be used in a tank mix.

Maintain good agitation at all times during the mixing process and application. Ensure that the tank mix product(s) is well mixed with the spray solution before adding this product. Mix only the amount of spray solution that will be used during the same day. Reduced weed control may result if a tank mixture is allowed to stand overnight. If the spray mix is allowed to settle, thorough agitation is required to resuspend the mixture before spraying is resumed.

Weed Control, Trim and Edge, and Bare Ground
This product may be used in general noncrop and non-food areas. It may be applied with any application equipment described in this label. This product may be used to trim and edge around objects in noncrop sites, for spot treatment of unwanted vegetation, and to eliminate unwanted weeds growing in established shrub beds or ornamental plantings. This product may be used prior to planting an area to ornamentals, flowers, turfgrass (sod or seed), or prior to laying asphalt or beginning construction projects.

To maintain bare ground, repeated applications up to the labeled rate of this product may be used.

This product provides control of emerged annual weeds and control or partial control of emerged perennial weeds, woody brush and trees when applied in a tank mix to bare ground.

Turfgrass Renovation, Seed or Sod Production

This product controls most existing vegetation prior to renovating turfgrass areas or establishing turfgrass grown for seed or sod. For maximum control of existing vegetation, delay planting or sodding to determine if any regrowth from escaped underground plant parts occurs. When repeat treatments are necessary, sufficient regrowth must be attained prior to application. For warm season turfgrass, including bermudagrass, summer or fall applications provide the best control. Where existing vegetation is growing under mowed turfgrass management, apply this product after omitting at last one regular mowing to allow sufficient grown for good interception of the spray.

Do not disturb soil or underground plant parts before treatment. Delay tillage or renovation techniques, including vertical mowing, coring, or slicing, for seven days after application to allow translocation into underground plant parts.

Desirable turfgrass may be planed following the above procedures.

Hand-held equipment may be used for spot treatment of unwanted vegetation growing in existing turfgrass. Broadcast or hand-held equipment may be used to control sod remnants or other unwanted vegetation after sod is harvested.

Do not feed or graze turfgrass grown for seed or sod production for eight weeks following application.

Ornamentals and Plant Nurseries

Post-Direct and Trim and Edge
This product may be used as a post-directed spray around established woody ornamental species, including arborvitae, azalea, boxwood, crabapple, euonymus, fir, Douglas fir, jojoba, hollies, lilac, magnolia, maple, oak, provet, pine, spruce and yew. This product may also be used to trim and edge around trees, buildings, sidewalks and roads, potted plants and other objects in a nursery setting.

Desirable plants may be protected from the spray solution by using shields or coverings made of cardboard or other impermeable material. Do not use this product for any over the top broadcast spray in ornamentals. Exercise care to avoid contact of spray, drift or mist with foliage or green bark of established ornamental species.

Site Preparation
This product may be used prior to planting any ornamental, nursery or Christmas tree species.

Greenhouse/Shadehouse
This product may be used to control weeds growing in and around greenhouses and shadehouses. Desirable vegetation must not be present during application and air circulation fans must be turned off.

Wildlife Habitat Management

This product may be used to control exotic and other undesirable vegetation in habitat management and natural areas, including rangeland and wildlife refuges. Apply to allow recovery of native plant species, prior to planting desirable native species, and for broad spectrum vegetation control. Apply spot treatments to selectively remove unwanted plants for habitat enhancement.

Wildlife Food Plots
This product may be used as a site preparation treatment to control annual and perennial weeds prior to planting wildlife food plots. Any wildlife food species may be planted after applying this product, or native species may be allowed to repopulate the area. If tillage is needed to prepare a seedbed, wait 7 days after application before tilling to allow translocation into underground plant parts.

Hollow Stem Injection

Apply this product to control giant knotweed (*Polygonum sachalinense*), Japanese knotweed (*Polygonum cuspidatum*), or other invasive knotweeds using individual stem treatment. Use a hand-held injection device that delivers the specified amount of this product into these hollow stem plants.

Make a hole through both sides of the stem about 6 inches above the ground, just below a node, using an awl or other pointed tool. Inject 5 mL of undiluted product directly into this hole in the hollow stem. Treat each stem of the knotweed plant.

Restrictions:
- Do not apply more than a total of 8 quarts of this product per acre for all treatments combined. At 5 mL per stem, 7.5 quarts will treat approximately 1420 stems per acre.

Parks, Recreational and Residential Areas

Use this product in parks, recreational and residential areas. Apply it with any application equipment described in this label. Use this product to trim and edge around trees, fences, paths, around buildings, sidewalks, and other objects in these areas. This product may be used for spot treatment of unwanted vegetation, eliminate unwanted weeds growing in established shrub beds or ornamental plantings, and prior to planting an area to ornamentals, flowers, turfgrass (sod or seed), or prior to laying asphalt or beginning construction projects.

All of the label instructions apply to park and recreational areas.

Railroads

All of the instructions in the Noncrop Areas and Industrial Sites and Roadside sections apply to railroads.

Bare Ground, Ballast and Shoulders, Crossings, and Spot Treatment
Use this product to maintain bare ground on railroad ballast and shoulders. Repeat applications up to the labled rate of this product may be used as weeds emerge to maintain bare ground. Use this product to control tall growing weeds to improve line of sight at railroad crossings and reduce the need for mowing along rights-of-way.

Brush Control
Apply 3 to 8 quarts of this product per acre as a broadcast spray, using boom-type or boomless nozzles. Applications up to 80 gallons of spray solution per acre may be used. Apply a 3/4 to 1.5 percent solution of this product when using high volume spray to wet applications. Apply a 5 to 10 percent solution of this product when using low volume directed sprays for spot treatment.

Roadsides

All of the instructions in the Noncrop Areas and Industrial Sites and Railroads sections apply to roadsides.

Shoulder Treatments
Use this product on road shoulders. Apply it with boom sprayers, shielded boom sprayers, high volume off-center nozzles, OC nozzle clusters, manifold nozzle systems, hand-held equipment, and similar equipment, and under-deck mowing plus herbicide systems.

Guardrails and Other Obstacles to Mowing
Use this product to control weeds growing under guardrails and around signposts and other objects along the roadside.

Spot Treatment
Use this product as a spot treatment to control unwanted vegetation growing along roadsides.

Tank Mixes: This product may be used in tank mix combination with other herbicide products to broaden the spectrum of vegetation controlled and for residual weed control. Follow applicable use directions, precautions and limitations on the respective product labels. Use according to the most restrictive precautionary statements for each product in the mixture. Any specified rate of this product may be used in a tank mix.

Chemical Mowing
Perennials: This product suppresses perennial grasses listed in this section to serve as a substitute for mowing. Use 4.5 fl oz of this product per acre when treating Kentucky bluegrass, tall fescue, fine fescue, orchardgrass, or quackgrass. Apply 12 fl oz of this product per acre when treating bermudagrass. Apply 4.5 to 8 fl oz of this product per acre when treating bahiagrass. Use the higher labled rates when grass is under heat stress. Apply 3 pints of this product per acre when treating torpedograss or paragrass. Apply treatments in 10 to 20 gallons of spray solution per acre.

Annuals: For growth suppression of some annual grasses, including annual ryegrass, wild barley and wild oats growing in coarse turfgrass on roadsides or other industrial areas, apply 3 to 3.75 fl oz of this product in 10 to 40 gallons of spray solution per acre. Apply when annual grasses are actively growing and before the seedheads are in the boot stage of development. Treatments may cause injury to the desired grasses.

Release of Dormant Bermudagrass or Bahiagrass
Apply 6 to 48 fl oz of this product per acre in 10 to 40 gallons of water per acre. Use only in areas where bermudagrass or bahiagrass are desirable groundcovers and where some temporary injury or discoloration can be tolerated. Treatments of more than 12 fl oz per acre may result in injury or delayed greenup in highly maintained areas, including golf courses and lawns.

For best results on winter annuals, treat when weeds are in an early growth stage (less than 6 inches in height) after most have germinated. For best results on tall fescue, treat when fescue is in or beyond the 4- to 6-leaf stage.

Tank Mixes: This product may be used in tank mix combination with other herbicide products to broaden the spectrum of vegetation controlled and for residual weed control. When tank mixing, read and follow all applicable use directions, precautions, and limitation on the respective product labels. Use according to the most restrictive precautionary statements for each product in the mixture. Any specified rate of this product may be used in a tank mix.

Actively Growing Bermudagrass
Use this product to control or partially control many annual and perennial weeds for effective release of actively growing bermudagrass. Use only in areas where some temporary injury or discoloration can be tolerated. Use only on well-established bermudagrass. Bermudagrass injury may result from the treatment, but regrowth will occur under moist conditions. Repeat applications of the tank mix in the same season are not recommended because severe injury may occur.

Apply up to 2.25 pints of this product in 10 to 40 gallons of spray solution per acre. Use the lower rate when treating annual weeds less than 6 inches in height (or runner length). Use the higher labled rate as weeds increase in size or as they approach flower or seedhead formation.

Actively Growing Bahiagrass
For suppression of vegetable growth and seedhead inhibition of bahiagrass for approximately 45 days, apply 4.5 fl oz of this product in 10 to 40 gallons of water per acre. Apply one to two weeks after full greenup or after mowing to a uniform height of 3 to 4 inches. Make this application prior to seedhead emergence. For suppression up to 120 days, apply 3 fl oz of this product per acre, followed by an application of 1.5 to 3 fl oz per acre about 45 days later. Make no more than two applications per year.

Tank Mixes: This product may be used in tank mix combination with other herbicide products to broaden the spectrum of vegetation controlled and for residual weed control. When tank mixing, read and follow all applicable use directions, precautions, and limitation on the respective product labels. Use according to the most restrictive precautionary statements for each product in the mixture. Any specified rate of this product may be used in a tank mix.

Utility Sites

Use this product for control of brush, tree, and weed control and side trimming in areas including electrical power, pipeline and telephone rights-of-ways, and other sites associated with these rights-of-ways including substations, roadsides, and railroads. This product may be applied with any application equipment or method described on this label unless specifically prohibited.

Tank Mixes: This product may be used in tank mix combination with other herbicide products to broaden the spectrum of vegetation controlled and for residual weed control. When tank mixing, read and follow all applicable use directions, precautions, and limitation on the respective product labels. Use according to the most restrictive precautionary statements for each product in the mixture. Any specified rate of this product may be used in a tank mix.

Rangelands

Use this product to control or suppress many annual weeds growing in perennial cool and warm season grass rangelands. Preventing weed seed production is critical to the successful control of annual grassy weeds invading these perennial grass sites. Eliminate most of the viable seeds with follow up applications in sequential years. Delay grazing of treated areas to encourage growth of desirable perennials. Allowing desirable perennials to flower and reseed in the treated area will encourage successful transition.

***Bromus*:** Use this product to control or suppress downy brome/cheatgrass (*Bromus tectorum*), Japanese brome (*Bromus japonicus*), soft chess (*Bromus mollis*), cheat (*Bromus secalinus*), cereal rye, and jointed goatgrass. Apply 6 to 12 fl oz of this product per acre as a broadcast treatment.

For best results, coincide treatments with early seedhead emergence of the most mature plants. Delaying the application until this growth stage maximizes the emergence of other weedy grass flushes. Make applications to the same site each year until seed banks are depleted and the desirable perennial grasses become established on the site.

Medusahead: Apply 12 fl oz of this product per acre to control or suppress medusahead at the 3-leaf stage when plants are actively growing. Delaying applications beyond this stage results in reduced or unacceptable control. Repeat applications in subsequent years to eliminate the seed bank before reestablishing desirable perennial grasses. Apply in the fall or spring.

Apply by ground or air. Make aerial applications for these uses with fixed wing or helicopter equipment. For aerial applications, apply in 2 to 10 gallons of water per acre. For ground applications, apply in at least 10 to 20 gallons of water per acre.

Spot Treatment and Wiper Application
Apply this product in rangeland, pastures, or industrial sites as a spot treatment or over the top of desirable grasses using wiper applicators to control tall weeds. See Wiper Application section for specific instructions. Make repeat applications up to the labeled rate in the same area at 30-day intervals.

The entire site or any portion of it may be treated when using 2.25 quarts or less of this product per acre for spot treatments or wiper applications. No more than 10 percent of the total site may be treated at any one time when using more than 2.25 quarts of this product per acre for spot treatments or wiper applications. To achieve maximum performance, remove domestic livestock before application and wait 7 days after application before grazing livestock or harvesting for feed.

Pastures

Type of Pastures: Bahiagrass, bermudagrass, bluegrass, brome, fescue, orchardgrass, ryegrass, timothy, wheatgrass, alfalfa, clover

Spot Treatment and Wiper Application
This product may be applied as a spot treatment or as a wiper application. Make applications in the same area at 30-day intervals. See Wiper Application section for specific instructions.

Precautions:
- For spot treatment and wiper applications, the entire field or any portion of it may be treated when using a rate of 2.25 quarts or less per acre.
- To achieve maximum performance, remove domestic livestock before application and wait 14 days after application before grazing livestock or harvesting.

Restrictions:
- Do not treat more than 10 percent of any acre at one time if applying more than 2.25 quarts per acre as a spot treatment or wiper application.

Preplant, Preemergence, and Pasture Renovation
Apply this product prior to planting or emergence of forage grasses and legumes. In addition, this product may be used to control perennial pasture species listed on this label prior to re-planting.

Precautions:
- If the application rates total 2.25 quarts or less per acre, there is no waiting period between treatment and feeding or livestock grazing is required.
- If the application rates total more than 2.25 quarts per acre, remove domestic livestock before application and wait eight weeks after application before grazing or harvesting.

Restrictions:
- Crops listed for treatment in this label may be planted into the treated area at any time. Wait 30 days between application and planting for all other crops.

Bamboo

Use this product on roadside rights-of way to control or suppress bamboo. Use the higher rate in the rate range for dense stands and larger plants. Mow or cut bamboo and allow it to resprout to have sufficient foliage in order for the spray solution to completely cover the foliage. Optimum control or suppression of bamboo is achieved when this product is applied between August and October (prior to frost). One application of this product plus a surfactant will not eradicate bamboo. Several mowings and applications are required to completely control bamboo.

Apply the specified rate plus a surfactant (1/4 to 1/2% v/v), such as a nonionic surfactant containing 80% active ingredient or more. Using this product without a surfactant results in reduced performance.

Application Method	Rate	Spray Volume (gal/acre)
ground broadcast	1.5 – 7.5 qt/acre	10 - 60
handgun spray to wet	0.75 – 2%	spray to wet
handgun or backpack low volume directed spray	4 – 10%	spray to cover

Restrictions:
- Do not apply more than a total of 8 quarts of this product per acre per year.

Annual Weeds, Perennial Weeds, and Woody Brush and Trees

Annual Weeds

Apply 24 fl oz of this product per acre if weeds are less than 6 inches in height or runner length. Use 1.25 to 3 quarts of this product per acre if weeds are more than 6 inches in height or runner length or when weeds are growing under stressed conditions. Use a higher rate in the rate range for tough to control species regardless of the size of the weed at the time of application. Treat tough to control weeds when they are relatively small. Tank mix this product with only those products that are labeled for application at the target site. Refer to the label of the tank mix partner for use sites and application rates.

Apply a 0.4 percent solution of this product as a spray to wet application to weeds less than 6 inches in height or runner length. Use a 0.7 to 1.5 percent solution for annual weeds more than 6 inches tall or for smaller weeds growing under stressed conditions. Use the higher concentration for tough to control species or for weeds more than 24 inches tall. Apply prior to seedhead formation in grass or bud formation in broadleaf weeds.

Use a 4 to 7 percent solution of this product for low volume directed spray applications. Spray coverage should be uniform with at least 50 percent of the foliage contacted. For best results, cover the top one-half of the plant. To ensure adequate spray coverage, spray both sides of large or tall weeds when foliage is thick and dense or where there are multiple sprouts.

Common Name	Scientific Name
anoda, spurred	*Anoda cristata*
balsamapple[1]	*Momordica charantia*
barley	*Hordeum vulgare*
barnyardgrass	*Echinochloa crus-galli*
bassia, fivehook	*Bassia hyssopifolia*
bittercress	*Cardamine* spp.
bluegrass, annual	*Poa annua*
bluegrass, bulbous	*Poa bulbosa*
brome, downy/cheatgrass	*Bromus tectorum*
brome, Japanese	*Bromus japonicus*
buttercup	*Ranunculus spp.*
Carolina foxtail	*Alopecurus carolinianus*
Carolina geranium	*Geranium carolinianum*
castorbean	*Ricinus communis*
chamomile, mayweed	*Anthemis cotula*
cheat	*Bromus secalinus*
chervil	*Anthriscus cerefolium*
chickweed	*Cerastium vulgatum*
cocklebur, common	*Xanthium strumarium*
coreopsis, plains	*Coreopsis tinctoria*
corn, volunteer	*Zea mays*
crabgrass	*Digitaria* spp.
dwarfdandelion, Virginia	*Krigia virginica*
eastern mannagrass	*Glyceria* spp.
eclipta	*Eclipta prostrata*
falsedandelion	*Pyrrhopappus carolinianus*
falseflax, smallseed	*Camelina microcarpa*
fiddleneck	*Amsinckia* spp.
field pennycress	*Thlaspi arvense*
fleabane, annual	*Erigeron annuus*
fleabane, hairy	*Conyza bonariensis*
fleabane, rough	*Erigeron strigosus*
Florida pusley	*Richardia scabra*
foxtail	*Setaria* spp.
goatgrass, jointed	*Aegilops cylindrica*
goosegrass	*Eleusine indica*
groundsel, common	*Senecio vulgaris*
henbit	*Lamium amplexicaule*
horseweed/marestail	*Conyza canadensis*
itchgrass	*Rottboellia cochinchinensis*
johnsongrass	*Sorghum halepense*
junglerice	*Echinochloa colona*
knotweed	*Polygonum* spp.
kochia[2]	*Kochia scoparia*
lambsquarters, common	*Chenopodium album*
mallow, little	*Malva parviflora*
medusahead	*Taeniatherum caput-medusae*
morningglory	*Ipomoea* spp.
mustard, blue	*Chorispora tenella*
mustard, tumble	*Sisymbrium altissimum*
mustard, wild	*Sinapis arvensis*
oats, wild	*Avena fatua*
panicum, fall	*Panicum dichotomiflorum*
pigweed, redroot	*Amaranthus retroflexus*
pigweed, smooth	*Amaranthus hybridus*
prickly lettuce	*Lactuca serriola*
puncturevine	*Tribulus terrestris*
purslane, common	*Portulaca oleracea*
ragweed, common	*Ambrosia artemisiifolia*
ragweed, giant	*Ambrosia trifida*
rocket, London	*Sisymbrium irio*
Russian-thistle	*Salsola tragus*
rye, cereal	*Secale cereale*
ryegrass, Italian[3]	*Lolium perenne*
sandbur, field	*Cenchrus spinifex*
sesbania, hemp	*Sesbania herbacea*
shattercane	*Sorghum bicolor*
shepherd's-purse	*Capsella bursa-pastoris*
sicklepod	*Senna obtusifolia*
signalgrass, broadleaf	*Urochloa platyphylla*
smartweed, Pennsylvania	*Polygonum pensylvanicum*
sowthistle, annual	*Sonchus oleraceus*
Spanishneedles[3]	*Bidens bipinnata*
speedwell, corn	*Veronica arvensis*
speedwell, purslane	*Veronica peregrina*
sprangletop	*Leptochloa* spp.
spurge, annual	*Chamaesyce* spp.
spurge, prostrate	*Chamaesyce humistrata*
spurge, spotted	*Chamaesyce maculata*
spurry, umbrella	*Holosteum umbellatum*
stinkgrass	*Eragrostis cilianensis*
sunflower, common	*Helianthus annuus*
tansymustard, pinnate	*Descurainia pinnata*
teaweed/sida, prickly	*Sida spinosa*
Texas panicum	*Panicum* spp.

Common Name (Cont.)	Scientific Name
velvetleaf	*Abutilon theophrasti*
Virginia pepperweed	*Lepidium virginicum*
wheat	*Triticum aestivum*
witchgrass	*Panicum capillare*
woolly cupgrass	*Eriochloa villosa*
yellow rocket	*Barbarea vulgaris*

[1]Apply with hand-held equipment only.
[2]Do not treat kochia in the button stage.
[3]Apply 3 pints of product per acre.

Perennial Weeds

Best results are obtained when perennial weeds are treated after they reach the reproductive stage of growth (seedhead initiation in grasses and bud formation in broadleaves). Best results are obtained when non-flowering plants are treated when they reach a mature stage of growth. In many situations, applications are required prior to these growth stages. Under these conditions, use a higher rate in the rate range.

When using spray to wet treatments with hand-held equipment, ensure thorough coverage of the plant. For best results, use a 1.5 percent solution on harder to control perennials including bermudagrass, dock, field bindweed, hemp dogbane, milkweed and Canada thistle.

Use a 4 to 7 percent solution of this product in low volume directed spray applications. Spray coverage should be uniform with at least 50 percent of the foliage contacted. For best results, cover the top one-half of the plant. To ensure adequate spray coverage, spray both sides of large or tall weeds when foliage is thick and dense or where there are multiple sprouts.

Allow 7 days or more after application before tillage.

Common Name	Scientific Name
alfalfa	*Medicago sativa*
alligatorweed[1]	*Alternanthera philoxeroides*
anise/fennel	*Foeniculum vulgare*
artichoke, Jerusalem	*Helianthus tuberosus*
bahiagrass	*Paspalum notatum*
beachgrass, European	*Ammophila arenaria*
bentgrass	*Agrostis* spp.
bermudagrass	*Cynodon dactylon*
bindweed, field	*Convolvulus arvensis*
bluegrass, Kentucky	*Poa pratensis*
blueweed, Texas	*Helianthus ciliaris*
brackenfern	*Pteridium aquilinum*
brome, smooth	*Bromus inermis*
bursage, woollyleaf	*Ambrosia grayi*
canarygrass, reed	*Phalaris arundinacea*
cattail	*Typha* spp.
clover, red	*Trifolium pratense*
clover, white	*Trifolium repens*
cogongrass	*Imperata clylindrica*
cordgrass-	*Spartina spp.*
cutgrass, giant[1]	*Zizaniopsis miliacea*
dallisgrass	*Paspalum dilatatum*
dandelion	*Taraxacum officinale*
dock, curly	*Rumex crispus*
dogbane, hemp	*Apocynum cannabinum*
fescue	*Festuca* spp.
fescue, tall	*Lolium arundinaceum*
German ivy	*Senecio mikanioides*
guineagrass	*Urochloa maxima*
horsenettle	*Solanum carolinense*
horseradish	*Armoracia rusticana*
iceplant, crystalline	*Mesembryanthemum crystallinum*
johnsongrass-	*Sorghum halepense*
kikuyugrass	*Pennisetum clandestinum*
knapweed, Russian	*Acroptilon repens*
lantana, largeleaf-	*Lantana camara*
lespedeza, common	*Kummerowia striata*
lespedeza, sericea-	*Lespedeza cuneata*
loosestrife, purple	*Lythrum salicaria*
lotus, American	*Nelumbo lutea*
maidencane	*Panicum hemitomon*
milkweed	*Asclepias* spp.
muhly, wirestem	*Muhlenbergia frondosa*
mullein, common	*Verbascum thapsus*
napiergrass	*Pennisetum purpureum*
nightshade, silverleaf	*Solanum elaeagnifolium*
nutsedge, purple	*Cyperus rotundus*
nutsedge, yellow	*Cyperus esculentus*
orchardgrass	*Dactylis glomerata*
pampasgrass	*Cortaderia selloana*
paragrass	*Urochloa mutica*
phragmites[2]	*Phragmites* spp.
poison-hemlock	*Conium maculatum*
quackgrass	*Elymus repens*
redvine	*Brunnichia ovata*
reed, giant	*Arundo donax*
ryegrass, perennial	*Lolium perenne*

Common Name (Cont.)	Scientific Name
smartweed, swamp	*Polygonum amphibium*
sowthistle, perennial	*Sonchus arvensis*
spatterdock	*Nuphar lutea*
starthistle, yellow-	*Centaurea solstitialis*
sweet potato, wild[1]	*Ipomoea pandurata*
thistle, artichoke	*Cynara cardunculus*
thistle, Canada	*Cirsium arvense*
timothy	*Phleum pratense*
torpedograss[1-]	*Panicum repens*
trumpetcreeper	*Campsis radicans*
tules, common	*Scirpus acutus*
vaseygrass	*Paspalum urvillei*
velvetgrass	*Holcus* spp.
water fern[3]	*Salvinia spp*
waterhyacinth	*Eichornia crassipes*
waterlettuce	*Pistia stratiotes*
waterprimrose	*Ludwigia* spp.
wheatgrass, western	*Pascopyrum smithii*

[1] Partial control.
[2] Partial control in southeastern states.
[3]Not for use in California

Woody Brush and Trees

Apply this product after full leaf expansion unless otherwise directed. Use the higher labeled rate for larger plants and/or dense areas of growth. On vines, use the higher labled rate for plants that have reached the woody stage of growth. Best results are obtained when application is made in late summer or fall after fruit formation.

In arid areas, best results are obtained when applications are made in the spring or early summer when brush species are at high moisture content and are flowering.

Ensure thorough coverage when using hand-held equipment.

See Low Volume Directed Spray Application section of label. Spray coverage should be uniform with at least 50 percent of the foliage contacted. For best results, cover the top half to 2/3 of the plant foliage. Spray both sides of large or tall woody brush and trees to ensure adequate spray coverage when foliage is thick and dense or where there are multiple sprouts. Symptoms may not appear prior to frost or senescence with fall treatments.

Allow seven days or more after application before tillage, mowing or removal. Repeat treatments up to the labeled rate may be necessary to control plants regenerating from underground parts or seed. Some autumn colors on undesirable deciduous species are acceptable provided no major leaf drop has occurred. Reduced performance may result if fall treatments are made following a frost.

Note: If brush has been mowed or tilled, or trees have been cut, do not treat until regrowth has reached the specified stage of growth.

This product will control, partially control, or suppress the following woody brush and trees.

Common Name	Scientific Name
alder	*Alnus* spp.
ash[1]	*Fraxinus* spp.
aspen, quaking	*Populus tremuloides*
bearclover, bearmat	*Ceanothus prostratus*
beach	*Fagus* spp.
birch	*Betula* spp.
bittercherry	*Prunus emarginata*
blackberry	*Rubus* spp.
blackgum	*Nyssa sylvatica*
blue gum, Tasmanian	*Eucalyptus globulus*
brackenfern	*Pteridium aquilinum*
broom, French	*Genista monspessulana*
broom, Scotch	*Cytisus scoparius*
buckwheat, California[1]	*Eriogonum fasciculatum*
cascara[1]	*Frangula purshiana*
catclaw-vine[1]	*Macfadyena unguis-cati*
ceanothus	*Ceanothus* spp.
chamise	*Adenostoma fasciculatum*
cherry	*Prunus* spp.
cherry, black	*Prunus serotina*
cherry, pin	*Prunus pensylvanica*
copperleaf, hophornbeam	*Acalypha ostryifolia*
coyotebrush	*Baccharis pilularis*
deer vetch	*Lotus unifoliolatus*
dewberry, southern	*Rubus trivialis*
dogwood	*Cornus* spp.
elderberry	*Sambucus nigra*
elm[1]	*Ulmus* spp.
gorse	*Ulex europaeus*
hasardia[1]	*Haplopappus squamosus*
hawthorn	*Crataegus* spp.
hazel	*Corylus* spp.
hickory	*Carya* spp.
holly, Florida	*Schinus terebinthifolius*

Common Name (Cont.)	Scientific Name
honeysuckle	*Lonicera* spp.
hornbeam, American	*Carpinus caroliniana*
kudzu	*Pueraria montana*
locust, black[1]	*Robinia pseudoacacia*
madrone, Pacific	*Arbutus menziesii*
manzanita	*Arctostaphylos* spp.
maple	*Acer* spp.
maple, red[1]	*Acer rubrum*
maple, sugar	*Acer saccharum*
maple, vine[1]	*Acer circinatum*
monkeyflower[1]	*Mimulus guttatus*
oak	*Quercus* spp.
oak, black[1]	*Quercus kellogia*
oak, pin	*Quercus palustris*
oak, post	*Quercus stellata*
oak, red	*Quercus rubra*
oak, southern red	*Quercus falcata*
oak, white[1]	*Quercus alba*
peppertree, Brazilian	*Schinus terebinthifolius*
persimmon[1]	*Diospyros* spp.
pine	*Pknus* spp.
poison-ivy, eastern	*Toxicodendron radicans*
poison-oak	*Toxicodendron* spp.
poison-sumac[1]	*Toxicodendron vernix*
prunus	*Prunus* spp.
raspberry	*Rubus* spp.
redbud, eastern-	*Cercis canadensis*
rose, multiflora-	*Rosa multiflora*
Russian-olive	*Elaeagnus angustifolia*
sage,: black, white	*Salvia* spp.
sagebrush, California	*Artemisia californica*
salmonberry	*Rubus spectabilis*
saltcedar[1]	*Tamarix ramosissima*
saltbush, sea myrtle	*Baccharis halimifolia*
sassafras-	*Sassafras albidum*
sourwood[1]	*Oxydendrum arboreum*
sumac, smooth[1]	*Rhus glabra*
sumac, dwarf[1]	*Rhus copallinum*
sweetgum-	*Liquidambar styraciflua*
swordfern[1]	*Polystichum munitum*
tallowtree, Chinese-	*Triadica sebifera*
oak, tanbark resprouts	*Lithocarpus densiflorus*
thimbleberry, western	*Rubus parviflorus*
tobacco, tree[1]	*Nicotiana glauca*
trumpetcreeper-	*Campsis radicans*
Virginia-creeper[1]	*Parthenocissus quinquefolia*
waxmyrtle, southern[1]	*Myrica cerifera*
willow-	*Salix* spp.
yellow-poplar [1]	*Liriodendron tulipifera*
yerba santa	*Eriodictyon californicum*

[1]Partial control

Terms and Conditions of Use

If terms of the following Warranty Disclaimer, Inherent Risks of Use, and Limitation of Remedies are not acceptable, return unopened package at once to the seller for a full refund of purchase price paid. Otherwise, to the extent permitted by law, use by the buyer or any other user constitutes acceptance of the terms under Warranty Disclaimer, Inherent Risks of Use and Limitations of Remedies.

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Dow AgroSciences warrants that this product conforms to the chemical description on the label and is reasonably fit for the purposes stated on the label when used in strict accordance with the directions, subject to the inherent risks set forth below. TO THE EXTENT PERMITTED BY LAW, Dow AgroSciences MAKES NO OTHER EXPRESS OR IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE OR ANY OTHER EXPRESS OR IMPLIED WARRANTY.

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It is impossible to eliminate all risks associated with use of this product. Crop injury, lack of performance, or other unintended consequences may result because of such factors as use of the product contrary to label instructions (including conditions noted on the label, such as unfavorable temperatures, soil conditions, etc.), abnormal conditions (such as excessive rainfall, drought, tornadoes, hurricanes), presence of other materials, the manner of application, or other factors, all of which are beyond the control of Dow AgroSciences or the seller. To the extent permitted by law, all such risks shall be assumed by buyer.

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The exclusive remedy for losses or damages resulting from this product (including claims based on contract, negligence, strict liability, or other legal theories), shall be limited to, at Dow AgroSciences' election, one of the following:

(1) Refund of purchase price paid by buyer or user for product bought, or
(2) Replacement of amount of product used.

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The terms of the Warranty Disclaimer, Inherent Risks of Use, and Limitation of Remedies cannot be varied by any written or verbal statements or agreements. No employee or sales agent of Dow AgroSciences or the seller is authorized to vary or exceed the terms of the Warranty Disclaimer or Limitation of Remedies in any manner.

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Produced for
Dow AgroSciences LLC
9330 Zionsville Road
Indianapolis, IN 46268

Label code: CD02-148-020
Replaced label: D02-148-007
LOES number: 010-01471

EPA accepted 11/27/18

Revisions

1. Updated the trademark line to read, "® ™ Trademarks of Dow AgroSciences, DuPont or Pioneer and their affiliated companies or respective owners"
2. Add "Caution" to the Precautionary Statements and combine the statements into one paragraph.
3. Under Rainfastness – revised sentence to read, "Heavy rainfall soon… repeat application up to the labeled rate may be required.
4. Revised 2nd paragraph of Directed Sprays to read, "Injury to larch may occur especially where spray patterns overlap or higher labeled rates of this…"
5. Removed rates and application method from table of Tank Mix Partners for Forestry Sites.
6. Broadcast Applications Outside Areas of Southeastern United States revised to read, "…overlap or the higher labeled rate is applied."
7. Chemical Mowing revised sentence to read, "Repeat applications of the tank mix in the same season are not recommended because severe injury may occur."
8. Add missing table for Hand Held Sprayers to sub-label B
9. Add following statements to Wiper Applications: "Rope or Sponge Wick applications: Use solutions of 33 to 75 percent of this product in water." "Panel Applications: Use solutions of 33 to 100 percent of this product in water."
10. Correct typo under "Hollow Stem Injection" "Do not apply more than a total of 7.5 quarts of this product…"
11. Update Mode of Action banner to reflect provisions in PR Notice 2017-01.

SAFETY DATA SHEET
DOW AGROSCIENCES LLC

Product name: RODEO Herbicide

Issue Date: 11/10/2015
Print Date: 11/10/2015

DOW AGROSCIENCES LLC encourages and expects you to read and understand the entire (M)SDS, as there is important information throughout the document. We expect you to follow the precautions identified in this document unless your use conditions would necessitate other appropriate methods or actions.

1. IDENTIFICATION

Product name: RODEO Herbicide

Recommended use of the chemical and restrictions on use
Identified uses: End use herbicide product

COMPANY IDENTIFICATION
DOW AGROSCIENCES LLC
9330 ZIONSVILLE RD
INDIANAPOLIS IN 46268-1053
UNITED STATES

Customer Information Number: 800-992-5994
info@dow.com

EMERGENCY TELEPHONE NUMBER
24-Hour Emergency Contact: 800-992-5994
Local Emergency Contact: 352-323-3500

2. HAZARDS IDENTIFICATION

Hazard classification
This material is not hazardous under the criteria of the Federal OSHA Hazard Communication Standard 29CFR 1910.1200.

Other hazards
No data available

3. COMPOSITION/INFORMATION ON INGREDIENTS

Chemical nature: Mixture
This product is a mixture.

Component	CASRN	Concentration
Glyphosate IPA salt	38641-94-0	53.75%

Isopropylamine	75-31-0	5.8%
Balance	Not available	40.45%

4. FIRST AID MEASURES

Description of first aid measures
General advice: First Aid responders should pay attention to self-protection and use the recommended protective clothing (chemical resistant gloves, splash protection). If potential for exposure exists refer to Section 8 for specific personal protective equipment.

Inhalation: Move person to fresh air. If person is not breathing, call an emergency responder or ambulance, then give artificial respiration; if by mouth to mouth use rescuer protection (pocket mask etc). Call a poison control center or doctor for treatment advice.

Skin contact: Take off contaminated clothing. Rinse skin immediately with plenty of water for 15-20 minutes. Call a poison control center or doctor for treatment advice.

Eye contact: Hold eyes open and rinse slowly and gently with water for 15-20 minutes. Remove contact lenses, if present, after the first 5 minutes, then continue rinsing eyes. Call a poison control center or doctor for treatment advice.

Ingestion: Call a poison control center or doctor immediately for treatment advice. Have person sip a glass of water if able to swallow. Do not induce vomiting unless told to do so by the poison control center or doctor. Never give anything by mouth to an unconscious person.

Most important symptoms and effects, both acute and delayed: Aside from the information found under Description of first aid measures (above) and Indication of immediate medical attention and special treatment needed (below), any additional important symptoms and effects are described in Section 11: Toxicology Information.

Indication of any immediate medical attention and special treatment needed
Notes to physician: No specific antidote. Treatment of exposure should be directed at the control of symptoms and the clinical condition of the patient. Have the Safety Data Sheet, and if available, the product container or label with you when calling a poison control center or doctor, or going for treatment.

5. FIREFIGHTING MEASURES

Suitable extinguishing media: To extinguish combustible residues of this product use water fog, carbon dioxide, dry chemical or foam. Dry chemical fire extinguishers. Carbon dioxide fire extinguishers. Foam. Straight or direct water streams may not be effective to extinguish fire. General purpose synthetic foams (including AFFF type) or protein foams are preferred if available. Alcohol resistant foams (ATC type) may function.

Unsuitable extinguishing media: No data available

Special hazards arising from the substance or mixture
Hazardous combustion products: During a fire, smoke may contain the original material in addition to combustion products of varying composition which may be toxic and/or irritating.

Unusual Fire and Explosion Hazards: This material will not burn until the water has evaporated. Residue can burn. Container may vent and/or rupture due to fire. Electrically ground and bond all equipment. Flammable mixtures of this product are readily ignited even by static discharge. May produce flash fire. Vapors are heavier than air and may travel a long distance and accumulate in low lying areas. Ignition and/or flash back may occur. Flammable mixtures may exist within the vapor space of containers at room temperature.

Advice for firefighters
Fire Fighting Procedures: Keep people away. Isolate fire and deny unnecessary entry. Stay upwind. Keep out of low areas where gases (fumes) can accumulate. Water may not be effective in extinguishing fire. Eliminate ignition sources. Move container from fire area if this is possible without hazard. To extinguish combustible residues of this product use water fog, carbon dioxide, dry chemical or foam. Contain fire water run-off if possible. Fire water run-off, if not contained, may cause environmental damage. Review the “Accidental Release Measures” and the “Ecological Information” sections of this (M)SDS.

Special protective equipment for firefighters: Wear positive-pressure self-contained breathing apparatus (SCBA) and protective fire fighting clothing (includes fire fighting helmet, coat, trousers, boots, and gloves). Avoid contact with this material during fire fighting operations. If contact is likely, change to full chemical resistant fire fighting clothing with self-contained breathing apparatus. If this is not available, wear full chemical resistant clothing with self-contained breathing apparatus and fight fire from a remote location. For protective equipment in post-fire or non-fire clean-up situations, refer to the relevant sections.

6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures: Isolate area. Refer to section 7, Handling, for additional precautionary measures. Keep unnecessary and unprotected personnel from entering the area. Keep personnel out of low areas. No smoking in area. Eliminate all sources of ignition in vicinity of spill or released vapor to avoid fire or explosion. Vapor explosion hazard. Keep out of sewers. For large spills, warn public of downwind explosion hazard. Check area with combustible gas detector before reentering area. Ground and bond all containers and handling equipment. Use appropriate safety equipment. For additional information, refer to Section 8, Exposure Controls and Personal Protection.

Environmental precautions: Prevent from entering into soil, ditches, sewers, waterways and/or groundwater. See Section 12, Ecological Information.

Methods and materials for containment and cleaning up: Contain spilled material if possible. Pump with explosion-proof equipment. If available, use foam to smother or suppress. Absorb with materials such as: Clay. Dirt. Sand. Sweep up. Collect in suitable and properly labeled containers. Large spills: Contact Dow AgroSciences for clean-up assistance. See Section 13, Disposal Considerations, for additional information.

7. HANDLING AND STORAGE

Precautions for safe handling: Keep away from heat, sparks and flame. No smoking, open flames or sources of ignition in handling and storage area. Electrically bond and ground all containers and equipment before transfer or use of material. Use of non-sparking or explosion-proof equipment may be necessary, depending upon the type of operation. Containers, even those that have been emptied,

can contain vapors. Do not cut, drill, grind, weld, or perform similar operations on or near empty containers. Vapors are heavier than air and may travel a long distance and accumulate in low lying areas. Ignition and/or flash back may occur. Never use air pressure for transferring product. Keep out of reach of children. Do not swallow. Avoid breathing vapor or mist. Avoid contact with eyes, skin, and clothing. Wash thoroughly after handling. Keep container closed. Use with adequate ventilation.

Conditions for safe storage: Minimize sources of ignition, such as static build-up, heat, spark or flame. Keep container closed. Do not store in: Carbon steel. Galvanized containers. Steel. Flammable mixtures may exist within the vapor space of containers at room temperature. Store in a dry place. Store in original container. Do not store near food, foodstuffs, drugs or potable water supplies.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Control parameters

Exposure limits are listed below, if they exist.

Component	Regulation	Type of listing	Value/Notation
Isopropylamine	ACGIH	TWA	5 ppm
	ACGIH	STEL	10 ppm
	OSHA Z-1	TWA	12 mg/m3 5 ppm

RECOMMENDATIONS IN THIS SECTION ARE FOR MANUFACTURING, COMMERCIAL BLENDING AND PACKAGING WORKERS. APPLICATORS AND HANDLERS SHOULD SEE THE PRODUCT LABEL FOR PROPER PERSONAL PROTECTIVE EQUIPMENT AND CLOTHING.

Exposure controls

Engineering controls: Use local exhaust ventilation, or other engineering controls to maintain airborne levels below exposure limit requirements or guidelines. If there are no applicable exposure limit requirements or guidelines, general ventilation should be sufficient for most operations. Local exhaust ventilation may be necessary for some operations.

Individual protection measures

Eye/face protection: Use safety glasses (with side shields).

Skin protection

Hand protection: Use gloves chemically resistant to this material when prolonged or frequently repeated contact could occur. Examples of preferred glove barrier materials include: Butyl rubber. Natural rubber (“latex”). Neoprene. Nitrile/butadiene rubber (“nitrile” or “NBR”). Polyethylene. Ethyl vinyl alcohol laminate (“EVAL”). Polyvinyl chloride (“PVC” or “vinyl”). NOTICE: The selection of a specific glove for a particular application and duration of use in a workplace should also take into account all relevant workplace factors such as, but not limited to: Other chemicals which may be handled, physical requirements (cut/puncture protection, dexterity, thermal protection), potential body reactions to glove materials, as well as the instructions/specifications provided by the glove supplier.

Other protection: Wear clean, body-covering clothing.

Respiratory protection: Respiratory protection should be worn when there is a potential to exceed the exposure limit requirements or guidelines. If there are no applicable exposure limit requirements or guidelines, wear respiratory protection when adverse effects, such as respiratory irritation or discomfort have been experienced, or where indicated by your risk assessment process. For most conditions no respiratory protection should be needed; however, if discomfort is experienced, use an approved air-purifying respirator.

The following should be effective types of air-purifying respirators: Organic vapor cartridge with a particulate pre-filter.

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance	
Physical state	Liquid.
Color	Yellow
Odor	Odorless
Odor Threshold	No data available
pH	4.8 *pH Electrode*
Melting point/range	Not applicable
Freezing point	No data available
Boiling point (760 mmHg)	No data available
Flash point	**closed cup** > 93 °C (> 199 °F) *Setaflash Closed Cup ASTM D3828* none below boiling point
Evaporation Rate (Butyl Acetate = 1)	No data available
Flammability (solid, gas)	No data available
Lower explosion limit	No data available
Upper explosion limit	No data available
Vapor Pressure	No data available
Relative Vapor Density (air = 1)	No data available
Relative Density (water = 1)	1.21 at 22 °C (72 °F) / 4 °C *Pyknometer*
Water solubility	Soluble
Partition coefficient: n-octanol/water	No data available
Auto-ignition temperature	none below 400 degC
Decomposition temperature	No test data available
Dynamic Viscosity	64.6 mPa.s at 20 °C (68 °F)
Kinematic Viscosity	53.4 mm2/s at 20 °C (68 °F)
Explosive properties	No
Oxidizing properties	No significant increase (>5C) in temperature.
Liquid Density	1.20 g/cm3 at 20 °C (68 °F) *Digital density meter*
Molecular weight	No data available

NOTE: The physical data presented above are typical values and should not be construed as a specification.

10. STABILITY AND REACTIVITY

Reactivity: No dangerous reaction known under conditions of normal use.

Chemical stability: Thermally stable at recommended temperatures and pressures.

Possibility of hazardous reactions: Polymerization will not occur.

Conditions to avoid: Active ingredient decomposes at elevated temperatures. Avoid static discharge.

Incompatible materials: Heat produced by the reaction with water will cause vaporization. Flammable hydrogen may be generated from contact with metals such as:

Hazardous decomposition products: Decomposition products depend upon temperature, air supply and the presence of other materials.

11. TOXICOLOGICAL INFORMATION

Toxicological information appears in this section when such data is available.

Acute toxicity

Acute oral toxicity
Very low toxicity if swallowed. Harmful effects not anticipated from swallowing small amounts.

As product:
LD50, Rat, male and female, > 5,000 mg/kg

Acute dermal toxicity
Prolonged skin contact is unlikely to result in absorption of harmful amounts.

As product:
LD50, Rabbit, male and female, > 5,000 mg/kg

Acute inhalation toxicity
No adverse effects are anticipated from single exposure to mist. Excessive exposure may cause irritation to upper respiratory tract (nose and throat).

As product:
LC50, Rat, male and female, 4 Hour, dust/mist, > 6.37 mg/l No deaths occurred at this concentration.

Skin corrosion/irritation
Brief contact is essentially nonirritating to skin.

Serious eye damage/eye irritation
May cause slight temporary eye irritation.
Corneal injury is unlikely.

Sensitization
Did not cause allergic skin reactions when tested in guinea pigs.

For respiratory sensitization:
No relevant data found.

Specific Target Organ Systemic Toxicity (Single Exposure)
Evaluation of available data suggests that this material is not an STOT-SE toxicant.

Specific Target Organ Systemic Toxicity (Repeated Exposure)
For similar active ingredient(s).
Glyphosate.
Based on available data, repeated exposures are not anticipated to cause significant adverse effects.
For the minor component(s):
In animals, effects have been reported on the following organs after inhalation:
Eye.
Respiratory tract.

Carcinogenicity
For similar material(s): Glyphosate. Did not cause cancer in laboratory animals. Weight of evidence evaluation of epidemiology studies supports no association between glyphosate exposure and cancer.

Teratogenicity
For similar active ingredient(s). Glyphosate. Has been toxic to the fetus in laboratory animals at doses toxic to the mother. Did not cause birth defects in laboratory animals.

Reproductive toxicity
For similar active ingredient(s). Glyphosate. In laboratory animal studies, effects on reproduction have been seen only at doses that produced significant toxicity to the parent animals.

Mutagenicity
For the active ingredient(s): In vitro genetic toxicity studies were negative in some cases and positive in other cases. Animal genetic toxicity studies were negative in some cases and positive in other cases.

Aspiration Hazard
Based on physical properties, not likely to be an aspiration hazard.

Carcinogenicity

Component	**List**	**Classification**
Glyphosate IPA salt	IARC	Group 2A: Probably carcinogenic to humans

12. ECOLOGICAL INFORMATION

Ecotoxicological information appears in this section when such data is available.

Toxicity

Acute toxicity to fish
Material is slightly toxic to aquatic organisms on an acute basis (LC50/EC50 between 10 and 100 mg/L in the most sensitive species tested).

LC50, Oncorhynchus mykiss (rainbow trout), 96 Hour, > 2,500 mg/l, OECD Test Guideline 203 or Equivalent

Acute toxicity to aquatic invertebrates
EC50, Daphnia magna (Water flea), 48 Hour, 918 mg/l, OECD Test Guideline 202 or Equivalent

Acute toxicity to algae/aquatic plants

ErC50, Pseudokirchneriella subcapitata (green algae), 72 Hour, 127 mg/l, OECD Test Guideline 201 or Equivalent

Toxicity to Above Ground Organisms
Material is practically non-toxic to birds on an acute basis (LD50 > 2000 mg/kg).

oral LD50, Colinus virginianus (Bobwhite quail), > 2000mg/kg bodyweight.

contact LD50, Apis mellifera (bees), > 100µg/bee

oral LD50, Apis mellifera (bees), > 100µg/bee

Persistence and degradability

Glyphosate IPA salt

Biodegradability: For similar active ingredient(s). Glyphosate. Biodegradation may occur under aerobic conditions (in the presence of oxygen).

Photodegradation
Test Type: Half-life (indirect photolysis)
Sensitizer: OH radicals
Atmospheric half-life: 0.115 d
Method: Estimated.

Isopropylamine

Biodegradability: Material is readily biodegradable. Passes OECD test(s) for ready biodegradability. Material is ultimately biodegradable (reaches > 70% mineralization in OECD test(s) for inherent biodegradability).
10-day Window: Pass
Biodegradation: 70 - 80 %
Exposure time: 28 d
Method: OECD Test Guideline 301F or Equivalent

Theoretical Oxygen Demand: 3.53 mg/mg

Chemical Oxygen Demand: 1,300 - 1,975 mg/g

Biological oxygen demand (BOD)

Incubation Time	BOD
5 d	18.3 %
10 d	54 %
20 d	59 %

Photodegradation
Test Type: Half-life (indirect photolysis)
Sensitizer: OH radicals
Atmospheric half-life: 3.26 Hour
Method: Estimated.

Balance

Biodegradability: No relevant data found.

Bioaccumulative potential

Bioaccumulation: For similar active ingredient(s). Bioconcentration potential is low (BCF < 100 or Log Pow < 3).

Mobility in soil

For similar active ingredient(s).
Expected to be relatively immobile in soil (Koc > 5000).

13. DISPOSAL CONSIDERATIONS

Disposal methods: If wastes and/or containers cannot be disposed of according to the product label directions, disposal of this material must be in accordance with your local or area regulatory authorities. This information presented below only applies to the material as supplied. The identification based on characteristic(s) or listing may not apply if the material has been used or otherwise contaminated. It is the responsibility of the waste generator to determine the toxicity and physical properties of the material generated to determine the proper waste identification and disposal methods in compliance with applicable regulations. If the material as supplied becomes a waste, follow all applicable regional, national and local laws.

14. TRANSPORT INFORMATION

DOT

Not regulated for transport

Classification for SEA transport (IMO-IMDG):

Not regulated for transport

Transport in bulk according to Annex I or II of MARPOL 73/78 and the IBC or IGC Code	Consult IMO regulations before transporting ocean bulk

Classification for AIR transport (IATA/ICAO):

Not regulated for transport

This information is not intended to convey all specific regulatory or operational requirements/information relating to this product. Transportation classifications may vary by container volume and may be influenced by regional or country variations in regulations. Additional transportation system information can be obtained through an authorized sales or customer service representative. It is the responsibility of the transporting organization to follow all applicable laws, regulations and rules relating to the transportation of the material.

15. REGULATORY INFORMATION

OSHA Hazard Communication Standard
This product is not a "Hazardous Chemical" as defined by the OSHA Hazard Communication Standard, 29 CFR 1910.1200.

Superfund Amendments and Reauthorization Act of 1986 Title III (Emergency Planning and Community Right-to-Know Act of 1986) Sections 311 and 312
Chronic Health Hazard

Superfund Amendments and Reauthorization Act of 1986 Title III (Emergency Planning and Community Right-to-Know Act of 1986) Section 313
This material does not contain any chemical components with known CAS numbers that exceed the threshold (De Minimis) reporting levels established by SARA Title III, Section 313.

California Proposition 65 (Safe Drinking Water and Toxic Enforcement Act of 1986)
This product contains no listed substances known to the State of California to cause cancer, birth defects or other reproductive harm, at levels which would require a warning under the statute.

Pennsylvania (Worker and Community Right-To-KnowAct): Pennsylvania Hazardous Substances List and/or Pennsylvania Environmental Hazardous Substance List:
The following product components are cited in the Pennsylvania Hazardous Substance List and/or the Pennsylvania Environmental Substance List, and are present at levels which require reporting.

Components	**CASRN**
Isopropylamine	75-31-0

Pennsylvania (Worker and Community Right-To-KnowAct): Pennsylvania Special Hazardous Substances List:
To the best of our knowledge, this product does not contain chemicals at levels which require reporting under this statute.

United States TSCA Inventory (TSCA)
This product contains chemical substance(s) exempt from U.S. EPA TSCA Inventory requirements. It is regulated as a pesticide subject to Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) requirements.

Federal Insecticide, Fungicide and Rodenticide Act
EPA Registration Number: 62719-324
This chemical is a pesticide product registered by the Environmental Protection Agency and is subject to certain labeling requirements under federal pesticide law. These requirements differ from the classification criteria and hazard information required for safety data sheets, and for workplace labels of non-pesticide chemicals. Following is the hazard information as required on the pesticide label:

CAUTION

Harmful if inhaled

16. OTHER INFORMATION

Hazard Rating System
NFPA

Health	Fire	Reactivity
1	2	0

Revision
Identification Number: 101188488 / A211 / Issue Date: 11/10/2015 / Version: 4.0
DAS Code: NAF-552
Most recent revision(s) are noted by the bold, double bars in left-hand margin throughout this document.

Legend

ACGIH	USA. ACGIH Threshold Limit Values (TLV)
OSHA Z-1	USA. Occupational Exposure Limits (OSHA) - Table Z-1 Limits for Air Contaminants
STEL	Short-term exposure limit
TWA	8-hour, time-weighted average

Information Source and References
This SDS is prepared by Product Regulatory Services and Hazard Communications Groups from information supplied by internal references within our company.

DOW AGROSCIENCES LLC urges each customer or recipient of this (M)SDS to study it carefully and consult appropriate expertise, as necessary or appropriate, to become aware of and understand the data contained in this (M)SDS and any hazards associated with the product. The information herein is provided in good faith and believed to be accurate as of the effective date shown above. However, no warranty, express or implied, is given. Regulatory requirements are subject to change and may differ between various locations. It is the buyer's/user's responsibility to ensure that his activities comply with all federal, state, provincial or local laws. The information presented here pertains only to the product as shipped. Since conditions for use of the product are not under the control of the manufacturer, it is the buyer's/user's duty to determine the conditions necessary for the safe use of this product. Due to the proliferation of sources for information such as manufacturer-specific (M)SDSs, we are not and cannot be responsible for (M)SDSs obtained from any source other than ourselves. If you have obtained an (M)SDS from another source or if you are not sure that the (M)SDS you have is current, please contact us for the most current version.

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GROUP 9 HERBICIDE

AquaNeat®

Aquatic Herbicide

FOR USE ON EMERGED AQUATIC WEEDS AND BRUSH IN AQUATIC SITES. FOR USE IN FORESTRY (INCLUDING WEED CONTROL IN CHRISTMAS TREE PLANTATIONS), PASTURES, RANGELANDS, RIGHTS-OF-WAY, HABITAT RESTORATION AREAS, NON-CROP AND OTHER LISTED APPLICATION SITES.

ACTIVE INGREDIENT:	
Glyphosate, N-(phosphonomethyl)glycine, in the form of its isopropylamine salt*	53.8%
OTHER INGREDIENTS:	46.2%
TOTAL:	100.0%

*Contains 648 grams per litre or 5.4 pounds per U.S. gallon of the active ingredient, glyphosate, in the form of its isopropylamine salt. Equivalent to 480 grams per litre or 4 pounds per U.S. gallon of the acid, glyphosate.

KEEP OUT OF REACH OF CHILDREN

CAUTION / PRECAUCION

Si usted no entiende la etiqueta, busque a alguien para que se la explique a usted en detalle.
(If you do not understand the label, find someone to explain it to you in detail.)

SEE INSIDE BOOKLET FOR FIRST AID AND ADDITIONAL PRECAUTIONARY STATEMENTS

EPA Reg. No. 228-365

EPA Est. No. 228-IL-001

For Chemical Spill, Leak, Fire, or Exposure, Call CHEMTREC (800) 424-9300

For Medical Emergencies Only, Call (877) 325-1840

Manufactured for
Nufarm Americas Inc.
11901 S. Austin Avenue
Alsip, IL 60803

Nufarm Grow a better tomorrow.

7 36211 76276 4

Net Contents

2.5 Gal.

(9.46 L)

Nonrefillable Container

14501000 [3]

file: 67720-1_book_art
folder: 67720-1_Nufarm_14501000[3]
colors: black, 348, 4625, 329
barcode: upca, 80%, -39m

created: 03/11/09 md
alt: 06-01-15 jw
size: 5.5"(w) x 6.5"(h)
☐ dp proofed___

PRECAUTIONARY STATEMENTS
HAZARDS TO HUMANS AND DOMESTIC ANIMALS
CAUTION / PRECAUCION

Harmful if inhaled. Avoid breathing spray mist. Remove contaminated clothing and wash clothing before reuse. Wash thoroughly with soap and water after handling.

FIRST AID	
IF INHALED	• Move person to fresh air. • If person is not breathing, call 911 or an ambulance, then give artificial respiration, preferably by mouth-to-mouth, if possible. • Call a poison control center or doctor for further treatment advice.

HOT LINE NUMBER

Have the product container or label with you when calling a poison control center or doctor, or going for treatment.
You may also contact 1-877-325-1840 for emergency medical treatment information.

PERSONAL PROTECTIVE EQUIPMENT (PPE):
Applicators and other handlers must wear long-sleeved shirt and long pants and shoes plus socks. Discard clothing and other absorbent materials that have been drenched or heavily contaminated with this product's concentrate. Do not reuse them. Follow manufacturer's instructions for cleaning/maintaining PPE. If no such instructions for washables exists, use detergent and hot water. Keep and wash PPE separately from other laundry.

Engineering Control Statements: When handlers use closed systems, enclosed cabs, or aircraft in a manner that meets the requirements listed in Worker Protection Standard (WPS) for agricultural pesticides [40 CFR 170.240 (d)], the handler PPE requirements may be reduced or modified as specified in the WPS.

USER SAFETY RECOMMENDATIONS

Users Should:

- Wash hands before eating, drinking, chewing gum, using tobacco, or using the toilet.
- Remove clothing immediately if pesticide gets inside. Then wash thoroughly and put on clean clothing.

ENVIRONMENTAL HAZARDS

For aquatic uses, do not contaminate water when disposing of equipment washwaters. Treatment of aquatic weeds can result in oxygen depletion or loss due to decomposition of dead plants. This oxygen loss can cause fish suffocation.

For terrestrial uses, do not apply directly to water, to areas where surface water is present or to intertidal areas below the mean high water mark.

In case of, SPILL OR LEAK, soak up and remove to a landfill. Do not contaminate water when disposing of equipment washwaters or rinsate.

PHYSICAL OR CHEMICAL HAZARDS

Spray solutions of this product must be mixed, stored and applied using only stainless steel, aluminum, fiberglass, plastic and plastic-lined steel containers.

DO NOT MIX, STORE OR APPLY THIS PRODUCT OR SPRAY SOLUTIONS OF THIS PRODUCT IN GALVANIZED STEEL OR UNLINED STEEL (EXCEPT STAINLESS STEEL) CONTAINERS OR SPRAY TANKS. This product or spray solutions of this product react with such containers and tanks to produce hydrogen gas which may form a highly combustible gas mixture. This gas mixture could flash or explode, causing serious personal injury, if ignited by open flame, spark, welder's torch, lighted cigarette or other ignition source.

DIRECTIONS FOR USE

It is a violation of Federal law to use this product in a manner inconsistent with its labeling.

Do not apply this product in a way that will contact workers or other persons, either directly or through drift. Only protected handlers may be in the area during application. For any requirements specific to your State or Tribe, consult the State or Tribal agency responsible for pesticide regulation.

Read the entire label before using this product. Use strictly in accordance with label precautionary statements and directions.

AGRICULTURAL USE REQUIREMENTS

Use this product only in accordance with its labeling and with the Worker Protection Standard, 40 CFR Part 170. This Standard contains requirements for the protection of agricultural workers on farms, forests, nurseries, and greenhouses, and handlers of agricultural pesticides. It contains requirements for training decontamination, notification, and emergency assistance. It also contains specific instructions and exceptions pertaining to the statements on this label about personal protection equipment (PPE) and Restricted-Entry Interval. The requirements in this box only apply to uses of this product that are covered by the Worker Protection Standard.

Do not enter or allow worker entry into treated areas during the Restricted-Entry Interval (REI) of 4 hours.

PPE required for early entry to treated areas that is permitted under the Worker Protection Standard and that involves contact with anything that has been treated, such as plants, soil, or water, is: coveralls, shoes plus socks, and waterproof gloves.

NON-AGRICULTURAL USE REQUIREMENTS

The requirements in this box apply to uses of this product that are NOT within the scope of the Worker Protection Standard for agricultural pesticides (40 CFR Part 170). The WPS applies when this product is used to produce agricultural plants on farms, forests, nurseries or greenhouses. Keep people and pets off treated areas until spray solution has dried.

PRODUCT INFORMATION

DO NOT APPLY THIS PRODUCT USING AERIAL SPRAY EQUIPMENT EXCEPT UNDER CONDITIONS AS SPECIFIED WITHIN THIS LABEL OR CURRENT SUPPLEMENTAL LABELING ISSUED BY MANUFACTURER.

This product, a water-soluble liquid, mixes readily with water and nonionic surfactant to be applied as a foliar spray after dilution and thoroughly mixing with water in accordance with label instructions for the control or destruction of many herbaceous and woody plants.

Always use the higher rate of this product per acre within the specified range when vegetation is heavy or dense, when treating dense multi-canopied sites, or woody vegetation or difficult-to-control herbaceous or woody plants.

This product moves through the plant from the point of foliage contact to and into the root system. Visible effects on most annual weeds occur within 2 to 4 days but on most perennial brush species may not occur for 7 days or more. Extremely cool or cloudy weather following treatment may slow the activity of this product and delay visual effects of control. Visible effects are a gradual wilting and yellowing of the plant which advances to complete browning of above-ground growth and deterioration of underground plant parts.

Unless otherwise directed on this label, delay application until vegetation has emerged and reached the stages described for control of such vegetation under the “WEEDS CONTROLLED” section of this label.

Unemerged plants arising from unattached underground rhizomes or root stocks of perennials or brush will not be affected by the spray and will continue to grow. For this reason best control of most perennial weeds or brush is obtained when treatment is made at late growth stages approaching maturity.

Do not treat weeds or brush under poor growing conditions such as drought stress, disease or insect damage, as reduced control may result. Reduced results may also occur when treating weeds or brush heavily covered with dust.

Reduced control may result when applications are made to any weed or brush species that have been mowed, grazed or cut, and have not been allowed to regrow to the recommended stage for treatment.

Rainfall or irrigation occurring within 6 hours after application may reduce effectiveness. Heavy rainfall or irrigation within 2 hours after application may wash the product off the foliage and a repeat treatment may be required.

Mixing this product with herbicides or other materials not instructed in this label may result in reduced performance. However, unless otherwise prohibited on this label or the label of an intended tank mix product may be applied in combination with any herbicide registered for the same site, timing, and method of application. Observe the most restrictive label statements of various tank mix products used. TO THE FULLEST EXTENT PERMITTED BY LAW, BUYER AND ALL USERS ARE RESPONSIBLE FOR ALL LOSS OR DAMAGE IN CONNECTION WITH THE USE OR HANDLING OF MIXTURES OF THIS PRODUCT OR OTHER MATERIALS THAT ARE NOT EXPRESSLY SPECIFIED IN THIS LABEL.

For best results, spray coverage must be uniform and complete. Do not spray weed foliage to the point of runoff.

When this product comes in contact with soil (on the soil surface or as suspended soil or sediment in water) it is bound to soil particles. Under labeled use situations, once this product is bound to soil particles, it is not available for plant uptake and will not harm off-site vegetation where roots grow into the treatment area or if the soil is transported off-site. Under labeled use conditions, the strong affinity of this product to soil particles prevents this product from leaching out of the soil profile and entering ground water. The affinity between this product and soil particles remains until this product is degraded, which is primarily a biological degradation process carried out under both aerobic and anaerobic conditions by soil micro flora.

This product does not provide residual weed control. For subsequent residual weed control, follow a label-approved herbicide program. Read and carefully observe the cautionary statements and all other information appearing on the labels of all herbicides used. Read “**WARRANTY DISCLAIMER**” and “**LIMITATION OF LIABILITY**” before buying or using. If items are not acceptable, return at once unopened. Buyer and all users are responsible for all loss or damage in connection with the use of handling of mixtures of this product or other materials that are not expressly specified in this label.

For more product information, call toll-free 1-800-345-3330.

ATTENTION

AVOID CONTACT WITH FOLIAGE, GREEN STEMS, EXPOSED NON-WOODY ROOTS, OR FRUIT OF CROPS, DESIRABLE PLANTS AND TREES, SINCE SEVERE INJURY OR DESTRUCTION MAY RESULT. AVOID DRIFT. EXTREME CARE MUST BE USED WHEN APPLYING THIS PRODUCT TO PREVENT INJURY TO DESIRABLE PLANTS AND CROPS.

Do not allow the herbicide solution to mist, drip, drift or splash onto desirable vegetation since minute quantities of this product can cause severe damage or destruction to the crop, plants or other areas on which treatment was not intended. The likelihood of plant or crop injury occurring from the use of this product is greatest when winds are gusty or in excess of 5 miles per hour or when other conditions, including lesser wind velocities, will allow spray drift to occur. When spraying, avoid combinations of pressure and nozzle type that will result in splatter or fine particles (mist) which are likely to drift. AVOID APPLYING AT EXCESSIVE SPEED OR PRESSURE.

NOTE: Use of this product in any manner not consistent with this label may result in injury to persons, animals or crops, or other unintended consequences. When not in use, keep container closed to prevent spills and contamination.

WEED RESISTANCE

Any weed population may contain plants that are naturally resistant to glyphosate, the active ingredient in this product, and to other herbicides with the same mode of action. ATTENTION: These resistant weed biotypes will not be controlled by this product. Consult advisors such as your local agricultural extension service for agronomic management practices to minimize the occurrence of glyphosate resistance and considerations for supplemental control measures.

Weed Management

To minimize the occurrence of glyphosate-resistant biotypes, observe the following general weed management practices:

- Scout application site before and after herbicide applications.
- Start with a clean application site, using either a burndown herbicide application or tillage.
- Control weeds early when they are relatively small.
- Add other herbicides (e.g. a selective and/or a residual herbicide) and cultural practices (e.g. tillage or crop rotation) where appropriate.
- Utilize the specified label rate for the most difficult to control weed in your field. Avoid tank mixtures with other herbicides that reduce this product's efficacy (through antagonism), or tank mixture directions that encourage application rates of this product below the label directions.
- Control weed escapes and prevent weeds from setting seeds.
- Clean equipment before moving from field to field to minimize the spread of weed seed or plant parts.
- Report any incidence of repeated non-performance of this product on a particular weed to your Nufarm representative, local retailer, or county extension agent.

Management of Glyphosate-Resistant Biotypes

Since the occurrence of new glyphosate-resistant weeds cannot be determined until after product use and scientific confirmation, manufacturer is not responsible for any losses that may result from the failure of this product to control glyphosate-resistant weed biotypes.

The following good agronomic practices are recommended to reduce the spread of confirmed glyphosate-resistant biotypes:

- If a naturally occurring resistant biotype is present in your application site, this product should be tank-mixed or applied sequentially with an appropriately labeled herbicide with a different mode of action to achieve control.
- Cultural and mechanical control practices (e.g. crop rotation or tillage) may also be used as appropriate.
- Scout treated application site after herbicide applications and control escaping weeds including resistant biotypes before they set seed.
- Thoroughly clean equipment before leaving fields known to contain resistant biotypes.

MIXING AND APPLICATION INSTRUCTIONS

APPLY THESE SPRAY SOLUTIONS IN PROPERLY MAINTAINED AND CALIBRATED EQUIPMENT CAPABLE OF DELIVERING DESIRED VOLUMES. HAND-GUN APPLICATIONS MUST BE PROPERLY DIRECTED TO AVOID SPRAYING DESIRABLE PLANTS. NOTE: REDUCED RESULTS MAY OCCUR IF WATER CONTAINING SOIL IS USED, SUCH AS WATER FROM PONDS AND UNLINED DITCHES.

TANK MIXTURES

Always predetermine the compatibility of labeled tank mixtures of this product with water carrier by mixing small proportional quantities in advance. Mix labeled tank mixtures of this product with water as follows:

1. Place a 20 to 35 mesh screen or wetting basket over filling port.
2. Through the screen, fill the spray tank one-half full with water and start agitation.
3. If a wettable powder is used, make a slurry with the water carrier, and add it SLOWLY through the screen into the tank. Continue agitation.
4. If a flowable formulation is used, premix one part flowable with one part water. Add diluted mixture SLOWLY through the screen into the tank. Continue agitation.
5. If an emulsifiable concentrate formulation is used, premix one part emulsifiable concentrate with two parts water. Add diluted SLOWLY through the screen into the tank. Continue agitation.
6. Continue filling the spray tank with water and add the required amount of this product near the end of the filling process.
7. Where nonionic surfactant is recommended, add this to the spray tank before completing the filling process.
8. Add individual formulations to the spray tank as follows: wettable powder, flowable, emulsifiable concentrate, drift control additive, water soluble liquid followed by surfactant.

Maintain good agitation at all times until the contents of the tank are sprayed. If the spray mixture is allowed to settle, thorough agitation is required to resuspend the mixture before spraying is resumed. To prevent or minimize foam, avoid the use of mechanical agitators, place the filling hose below the surface of the spray solution, terminate by-pass and return lines at the bottom of the tank and if needed use an approved anti-foam or defoaming agent.

Use screen size in nozzle or line strainers that are no finer than 50 mesh. Carefully select proper nozzle to avoid spraying a fine mist. For best results with conventional ground application equipment, use flat fan nozzles.

Clean sprayer and parts immediately after using this product by thoroughly flushing with water.

For best results with conventional ground application equipment, use flat fan nozzles. Check for even distribution of spray droplets.

When using this product, mix 2 or more quarts of a nonionic surfactant per 100 gallons of spray solution. Use a nonionic surfactant labeled for use with herbicides. The surfactant must contain 50 percent or more active ingredient.

Always read and follow the manufacturer's surfactant label instructions for best results.

Do not use surfactants in excess of 1 quart per acre when making broadcast applications.

Colorants or marking dyes approved for use with herbicides may be added to spray mixtures of this product. Colorants or dyes used in spray solutions of this product may reduce performance, especially at lower rates or dilutions. Use colorants or dyes according to the manufacturer's label instructions.

Clean sprayer and parts immediately after using this product by thoroughly flushing with water and dispose of rinsate according to labeled use or disposal instructions.

Carefully observe all cautionary statements and other information appearing in the surfactant label.

APPLICATION EQUIPMENT AND TECHNIQUES

This product may be applied with the following application equipment:

Broadcast Spray

Controlled Droplet Applicator (CDA) - Hand-held or boom-mounted applicators which produce a spray consisting of a narrow range of droplet sizes.

Hand-Held and High-Volume Spray Equipment* - Knapsack and backpack sprayers, pump-up pressure sprayers, handguns, handwands, lances and other hand-held and motorized spray equipment used to direct the spray onto weed foliage.

*This product is not registered in California or Arizona for use in mistblowers.

Selective Equipment - Recirculating sprayers and wiper applicators. See the appropriate part of this section for specific instructions and rates of application.

Aerial - Fixed Wing and Helicopter

APPLICATION INFORMATION

Observe the following directions to minimize off-site movement during aerial application of this herbicide. Minimization of off-site movement is the responsibility of the grower, Pest Control Advisor, and aerial applicator.

BOOM EQUIPMENT

For control of weed or brush species listed in this label using conventional boom equipment - Use the specified rates of this product and surfactant in 3 to 30 gallons of water per acre as a broadcast spray, unless otherwise specified. See the "WEEDS CONTROLLED" section of this label for specific rates. As density of vegetation increases, spray volume may be increased within the specified range to ensure complete coverage. Carefully select correct nozzle to avoid spraying a fine mist. For best results with ground application equipment, use flat fan nozzles. Check for even distribution of spray droplets.

HAND-HELD AND HIGH-VOLUME EQUIPMENT

Use Coarse Sprays Only

For control of weeds listed in this label using knapsack sprayers or high-volume spraying equipment utilizing handguns or other suitable nozzle arrangements - Prepare a 0.75 to 2 percent solution of this product in water, add a nonionic surfactant and apply to foliage of vegetation to be controlled. For specific rates of application and instructions for control of various annual and perennial weeds, see the "WEEDS CONTROLLED" section in this label.

Apply on a spray-to-wet basis so that the spray coverage is uniform and complete. Do not spray to point of runoff.

This product may be used as a 5 to 8 percent solution plus 0.5 to 1 fluid ounce non-ionic surfactant per gallon spray solution for low-volume directed sprays for spot treatment of trees and brush. It is most effective in areas where there is a low density of undesirable trees or brush. If a straight stream nozzle is used, start the application at the top of the targeted vegetation and spray from top to bottom in a lateral zig-zag motion. Ensure that at least 50 percent of the leaves are contacted by the spray solution. For flat fan and cone nozzles and with hand-directed mist blowers, mist the application over the foliage of the targeted vegetation. Small, open-branched trees need only be treated from one side. If the foliage is thick or there are multiple root sprouts, applications must be made from several sides to ensure adequate spray coverage.

For use in knapsack sprayers, it is suggested that the specified amount of this product be mixed with water in a large container. Fill sprayer with the mixed solution and add the correct amount of surfactant.

Prepare the desired volume of spray solution by mixing the amount of this product in water as shown in the following table:

SPRAY SOLUTION

DESIRED VOLUME	AMOUNT OF PRODUCT					
	0.75%	1.0%	1.25%	1.5%	5.0%	8.0%
1 Gallon	1.0 fl. oz.	1.33 fl. oz.	1.66 fl. oz.	2.0 fl. oz.	6.0 fl. oz.	10.25 fl. oz.
25 Gallons	1.5 pts.	1.0 qt.	1.25 qts.	1.5 qts.	5.0 qts.	2.0 gals.
100 Gallons	3.0 qts.	1.0 gal.	1.25 gals.	1.5 gals.	5.0 gals.	8.0 gals.

2 Tablespoons = 1 fluid ounce

SELECTIVE EQUIPMENT

For terrestrial application, this product may be applied through a shielded applicator, or a wiper applicator after dilution and thorough mixing with water to listed weeds growing in any non-crop site specified on this label.

- A shielded applicator directs the herbicide solution onto weeds, while shielding desirable vegetation from the herbicide.
- A wiper applicator applies the herbicide solution onto weeds by rubbing the weed with an absorbent material containing the herbicide solution.

AVOID CONTACT WITH DESIRABLE VEGETATION.

This section summarizes the general weed control spectrum and rates of application for this herbicide. Additional information specific to individual use patterns is detailed in following sections.

AERIAL EQUIPMENT

Use the specified rates of this product and surfactant in 3 to 20 gallons of water per acre as a broadcast spray, unless otherwise specified. See the "WEEDS CONTROLLED" section of this label for specific rates. Unless otherwise specified, do not exceed 1.5 pints per acre. Aerial applications of this product may only be made as specified in this label.

AVOID DRIFT - DO NOT APPLY DURING LOW-LEVEL INVERSION CONDITIONS, WHEN WINDS ARE GUSTY OR UNDER ANY OTHER CONDITION WHICH WILL ALLOW DRIFT. DRIFT MAY CAUSE DAMAGE TO ANY VEGETATION CONTACTED TO WHICH TREATMENT IS NOT INTENDED. TO PREVENT INJURY TO ADJACENT DESIRABLE VEGETATION, APPROPRIATE BUFFER ZONES MUST BE MAINTAINED.

Coarse sprays are less likely to drift; therefore, do not use nozzles or nozzle configurations which dispense spray as fine spray droplets. Do not angle nozzles forward into the airstream and do not increase spray volume by increasing nozzle pressure above the manufacturer's instructions.

Drift control additives may be used. When a drift control additive is used, read and carefully observe the precautionary statements and all other information appearing in the additive label.

Ensure uniform application - To avoid streaked, uneven or overlapped application, use appropriate marking devices.

Thoroughly wash aircraft, especially landing gear, after each day of spraying to remove residues of this product accumulated during spraying or from spills. PROLONGED EXPOSURE OF THIS PRODUCT TO UNCOATED STEEL SURFACES MAY RESULT IN CORROSION AND POSSIBLE FAILURE OF THE PART. LANDING GEAR ARE MOST SUSCEPTIBLE. The maintenance of an organic coating (paint) which meets aerospace specification MIL-C-38413 may prevent corrosion.

For use of this product by air in California see additional instructions in "FOR AERIAL APPLICATION IN CALIFORNIA ONLY" Section.

FOR AERIAL APPLICATION IN CALIFORNIA ONLY

EXTREME CARE MUST BE EXERCISED TO AVOID CONTACT OF SPRAY WITH FOLIAGE, GREEN STEMS, OR FRUIT OF DESIRABLE CROPS, PLANTS, TREES, OR OTHER DESIRABLE VEGETATION SINCE SEVERE DAMAGE OR DESTRUCTION MAY RESULT.

Written Directions

A written direction MUST be submitted by or on behalf of the applicator to the Fresno County Agricultural Commissioner 24 hours prior to the application. This written direction MUST state the proximity of surrounding crops, and that conditions of each manufacturer's applicable product label(s) and this label have been satisfied.

Aerial Applicator Training and Equipment

Aerial application of this herbicide is limited to pilots who have successfully completed a Fresno County Agricultural Commissioner and California Department of Pesticide Regulation approved training program for aerial application of herbicides. All aircraft must be inspected, critiqued in flight, and certified at a Fresno County Agricultural Commissioner approved fly-in. Test and calibrate spray equipment at intervals sufficient to insure that proper rates of herbicides and adjuvants are being applied during commercial use. Applicator must document such calibrations and testing. Demonstration of performance at Fresno County Agricultural Commissioner approved "fly-ins" constitutes such documentation, or other written records showing calculations and measurements of flight and spray parameters acceptable to the Fresno County Agricultural Commissioner.

Application at night
Do not apply this product by air earlier than 30 minutes prior to sunrise and/or later than 30 minutes after sunset without prior permission from the Fresno County Agricultural Commissioner.

Aquatic and Other Noncrop Sites
When applied as directed and under the conditions described in the "Weeds Controlled" section of the label booklet for this product, this herbicide will control or partially control the labeled weeds growing in the following industrial, recreational and public areas, or other similar sites.

Aquatic Sites-including all bodies of fresh and brackish water which may be flowing, nonflowing or transient. This includes lakes, rivers, streams, ponds, seeps, irrigation and drainage ditches, canals, reservoirs, estuaries and similar sites.

If aquatic sites are present in the noncrop areas and are part of the intended treatment, read and observe the following directions: There is no limit on the use of treated water for irrigation, recreation or domestic purposes.

Consult local state fish and game agency and water control authorities before applying this product to public water. Permits may be required to treat such water.

NOTE: Do not apply this product within 1/2 mile upstream of an active potable water intake in flowing water (i.e., river, stream, etc.) or within 1/2 mile of an active potable water intake in a standing body of water such as a lake, pond or reservoir. To make aquatic applications around and within 1/2 mile of active potable water intakes, the water intake must be turned off for a minimum period of 48 hours after the application. The water intake may be turned on prior to 48 hours if the glyphosate level in the intake water is below 0.7 parts per million as determined by laboratory analysis. These aquatic applications may be made ONLY in those cases where there are alternative water sources or holding ponds which would permit the turning off of an active potable water intake for a minimum period of 48 hours after application.

This product does not control plants which are completely submerged or have a majority of their foliage underwater.

AVOID DRIFT - DO NOT APPLY WHEN WINDS ARE GUSTY OR UNDER ANY OTHER CONDITION WHICH WILL ALLOW DRIFT. DRIFT MAY CAUSE DAMAGE TO ANY VEGETATION CONTACTED TO WHICH TREATMENT IS NOT INTENDED. TO PREVENT INJURY TO ADJACENT DESIRABLE VEGETATION, APPROPRIATE BUFFER ZONES MUST BE MAINTAINED.

Use the following guidelines when aerial applications are made near crops or desirable perennial vegetation after bud break and before total leaf drop, and/or near other desirable vegetation or annual crops.
1. Do not apply within 100 feet of all desirable vegetation or crop(s).
2. If wind up to 5 miles per hour is blowing toward desirable vegetation or crop(s), do not apply within 500 feet of the desirable vegetation or crop(s).
3. Winds blowing from 5 to 10 miles per hour toward desirable vegetation or crop(s) may require buffer zones in excess of 500 feet.
4. Do not apply when winds are in excess of 10 miles per hour or when inversion conditions exist.

FOR AERIAL APPLICATION IN FRESNO COUNTY, CALIFORNIA ONLY

(From February 15 through March 31 only)

For aerial application outside of these dates (April 1 through February 14), refer to the "FOR AERIAL APPLICATION IN CALIFORNIA ONLY" section printed above.

Applicable Area
This supplement only applies to the area contained inside the following boundaries within Fresno County, California only.
North: Fresno County line
South: Fresno County line
East: State Highway 99
West: Fresno County line

Information
Always read and follow the label directions and precautionary statements for all products used in the aerial application. Observe the following directions to minimize off-site movement during aerial application of this product. Minimization of off-site movement is the responsibility of the grower, Pest Control Advisor and aerial applicator.

Written directions MUST be submitted by or on behalf of the applicator to the Fresno County Agricultural Commissioner 24 hours prior to the application. This written direction MUST state the proximity of surrounding crops, and that conditions of each manufacturer's product label and this label have been satisfied.

Aerial Applicator Training and Equipment
Aerial application of this product is limited to pilots who have successfully completed a Fresno County Agricultural Commissioner and California Department of Pesticide Regulation approved training program for aerial application of herbicides. All aircraft must be inspected, critiqued in flight and certified at a Fresno County Agricultural Commissioner approved fly-in. Test and calibrate spray equipment at intervals sufficient to insure that proper rates of herbicides and adjuvants are being applied during commercial use. Applicator must document such calibrations and testing. Demonstration of performance at Fresno County Agricultural Commissioner approved fly-ins constitutes such documentation, or other written records showing calculations and measurements of flight and spray parameters acceptable to the Fresno County Agricultural Commissioner.

Applications at Night—Do not apply this product by air earlier than 30 minutes prior to sunrise and/or later than 30 minutes after sunset without prior permission from the Fresno County Agricultural Commissioner.

For aerial application from April 1 through February 14, refer to the "FOR AERIAL APPLICATION IN CALIFORNIA ONLY" section printed above.

SPRAY DRIFT MANAGEMENT

Avoiding spray drift at the application site is the responsibility of the applicator. The interaction of many equipment and weather related factors determine the potential for spray drift. The applicator and the grower are responsible for considering all these factors when making decisions. The following drift management requirements must be followed to avoid off-target drift movement from aerial applications. These requirements do not apply to forestry applications, public health uses or to applications using dry formulations.

1. The distance of the outer most operating nozzles on the boom must not exceed 3/4 the length of the rotor.
2. Nozzles must always point backward parallel with the air stream and never be pointed downward more than 45 degrees. Where states have more stringent regulations, they must be observed.

The applicator must be familiar with and take into account the information covered in the Aerial Drift Reduction Advisory Information.

Importance of Droplet Size

The most effective way to reduce drift potential is to apply large droplets. The best drift management strategy is to apply the largest droplets that provide sufficient coverage and control. Applying larger droplets reduces drift potential, but will not prevent drift if applications are made improperly, or under unfavorable environmental conditions (see Wind, Temperature and Humidity, and Temperature Inversions sections of this label).

Controlling Droplet Size

- **Volume -** Use high flow rate nozzles to apply the highest practical spray volume. Nozzles with higher rated flows produce larger droplets.
- **Pressure -** Do not exceed the nozzle manufacturer's specified pressures. For many nozzle types, lower pressure produces larger droplets. When higher flow rates are needed, use higher flow rate nozzles instead of increasing pressure. Higher pressure reduces droplet size and does not improve canopy protection.
- **Number of Nozzles -** Use the minimum number of nozzles that provide uniform coverage.
- **Nozzle Orientation -** Orienting nozzles so that the spray is released backwards, parallel to the air stream produces larger droplets than other orientations. Significant deflection from horizontal will reduce droplet size and increase drift potential.
- **Nozzle Type -** Use a nozzle type that is designed for the intended application. With most nozzle types, narrower spray angles produce larger droplets. Consider using low-drift nozzles. Solid stream nozzles oriented straight back produce the largest droplets and the lowest drift.
- **Boom Length -** For some use patterns, reducing the effective boom length to less than 3/4 of the wingspan or rotor length may further reduce drift without reducing swath width.
- **Application Height -** Applications must not be made at a height greater than 10 feet above the top of the largest plants unless a greater height is required for aircraft safety. Making applications at the lowest height that is safe reduces exposure of droplets to evaporation and wind.

Swath Adjustment

When applications are made with a crosswind, the swath will be displaced downwind. Therefore, on the up and downwind edges of the field, the applicator must compensate for this displacement by adjusting the path of the aircraft upwind. Swath adjustment distance must increase, with increasing drift potential (higher wind, smaller drops, etc.).

Wind

Drift potential is lowest between wind speeds of 2-10 mph. However, many factors, including droplet size and equipment type, determine drift potential at any given speed. Do not make applications when wind speed is below 2 mph due to variable wind direction and high inversion potential. Note: Local terrain can influence wind patterns. Every applicator must be familiar with local wind patterns and how they affect spray drift.

Temperature and Humidity

When making applications in low relative humidity, set up equipment to produce larger droplets to compensate for evaporation. Droplet evaporation is most severe when conditions are both hot and dry.

Temperature Inversions

Applications must not occur during a local, low level temperature inversion because drift potential is high. Temperature inversions restrict vertical air mixing, which causes small suspended droplets to remain in a concentrated cloud. This cloud can move in unpredictable directions due to the light variable winds common during inversions. Temperature inversions are characterized by increasing temperatures with altitude and are common on nights with limited cloud cover and light to no wind. They begin to form as the sun sets and often continue into the morning. Their presence can be indicated by ground fog; however, if fog is not present, inversions can also be identified by the movement of the smoke from a ground source or an aircraft smoke generator. Smoke that layers and moves laterally in a concentrated cloud (under low wind conditions) indicates an inversion, while smoke that moves upward and rapidly dissipates indicates good vertical air mixing.

Sensitive Areas
Only make applications when the potential for drift to adjacent sensitive areas (e.g., residential areas, bodies of water, known habitat for threatened or endangered species, non-target crops) is minimal (e.g. when wind is blowing away from the sensitive areas).

WEEDS CONTROLLED

ANNUAL WEEDS
Apply to actively growing annual grasses and broadleaf weeds.

Allow at least 3 days after application before disturbing treated vegetation. After this period the weeds may be mowed, tilled or burned. See "DIRECTIONS FOR USE", "PRODUCT INFORMATION" and "MIXING AND APPLICATION INSTRUCTIONS" for labeled uses and specific application instructions.

Broadcast Application - Use 1-1/2 pints of this product per acre plus 2 or more quarts of a nonionic surfactant per 100 gallons of spray solution, if weeds are less than 6 inches tall. If weeds are greater than 6 inches tall, use 2-1/2 pints of this product per acre plus 2 or more quarts of an approved nonionic surfactant per 100 gallons of spray solution.

Hand-Held, High-Volume Application - Use a 3/4 percent solution of this product in water plus 2 or more quarts of a nonionic surfactant per 100 gallons of spray solution and apply to foliage of vegetation to be controlled.

When applied as directed under the conditions described in this label, this product plus nonionic surfactant WILL CONTROL the following ANNUAL WEEDS:

Balsamapple**
Momordica charantia
Barley
Hordeum vulgare
Barnyardgrass
Echinochloa crus-galli
Bassia, fivehook
Bassia hyssopifolia
Bluegrass, annual
Poa annua
Bluegrass, bulbous
Poa bulbosa
Brome*
Bromus spp.
Buttercup
Ranunculus spp.
Cheat
Bromus secalinus
Chickweed, mouseear
Cerastium vulgatum
Cocklebur
Xanthium strumarium
Corn, volunteer
Zea mays
Crabgrass
Digitaria spp.
Dwarf dandelion
Krigia cespitosa
False dandelion
Krigia cespitosa
Falseflax, smallseed
Camelina microcarpa
Fiddleneck*
Amsinckia spp.
Flax leaf fleabane*
Conyza bonariensis
Fleabane
Erigeron spp.
Foxtail
Setaria spp.
Foxtail, Carolina
Alopecurus carolinianus
Groundsel, common
Senecio vulgaris
Horseweed/Marestail
Conyza canadensis
Kochia*
Kochia scoparia
Lambsquarters, common
Chenopodium album
Lettuce, prickly*
Lactuca serriola
Morningglory
Ipomoea spp.
Mustard, blue
Chorispora tenella
Mustard, tansy
Descurainia pinnata
Mustard, tumble
Sisymbrium altissimum
Mustard, wild
Sinapis arvensis
Oats, wild
Avena fatua
Panicum*
Panicum spp.
Pennycress, field
Thlaspi arvense
Pigweed, redroot
Amaranthus retroflexus
Pigweed, smooth
Amaranthus hybridus
Ragweed, common*
Ambrosia artemisiifolia
Ragweed, giant*
Ambrosia trifida
Rocket, London
Sisymbrium irio
Rye
Secale cereale
Ryegrass, Italian*
Lolium multiflorum
Sandbur, field
Cenchrus spp.
Shattercane
Sorghum bicolor
Shepherd's-purse
Capsella bursa-pastoris
Signalgrass, broadleaf
Brachiaria platyphylla
Smartweed, Pennsylvania
Polygonum pensylvanicum
Sowthistle, annual*
Sonchus oleraceus
Spanishneedles*
Bidens bipinnata
Spurry, umbrella
Holosteum umbellatum
Stinkgrass
Eragrostis cilianensis
Sunflower*
Helianthus annuus
Thistle, Russian
Salsola kali
Velvetleaf*
Abutilon theophrasti
Wheat
Triticum aestivum
Witchgrass
Panicum capillare

*Apply 3 pints of this product per acre.
**Apply with hand-held equipment only.

Annual weeds will generally continue to germinate from seed throughout the growing season. Repeat treatments will be necessary to control later germinating weeds.

PERENNIAL WEEDS

Apply this product as follows to control or destroy most vigorously growing perennial weeds. Unless otherwise directed, allow at least 7 days after application before disturbing vegetation.

See individual control instructions for specific weeds following the table. For other perennials listed on this label, apply 4-1/2 to 7-1/2 pints of product per acre as a broadcast spray or as a 3/4 to 1-1/2 percent solution with hand-held equipment. Apply when target plants are actively growing and most have reached early head or early bud stage of growth.

Add 2 or more quarts of a nonionic surfactant per 100 gallons of spray solution to the rates of this product given in this list. See the "PRODUCT INFORMATION", "DIRECTIONS FOR USE" and "MIXING AND APPLICATION" sections in this label for specific uses and application instructions.

NOTE: If weeds have been mowed or tilled, do not treat until regrowth has reached the recommended stages. Fall treatments must be applied before a killing frost.

Repeat treatments may be necessary to control weeds regenerating from underground parts or seed.

When applied as specified under the conditions described, this product plus surfactant WILL CONTROL the following PERENNIAL WEEDS:

Alfalfa
Medicago sativa
Alligatorweed*
Alternanthera philoxeroides
Anise/Fennel
Foeniculum vulgare
Artichoke, Jerusalem
Helianthus tuberosus
Bahiagrass
Paspalum notatum
Bermudagrass
Cynodon dactylon
Bindweed, field
Convolvulus arvensis
Bluegrass, Kentucky
Poa pratensis
Blueweed, Texas
Helianthus ciliaris
Brackenfern
Pteridium spp.
Bromegrass, smooth
Bromus inermis
Canarygrass, reed
Phalaris arundinacea
Cattail
Typha spp.
Clover, red
Trifolium pratense
Clover, white
Trifolium repens
Cogongrass
Imperata cylindrica
Cordgrass
Spartina spp.
Cutgrass, giant*
Zizaniopsis miliacea
Dallisgrass
Paspalum dilatatum
Dandelion
Taraxacum officinale
Dock, curly
Rumex crispus
Dogbane, hemp
Apocynum cannabinum
Fescue
Festuca spp.
Fescue, tall
Festuca arundinacea
Guineagrass
Panicum maximum
Hemlock, poison
Conium maculatum
Horsenettle
Solanum carolinense
Horseradish
Armoracia rusticana
Ice Plant
Mesembryanthemum crystallinum
Johnsongrass
Sorghum halepense
Kikuyugrass
Pennisetum clandestinum
Knapweed
Centaurea repens
Lantana
Lantana camara
Lespedeza: common, services
Lespedeza striata
Lespedeza cuneata
Loosestrife, purple
Lythrum salicaria
Lotus, American
Nelumbo lutea
Maidencane
Panicum hematomon
Milkweed
Asclepias spp.
Muhly, wirestem
Muhlenbergia frondonsa
Mullein, common
Verbascum thapsus
Napiergrass
Pennisetum purpureum
Nightshade, silverleaf
Solanum elaeagnifolium
Nutsedge: purple, yellow
Cyperus rotundus
Cyperus esculentus
Orchardgrass
Dactylis glomerata
Pampas grass
Cortaderia jubata
Paragrass
Brachiaria mutica
Phragmites**
Phragmites spp.
Quackgrass
Agropyron repens
Reed, giant
Arundo donax
Ryegrass, perennial
Lolium perenne
Smartweed, swamp
Polygonum coccineum
Spatterdock
Nuphar luteum
Starthistle, yellow
Centaurea solstitalis
Sweet potato, wild*
Ipomoea pandurata
Thistle, artichoke
Cynara cardunculus
Thistle, Canada
Cirsium arvense
Timothy
Phleum pratense
Torpedograss*
Panicum repens
Tules, common
Scirpus acutus
Vaseygrass
Paspalum urvillei
Velvetgrass
Holcus spp.
Waterhyacinth
Eichornia crassipes
Waterlettuce
Pistia stratiotes
Waterprimrose
Ludwigia spp.
Wheatgrass, western
Agropyron smithii

*Partial control.
**Partial control in southeastern states. See specific instructions below.

Alligatorweed - Apply 6 pints of this product per acre as a broadcast spray or as a 1-1/4 percent solution with hand-held equipment to provide partial control of alligatorweed. Apply when most of the target plants are in bloom. Repeat applications will be required to maintain such control.

Bermudagrass - Apply 7-1/2 pints of this product per acre as a broadcast spray or as a 1-1/2 percent solution with hand-held equipment. Apply when target plants are actively growing and when seedheads appear.

Bindweed, field/Silverleaf Nightshade/Texas Blueweed - Apply 6 to 7-1/2 pints of this product per acre as a broadcast spray west of the Mississippi River and 4-1/2 to 6 pints of this product per acre east of the Mississippi River. With hand-held equipment, use a 1-1/2 percent solution. Apply when target plants are actively growing and are at or beyond full bloom. For silverleaf nightshade, best results can be obtained when application is made after berries are formed. Do not treat when weeds are under drought stress. New leaf development indicates active growth. For best results apply in late summer or fall.

Brackenfern - Apply 4-1/2 to 6 pints of this product per acre as a broadcast spray or as a 3/4 to 1 percent solution with hand-held equipment. Apply to fully expanded fronds which are at least 18 inches long.

Cattail - Apply 4-1/2 to 6 pints of this product per acre as a broadcast spray or as a 3/4 percent solution with hand-held equipment. Apply when target plants are actively growing and are at or beyond the early-to-full bloom stage of growth. Best results are achieved when application is made during the summer or fall months.

Cogongrass - Apply 4-1/2 to 7-1/2 pints of this product per acre as a broadcast spray. Apply when cogongrass is at least 18 inches tall and actively growing in late summer or fall. Allow 7 or more days after application before tillage or mowing. Due to uneven stages of growth and the dense nature of vegetation preventing good spray coverage, repeat treatments may be necessary to maintain control.

Cordgrass - Apply 4-1/2 to 7-1/2 pints of this product per acre as a broadcast spray or as a 1 to 2 percent solution with hand-held equipment. Schedule applications in order to allow 6 hours before treated plants are covered by tidewater. The presence of debris and silt on the cordgrass plants will reduce performance. It may be necessary to wash targeted plants prior to application to improve uptake of this product into the plant.

Cutgrass, giant - Apply 6 pints of this product per acre as a broadcast spray or as a 1 percent solution with hand-held equipment to provide partial control of giant cutgrass. Repeat applications will be required to maintain such control, especially where vegetation is partially submerged in water. Allow for substantial regrowth to the 7- to 10-leaf stage prior to retreatment.

Dogbane, hemp/Knapweed/Horseradish - Apply 6 pints of this product per acre as a broadcast spray or as a 1-1/2 percent solution with hand-held equipment. Apply when target plants are actively growing and most have reached the late bud-to-flower stage of growth. For best results, apply in late summer or fall.

Fescue, tall - Apply 4-1/2 pints of this product per acre as a broadcast spray or as a 1 percent solution with hand-held equipment. Apply when target plants are actively growing and most have reached the boot-to-head stage of growth. When applied prior to the boot stage, less desirable control may be obtained.

Guineagrass - Apply 4-1/2 pints of this product per acre as a broadcast spray or as a 3/4 percent solution with hand-held equipment. Apply when target plants are actively growing and when most have reached at least the 7-leaf stage of growth.

Johnsongrass/Bluegrass, Kentucky/Bromegrass, smooth/Canarygrass, reed/Orchardgrass/Ryegrass, perennial/Timothy/Wheatgrass, western - Apply 3 to 4-1/2 pints of this product per acre as a broadcast spray or as a 3/4 percent solution with hand-held equipment. Apply when target plants are actively growing and most have reached the boot-to-head stage of growth. When applied prior to the boot stage, less desirable control may be obtained. In the fall, apply before plants have turned brown.

Lantana - Apply this product as a 3/4 to 1 percent solution with hand-held equipment. Apply to actively growing Lantana at or beyond the bloom stage of growth. Use the higher application rate for plants that have reached the woody stage of growth.

Loosestrife, purple - Apply 4 pints of this product per acre as a broadcast spray or as a 1 to 1-1/2 percent solution using hand-held equipment. Treat when plants are actively growing at or beyond the bloom stage of growth. Best results are achieved when application is made during summer or fall months. Fall treatments must be applied before a killing frost.

Lotus, American - Apply 4 pints of this product per acre as a broadcast spray or as a 3/4 percent solution with hand-held equipment. Treat when plants are actively growing at or beyond the bloom stage of growth. Best results are achieved when application is made during summer or fall months. Fall treatments must be applied before a killing frost. Repeat treatment may be necessary to control regrowth from underground parts and seeds.

Maidencane/Paragrass - Apply 6 pints of this product per acre as a broadcast spray or as a 3/4 percent solution with hand-held equipment. Repeat treatments will be required, especially to vegetation partially submerged in water. Under these conditions, allow for regrowth to the 7- to 10-leaf stage prior to retreatment.

Milkweed, common - Apply 4-1/2 pints of this product per acre as a broadcast spray or as a 1-1/2 percent solution with hand-held equipment. Apply when target plants are actively growing and most have reached the late bud-to-flower stage of growth.

Nutsedge: purple, yellow - Apply 4-1/2 pints of this product per acre as a broadcast spray, or as a 3/4 percent solution with hand-held equipment to control existing nutsedge plants and immature nutlets attached to treated plants. Apply when target plants are in flower or when new nutlets can be found at rhizome tips. Nutlets which have not germinated will not be controlled and may germinate following treatment. Repeat treatments will be required for long-term control.

Pampasgrass - Apply a 1-1/2 percent solution of this product with hand-held equipment when plants are actively growing.

Phragmites - For partial control of phragmites in Florida and the counties of other states bordering the Gulf of Mexico, apply 7-1/2 pints per acre as a broadcast spray or apply a 1-1/2 percent solution with hand-held equipment. In other areas of the U.S., apply 4 to 6 pints per acre as a broadcast spray or apply a 3/4 percent solution with hand-held equipment for partial control. For best results, treat during late summer or fall months when plants are actively growing and in full bloom. Due to the dense nature of the vegetation, which may prevent good spray coverage and uneven stages of growth, repeat treatments may be necessary to maintain control. Visual control symptoms will be slow to develop.

Quackgrass/Kikuyugrass/Muhly, wirestem - Apply 3 to 4-1/2 pints of this product per acre as a broadcast spray or as a 3/4 percent solution with hand-held equipment when most quackgrass or wirestem muhly is at least 8 inches in height (3- to 4-leaf stage of growth) and actively growing. Allow 3 or more days after application before tillage.

Reed, giant/ice plant - For control of giant reed and ice plant, apply a 1-1/2 percent solution of this product with hand-held equipment when plants are actively growing. For giant reed, best results are obtained when applications are made in late summer to fall.

Spatterdock - Apply 6 pints of this product per acre as a broadcast spray or as a 3/4 percent solution with hand-held equipment. Apply when most plants are in full bloom. For best results, apply during the summer or fall months.

Sweet potato, wild - Apply this product as a 1-1/2 percent solution using hand-held equipment. Apply to actively growing weeds that are at or beyond the bloom stage of growth. Repeat applications will be required. Allow the plant to reach the recommended stage of growth before retreatment.

Thistle: Canada, artichoke - Apply 3 to 4-1/2 pints of this product per acre as a broadcast spray or as a 1-1/2 percent solution with hand-held equipment for Canada thistle. To control artichoke thistle, apply a 2 percent solution as a spray to wet application. Apply when target plants are actively growing and are at or beyond the bud stage of growth.

Torpedograss - Apply 6 to 7-1/2 pints of this product per acre as a broadcast spray or as a 3/4 to 1-1/2 percent solution with hand-held equipment to provide partial control of torpedograss. Use the lower rates under terrestrial conditions, and the higher rates under partially submerged or a floating mat condition. Repeat treatments will be required to maintain such control.

Tules, common - Apply this product as a 1-1/2 percent solution with hand-held equipment. Apply to actively growing plants at or beyond the seedhead stage of growth. After application, visual symptoms will be slow to appear and may not occur for 3 or more weeks.

Waterhyacinth - Apply 5 to 6 pints of this product per acre as a broadcast spray or apply a 3/4 to 1 percent solution with hand-held equipment. Apply when target plants are actively growing and at or beyond the early bloom stage of growth. After application, visual symptoms may require 3 or more weeks to appear with complete necrosis and decomposition usually occurring within 60 to 90 days. Use the higher rates when more rapid visual effects are desired.

Waterlettuce - For control, apply a 3/4 to 1 percent solution using hand-held equipment to actively growing plants. Use higher rates where infestations are heavy. Best results are obtained from mid-summer through winter applications. Spring applications may require retreatment.

Waterprimrose - Apply this product as a 3/4 percent solution using hand-held equipment. Apply to plants that are actively growing at or beyond the bloom stage of growth, but before fall color changes occur. Thorough coverage is necessary for best control.

Other perennials listed on this label - Apply 4-1/2 to 7-1/2 pints of this product per acre as a broadcast spray or as a 3/4 to 1-1/2 percent solution with hand-held equipment. Apply when target plants are actively growing and most have reached early head or early bud stage of growth.

WOODY BRUSH AND TREES

See individual control instructions for specific woody brush and trees to be controlled in the following table. For partial control of other woody brush and trees listed in the table, apply 1.5 to 7.5 quarts of this product per acre as a broadcast spray or as a 0.75 to 10 percent solution with hand-held equipment.

Apply the specified rate of this product plus 2 or more quarts of a nonionic surfactant per 100 gallons of spray solution when plants are actively growing and, unless otherwise directed, after full-leaf expansion. Use the higher rate for larger plants and/or dense areas of growth. On vines, use the higher rate for plants that have reached the woody stage of growth. Best results are obtained when application is made in late Summer or Fall after fruit formation.

Applied as a 5 to 8 percent solution as a directed application as described in the "HAND-HELD AND HIGH-VOLUME EQUIPMENT" section, this product will control or partially control all species listed in this section of the label. Use the higher rate of application for dense stands and larger woody brush and trees.

In arid areas, best results are obtained when application is made in the Spring or early Summer when brush species are at high moisture content and are flowering. Ensure thorough coverage when using hand-held equipment. Symptoms may not appear prior to frost or senescence with Fall treatment.

Allow 7 or more days after application before mowing or removal. Repeat treatments may be necessary to control plants regenerating from underground parts or seed. Some autumn colors on undesirable deciduous species are acceptable provided no major leaf drop has occurred. Reduced performance may result if Fall treatments are made following a frost.

Application Rates[1]

METHOD OF APPLICATION	APPLICATION RATE	SPRAY VOLUME (Gallons/Acre)
Broadcast Aerial Ground	 1.5 to 7.5 qts./ acre 1.5 to 7.5 qts./ acre	 5 to 30 10 to 60
Spray-to-Wet Handgun, Backpack, Mistblower	0.75% to 2.0% by volume	Spray-to-Wet
Low Volume Directed Spray[2] Handgun, Backpack, Mistblower	5.0% to 10.0% by volume	Partial Coverage

[1] Where repeat applications are necessary do not exceed 8.0 quarts per acre per year.
[2] For low volume directed spray applications, coverage should be uniform with at least 50 percent of the foliage contacted. For best results, coverage of the top one-half of the plant is important.

NOTE: If brush has been mowed or tilled or trees have been cut, do not treat until regrowth has reached the recommended stage of growth.

When applied as specified under the conditions described, this product plus surfactant CONTROLS or PARTIALLY CONTROLS the following woody brush plants and trees:

Alder
Alnus spp.
Ash*
Fraxinus spp.
Aspen, quaking
Populus tremuloides
Bearclover, Bearmat
Chamaebatia foliolosa
Birch
Betula spp.
Blackberry
Rubus spp.
Broom:
French
Cytisus monspessulanus
Scotch
Cytisus scoparius
Buckwheat, California*
Eriogonum fasciculatum
Cascara*
Rhamnus purshiana
Catsclaw*
Acacia greggi
Ceanothus
Ceanothus spp.
Chamise
Adenostoma fasciculatum
Cherry:
Bitter
Prunus emarginata
Black
Prunus serotina
Pin
Prunus pensylvanica
Coyote brush
Bacharis consanguinea
Creeper, Virginia*
Parthenocissus quinquefolia
Dewberry
Rubus trivialis
Dogwood
Cornus spp.
Elderberry
Sambucus spp.
Elm*
Ulmus spp.
Eucalyptus, bluegum
Eucalyptus globules
Hasardia*
Haplopappus squamosus
Hawthorn
Crataegus spp.
Hazel
Corylus spp.
Hickory
Carya spp.
Holly, Florida; Brazilian Peppertree
Schinus terebinthifolius
Honeysuckle
Lonicera spp.
Hornbeam, American
Carpinus caroliniana
Kudzu
Pueraria lobata
Locust, black*
Robinia pseudoacacia
Manzanita
Arctostaphylos spp.
Maple:
Red**
Acer rubrum
Sugar
Acer saccharum
Vine*
Acer circinatum
Monkey Flower*
Mimulus guttatus
Oak:
Black*
Quercus velutina
Northern pine
Quercus palustris
Post
Quercus stellata
Red
Quercus rubra
Southern red
Quercus falcata
White*
Quercus alba
Persimmon*
Diospyros spp.
Poison Ivy
Rhus radicans
Poison Oak
Rhus toxicodendron
Poplar, yellow*
Liriodendron tulipifera
Prunus
Prunus spp.
Raspberry
Rubus spp.
Redbud, eastern
Cercis canadensis
Rose, multiflora
Rosa multiflora
Russian-olive
Elaeagnus angustifolia
Sage: black, white
Salvia spp.
Sagebrush, California
Artemisia californica

(continued)

Salmonberry
Rubus spectabilis
Salt cedar*
Tamarix spp.
Saltbush, Sea myrtle
Baccharis halimifolia
Sassafras
Sassafras aibidum
Sourwood*
Oxydendrum arboreum

Sumac:
Poison*
Rhus vernix
Smooth*
Rhus glabra
Winged*
Phus copallina
Sweet gum
Liquidambar styraciflua
Swordfern*
Polystichum munitum

Tallowtree, Chinese
Sapium sebiferum
Thimbleberry
Rubus parviflorus
Tobacco, tree*
Nicotiana glauca
Trumpetcreeper
Campsis radicans
Waxmyrtle, southern*
Myrica cerifera
Willow
Salix spp.

*Partial control
**See below for control or partial control instruction.

See the "DIRECTIONS FOR USE" and "MIXING AND APPLICATION INSTRUCTIONS" sections in this label for labeled use and specific application instructions.

Apply the product as follows to control or partially control the following woody brush and trees.

Alder/Blackberry/Dewberry/Honeysuckle/Oak, Post/Raspberry - For control, apply 4-1/2 to 6 pints per acre as a broadcast spray or as a 3/4 to 1-1/4 percent solution with hand-held equipment.

Aspen, Quaking/Hawthorn/Trumpetcreeper - For control, apply 3 to 4-1/4 pints of this product per acre as a broadcast spray or as a 3/4 to 1-1/4 percent solution with hand-held equipment.

Birch/Elderberry/Hazel/Salmonberry/Thimbleberry - For control, apply 3 pints per acre of this product as a broadcast spray or as a 3/4 percent solution with hand-held equipment.

Broom: French, Scotch - For control, apply a 1-1/4 to 1-1/2 percent solution with hand-held equipment.

Buckwheat, California/Hasardia/Monkey Flower/Tobacco, Tree - For partial control of these species apply a 3/4 to 1-1/2 percent solution of this product as a foliar spray with hand-held equipment. Thorough coverage of foliage is necessary for best results.

Catsclaw - For partial control, apply a 1-1/4 to 1-1/2 percent solution with hand-held equipment when at least 50 percent of the new leaves are fully developed.

Cherry: Bitter, Black, Pin/Oak, Southern Red/Sweet Gum/Prunus - For control, apply 3 to 7-1/2 pints of this product per acre as a broadcast spray or as a 1 to 1-1/2 percent solution with hand-held equipment.

Coyote brush - For control, apply a 1-1/4 to 1-1/2 percent solution with hand-held equipment when at least 50 percent of the new leaves are fully developed.

Dogwood/Hickory/Salt cedar - For partial control, apply a 1 to 2 percent solution of this product with hand-held equipment or 6 to 7-1/2 pints per acre as a broadcast spray.

Eucalyptus, bluegum - For control of eucalyptus resprouts, apply a 1-1/2 percent solution of this product with hand-held equipment when resprouts are 6- to 12-feet tall. Ensure complete coverage. Apply when plants are actively growing. Avoid application to drought-stressed plants.

Holly, Florida/Waxmyrtle, southern - For partial control, apply this product as a 1-1/2 percent solution with hand-held equipment.

Kudzu - For control, apply 6 pints of this product per acre as a broadcast spray or as a 1-1/2 percent solution with hand-held equipment. Repeat applications will be required to maintain control.

Maple, Red - For control, apply as a 3/4 to 1-1/4 percent solution with hand-held equipment when leaves are fully developed. For partial control, apply 2 to 7-1/2 pints of this product per acre as a broadcast spray.

Maple, Sugar/Oak: Northern Pine, Red - For control, apply as a 3/4 to 1-1/4 percent solution with hand-held equipment when at least 50 percent of the new leaves are fully developed.

Poison Ivy/Poison Oak - For control, apply 6 to 7-1/2 pints of this product per acre as a broadcast spray or as a 1-1/2 percent solution with hand-held equipment. Repeat applications may be required to maintain control. Fall treatments must be applied before leaves lose green color.

Rose, multiflora - For control, apply 3 pints of this product per acre as a broadcast spray or as a 3/4 to 1-1/2 percent solution with handheld equipment. Make treatments prior to leaf deterioration by leaf-feeding insects.

Sage, black/Sagebrush, California/Chamise/Tallowtree, Chinese - For control of these species, apply a 3/4 percent solution with hand-held equipment. Thorough coverage of foliage is necessary for best results.

Saltbush, Sea myrtle - For control, apply this product as a 1 percent solution with hand-held equipment.

Willow - For control, apply 4-1/2 pints of this product per acre as a broadcast spray or as a 3/4 percent solution with hand-held equipment.

Other woody brush and trees listed in this label - For partial control, apply 3 to 7-1/2 pints of this product per acre as a broadcast spray or as a 3/4 to 1-1/2 percent solution with hand-held equipment.

PASTURE AND RANGELANDS

PASTURES

LABELED GRASSES: Bahiagrass, Bermudagrass, Bluegrass, Brome, Fescue, Guineagrass, Kikuyugrass, Orchardgrass, Pangola grass, Ryegrass, Timothy and Wheatgrass.

TYPES OF APPLICATIONS: Preplant, Preemergence, Pasture Renovation, Spot Treatment, Over-the-Top Wiper Applications, Postemergent Weed Control (Broadcast Treatments).

Preplant, Preemergence, Pasture Renovation

USE INSTRUCTIONS: This product can be applied prior to planting or emergence of forage grasses or used to control perennial pasture species listed on this label prior to re-planting.

RESTRICTIONS: If application rates total 4.5 pints per acre or less, no waiting period between treatment and feeding of livestock grazing is required. If the rate is greater than 4.5 pints per acre, remove domestic livestock before application and wait 8 weeks after application before grazing or harvesting. Crops listed for treatment in this label may be planted into the treated area at any time; for other crops, wait 30 days between application and planting.

Spot Treatment, Over-the-Top Wiper Applications

USE INSTRUCTIONS: This product can be applied as a spot treatment or with wiper applicators in pastures. Applications may be made in the same area at 30-day intervals.

PRECAUTIONS: To achieve maximum performance, remove domestic livestock before application and wait 7 days after application before grazing livestock or harvesting.

RESTRICTIONS: For spot treatments or wiper application methods using rates of 4.5 pints per acre or less, the entire field or any portion of it may be treated. When spot treatments or wiper application are made using rates above 4.5 pints per acre, no more than 10 percent of the total pasture may be treated at any one time.

Postemergent Weed Control (Broadcast Treatments)

USE INSTRUCTIONS: This product can be used to suppress competitive growth and seed production of annual weeds and undesirable vegetation in pastures. For selective applications with broadcast spray equipment, apply 9 to 12 fluid ounces of this product per acre in early spring before desirable perennial grasses break dormancy and initiate green growth. Late fall applications can be made after desirable perennial grasses have reached dormancy.

PRECAUTIONS: Some stunting of perennial grasses will occur if broadcast applications are made when plants are not dormant. No waiting period is required between application and grazing or harvesting for feed. Use of higher application rates will cause stand reductions.

RESTRICTIONS: Do not apply more than 72 fluid ounces per acre per year onto pasture grasses except for renovation uses (see instructions above). If replanting is needed due to severe stand reduction, applications must be made at least 30 days prior to planting any crop not listed for treatment in this label.

RANGELANDS

TYPES OF APPLICATIONS: Postemergence.

This product will control or suppress many annual weeds growing in perennial cool and warm-season grass rangelands.

Preventing viable seed production is key to the successful control and invasion of annual grassy weeds in rangelands. Follow-up applications in sequential years should eliminate most of the viable seeds. Delay grazing of treated areas to encourage growth of desirable perennials. Allowing desirable perennials to flower and reseed in the treated area will encourage successful transition.

USE INSTRUCTIONS: Apply 9 to 12 fluid ounces of this product per acre to control or suppress many weeds, including downy brome, cheatgrass, cereal rye and jointed goatgrass in rangelands. Apply when most brome plants are in early flower and before the plants, including seedheads, turn color. Allowing for secondary weed flushes to occur in the spring following rain events further depletes the seed reserve and encourages perennial grass conversion on weedy sites. Fall applications are possible, and recommended, where spring moisture is usually limited and fall germination allows for good weed growth.

For medusahead, apply 12 fluid ounces of this product per acre at the 3-leaf stage. Delaying applications beyond this stage will result in reduced or unacceptable control. Controlled burning may be useful in eliminating the thatch layer produced by slow decaying culms prior to application. Allow new growth to occur before spraying after a burn. Repeat applications in subsequent years may be necessary to eliminate the seedbank before reestablishing desirable perennial grasses in medusahead-dominated rangelands.

PRECAUTIONS: Slight discoloration of the desirable grasses may occur, but they will regreen and regrow under moist soil conditions as effects of this product wear off. No waiting period between treatment and feeding of livestock or grazing is required.

RESTRICTIONS: Do not use ammonium sulfate when spraying rangeland grasses with this product. Do not apply more than 4.5 pints per acre per year.

RANGELAND AND PASTURE THE USE OF SURFACTANT

When using this product for use on Rangeland and Pasture the use of a nonionic surfactant is required. Mix two or more quarts of a nonionic surfactant per 100 gallons of spray solution. Examples of when to use the higher surfactant rate include, but are not limited to: high water volumes, adverse environmental conditions, tough to control weeds, weeds under stress, surfactants with less than 70 percent active ingredient, tank mixes, etc.

When applied as directed under the conditions described, this product controls annual and perennial weeds listed in the label booklet. Do not reduce rates of this product when adding surfactant. DO NOT add buffering agents or pH adjusting agents to the spray solution when AquaNeat is the only pesticide used.

NON-CROP USES

See "PRODUCT INFORMATION" and "MIXING AND APPLICATION INSTRUCTIONS" sections of this label for essential product performance information and the following "NON-CROP" sections for specific uses.

EXTREME CARE MUST BE EXERCISED TO AVOID CONTACT OR SPRAY WITH FOLIAGE, GREEN STEMS, EXPOSED NON-WOODY ROOTS OR FRUIT OF CROPS, DESIRABLE TURFGRASSES, TREES, SHRUBS OR OTHER DESIRABLE VEGETATION SINCE SEVERE DAMAGE OR DESTRUCTION MAY RESULT.

Repeat treatments may be necessary to control weeds regenerating from underground parts or seeds. Where repeat applications are necessary, do not exceed 8 quarts of this product per acre per year.

This product does not provide residual weed control. For subsequent weed control, follow a label-approved herbicide program.

Read and carefully observe the cautionary statements and all other information appearing on the labels of all herbicides used.

INDUSTRIAL, RECREATIONAL AND PUBLIC AREAS

When applied as directed for "NON-CROP USES", under conditions described, this product may be used to control the listed weeds.

Non-Crop Sites - This product may be used to control the listed weeds in terrestrial noncrop sites and/or in aquatic sites within these areas:

airfields; airports; alleys, lanes, trails & access roads; around commercial or industrial structures or outbuildings; around farm and ranch structures and outbuildings; around ornamental gardens; around ornamental trees & shrubs; bare ground; beaches; campgrounds; construction sites; ditch banks; drive-in theaters; driveways & ramps; dry ditches & canals; fences & fencerows; firebreaks; golf courses: gravel yards; habitat restoration & management areas; highways & roadsides (including aprons, medians, guardrails & right of ways); industrial plant sites; industrial areas; lumber yards; mulched areas; natural areas; paths and trails; parking areas; parks; paved areas; petroleum & other tank farms; pumping installations; pipeline, power, telephone & utility rights-of-way; power stations; preplant to turf & ornamental plants; railroad rights-of way; recreation areas; refineries; resorts; schools; sidewalks; sports areas; storage areas; substations; tennis courts; uncropped farmstead areas; uncultivated non-agricultural areas; vacant lots; walkways; wastelands; & wildlife habitat areas.

This product is a non-selective herbicide that is diluted and applied to the foliage of actively growing weeds as a spot or broadcast application. It is absorbed by the leaves and moves throughout the stem and roots to control the entire plant. Visible symptoms may require a week or more to appear, with burndown usually occurring in 2 to 4 weeks. Symptoms are a gradual wilting and yellowing of the sprayed plant followed by deterioration of both shoots and roots. This product has no herbicide activity in the soil and will not wash or leach to affect nearby vegetation. Any ornamental species may be planted in treated areas 7 days or more after application. For most effective results, delay mowing, clipping, planting or sodding of treated areas for at least 7 days after application. This allows time for this product to move within the plant.

For specific rates of application and instructions for control of particular annual weeds, perennial weeds, woody brush and trees, see the "WEEDS CONTROLLED" section of this label. These applications may be made to large affected areas or as spot treatments. For general use in small areas, see alternative instructions below under "Small Area Treatment With Hand-held Sprayers".

Unless the "Agriculture Use Requirements" on this label are observed, the following restrictions apply:

Not for use on plants being grown for sale or other commercial use, or for commercial seed production, or for research purposes. For use on plants intended for aesthetic purposes or climactic modification and being grown in ornamental gardens or parks, or on golf courses or lawns and grounds.

AVOID SPRAY DRIFT CONTACT WITH DESIRABLE LAWN GRASSES, FLOWERS, VEGETABLES, SHRUBS OR TREES. DO NOT CONTACT GREEN BARK OF TREES OR SHRUBS. IF DESIRABLE VEGETATION IS CONTACTED, WASH IMMEDIATELY WITH WATER.

Depending on the type of non-crop application, this product may be applied with boom equipment, high-volume spray equipment and hand-held sprayers as described in the respective portions of the "APPLICATION EQUIPMENT and TECHNIQUES" section of the label. Additionally, the product may be applied with recirculating sprayers, shielded applicators, or wiper applicators in any non-crop site specified on this label. See the "Selective Equipment" part of "APPLICATION EQUIPMENT AND TECHNIQUES" section of this label for information on proper use and calibration of this equipment.

Small Area Treatment With Hand-held Sprayers

Add 2.25 to 4.5 fluid ounces of this product plus 0.5 to 1 fluid ounce of nonionic surfactant to 1 gallon of clean water. Use the low rate for many grasses and annual weeds. Use the higher specified rate for control of perennials and brush. Use pump-up sprayer, backpack sprayer or other sprayer suitable for small areas. Adjust equipment to deliver a coarse spray pattern. USE OF HOSE-END SPRAYERS OR SPRINKLER-TYPE DEVICES MAY NOT BE USED.

TANK MIXTURES FOR NON-CROP SITES

When applied as a tank mixture, this product provides control of the emerged annual weeds and partial control of the emerged perennial weeds listed in this label. When applied as a tank mixture, the following residual herbicides will provide preemergence control of the weeds listed in the individual product labels.

This product PLUS Diuron
This product PLUS Krovar® I
This product PLUS Princep®, Caliber®90, Simazine 4L, 80W or 90DF
This product PLUS Surflan®75W, Surflan AS
This product PLUS Ronstar®50WP
This product PLUS Spyder or Spyder Extra
This product PLUS ProClipse
This product PLUS Polaris AC Complete

When tank mixing with residual herbicides, add an nonionic surfactant at 0.5 to 1 percent by volume of spray solution. See the "APPLICATION EQUIPMENT AND TECHNIQUES" section of this label before preparing these tank mixtures.

Read and carefully observe the label claims, precautionary statements, specified use rate and all other information on the labels of all products used in these tank mixtures.

Use according to the most restrictive label directions for each product in the mixture.

CONTROL OF EMERGED WEEDS

Note: For backpack sprayer and handgun applications, see the "HAND-HELD AND HIGH VOLUME EQUIPMENT" section for specified rates.

Annual Weeds

Apply 1.5 pints per acre of this product in these tank mixtures when weeds are less than 6 inches tall and 2.25 pints per acre when weeds are more than 6 inches tall.

Perennial Weeds

For partial control of perennial weeds using these tank mixtures, apply 1.5 to 7.5 pints per acre of this product. Follow the recommendations in the "WEEDS CONTROLLED" section of this label for stage of growth and rate of application for specific perennial weeds.

PREEMERGENCE WEED CONTROL

For preemergence weed control, refer to the individual product labels for specific non-crop sites, rates, carrier volumes and precautionary statements.

Mix only the quantity of spray solution which can be used during the same day. Do not allow these tank mixtures to stand overnight as this may result in reduced weed control.

BROADCAST APPLICATION FOR WEED CONTROL IN CHRISTMAS TREE PLANTATIONS

NOTE: IF THIS PRODUCT IS IMPROPERLY APPLIED, IT HAS THE POTENTIAL TO CAUSE SEVERE INJURY TO CHRISTMAS TREES. FOLLOW ALL LABELED DIRECTIONS.

This product may be applied as a broadcast spray over established Christmas trees. To prevent drift onto nearby desirable crops or vegetation, ensure that adequate buffers are maintained.

The following Christmas tree species are approved for this application:
- Douglas Fir (*Pseudotsuga menziesii*)
- Fir species (*Abies* spp.)
- Spruce species (*Picea* spp.)

Do not apply this product until trees have completed at least a full growing season since planting or transplanting.
Pre-harvest Interval (PHI): Do not apply within 1 full year prior to tree harvest.

In the fall, applications may only be made after the formation of final conifer resting buds. Final resting buds must be in the dormant stage and fully hardened. If applications are made at any other time, unacceptable Christmas tree injury may occur.

Avoid spray pattern overlap, as injury may result.

Apply 24 fluid ounces of this product per acre in 5 to 30 gallons of water per acre.

NOTE: ADDING SURFACTANTS, ADDITIVES CONTAINING SURFACTANTS, OR ANY OTHER ADDITIVES TO THIS PRODUCT MAY RESULT IN SEVERE CHRISTMAS TREE INJURY.

In some areas, this product may be used at rates from 24 to 48 fluid ounces per acre. Consult your local Nufarm representative for specific instructions if you require rates that exceed 24 fluid ounces per acre.

Do not use drift control additives as they may increase Christmas tree injury. Do not use other herbicides in a tank mix with this product as Christmas trees could be severely injured.

SILVICULTURAL SITES AND RIGHTS-OF-WAY

NOTE: DO NOT USE AS AN OVER-THE-TOP BROADCAST SPRAY IN SILVICULTURAL NURSERIES.

When applied as directed for "NON-CROP USES" under conditions described this product controls undesirable vegetation listed on this label. This product also suppresses or controls undesirable vegetation listed on this label when applied at specified rates for release of established coniferous species listed on this label.

For specific rates of application and instructions for control of various brush, annual and perennial weeds, see the "WEEDS CONTROLLED" section of this label. For specific rates of application for release of listed coniferous species, see the "CONIFER RELEASE" part of this section of the label.

Where repeat applications are necessary, do not exceed 8 quarts of this product per acre per year.

Aerial Application

This product may be applied using aerial spray equipment for silvicultural site preparation, conifer release and rights-of-way treatments. See the "APPLICATION EQUIPMENT and TECHNIQUES" part of the "MIXING AND APPLICATION INSTRUCTIONS APPLICATION EQUIPMENT AND TECHNIQUES" section of this label for information on how to apply this product by air.

DO NOT APPLY THIS PRODUCT BY AIR TO RIGHTS-OF-WAY SITES IN THE STATE OF CALIFORNIA.
For aerial application, do not exceed 8 quarts per acre per year.
The maximum aerial application rate is 7-1/2 quarts per application.

SITE PREPARATION

Following preplant applications of this product, any silvicultural species may be planted.

POST DIRECTED SPRAY

In established silvicultural sites, use as a spray on the foliage of undesirable vegetation. Care must be exercised to avoid contact of spray, drift or mist with foliage or green bark of desirable species.

CONIFER RELEASE

For release, apply at the end of the first growing season, except in California. Do not disturb vegetation of target weeds or trees prior to treatment or until visual symptoms appear after treatment. Symptoms of treatment are slow to appear, especially in woody species treated in late Fall. **Injury may occur to conifers treated for release, especially where spray patterns overlap or the higher rates are applied or when applications are made during periods of active conifer growth.**

Applications must be made after formation of final conifer resting buds in the fall or prior to initial bud swelling in spring. Some autumn colors on undesirable deciduous species are acceptable provided no major leaf drop has occurred. Use the following rates for conifer release to control or partially control the weeds listed in the "WEEDS CONTROLLED" section of this label.

For release of the following conifer species:

Douglas Fir	**Fir**	**Hemlock**	**Pines***	**Spruce**
Pseudotsuga menziesii	*Abies* spp.	*Tsuga* spp.	*Pinus* spp.	*Picea* spp.

*Includes all species except eastern white pine, loblolly pine or slash pine.

Apply 2.25 to 3 pints of this product per acre except in Washington and Oregon, west of the crest of the Cascade Mountains. For Spring treatments west of the crest of the Cascade Mountains, apply 1 quart of this product per acre before conifer bud swell for control of annual weeds. For Fall treatments in Washington and Oregon, west of the crest of the Cascade Mountains, apply 1.5 to 2.25 pints of this product per acre before any major leaf drop of deciduous species. Add 10 fluid ounces nonionic surfactant per 2 pints of this product. In Maine, up to 4.5 pints per acre may be used for the control of difficult weeds.

Note for Douglas fir release: Ensure that surfactant has been adequately tested for Douglas fir safety and follow manufacturer's specifications for rate of application.

For release of Western hemlock, apply 1 quart of this product per acre.

For release of the following conifer species:

Loblolly Pine	**Eastern white pine**	**Slash pine**
Pinus taeda	*Pinus strobus*	*Pinus elliottii*

Late Season Application - Apply 2-1/4 to 3 pints of this product in a minimum of 5 gallons of spray solution per acre during early autumn. Nufarm does not recommend the use of a crop oil concentrate or MSO (methylated seed oil) based surfactant for use in southern conifer species release with this product. The addition of a tested and approved southern conifer release surfactant is recommended. Applications made prior to September 1 or when conditions are conducive to rapid growth of conifers will create the potential for increased injury in the form of tip and/or needle burn. Injury may decrease with later applications. Some autumn colors are acceptable at time of application. Apply prior to frost or leaf drop of undesirable plants.

Applications made according to label directions will release loblolly pine, eastern white pine and slash pine by reducing competition from the following species:

Ash	**Hawthorn**	**Oak, Post**	**Poplar, yellow**	**Sumac, Smooth**
Fraxinus spp.	*Crataegus* spp.	*Quercus stellata*	*Liriodendron tulipfera*	*Rhus glabra*
Cherry, Black	**Locust, Black**	**Oak, Southern Red**	**Sassafras**	**Sumac, Winged**
Prunus serotina	*Robinia pseudoacacia*	*Quercus falcata*	*Sassafras aibidum*	*Rhus copallina*
Cherry, Pin	**Maple, Red**	**Oak, White**	**Sourwood**	**Sweetgum**
Prunus pensylvanica	*Acer rubra*	*Quercus alba*	*Oxydendrum arboreum*	*Liquidambar styraciflua*
Elm	**Oak, Black**	**Persimmon**	**Sumac, Poison**	
Ulmus spp.	*Quercus velutina*	*Diospyros* spp.	*Rhus vernix*	

Apply only to those sites where woody brush and trees listed in this label constitute the majority of the undesirable species.

For aerial application, do not exceed 8 quarts per acre per year.
The maximum aerial application rate is 7-1/2 quarts per application.

THIS PRODUCT PLUS SPYDER TANK MIXTURES FOR CONIFER RELEASE FROM HERBACEOUS WEEDS

To release Loblolly pines, Slash, Red pine and Virginia pine from herbaceous weeds, tank mixtures of this product with Spyder will provide control of annual weeds listed in the "WEEDS CONTROLLED" section of this and the Spyder label, and partial control of the perennial weeds listed below .

Apply 12 to 18 fluid ounces of this product plus 2 to 4 fluid ounces of Spyder in 10 to 30 gallons of spray solution per acre. Nufarm does not recommend the use of a crop oil concentrate or MSO (methylated seed oil) based surfactant for use in southern conifer species release with this product. The addition of a tested and approved southern conifer release surfactant is recommended. Make application to actively growing weeds as a broadcast spray over the top of the young Loblolly pine, Red pine, Slash pine and Virginia pine.

This tank mixture may be applied using aerial equipment. For aerial application, do not exceed 8 quarts of this product (8 lbs. ae glyphosate) per acre per year. The maximum aerial application rate is 7-1/2 quarts per application.

When applying by air, use the specified rate in 5 to 15 gallons of spray solution per acre. This product plus Spyder tank mixtures may not be applied by air in California.

For control of annual weeds below 12 inches in height (or runner length on annual vines), use the lower rates of both products.

Use the higher rates of both products when annual weeds are in more advanced stages of growth and approaching flower or seed formation.

Use the higher rates of both products for partial control of the following perennial weeds. Use the lower rates for suppression of growth.

Bahiagrass *Paspalum notatum*	**Dock, curly** *Rumex crispus*	**Fescues, tall** *Festuca arundinacea*	**Poorjoe*** *Diodia teres*	**Vaseygrass** *Paspalum urvillei*
Broomsedge *Andropogon virginicus*	**Dogfennel** *Eupatorium capilliflorium*	**Johnsongrass*** *Sorghum halepense*	**Trumpetcreeper**** *Campsis radicans*	**Vervain, blue** *Verbena hastata*

*Control at the higher rates
**Suppression at the higher rates only.

Pine damage may occur or can be accentuated if treatment takes place when young trees are under stress from drought, flood water, insects or disease, or are in an active growth stage.

Read and observe the cautionary statements and all other information appearing on the labels of all herbicides used.

Note To User: This product must not be used in areas where adverse impact on federally designated endangered/threatened plant or aquatic species is likely. Prior to making applications, the user of this product must determine that no such species are located in or immediately adjacent to the area to be treated.

WILDLIFE HABITAT RESTORATION AND MANAGEMENT AREAS

This product is for the restoration and/or maintenance of native habitat and in wildlife management areas.

Habitat Restoration and Maintenance

When applied as directed, exotic and other undesirable vegetation may be controlled in habitat management areas. Applications may be made to allow recovery of native plant species, to open up water to attract waterfowl, and for similar broad-spectrum vegetation control requirements in habitat management areas. Spot treatments may be made to selectively remove unwanted plants for habitat enhancement. For spot treatments, care must be exercised to keep spray off of desirable plants.

Wildlife Food Plots

This product may be used as site preparation treatment prior to planting wildlife food plots. Apply as directed to control vegetation in the plot area. Any wildlife food species may be planted after applying this product, or native species may be allowed to re-infest the area. If tillage is needed to prepare a seedbed, wait 7 days after applying this product before tilling to allow for maximum effectiveness.

WIPER APPLICATIONS

For wick or wiper applications, mix 1 gallon of this product with 2 gallons of clean water to make a 33 percent solution. Addition of a nonionic surfactant at a rate of 10 percent by volume of total herbicide solution is recommended.

Wiper applications can be used to control or suppress annual and perennial weeds listed on this label. In heavy weed stands, a double application in opposite directions may improve results. See the “WEEDS CONTROLLED” section in this label for specified timing, growth stage and other instructions for achieving optimum results.

CUT STUMP APPLICATION

Woody vegetation may be controlled by treating freshly cut stumps of trees and resprouts with this product. Apply this product using suitable equipment to ensure coverage of the entire cambium. Cut vegetation close to the soil surface. **Apply a 50 to 100 percent solution of this product to the freshly-cut surface immediately after cutting.** Delay in application may result in reduced performance. For best results, make applications during periods of active growth and full leaf expansion.

When used according to directions for cut stump application, this product will control, partially control or suppress many types of woody brush and tree species, some of which are listed below:

Alder	**Eucalyptus**	**Maple**	**Reed, Giant**	**Sycamore**
Alnus spp.	*Eucalyptus* spp.	*Acer* spp.	*Arundo donax*	*Platanus occidentalis*
Coyote Brush	**Hickory**	**Oak**	**Salt cedar**	**Tan Oak**
Baccharis consanguinea	*Carya* spp.	*Quercus* spp.	*Tamarix* spp.	*Lithocarpus densiflorus*
Dogwood	**Madrone**	**Poplar**	**Sweet gum**	**Willow**
Cornus spp.	*Arbutus menziesii*	*Populus spp.*	*Liquidambar styraciflua*	*Salix* spp.

INJECTION AND FRILL APPLICATIONS

Woody vegetation may be controlled by injection or frill application of this product. Apply this product using suitable equipment which must penetrate into living tissue. Apply the equivalent of 1 ml of this product per 2 to 3 inches of trunk diameter. This is best achieved by applying 25 to 100 percent concentration of this product either to a continuous frill around the tree or as cuts evenly spaced around the tree below all branches. As tree diameter increases in size, better results are achieved by applying dilute material to a continuous frill or more closely spaced cuttings. Avoid application techniques that allow runoff to occur from frill or cut areas in species that exude sap freely after frills or cutting. In species such as these, make frill or cut at an oblique angle so as to produce a cupping effect and use undiluted material. For best results, make applications during periods of active growth and full leaf expansion.

Control		Suppression	
Oak	*Quercus* spp.	**Black Gum***	*Nyssa sylvatica*
Poplar	*Populus* spp.	**Dogwood**	*Cornus* spp.
Sweetgum	*Liquidambar styraciflua*	**Hickory**	*Carya* spp.
Sycamore	*Platanus occidentalis*	**Maple, Red**	*Acer rubrum*

*This product is not approved for this use on this species in the state of California.

INJECTION METHOD FOR CONTROL OF JAPANESE KNOTWEED *(Polygonum cuspidatum)* & GIANT KNOTWEED *(Polygonum polystachyum)*

DIRECTIONS FOR USE

It is a violation of Federal law to use this product in any manner inconsistent with its labeling.

This label must be in the possession of the user at the time of application.

All applicable directions and precautions in the AquaNeat Herbicide label booklet must be followed.

See the ''PRODUCT INFORMATION'' and ''MIXING AND APPLICATION INSTRUCTIONS" sections of this product's label booklet for essential product performance information.

This product may be used for control of Japanese knotweed and giant knotweed using individual stem treatment. Individual knotweed stems may be treated by injecting up to 5 ml of this product, undiluted directly into the hollow stem just below a node. Make a hole suitable for injecting the herbicide through both sides of the stem using an awl or other convenient pointed tool about 6 inches above the ground, just below a node. (Nodes are circular thickenings or scars surrounding the stem where leaves are or were previously attached.) The herbicide is then injected into this hole. Each stem of the knotweed plant must be treated.

This product can be injected using any injection device capable of delivering a 5 ml dose. For convenience and accuracy, a hand-operated injection device designed to deliver repeated pre-measured doses from a supply reservoir is recommended.

Commercially available dose measuring equipment may be adapted for this purpose. Calibrate the devise to deliver a dose of 5 ml per injection cycle. A sharpened hollow probe for puncturing the stem and delivery of the herbicide can also be integrated into the delivery system.

Restriction: Do not apply more than 7.5 quarts of this product per acre. At 5 ml per stem, 7.5 quarts is sufficient to treat a maximum of 1,420 stems per acre.

RELEASE OF BERMUDAGRASS OR BAHIAGRASS ON NONCROP SITES RELEASE OF DORMANT BERMUDAGRASS AND BAHIAGRASS

When applied as directed, this product will provide control or suppression of many winter annual weeds and tall fescue for effective release of dormant bermudagrass or bahiagrass. Make applications to dormant bermudagrass or bahiagrass.

For best results on winter annuals, treat when weeds are in an early growth stage (below 6 inches in height) after most have germinated. For best results on tall fescue, treat when fescue is in or beyond the 4- to 6-leaf stage.

WEEDS CONTROLLED

Rate for control or suppression of winter annuals and tall fescue are listed below.

Apply the specified rates of this product in 10 to 25 gallons of water per acre, plus 2 quarts nonionic surfactant per 100 gallons of total spray volume.

WEEDS CONTROLLED OR SUPPRESSED*

NOTE: C = Control
S = Suppression

	AQUANEAT AQUATIC HERBICIDE (FLUID OZ/ACRE)					
WEED SPECIES	**6**	**9**	**12**	**18**	**24**	**48**
Barley, little *Hordeum pusillum*	S	C	C	C	C	C
Bedstraw, catchweed *Galium aparine*	S	C	C	C	C	C
Bluegrass, annual *Poa annual*	S	C	C	C	C	C
Chervil *Chaerophyllum tainturieri*	S	C	C	C	C	C
Chickweed, common *Stellaria media*	S	C	C	C	C	C
Clover, crimson *Trifolium incarnatum*	.	S	S	C	C	C
Clover, large hop *Trifolium campestre*	.	S	S	C	C	C
Speedwell, corn *Veronica arvensis*	S	C	C	C	C	C
Fescue, tall *Festuca arundinacea*	.	.	.	.	S	S
Geranium, Carolina *Geranium carolinianum*	.	.	S	S	C	C
Henbit *Lamium amplexicaule*	.	S	C	C	C	C
Ryegrass, Italian *Lolium multiflorum*	.	.	S	C	C	C
Vetch, common *Vicia sativa*	.	.	S	C	C	C

*These rates apply only to sites where an established competitive turf is present.

RELEASE OF ACTIVELY GROWING BERMUDAGRASS

NOTE: USE ONLY ON SITES WHERE BAHIAGRASS OR BERMUDAGRASS ARE DESIRED FOR GROUND COVER AND SOME TEMPORARY INJURY OR YELLOWING OF THE GRASSES CAN BE TOLERATED.

When applied as directed, this product will aid in the release of bermudagrass by providing control of annual species listed in the "WEEDS CONTROLLED" section in this label, and suppression or partial control of certain perennial weeds.

For control or suppression of those annual species listed in this label, use 3/4 to 2-1/4 pints of this product as a broadcast spray in 10 to 25 gallons of spray solution per acre, plus 2 quarts of a nonionic surfactant per 100 gallons of total spray volume. Use the lower rate when treating annual weeds below 6 inches in height (or length of runner in annual vines). Use the higher rate as size of plants increases or as they approach flower or seedhead formation.

Use the higher rate for partial control or longer-term suppression of the following perennial species. Use lower rates for shorter-term suppression of growth.

Bahiagrass Johnsongrass**
Dallisgrass Trumpetcreeper*
Fescue (tall) Vaseygrass

*Suppression at the higher rate only.
**Johnsongrass is controlled at the higher rate.

Use only on well-established bermudagrass. Bermudagrass injury may result from the treatment but regrowth will occur under moist conditions. Do not make repeat applications in the same season, since severe injury may result.

BAHIAGRASS SEEDHEAD AND VEGETATIVE SUPPRESSION

When applied as directed in the "NONCROP SITES" section in this label, this product will provide significant inhibition of seedhead emergence and will suppress vegetative growth for a period of approximately 45 days with single applications and approximately 120 days with sequential applications.

Apply this product 1 to 2 weeks after full green-up of bahiagrass or after the bahiagrass has been mowed to a uniform height of 3 to 4 inches. Applications must be made prior to seedhead emergence. Apply 5 fluid ounces per acre of this product, plus 2 quarts of an approved nonionic surfactant per 100 gallons of total spray volume in 10 to 25 gallons of water per acre.

Sequential applications of this product plus nonionic surfactant may be made at approximately 45-day intervals to extend the period of seedhead and vegetative growth suppression. For continued vegetative growth suppression, sequential applications must be made prior to seedhead emergence.

Apply no more than 2 sequential applications per year. As a first sequential application, apply 3 fluid ounces of this product per acre plus nonionic surfactant. A second sequential application of 2 to 3 fluid ounces per acre plus nonionic surfactant may be made approximately 45 days after the last application.

ANNUAL GRASS GROWTH SUPPRESSION

For growth suppression of some annual grasses, such as annual ryegrass, wild barley and wild oats growing in coarse turf on roadsides or other industrial areas, apply 3 to 4 ounces of this product in 10 to 40 gallons of spray solution per acre. Mix 2 quarts of a nonionic surfactant per 100 gallons of spray solution. Make application when annual grasses are actively growing and before the seedheads are in the boot stage of development. Treatments made after seedhead emergence may cause injury to the desired grasses.

AQUATIC SITES

When applied as directed and under the conditions described in the "WEEDS CONTROLLED" section in this label, this product will control or partially control the labeled weeds growing in aquatic sites.

Aquatic Sites - This product may be applied to emerged weeds in all bodies of fresh and brackish water which may be flowing, non-flowing or transient. This includes lakes, rivers, streams, ponds, estuaries, rice levees, seeps, irrigation and drainage ditches, canals, reservoirs, wastewater treatment facilities, wildlife habitat restoration and management areas, and similar sites.

Wetland Sites - This product may be used in and around water (aquatic areas) and wetlands found in forestry and in power, telephone and pipeline rights-of-way sites including where these sites are adjacent to or surrounding domestic water supply reservoirs, supply streams, lakes and ponds. Read and observe the following before making applications in and around water.

If aquatic sites are present in the noncrop area and are part of the intended treatment, read and observe the following directions:

This product does not control plants which are completely submerged or have a majority of their foliage under water.

There is no restriction on the use of treated water for irrigation, recreation or domestic purposes.

Consult local state fish and game agency and water control authorities before applying this product in, around and to public water. Permits may be required to treat such water.

Do not spray open bodies of water where woody brush, trees and herbaceous weeds do not exist. The maximum application rate of 3.75 quarts per acre must not be exceeded in a single over-water broadcast application except as follows, where any specified rate may be applied:

- Stream crossings in utility right-of-way.
- Where applications will result in less than 20 percent of the total water area being treated.

Restrictions: Do not apply this product directly to water within 1/2 mile up-stream of an active potable water intake in flowing water (i.e., river, stream, etc.) or within 1/2 mile of an active potable water intake in a standing body of water such as lake, pond or reservoir. To make aquatic applications around and within 1/2 mile of active potable water intakes, the water intake must be turned off for a minimum period of 48 hours after the application. The water intake may be turned on prior to 48 hours if the glyphosate level in the intake water is below 0.7 parts per million as determined by laboratory analysis. These aquatic applications may be made ONLY in those cases where there are alternative water sources or holding ponds which would permit the turning off of an active potable water intake for a minimum period of 48 hours after the applications. This restriction does not apply to intermittent inadvertent overspray of water in terrestrial use sites.

For treatments after drawdown of water or in dry ditches, allow 7 or more days after treatment before reintroduction of water to achieve maximum weed control. Apply this product within 1 day after drawdown to ensure application to actively growing weeds. Floating Mats of vegetation may require retreatment. Avoid wash-off of sprayed foliage by spray boat or recreational boat backwash or by rainfall within 6 hours of application. Do not re-treat within 24 hours following the initial treatment.

Applications made to moving bodies of water must be made while traveling upstream to prevent concentration of this herbicide in water. When making any bankside applications, do not overlap more than 1 foot into open water. Do not spray in bodies of water where weeds do not exist.

Maximum Application Rate: Do not exceed 8 quarts per acre per year. The maximum application rate of 7-1/2 quarts per acre must not be exceeded in any single ground broadcast application or aerial broadcast application that is being made over water.

When emerged infestations require treatment of the total surface area of impounded water, treating the area in strips may avoid oxygen depletion due to decaying vegetation. Oxygen depletion may result in fish kill.

STORAGE AND DISPOSAL

Do not contaminate water, food or feed by storage or disposal.

PESTICIDE STORAGE: Do not store below 32ºF or above 100ºF. Store in original container in a well-ventilated area separately from fertilizer, feed, and food stuffs. Avoid cross-contamination with other pesticides.

PESTICIDE DISPOSAL: Pesticide wastes are toxic. Wastes resulting from this product may be disposed of on site or at an approved waste disposal facility. Improper disposal of excess pesticide, spray mix, or rinsate is a violation of federal law. If these wastes cannot be disposed of according to label instructions, contact the state agency responsible for pesticide regulation or the Hazardous Waste representative at the nearest EPA Regional Office for guidance.

CONTAINER HANDLING:
NOTE: This product is available in multiple containers. Refer to the Net Contents section of this products labeling for the applicable "Nonrefillable" or "Refillable" designation. Follow the container handling instructions below that apply to your container type / size.

Nonrefillable Containers 5 Gallons or Less: Nonrefillable container. Do not reuse or refill this container. Triple rinse container (or equivalent) promptly after emptying. **Triple rinse as follows:** Empty the remaining contents into application equipment or a mix tank and drain for 10 seconds after the flow begins to drip. Fill the container 1/4 full with water and recap. Shake for 10 seconds. Pour rinsate into application equipment or a mix tank or store rinsate for later use or disposal. Drain for 10 seconds after the flow begins to drip. Repeat this procedure two more times. Then offer for recycling or reconditioning, or puncture and dispose of in a sanitary landfill, or by other procedures approved by State and local authorities. Plastic containers are also disposable by incineration, or, if allowed by State and local authorities, by burning. If burned stay out of smoke

Nonrefillable containers larger than 5 gallons: Nonrefillable container. Do not reuse or refill this container. Offer for recycling if available. Triple rinse or pressure rinse container (or equivalent) promptly after emptying. **Triple rinse as follows:** Empty the remaining contents into application equipment or a mix tank. Fill the container 1/4 full with water. Replace and tighten closures. Tip container on its side and roll it back and forth, ensuring at least one complete revolution, for 30 seconds. Stand the container on its end and tip it back and forth several times. Turn the container over onto its other end and tip it back and forth several times. Empty the rinsate into application equipment or a mix tank or store rinsate for later use or disposal. Repeat this procedure two more times. **Pressure rinse as follows:** Empty the remaining contents into application equipment or a mix tank and continue to drain for 10 seconds after the flow begins to drip. Hold container upside down over application equipment or mix tank and continue to drain for 10 seconds after the flow begins to drip. Hold container upside down over application equipment or mix tank or collect rinsate for later use or disposal. Insert pressure rinsing nozzle in the side of the container, and rinse at about 40 psi for at least 30 seconds. Drain for 10 seconds after the flow begins to drip.

Refillable containers larger than 5 gallons: Refillable container. Refill this container with pesticide only. Do not reuse this container for any other purpose. Cleaning the container before final disposal is the responsibility of the person disposing of the container. Cleaning before refilling is the responsibility of the refiller. To clean the container before final disposal, empty the remaining contents from this container into application equipment or a mix tank. Fill the container about 10% full with water and, if possible, spray all sides while adding water. If practical, agitate vigorously or recirculate water with the pump for two minutes. Pour or pump rinsate into application equipment or rinsate collection system. Repeat this rinsing procedure two more times.

WARRANTY DISCLAIMER

The directions for use of this product must be followed carefully. TO THE EXTENT CONSISTENT WITH APPLICABLE LAW, (1) THE GOODS DELIVERED TO YOU ARE FURNISHED "AS IS" BY MANUFACTURER OR SELLER AND (2) MANUFACTURER AND SELLER MAKE NO WARRANTIES, GUARANTEES, OR REPRESENTATIONS OF ANY KIND TO BUYER OR USER, EITHER EXPRESS OR IMPLIED, OR BY USAGE OF TRADE, STATUTORY OR OTHERWISE, WITH REGARD TO THE PRODUCT SOLD, INCLUDING, BUT NOT LIMITED TO MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE, USE, OR ELIGIBILITY OF THE PRODUCT FOR ANY PARTICULAR TRADE USAGE. UNINTENDED CONSEQUENCES, INCLUDING BUT NOT LIMITED TO INEFFECTIVENESS, MAY RESULT BECAUSE OF SUCH FACTORS AS THE PRESENCE OR ABSENCE OF OTHER MATERIALS USED IN COMBINATION WITH THE GOODS, OR THE MANNER OF USE OR APPLICATION, INCLUDING WEATHER, ALL OF WHICH ARE BEYOND THE CONTROL OF MANUFACTURER OR SELLER AND ASSUMED BY BUYER OR USER. THIS WRITING CONTAINS ALL OF THE REPRESENTATIONS AND AGREEMENTS BETWEEN BUYER, MANUFACTURER AND SELLER, AND NO PERSON OR AGENT OF MANUFACTURER OR SELLER HAS ANY AUTHORITY TO MAKE ANY REPRESENTATION OR WARRANTY OR AGREEMENT RELATING IN ANY WAY TO THESE GOODS.

LIMITATION OF LIABILITY

TO THE EXTENT CONSISTENT WITH APPLICABLE LAW, IN NO EVENT SHALL MANUFACTURER OR SELLER BE LIABLE FOR SPECIAL, INCIDENTAL, OR CONSEQUENTIAL DAMAGES, OR FOR DAMAGES IN THEIR NATURE OF PENALTIES RELATING TO THE GOODS SOLD, INCLUDING USE, APPLICATION, HANDLING, AND DISPOSAL. TO THE EXTENT CONSISTENT WITH APPLICABLE LAW, MANUFACTURER OR SELLER SHALL NOT BE LIABLE TO BUYER OR USER BY WAY OF INDEMNIFICATION TO BUYER OR TO CUSTOMERS OF BUYER, IF ANY, OR FOR ANY DAMAGES OR SUMS OF MONEY, CLAIMS OR DEMANDS WHATSOEVER, RESULTING FROM OR BY REASON OF, OR RISING OUT OF THE MISUSE, OR FAILURE TO FOLLOW LABEL WARNINGS OR INSTRUCTIONS FOR USE, OF THE GOODS SOLD BY MANUFACTURER OR SELLER TO BUYER. ALL SUCH RISKS SHALL BE ASSUMED BY THE BUYER, USER, OR ITS CUSTOMERS. TO THE EXTENT CONSISTENT WITH APPLICABLE LAW, BUYER'S OR USER'S EXCLUSIVE REMEDY, AND MANUFACTURER'S OR SELLER'S TOTAL LIABILITY SHALL BE FOR DAMAGES NOT EXCEEDING THE COST OF THE PRODUCT.

If you do not agree with or do not accept any of the directions for use, the warranty disclaimers, or limitations on liability, do not use the product, and return it unopened to the Seller, and the purchase price will be refunded.

(RV051215)

AquaNeat is a registered trademark of Nufarm, Inc.

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AquaNeat®

Aquatic Herbicide

GROUP 9 HERBICIDE

PULL HERE TO OPEN

FOR USE ON EMERGED AQUATIC WEEDS AND BRUSH IN AQUATIC SITES. FOR USE IN FORESTRY (INCLUDING WEED CONTROL IN CHRISTMAS TREE PLANTATIONS), PASTURES, RANGELANDS, RIGHTS-OF-WAY, HABITAT RESTORATION AREAS, NON-CROP AND OTHER LISTED APPLICATION SITES.

ACTIVE INGREDIENT:	
Glyphosate, N-(phosphonomethyl)glycine, in the form of its isopropylamine salt*	53.8%
OTHER INGREDIENTS:	46.2%
TOTAL:	100.0%

*Contains 648 grams per litre or 5.4 pounds per U.S. gallon of the active ingredient, glyphosate, in the form of its isopropylamine salt. Equivalent to 480 grams per litre or 4 pounds per U.S. gallon of the acid, glyphosate.

KEEP OUT OF REACH OF CHILDREN

CAUTION / PRECAUCION

Si usted no entiende la etiqueta, busque a alguien para que se la explique a usted en detalle.
(If you do not understand the label, find someone to explain it to you in detail.)

SEE ATTACHED BOOKLET FOR COMPLETE PRECAUTIONARY STATEMENTS AND DIRECTIONS FOR USE

For Chemical Spill, Leak, Fire, or Exposure, Call CHEMTREC (800) 424-9300
For Medical Emergencies Only, Call (877) 325-1840

PRECAUTIONARY STATEMENTS
HAZARDS TO HUMANS AND DOMESTIC ANIMALS
CAUTION / PRECAUCION

Harmful if inhaled. Avoid breathing spray mist. Remove contaminated clothing and wash clothing before reuse. Wash thoroughly with soap and water after handling.

FIRST AID	
IF INHALED	• Move person to fresh air. • If person is not breathing, call 911 or an ambulance, then give artificial respiration, preferably by mouth-to-mouth, if possible. • Call a poison control center or doctor for further treatment advice.

HOT LINE NUMBER

Have the product container or label with you when calling a poison control center or doctor, or going for treatment. You may also contact 1-877-325-1840 for emergency medical treatment information.

STORAGE AND DISPOSAL

Do not contaminate water, food or feed by storage or disposal.

PESTICIDE STORAGE: Do not store below 32°F or above 100°F. Store in original container in a well-ventilated area separately from fertilizer, feed, and food stuffs. Avoid cross-contamination with other pesticides.

PESTICIDE DISPOSAL: Pesticide wastes are toxic. Wastes resulting from this product may be disposed of on site or at an approved waste disposal facility. Improper disposal of excess pesticide, spray mix, or rinsate is a violation of federal law. If these wastes cannot be disposed of according to label instructions, contact the state agency responsible for pesticide regulation or the Hazardous Waste representative at the nearest EPA Regional Office for guidance.

(continued)

STORAGE AND DISPOSAL *(continued)*

CONTAINER HANDLING: NOTE: This product is available in multiple containers. Refer to the Net Contents section of this products labeling for the applicable "Nonrefillable" or "Refillable" designation. Follow the container handling instructions below that apply to your container type / size.

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Nonrefillable containers larger than 5 gallons: Nonrefillable container. Do not reuse or refill this container. Offer for recycling if available. Triple rinse or pressure rinse container (or equivalent) promptly after emptying. **Triple rinse as follows:** Empty the remaining contents into application equipment or a mix tank. Fill the container 1/4 full with water. Replace and tighten closures. Tip container on its side and roll it back and forth, ensuring at least one complete revolution, for 30 seconds. Stand the container on its end and tip it back and forth several times. Turn the container over onto its other end and tip it back and forth several times. Empty the rinsate into application equipment or a mix tank or store rinsate for later use or disposal. Repeat this procedure two more times. **Pressure rinse as follows:** Empty the remaining contents into application equipment or a mix tank and continue to drain for 10 seconds after the flow begins to drip. Hold container upside down over application equipment or mix tank and continue to drain for 10 seconds after the flow begins to drip. Hold container upside down over application equipment or mix tank or collect rinsate for later use or disposal. Insert pressure rinsing nozzle in the side of the container, and rinse at about 40 psi for at least 30 seconds. Drain for 10 seconds after the flow begins to drip.

Refillable containers larger than 5 gallons: Refillable container. Refill this container with pesticide only. Do not reuse this container for any other purpose. Cleaning the container before final disposal is the responsibility of the person disposing of the container. Cleaning before refilling is the responsibility of the refiller. To clean the container before final disposal, empty the remaining contents from this container into application equipment or a mix tank. Fill the container about 10% full with water and, if possible, spray all sides while adding water. If practical, agitate vigorously or recirculate water with the pump for two minutes. Pour or pump rinsate into application equipment or rinsate collection system. Repeat this rinsing procedure two more times.

(RV051215)

EPA Reg. No. 228-365
EPA Est. No. 228-IL-001

Manufactured for
Nufarm Americas Inc.
11901 S. Austin Avenue
Alsip, IL 60803

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folder: 67721-1_Nufarm_14501000[3]
color: black
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created by: 03-27-15 jw
alt: 06-01-15 jw
size: 6.375"(w) x 6.5"(h)

Nufarm

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

Product Name: **Aquaneat Aquatic Herbicide**
EPA Reg. No.: 228-365
Product Type: Herbicide
Company Name: Nufarm Americas Inc.
11901 S. Austin Avenue
Alsip, IL 60803
1-800-345-3330
Telephone Numbers: **For Chemical Emergency, Spill, Leak, Fire, Exposure, or Accident,**
Call CHEMTREC Day or Night: 1-800-424-9300
For Medical Emergencies Only, Call 1-877-325-1840

This product is an EPA FIFRA registered pesticide. Some classifications on this SDS are not the same as on the FIFRA label. Certain sections are superseded by federal law governed by EPA for a registered pesticide. Please see Section 15. Regulatory Information for explanation.

2. HAZARDS IDENTIFICATION

PHYSICAL HAZARDS:
Not Hazardous

HEALTH HAZARDS:
Not Hazardous

ENVIRONMENTAL HAZARDS

Hazardous to aquatic environment, acute	Category 2
Hazardous to aquatic environment, chronic	Category 2

SIGNAL WORD
None

HAZARD STATEMENTS:
Toxic to aquatic life with long lasting effects.

PRECAUTIONARY STATEMENTS
Avoid release to the environment.

Collect spillage.

Dispose of contents in accordance with local, state, and federal regulations.

3. COMPOSITION / INFORMATION ON INGREDIENTS

COMPONENTS	CAS NO.	% BY WEIGHT
N-(phosphonomethyl)glycine, Isopropylamine salt	38641-94-0	52.2 – 55.4
Other Ingredients	Trade Secret	Trade Secret

Synonyms: Mixture containing Glyphosate IPA salt; N-(phosphonomethyl) glycine, in the form of its isopropylamine salt.

Ingredients not precisely identified are proprietary or non-hazardous. Values are not product specifications.

4. FIRST AID MEASURES

If in Eyes: Hold eye open and rinse slowly and gently with water Remove contact lenses, if present, after the first 5 minutes, then continue rinsing eye. Get medical attention if irritation develops and persists.
If on Skin or Clothing: Take off contaminated clothing. Wash with soap and water. Get medical attention if irritation develops and persists.
If Inhaled: Move person to fresh air. If symptoms develop, get medical advice.
If Swallowed: Have person sip a glass of water if able to swallow. Do not induce vomiting unless told to do so by the poison control center or doctor. Do not give anything by mouth to an unconscious person. If symptoms develop, get medical advice.
Most Important symptoms/effects, acute and delayed: None expected. May cause mild eye irritation.
Indication of Immediate medical attention and special treatment if needed: None expected. For ingestion there is no specific antidote available. Treat symptomatically.

5. FIRE FIGHTING MEASURES

Extinguishing Media: Recommended for large fires: foam or water spray. Recommended for small fires: dry chemical or carbon dioxide.
Special Fire Fighting Procedures: Firefighters should wear NIOSH/approved self-contained breathing apparatus and full fire-fighting turn out gear. Dike area to prevent runoff and contamination of water sources. Dispose of fire control water later.
Unusual Fire and Explosion Hazards: If water is used to fight fire, contain runoff, using dikes to prevent contamination of water supplies. Dispose of fire control water later. This product reacts with galvanized steel or unlined steel (except stainless steel) to produce hydrogen gas that may form a highly combustible gas mixture which could flash or explode.
Hazardous Decomposition Materials (Under Fire Conditions): May produce gases such as oxides of carbon, nitrogen, and phosphorous.

6. ACCIDENTAL RELEASE MEASURES

Personal Precautions: Wear appropriate protective gear for the situation. See Personal Protection information in Section 8.
Environmental Precautions: Prevent material from entering public sewer systems or any waterways. Do not flush to drain. Large spills to soil or similar surfaces may necessitate removal of topsoil. The affected area should be removed and placed in an appropriate container for disposal.
Methods for Containment: Dike spill using absorbent or impervious materials such as earth, sand or clay. Collect and contain contaminated absorbent and dike material for disposal.
Methods for Cleanup and Disposal: Pump any free liquid into an appropriate closed container. Collect washings for disposal. Decontaminate tools and equipment following cleanup. See Section 13: DISPOSAL CONSIDERATIONS for more information.
Other Information: Large spills may be reportable to the National Response Center (800-424-8802) and to state and/or local agencies.

7. HANDLING AND STORAGE

Handling:
Users should wash hands before eating, drinking, chewing gum, using tobacco or using the toilet. Remove clothing immediately if pesticide gets inside. Then wash thoroughly and put on clean clothing. Remove Personal Protective Equipment (PPE) immediately after handling this product. Wash outside of gloves before removing. As soon as possible, wash thoroughly and change into clean clothing.

DO NOT MIX, STORE OR APPLY THIS PRODUCT OR SOLUTIONS OF THIS PRODUCT IN GALVANIZED STEEL OR UNLINED STEEL (EXCEPT STAINLESS STEEL) CONTAINERS OR SPRAY TANKS. This product or spray solutions of this product react with such containers and tanks to produce hydrogen gas which may form a highly combustible gas mixture. This gas mixture could flash or explode, causing serious personal injury, if ignited by open flame, spark, welder's torch, lighted cigarette or other ignition source.
Storage:
STORE ABOVE 32º F (0º C) TO KEEP PRODUCT FROM CRYSTALLIZING. Crystals will settle to the bottom. If allowed to crystallize, warm to 68º F (20º C) and mix well or recirculate to redissolve before using. Do not contaminate water, foodstuffs, feed or seed by storage or disposal.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Engineering Controls:
Where engineering controls are indicated by specific use conditions or a potential for excessive exposure, use local exhaust ventilation at the point of generation.
Personal Protective Equipment:
Eye/Face Protection: To avoid contact with eyes, wear goggles or safety glasses with front, brow and temple protection. Washing facilities should be readily accessible to the work area.
Skin Protection: To avoid contact with skin, wear long pants, long-sleeved shirt, socks, shoes and chemical-resistant gloves. Washing facilities should be readily accessible to the work area.
Respiratory Protection: Not normally required. If vapors or mists exceed acceptable levels, wear NIOSH approved air-purifying respirator with cartridges/canisters approved for use against pesticides.
General Hygiene Considerations: Personal hygiene is an important work practice exposure control measure and the following general measures should be taken when working with or handling this material: 1) do not store, use and/or consume foods, beverages, tobacco products, or cosmetics in areas where this material is stored;
2) wash hands and face carefully before eating, drinking, using tobacco, applying cosmetics or using the toilet.

Exposure Guidelines:

	OSHA		ACGIH		
Component	TWA	STEL	TWA	STEL	Unit
Glyphosate IPA	NE	NE	NE	NE	
Other Ingredients	NE	NE	NE	NE	

NE = Not Established

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance:	Clear green or yellow tinted liquid
Odor:	Odorless
Odor threshold:	No data available
pH:	4.82 (1% dilution w/w in DIW @ 24º C)
Melting point/freezing point:	No data available
Initial boiling point and boiling range	No data available
Flash point:	Not applicable due to aqueous formulation
Evaporation rate:	Not applicable
Flammability (solid, gas):	Not applicable
Upper/lower flammability or explosive limits:	Not applicable
Vapor pressure:	No data available (mixture)
Vapor density:	No data available
Relative density:	1.21 g/mL @ 20º C
Solubility(ies):	No data available
Partition coefficient: n-octanol/water:	No data available
Autoignition temperature:	No data available
Decomposition temperature:	No data available
Viscosity:	67.9 cPs @ 20º C, 29.8 cPs @ 20º C
VOC Emission Potential (%):	0.00

Note: Physical data are typical values, but may vary from sample to sample. A typical value should not be construed as a guaranteed analysis or as a specification.

10. STABILITY AND REACTIVITY

Reactivity: Corrosive to mild steel, reaction with galvanized steel or unlined steel may produce hydrogen gas.
Chemical Stability: This material is stable under normal handling and storage conditions.
Possibility of Hazardous Reactions: Will not occur.
Conditions to Avoid: Excessive heat. Do not store near heat or flame.
Incompatible Materials: This product reacts with galvanized steel or unlined steel (except stainless steel) to produce hydrogen gas that may form a highly combustible gas mixture which could flash or explode.
Hazardous Decomposition Products: Under fire conditions, may produce gases such as oxides of carbon, nitrogen and phosphorous.

11. TOXICOLOGICAL INFORMATION

Likely Routes of Exposure: Eye contact, Skin contact
Symptoms of Exposure: Minimally irritating to the eye based on toxicity studies. Slightly toxic and non-irritating to the skin based on toxicity studies. Low inhalation toxicity. Inhalation of mists may cause coughing and sneezing. Slightly toxic if ingested based on toxicity studies. No significant adverse health effects are expected to develop if only small amounts (less than a mouthful) are swallow
Delayed, immediate and chronic effects of exposure: None known

Toxicological Data:
Data from laboratory studies on this product are summarized below:
Oral: Rat LD_{50}: >5,000 mg/kg
Dermal: Rat LD_{50}: >5,000 mg/kg
Inhalation: Rat 4-hr LC_{50}: >2.07 mg/l (no mortality at highest dose tested)
Eye Irritation: Rabbit: Minimally irritating
Skin Irritation: Rabbit: Non-irritating
Skin Sensitization: Not a contact sensitizer in guinea pigs following repeated skin exposure.

Subchronic (Target Organ) Effects: Repeated overexposure to glyphosate may decrease body weight gains and effects to liver.
Carcinogenicity / Chronic Health Effects: Prolonged overexposure to glyphosate may cause effects to the liver. EPA has given glyphosate a Group E classification (evidence of non-carcinogenicity in humans). Canada PMRA has classified glyphosate as non-carcinogenic. n 2015, IARC classified glyphosate as a probable human carcinogen Group 2A based on limited human evidence and some evidence in animals.
Reproductive Toxicity: In laboratory animal studies with glyphosate, effects on reproduction have been seen only at doses that produced significant toxicity to the parent animals.
Developmental Toxicity: In animal studies, glyphosate did not cause birth defects in animals; other effects were seen in the fetus only at doses which caused toxic effects to the mother.
Genotoxicity: Glyphosate has produced no genetic changes in a variety of standard tests using animals and animal or bacterial cells.

ASSESSMENT CARCINOGENICITY:

	Regulatory Agency Listing As Carcinogen			
Component	**ACGIH**	**IARC**	**NTP**	**OSHA**
Glyphosate IPA Salt	No	2A	No	No
Other Ingredients	No	No	No	No

12. ECOLOGICAL INFORMATION

Ecotoxicity:

Data on Glyphosate IPA
96-hour LC_{50} Rainbow Trout: >1000 mg/l
48-hour EC_{50} Daphnia: 930 mg/l
72-hour ErC_{50} Algae: 166 mg/l

Data on Glyphosate Acid:
96-hour LC_{50} Bluegill: 120 mg/l
96-hour LC_{50} Rainbow Trout: 786 mg/l
48-hour EC_{50} Daphnia: 780 mg/l
96-hour EC_{50} Diatoms: 1.3 mg/l
14-day EC_{50} Duckweed: 25.5 mg/l
72-hour EC_{50} Algae: 450 mg/l

Bobwhite Quail Acute Oral LD_{50}: >3,851 mg/kg
Bobwhite Quail 5-day Dietary LC_{50}: >4,640 ppm
Mallard Duck 5-day Dietary LC_{50}: >4,640 ppm

Environmental Fate:
In the environment glyphosate adsorbs strongly to soil and is expected to be immobile in soil. Glyphosate is readily degraded by soil microbes to AMPA (aminomethyl phosphonic acid) that is further degraded to carbon dioxide. Glyphosate and AMPA are unlikely to enter ground water due to their strong adsorptive characteristics. Terrestrially-applied glyphosate has the potential to move into surface waters through soil erosion because it may be adsorbed to soil particles suspended in the runoff. Aquatic applications registered for certain formulations may also result in glyphosate entering surface waters. Complete degradation is slow, but dissipation in water is rapid because glyphosate is bound in sediments and has low biological availability to aquatic organisms. These

characteristics suggest a low potential for bioconcentration in aquatic organisms and this has been verified by laboratory investigations of glyphosate bioconcentration in numerous marine and freshwater organisms with and without soil. The maximum whole body bioconcentration factors for fish were observed to be less than 1X. Bioconcentration factors for sediment dwelling mollusks and crayfish tended to be slightly higher, but were always less than 10X. In addition, any residues accumulated in organisms were rapidly eliminated.

13. DISPOSAL CONSIDERATIONS

Waste Disposal Method:
Wastes resulting from use of this product that cannot be used or chemically reprocessed should be disposed of in a landfill approved for pesticide disposal or in accordance with applicable Federal, state or local procedures. Emptied container retains vapors and product reside. Observe all labeled safeguards until container is cleaned, reconditioned or destroyed.

Container Handling and Disposal:
Nonrefillable Containers 5 Gallons or Less: Nonrefillable container. Do not reuse or refill this container. Triple rinse container (or equivalent) promptly after emptying. Triple rinse as follows: Empty the remaining contents into application equipment or a mix tank and drain for 10 seconds after the flow begins to drip. Fill the container 1/4 full with water and recap. Shake for 10 seconds. Pour rinsate into application equipment or a mix tank or store rinsate for later use or disposal. Drain for 10 seconds after the flow begins to drip. Repeat this procedure two more times. Then offer for recycling or reconditioning, or puncture and dispose of in a sanitary landfill, or by other procedures approved by State and local authorities. Plastic containers are also disposable by incineration, or, if allowed by State and local authorities, by burning. If burned stay out of smoke.

Nonrefillable containers larger than 5 gallons: Nonrefillable container. Do not reuse or refill this container. Offer for recycling if available. Triple rinse or pressure rinse container (or equivalent) promptly after emptying. **Triple rinse as follows**: Empty the remaining contents into application equipment or a mix tank. Fill the container 1/4 full with water. Replace and tighten closures. Tip container on its side and roll it back and forth, ensuring at least one complete revolution, for 30 seconds. Stand the container on its end and tip it back and forth several times. Turn the container over onto its other end and tip it back and forth several times. Empty the rinsate into application equipment or a mix tank or store rinsate for later use or disposal. Repeat this procedure two more times. **Pressure rinse as follows:** Empty the remaining contents into application equipment or a mix tank and continue to drain for 10 seconds after the flow begins to drip. Hold container upside down over application equipment or mix tank or collect rinsate for later use or disposal. Insert pressure rinsing nozzle in the side of the container, and rinse at about 40 psi for at least 30 seconds. Drain for 10 seconds after the flow begins to drip.

Refillable containers larger than 5 gallons: Refillable container. Refill this container with pesticide only. Do not reuse this container for any other purpose. Cleaning the container before final disposal is the responsibility of the person disposing of the container. Cleaning before refilling is the responsibility of the refiller. To clean the container before final disposal, empty the remaining contents from this container into application equipment or a mix tank. Fill the container about 10% full with water and, if possible, spray all sides while adding water. If practical, agitate vigorously or recirculate water with the pump for two minutes. Pour or pump rinsate into application equipment or rinsate collection system. Repeat this rinsing procedure two more times.

14. TRANSPORTATION INFORMATION

Follow the precautions indicated in Section 7: HANDLING AND STORAGE of this MSDS.

DOT:
Non Regulated

IMDG:
Non Regulated

IATA:
Non Regulated

15. REGULATORY INFORMATION

EPA FIFRA INFORMATION

This chemical is a pesticide product registered by the United States Environmental Protection Agency and is subject to certain labeling requirements under federal pesticide law. These requirements differ from the classification criteria and hazard information required for safety data sheets (SDS), and for workplace labels of non-pesticide chemicals. The hazard information required on the pesticide label is reproduced below. The pesticide label also includes other important information, including directions for use.

Caution. Harmful if inhaled. Avoid breathing spray mist. Remove contaminated clothing and wash clothing before reuse. Wash thoroughly with soap and water after handling.

U.S. FEDERAL REGULATIONS

TSCA Inventory: This product is exempted from TSCA because it is solely for FIFRA regulated use.

SARA Hazard Notification/Reporting:
Hazard Categories Under Criteria of SARA Title III Rules (40 CFR Part 370):
Not Hazardous

Section 313 Toxic Chemical(s):
None

Reportable Quantity (RQ) under U.S. CERCLA:
None

RCRA Waste Code:
Under RCRA, it is the responsibility of the product user to determine at the time of disposal, whether a material containing the product or derived from the product should be classified as a hazardous waste.

State Information:
Other state regulations may apply. Check individual state requirements.

California Proposition 65: ⚠ **ATTENTION.** This product can expose you to chemicals including glyphosate which is known to the State of California to cause cancer. For more information go to www.P65Warnings.ca.gov.

16. OTHER INFORMATION

National Fire Protection Association (NFPA) Hazard Rating:
Rating for this product: Health: 1 **Flammability:** 0 **Reactivity:** 0
Hazards Scale: 0 = Minimal 1 = Slight 2 = Moderate 3 = Serious 4 = Severe

This Safety Data Sheet (SDS) serves different purposes than and DOES NOT REPLACE OR MODIFY THE EPA-ACCEPTED PRODUCT LABELING (attached to and accompanying the product container). This SDS provides important health, safety and environmental information for employers, employees, emergency responders and others handling large quantities of the product in activities generally other than product use, while the labeling provides that information specifically for product use in the ordinary course.

Use, storage and disposal of pesticide products are regulated by the EPA under the authority of the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) through the product labeling, and all necessary and appropriate precautionary, use, storage, and disposal information is set forth on that labeling. It is a violation of Federal law to use a pesticide product in any manner not prescribed on the EPA-accepted label.

Although the information and recommendations set forth herein (hereinafter “Information”) are presented in good faith and believed to be correct as of the date hereof, Nufarm Americas Inc. makes no representations as to the completeness or accuracy thereof. Information is supplied upon the condition that the persons receiving same will make their own determination as to its suitability for their purposes prior to use. In no event will Nufarm Americas Inc. be responsible for damages of any nature whatsoever resulting from the use of or reliance upon Information. NO REPRESENTATIONS OR WARRANTIES, EITHER EXPRESS OR IMPLIED, OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE OR OF ANY OTHER NATURE ARE MADE HEREUNDER WITH RESPECT TO INFORMATION OR THE PRODUCT TO WHICH INFORMATION REFERS AND ALL SUCH WARRANTIES ARE HEREBY SPECIFICALLY DISCLAIMED.

Date of Issue: January 25, 2018 **Supersedes:** May 15, 2015

GROUP	9	HERBICIDE

Roundup PRO®

Herbicide

Complete Directions for Use

A complete broad-spectrum postemergence herbicide for industrial, turf, ornamental, forestry, roadside, utility rights-of-way, and other listed terrestrial weed control.

(For a complete list of terrestrial use sites, see the Directions for Use section of this label.)

ACTIVE INGREDIENT:	
*Glyphosate, N-(phosphonomethyl)glycine, in the form of its isopropylamine salt	**41.0%**
OTHER INGREDIENTS (including surfactant):	**59.0%**
	100.0%

*Contains 480 grams of the active ingredient glyphosate, in the form of its isopropylamine salt, per liter or 4 pounds per U.S. gallon, which is equivalent to 356 grams of the acid, glyphosate, per liter or 3 pounds per U.S. gallon (30.4% by weight).

Keep out of reach of children

CAUTION

Please refer to booklet for additional precautionary statements and directions for use.

Not all products listed on this label are registered for use in California. Check the registration status of each product in California before using.

THIS IS AN END-USE PRODUCT. BAYER CROPSCIENCE LP DOES NOT INTEND AND HAS NOT REGISTERED IT FOR REFORMULATION OR REPACKAGING.

FOR PRODUCT INFORMATION OR ASSISTANCE USING THIS PRODUCT,
CALL TOLL-FREE, 1-866-99BAYER (1-866-992-2937).

IN CASE OF AN EMERGENCY INVOLVING THIS PRODUCT,
OR FOR MEDICAL ASSISTANCE, CALL COLLECT, DAY OR NIGHT, 1-800-334-7577.

EPA Reg. No. 524-475 EPA Est. No. 524-IA-1

Packed For:
BAYER CROPSCIENCE LP
800 N. LINDBERGH BLVD.
ST. LOUIS, MISSOURI, 63167 U.S.A.

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US62218078B 161018Bv2 08/20

AVOID CONTACT OF THIS HERBICIDE WITH FOLIAGE, GREEN STEMS, EXPOSED NON-WOODY ROOTS OR FRUIT OF CROPS, DESIRABLE PLANTS AND TREES, AS SEVERE PLANT INJURY OR DESTRUCTION COULD RESULT.

Read the entire label before using this product.

Use only according to label directions.

Read the "LIMIT OF WARRANTY AND LIABILITY" statement at the end of the label before buying or using. If terms are not acceptable, return at once unopened.

CONTENTS

1.0 INGREDIENTS

ACTIVE INGREDIENT:

*Glyphosate, N-(phosphonomethyl)glycine, in the form of its isopropylamine salt	41.0%
OTHER INGREDIENTS (including surfactant):	59.0%
	100.0%

*Contains 480 grams of the active ingredient glyphosate, in the form of its isopropylamine salt, per liter or 4 pounds per U.S. gallon, which is equivalent to 356 grams of the acid, glyphosate, per liter or 3 pounds per U.S. gallon (30.4% by weight).

This product is protected by U.S. Patent No's. 5,683,958; 5,703,015; 6,063,733; 6,121,199; 6,121,200. No license granted under any non-U.S. patent(s).

2.0 IMPORTANT PHONE NUMBERS

1. FOR PRODUCT INFORMATION OR ASSISTANCE USING THIS PRODUCT, CALL TOLL-FREE, 1-866-99BAYER (1-866-992-2937).
2. IN CASE OF AN EMERGENCY INVOLVING THIS PRODUCT, OR FOR MEDICAL ASSISTANCE, CALL COLLECT, DAY OR NIGHT, 1-800-334-7577.

3.0 PRECAUTIONARY STATEMENTS

3.1 Hazards to Humans and Domestic Animals

Keep out of reach of children

CAUTION

Causes eye irritation
Avoid contact with eyes or clothing

FIRST AID	
IF IN EYES	• Hold eye open and rinse slowly and gently with water for 15 to 20 minutes. • Remove contact lenses, if present, after the first 5 minutes then continue rinsing eye. • Call a poison control center or doctor for treatment advice.

- Have the product container or labeling with you when calling a poison control center or doctor, or going for treatment.
- You can also call **1-800-334-7577**, collect, day or night, for emergency medical treatment information.
- This product is identified as **Roundup PRO® Herbicide, EPA Registration No. 524-475.**

DOMESTIC ANIMALS: This product is considered to be relatively nontoxic to dogs and other domestic animals; however, ingestion of this product or large amounts of freshly sprayed vegetation could result in temporary gastrointestinal irritation (vomiting, diarrhea, colic, etc.). If such symptoms are observed, provide the animal with plenty of fluids to prevent dehydration. Call a veterinarian if symptoms persist for more than 24 hours.

Personal Protective Equipment (PPE)

Applicators and other handlers must wear: long-sleeved shirt and long pants, socks and shoes.

Follow manufacturer's instructions for cleaning/maintaining PPE (Personal Protective Equipment). If there are no instructions for washables, use detergent and hot water. Keep and wash PPE separately from other laundry.

User Safety Recommendations

Users should:

- Wash hands before eating, drinking, chewing gum, using tobacco or using the toilet.
- Remove clothing immediately if pesticide gets inside. Then wash thoroughly and put on clean clothing.

3.2 Environmental Hazards

Do not apply directly to water, to areas where surface water is present or to intertidal areas below the mean high-water mark. Do not contaminate water when cleaning equipment or disposing of equipment wash waters and rinsate.

3.3 Physical or Chemical Hazards

Spray solutions of this product may be mixed, stored and applied using stainless steel, fiberglass, plastic or plastic-lined steel containers.

DO NOT MIX, STORE OR APPLY THIS PRODUCT OR SPRAY SOLUTIONS OF THIS PRODUCT IN GALVANIZED STEEL OR UNLINED STEEL (EXCEPT STAINLESS STEEL) CONTAINERS OR SPRAY TANKS. This product or spray solutions of this product react with such containers and tanks to produce hydrogen gas, which can form a highly combustible gas mixture. This gas mixture could flash or explode if ignited by open flame, spark, welder's torch, lighted cigarette or other ignition source and cause serious personal injury.

DIRECTIONS FOR USE

It is a violation of Federal law to use this product in any manner inconsistent with its labeling. This product may only be used in accordance with the Directions for Use on this label or on separately published supplemental labeling. Supplemental labeling can be obtained from your Authorized Bayer CropScience LP Retailer or Bayer CropScience LP representative.

Do not apply this product in a way that will contact workers or other persons, either directly or through drift. Only protected handlers may be in the area during application. For any requirements specific to your State or Tribe, consult the agency responsible for pesticide regulation.

Agricultural Use Requirements

Use this product only in accordance with its labeling and with the Worker Protection Standard, 40 CFR Part 170. This Standard contains requirements for the protection of agricultural workers on farms, forests, nurseries, and greenhouses, and handlers of agricultural pesticides. It contains requirements for training, decontamination, notification and emergency assistance. It also contains specific instructions and exceptions pertaining to the statements on this label about Personal Protective Equipment (PPE) and restricted-entry interval. The requirements in this box only apply to uses of this product that are covered by the Worker Protection Standard.

Do not enter or allow worker entry into treated areas during the restricted-entry interval (REI) of 4 hours.

PPE required for early entry to treated areas that is permitted under the Worker Protection Standard and that involves contact with anything that has been treated, such as plants, soil or water, is: coveralls, shoes plus socks, and chemical resistant gloves made of any waterproof material.

Non-Agricultural Use Requirements

The requirements in this box apply to uses of this product that are NOT within the scope of the Worker Protection Standard (40 CFR Part 170) for agricultural pesticides. The WPS applies when this product is used to produce agricultural plants on farms, forests, nurseries or greenhouses.

Keep people and pets off treated areas until spray solution has dried.

4.0 STORAGE AND DISPOSAL

Proper pesticide storage and disposal are essential to protect against exposure to people and the environment due to leaks and spills, excess product or waste, and vandalism. Do not allow this product to contaminate water, foodstuffs, feed or seed by storage or disposal.

PESTICIDE STORAGE: Store pesticides away from food, pet food, feed, seed, fertilizers, and veterinary supplies. Keep container closed to prevent spills and contamination. See individual container label for additional storage conditions, if any.

PESTICIDE DISPOSAL: To avoid wastes, use all material in the container, including rinsate, by application according to label directions. If wastes cannot be avoided, offer remaining product to a waste disposal facility or pesticide disposal program. Such programs are often run by state or local governments or by industry. All disposal must be in accordance with applicable federal, state and local regulations and procedures.

CONTAINER HANDLING AND DISPOSAL: Nonrefillable container. Do not reuse the container to hold materials other than pesticides or dilute pesticides (rinsate). After emptying and cleaning, it may be allowable to temporarily hold rinsate or other pesticide-related materials in the container. Contact your state regulatory agency to determine allowable practices in your state.

Triple rinse or pressure rinse (or equivalent) the container promptly after emptying.

Triple rinse as follows: Empty the remaining contents into application equipment or mix-tank and continue to drain for 10 seconds after the flow begins to drip. Fill the container 1/4 full with water and recap. Shake for 10 seconds. Pour rinsate into application equipment or mix-tank, or store rinsate for later use or disposal. Continue to drain for 10 seconds after the flow begins to drip. Repeat this procedure two more times.

Pressure rinse as follows: Empty the remaining contents into application equipment or mix-tank and continue to drain for 10 seconds after the flow begins to drip. Place container so that it can drain directly into application equipment or mix-tank while rinsing, or collect rinsate for later use or disposal. Insert pressure rinsing nozzle into the side of the container and rinse at about 40 PSI for at least 30 seconds. Continue to drain for 10 seconds after the flow begins to drip.

Once properly rinsed, some plastic pesticide containers can be taken to a container collection site or picked up for recycling.

To find the nearest collection site, contact your chemical dealer or Bayer CropScience LP at 1-800-768-6387.

If recycling is not available, dispose of in accordance with federal, state and local regulations and procedures, which may include puncturing the properly rinsed container and disposing in a sanitary landfill.

5.0 PRODUCT INFORMATION

Product Description: This product is a postemergence, systemic herbicide with no soil residual activity. This product provides broad-spectrum control of many annual and perennial weeds, woody brush, trees and vines. It is formulated as a water-soluble liquid containing surfactant that may be applied using standard and specialized pesticide application equipment after dilution and thorough mixing with water or other carriers according to label directions.

Mechanism of Action: The active ingredient in this product inhibits an enzyme found only in plants and microorganisms that is essential to the formation of specific amino acids.

No Soil Activity: This product binds tightly to soil particles and does not provide residual weed control. Weeds must be emerged at the time of application to be controlled by foliar application of this product. Weed seeds in the soil will not be affected by this product and will continue to germinate. Unattached plant rhizomes and rootstocks beneath the soil surface will also not be affected by this product.

Biological Degradation: Degradation of this product is primarily a biological process carried out by soil microbes.

Stage of Weeds: Annual weeds are easiest to control when they are small. Enhanced control of most perennial weeds is obtained when this product is applied at late growth stages approaching maturity. Refer to the "WEEDS CONTROLLED" section for more information on the control of specific weeds.

Cultural Considerations: Reduced weed control could result when application is made to annual or perennial weeds that have been mowed, grazed or cut, and have not been allowed to re-grow prior to application. Always use a higher application rate of this product within the given range when weed growth is heavy or dense, or when weeds are growing in an undisturbed (non-cultivated) area. Reduced weed control could result when this product is applied to weeds that show signs of disease or insect damage, are covered with dust, or are surviving under poor growing conditions.

Spray Coverage: For enhanced results, spray coverage must be uniform and complete. Do not spray foliage to the point of runoff.

Rainfastness: Rainfall within 4 hours of application could wash this product off of the foliage and a second application might then be needed for acceptable weed control. Refer to specific use sections of this label for additional information on minimum intervals required before re-application of this product.

Time to Symptoms: This product moves through the plant from the point of foliage contact to and into the root system. Visible effects are a gradual wilting and yellowing of the plant that advances to complete browning of aboveground growth and deterioration of underground plant parts. Effects are visible on most annual weeds within 2 to 4 days, but on most perennial weeds, effects might not be visible for 7 or more days after application. Extremely cool or cloudy weather following application could slow activity of this product and delay development of visual symptoms.

Maximum Application Rates: The maximum application or use rates stated throughout this label are given in units of volume (fluid ounces or quarts) of this product per acre. However, the maximum allowable application rates apply to this product combined with the use of any and all other herbicides containing the active ingredient glyphosate, whether applied separately or in a tank mixture, on a basis of total pounds of glyphosate (acid equivalents) per acre. If more than one glyphosate-containing product is applied to the same site within the same year, you must ensure that the total use of glyphosate (pounds acid equivalents) does not exceed the maximum allowed. See the "INGREDIENTS" section of this label for necessary product information.

Unless otherwise specified on this label, the combined total of all applications of this product on a site must not exceed 10.6 quarts (8 pounds of glyphosate acid) per acre per year.

6.0 WEED RESISTANCE MANAGEMENT

GROUP	9	HERBICIDE

Glyphosate, the active ingredient in this product, is a Group 9 herbicide based on the mechanism of action classification system of the Weed Science Society of America. Any weed population can contain plants that are naturally resistant to Group 9 herbicides. Weeds resistant to Group 9 herbicides can be effectively managed by using another herbicide from a different Group (either alone or in a mixture according to label directions), by using other cultural or mechanical methods of weed control, or a combination of the two. Consult your local company representative, state cooperative extension agent, professional consultant or other qualified authority to determine appropriate actions for controlling specific resistant weeds.

6.1 Weed Management Practices

Resistant populations arise when rare individual plants are uncontrolled by a normal dose of a given herbicide under normal environmental conditions. In the absence of other control measures these individuals survive, produce seed, and eventually become the dominant biotype in the field through continuous selection. The best means of reducing this selection is to use diverse weed control practices such as multiple herbicides with different mechanisms of action, and often in combination with various mechanical and cultural practices.

To minimize the occurrence of herbicide-resistant biotypes, including those resistant to glyphosate, implement the following weed management practice options that are practical to your situation. These management practices are applicable to reduce the spread of confirmed resistant biotypes (managing existing resistant biotypes) and to reduce the potential for selecting for resistance in new species (proactive resistance management).

- Use a diversified approach toward weed management focused on preventing weed seed production and reducing the number of weed seeds in the soil.
- Plant crops into fields that are as weed-free as possible and then keep them as weed-free as possible.
- Plant seed that is as weed-free as possible.
- Scout fields and application sites routinely, before and after herbicide application.
- Use multiple herbicide mechanisms of action that are effective against the most troublesome weeds on your application site and against those with known resistance.
- Apply herbicides at application rates listed on the label when weeds are within the size range indicated on the label.
- Emphasize cultural practices that suppress weeds by using crop competiveness.
- Use mechanical and biological weed management practices, where appropriate.
- Prevent field-to-field and within-field movement of weed seed or vegetative propagules.
- Manage weed seed at harvest and after harvest to prevent a buildup of the weed seedbank.

6.2 Management of Glyphosate-Resistant Biotypes

Appropriate testing is needed to determine if a weed is resistant to glyphosate. Call 1-866-99BAYER (1-866-992-2937) or contact your Bayer CropScience LP representative to determine if resistance in any particular weed biotype has been confirmed in your area, or visit on the Internet at www.weedresistancemanagement.com or www.weedscience.org.

Glyphosate-resistant weeds can be controlled or managed by applying this product in combination with residual preemergence herbicides and/or other postemergence herbicides labeled for control of the targeted weed in the crop being grown or on the site of application. For more information, see the "WEEDS CONTROLLED" section of this label.

Since the occurrence of resistant weeds is difficult to detect before use, Bayer CropScience LP accepts no liability for any losses that result from the failure of this product to control resistant weeds.

7.0 MIXING

Spray solutions of this product may be mixed, stored and applied using clean stainless steel, fiberglass, plastic or plastic-lined steel containers.

DO NOT MIX, STORE OR APPLY THIS PRODUCT OR SPRAY SOLUTIONS OF THIS PRODUCT IN GALVANIZED STEEL OR UNLINED STEEL (EXCEPT STAINLESS STEEL) CONTAINERS OR SPRAY TANKS.

Eliminate any risk of siphoning the contents of the tank back into the carrier source while mixing. Use approved anti-back-siphoning devices where required by State or local regulations.

A 50-mesh nozzle screen or line strainer on the spray equipment is adequate.

Clean sprayer parts promptly after using this product by thoroughly flushing with water.

7.1 Mixing with Water

PERFORMANCE OF THIS PRODUCT CAN BE SIGNIFICANTLY REDUCED IF WATER CONTAINING SOIL SEDIMENT IS USED AS CARRIER. DO NOT MIX THIS PRODUCT WITH WATER FROM PONDS OR DITCHES THAT IS VISIBLY MUDDY OR MURKY.

This product mixes readily with water. Mix spray solutions of this product as follows: Begin filling the mixing tank or spray tank with clean water. Add the required amount of this product near the end of the filling process and mix gently. Foaming of the spray solution can occur during mixing. To prevent or minimize foaming, mix gently, terminate by-pass and return lines at the bottom of the tank and, if necessary, add an appropriate anti-foam or defoaming agent to the spray solution.

7.2 Tank Mixtures

This product does not provide residual weed control. This product may be tank-mixed with other herbicides to provide residual weed control in the soil, a broader weed control spectrum or an alternate mechanism of action.

When a tank-mix with a generic active ingredient, such as 2,4-D or dicamba, or any other product or material listed on this label, the user is responsible for ensuring that the specific application being made and the use site are included on the label of the product used in the mix.

Bayer CropScience LP has not tested all tank-mix product formulations for compatibility, antagonism or reduction in product performance. Mixing this product with herbicides or other materials not specified on this label could result in reduced performance of this product. To the extent consistent with applicable law, buyer and all users are responsible for any loss or damage in connection with the use or handling of mixtures of this product with herbicides or other materials that are not expressly specified on this label, or on separate supplemental labeling or Fact Sheets published for this product.

Refer to all individual product labels, supplemental labeling and Fact Sheets for all products in the tank mixture and observe all precautions and limitations on the label, including any application timing restrictions, soil restrictions, minimum re-cropping intervals and/or crop rotation restrictions. Use according to the most restrictive precautionary statements for each product in the tank mixture.

This product may be applied at any rate listed on this label in a tank mixture with the following products to provide preemergence and/or improved postemergence control of weeds listed on the individual product labels.

2,4-D; atrazine; dicamba; bromacil; diuron; imazapyr; metsulfuron methyl; oryzalin; pendimethalin, prodiamine; simazine; sulfosulfuron; trichlopyr

Arsenal; Arsenal Herbicide Applicators Concentrate; Banvel; Banvel 480; Barricade 4L; Barricade 65WG; Certainty® Turf; Chopper Gen2; Crossbow; Endurance; Escort XP; Forestry Garlon 4 Specialty; Forestry Garlon XLT Specialty; Gallery SC; Gallery 75 Dry Flowable Specialty; Garlon; 3A Specialty; Garlon 4 Specialty; Garlon 4 Ultra Specialty; Goal 2XL; GoalTender; Habitat; Hyvar X; Hyvar X-L; Karmex DF; Krenite S Brush Control Agent; Krovar I DF; Landmark; Landmark XP; Oust Extra; Oust XP; Outrider®; Plateau; Poast; Poast Plus; Ronstar 50 WSP; Ronstar Flo; Ronstar G; Sahara DG; Spike 20P Specialty; Spike 80 DF Specialty; Stalker; Surflan AS Specialty; Surflan Flex; Surflan Flex T&O; Surflan XL 2G; Surflan Pro; Telar XP; Tordon 101 Mixture Specialty; Tordon 22K Specialty; Tordon K Herbicide Specialty; Transline Specialty; Vanquish; Velpar DF CU; Velpar DF VU; Velpar L CU; Velpar L; Velpar L VU

When used in combination as described on this label, and to the extent consistent with applicable law, the liability of Bayer CropScience LP shall in no manner extend to any damage, loss or injury not solely and directly caused by the inclusion of the Bayer CropScience LP product in such combination use.

7.3 Tank-Mixing Procedure

Always predetermine the compatibility of all tank-mix products together in the carrier by mixing small proportional quantities in advance.

Add individual tank-mix components to the tank in the following order: wettable powders; flowables; emulsifiable concentrates; drift reduction additives; water soluble liquids (this product) Ensure that the tank-mix products are well mixed in the spray solution before adding this product.

Mix only the quantity of spray solution that will be applied that day. Application of tank-mix solutions that are allowed to stand overnight could result in reduced weed control.

Maintain gentle agitation at all times until the contents of the tank are sprayed out. If the spray mixture is allowed to settle, agitate thoroughly to resuspend the mixture before resuming application.

Keep by-pass line on or near the bottom of the tank to minimize foaming.

A 50-mesh nozzle screen or line strainer on the spray equipment is adequate.

7.4 Mixing Spray Solution Concentrations

All reference throughout this label to concentration of this product in a spray solution is on a percentage-of-volume basis.

Prepare the desired volume of spray solution at a given concentration by mixing the amount of this product as indicated on the following table in water.

Desired Volume of Spray Solution	Amount of Roundup PRO Herbicide to Achieve Indicated Concentration in Spray Solution (percent by volume)					
	½%	1%	1 ½%	2%	5%	10%
1 gallon	2/3 fl oz	1 1/3 fl oz	2 fl oz	2 2/3 fl oz	6 1/2 fl oz	13 fl oz
25 gallons	16 fl oz	1 qt	1 1/2 qts	2 qts	5 qts	10 qts
100 gallons	2 qts	1 gal	1 1/2 gals	2 gals	5 gals	10 gals

2 tablespoons = 1 fluid ounce (fl oz)

For filling backpack and pump-up sprayers, consider mixing the appropriate amount of this product with water in a larger container and then filling the sprayer from the larger container.

7.5 Colorants and Dyes

Colorants and marking dyes may be added to spray solutions of this product; however they can reduce the performance of this product. Use colorants and dyes according to the manufacturer's directions.

8.0 APPLICATION EQUIPMENT AND TECHNIQUES

This product may be applied with the following equipment:

Aerial Application Equipment—fixed-wing and helicopter

Ground Application Equipment—boom or boomless systems, pull-type sprayers, floaters, pick-up sprayers, spray coupes and other ground broadcast application equipment

Handheld Sprayers—backpack sprayers, pump-up pressure sprayers, handguns, handwands, mistblowers*, lances and other handheld and motorized spray equipment used to direct the spray onto unwanted foliage.

* This product is not registered in California or Arizona for use in mistblowers.

Selective Application Equipment—recirculating sprayer, shielded and hooded sprayers, wiper applicator, sponge bar, single or hollow stem injectors, tree injector, spray bottle

Injection Systems—aerial or ground injection sprayers

Controlled Droplet Applicator (CDA)—handheld or boom-mounted applicators that produce a spray pattern consisting of a narrow range of droplet sizes

APPLY THIS PRODUCT USING PROPERLY MAINTAINED AND CALIBRATED EQUIPMENT CAPABLE OF ACCURATELY DELIVERING DESIRED VOLUMES.

Do not apply this product through any type of irrigation system.

8.1 Spray Drift Management

AVOID CONTACT OF THIS HERBICIDE WITH FOLIAGE, GREEN STEMS, EXPOSED NON-WOODY ROOTS OR FRUIT OF CROPS, DESIRABLE PLANTS AND TREES, AS SEVERE PLANT INJURY OR DESTRUCTION COULD RESULT.

Do not allow the herbicide solution to mist, drip, drift or splash onto desirable vegetation, as even small quantities of this product can cause severe damage or destruction to the crop, plants or other vegetation on which application was not intended.

AVOID DRIFT. USE EXTREME CARE TO PREVENT INJURY TO DESIRABLE PLANTS AND CROPS WHEN APPLYING THIS PRODUCT.

Avoiding spray drift at the application site is the responsibility of the applicator. The interaction of many equipment- and weather-related factors determines the potential for spray drift. The applicator and grower are responsible for considering all these factors when making decisions regarding the application of this product.

The likelihood of injury occurring as the result of spray drift while applying this product increases when winds are gusty, as wind velocity increases, when wind direction is constantly changing or when there are other meteorological conditions that favor spray drift. When spraying, avoid combinations of pressure and nozzle type that will result in splatter or generation of fine particles (mist) that are likely to drift.

TO PREVENT INJURY TO ADJACENT DESIRABLE VEGETATION, APPROPRIATE BUFFERS MUST BE MAINTAINED.

AVOID APPLYING THIS PRODUCT AT EXCESSIVE SPEED OR SPRAYER PRESSURE.

8.2 Aerial Application Equipment

Unless otherwise prohibited, all broadcast applications of this product described on this label may be made using aerial application equipment where appropriate, provided that the applicator complies with the precautions and restrictions specified on this label and on separate supplemental labeling published for this product.

DO NOT APPLY THIS PRODUCT USING AERIAL APPLICATION EQUIPMENT EXCEPT UNDER CONDITIONS SPECIFIED ON THIS LABEL OR ON SEPARATELY PUBLISHED SUPPLEMENTAL LABELING FOR THIS PRODUCT.

FOR SPECIFIC USE INSTRUCTIONS, RESTRICTIONS AND REQUIREMENTS RELATED TO THE AERIAL APPLICATION OF THIS PRODUCT IN CALIFORNIA, OR SPECIFIC COUNTIES THEREIN, REFER TO THE LIMITATIONS ON AERIAL APPLICATION IN THAT STATE OR COUNTY PRESENTED IN THIS SECTION.

Apply this product at the rate specified on this label in 3 to 25 gallons of water per acre, unless otherwise directed. Use a larger spray volume within this range where weeds, brush, trees and vines are dense or form multiple canopy layers.

Avoid direct application to any body of water.

Drift control additives may be used.

Ensure uniform application. To avoid streaked, uneven or overlapped application, use appropriate marking devices.

Aircraft Maintenance

Thoroughly wash aircraft, especially landing gear, after each day of spraying to remove residues of this product accumulated during spraying or from spills. PROLONGED EXPOSURE OF THIS PRODUCT TO UNCOATED STEEL SURFACES COULD RESULT IN CORROSION AND POSSIBLE FAILURE OF THE PART. LANDING GEAR IS MOST SUSCEPTIBLE. Maintaining an organic coating (paint) that meets aerospace specification MIL-C-38413 can help prevent corrosion.

AERIAL SPRAY DRIFT MANAGEMENT

The following drift management requirements must be followed to minimize off-target drift movement during aerial application. These requirements do not apply to forestry applications.

1. The distance of the outermost nozzles on the boom must not exceed 3/4 the length of the wingspan or rotor.
2. Nozzles must always point backward, parallel with the air stream and never be pointed downwards more than 45 degrees. Where states have more stringent regulations, they must be followed.

Importance of Droplet Size

The most effective way to reduce drift potential is to apply large droplets. The best drift management strategy is to apply the largest droplets that provide sufficient coverage and control. Applying larger droplets reduces drift potential, but will not prevent drift if applications are made improperly or under unfavorable environmental conditions, such as in windy, high temperature with low humidity, and/or inversion conditions as described below.

Controlling Droplet Size

- **Volume:** Use high flow rate nozzles to apply the highest practical spray volume. Nozzles with the higher rated flows produce larger droplets.
- **Pressure:** Operate sprayer at a pressure towards the lower end of the range listed for the nozzle. Higher pressure reduces droplet size and does not improve canopy penetration. When higher flow rates are needed, use higher flow rate nozzles instead of increasing pressure.
- **Number of nozzles:** Use the minimum number of nozzles that provides uniform coverage.
- **Nozzle orientation:** Orienting nozzles so that the spray is released backwards, parallel to the air stream, will produce larger droplets than other orientations. Significant deflection from the horizontal will reduce droplet size and increase drift potential.
- **Nozzle type:** Use a nozzle type that is designed for the intended application. With most nozzle types, narrower spray angles produce larger droplets. Consider using low-drift nozzles. Solid stream nozzles oriented straight back produce larger droplets than other nozzle types.
- **Boom length:** For some use patterns, reducing the effective boom length to less than 3/4 of the wingspan or rotor length can further reduce drift without reducing swath width.
- **Application height:** Application must be made at a height of 10 feet or less above the top of the tallest plants, unless a greater height is required for aircraft safety. Making the application at the lowest height that is safe reduces the exposure of the droplets to evaporation and wind.

Swath Adjustment

When an application is made in the presence of a crosswind, the swath will be displaced downwind. Therefore, on the upwind and downwind edges of the field, the applicator must compensate for this displacement by adjusting the path of the aircraft upwind. Increase the swath adjustment distance with increasing drift potential (higher wind speed, smaller droplets, etc.).

Wind

Drift potential is lowest at wind speeds of between 2 and 10 miles per hour. However, many factors, including droplet size and equipment type determine drift potential at any given wind speed. Avoid application when wind speeds are below 2 miles per hour due to variable wind direction and high inversion potential. **NOTE:** Local terrain can influence wind patterns. Every applicator must be familiar with local wind patterns and how they affect drift.

Temperature and Humidity

When making an application in low relative humidity, set application equipment to produce larger droplets to compensate for evaporation. Droplet evaporation is most severe when conditions are both hot and dry.

Temperature Inversions

Do not apply this product during a temperature inversion as drift potential is high under these conditions. Temperature inversions restrict vertical air mixing, which causes small droplets to remain suspended in a concentrated cloud. This cloud can move in unpredictable directions due to the light variable winds common during inversions. Temperature inversions are characterized by increasing temperatures with altitude and are common on nights with limited cloud cover and light to no wind. They begin to form as the sun sets and often continue into the morning. Their presence can be indicated by ground fog. If fog is not present, inversions can also be identified by the movement of smoke from a ground source or an aircraft smoke generator. Smoke that layers and moves laterally in a concentrated cloud (under low wind conditions) indicates an inversion, while smoke that moves upward and rapidly dissipates indicates good vertical air mixing.

Sensitive Areas

Apply this product only when the potential for drift to adjacent sensitive areas (e.g., residential areas, bodies of water, known habitat for threatened or endangered species, non-target crops) is minimal (e.g., when wind is blowing away from a sensitive area).

State Specific Limitations on Aerial Application

LIMITATIONS ON AERIAL APPLICATION IN CALIFORNIA ONLY

DO NOT apply this product using aerial application equipment in residential areas.

AVOID DRIFT – DO NOT APPLY WHEN WINDS ARE GUSTY OR UNDER ANY OTHER CONDITION THAT FAVORS DRIFT. DRIFT OF THIS PRODUCT ONTO ANY VEGETATION TO WHICH APPLICATION WAS NOT INTENDED CAN CAUSE DAMAGE. TO PREVENT INJURY TO ADJACENT DESIRABLE VEGETATION, USE PROPER AERIAL APPLICATION EQUIPMENT FITTED WITH APPROPRIATE NOZZLES AND MAINTAIN ADEQUATE BUFFERS.

Follow the directions below when making an aerial application near non-target crops, desirable annual vegetation, or perennial vegetation after bud break and before total leaf drop.

1. Do not apply this product within 100 feet of all desirable vegetation or non-target crops.
2. If winds are blowing up to 5 miles per hour TOWARD desirable vegetation or non-target crops, do not apply this product within 500 feet of the desirable vegetation or crops.
3. If winds are blowing between 5 and 10 miles per hour TOWARD desirable vegetation or non-target crops, a buffer zone greater than 500 feet might be needed to protect the desirable vegetation or crops.
4. Do not apply this product using aerial application equipment when winds are blowing in excess of 10 miles per hour.
5. Do not apply this product using aerial application equipment when inversion conditions exist.

When tank-mixing this product with 2,4-D, only 2,4-D amine formulations may be applied in California using aerial application equipment. Tank mixtures of this product with 2,4-D amine formulations may be applied by air in California on fallow fields and in reduced tillage systems, and for pasture renovation applications only.

This product, when tank-mixed with dicamba, may not be applied by air in California.

ADDITIONAL LIMITATIONS ON AERIAL APPLICATION IN FRESNO COUNTY, CALIFORNIA ONLY

Always read and follow the label directions and precautionary statements for all products used in the aerial application.

The following information applies only from February 15 through March 31 within the following boundaries of Fresno County, California:

North: Fresno County line
South: Fresno County line
East: State Highway 99
West: Fresno County line

Observe the following directions to minimize off-site movement during aerial application of this product. Minimization of off-site movement is the responsibility of the grower, Pest Control Advisor and aerial applicator.

Written Directions

Written directions MUST be submitted by or on behalf of the applicator to the Fresno County Agricultural Commissioner 24 hours prior to the application. These written directions MUST state the proximity of surrounding crops, and that conditions of each manufacturer's product label and this label have been satisfied.

Aerial Applicator Training and Equipment

Aerial application of this product is limited to pilots who have successfully completed a Fresno County Agricultural Commissioner and California Department of Pesticide Regulation approved training program for aerial application of herbicides. All aircraft must be inspected, critiqued in flight and certified at a Fresno County Agricultural Commissioner approved fly-in. Test and calibrate spray equipment at intervals sufficient to insure that proper rates of herbicides and adjuvants are being applied during commercial use. Applicator must document such calibrations and testing. Demonstration of performance at Fresno County Agricultural Commissioner approved fly-ins constitutes such documentation, or other written records showing calculations and measurements of flight and spray parameters acceptable to the Fresno County Agricultural Commissioner.

Applications at Night – Do not apply this product by air earlier than 30 minutes prior to sunrise and/or later than 30 minutes after sunset without prior permission from the Fresno County Agricultural Commissioner.

For additional information on the proper aerial application of this product in Fresno County, call 1-866-99BAYER (1-866-992-2937).

8.3 Ground Application Equipment

Apply this product at the appropriate rate specified on this label in 3 to 40 gallons of water per acre when making a broadcast application using ground application equipment, unless otherwise directed on this label or on separate supplemental labeling or Fact Sheets published for this product. As the weed density increases, increase the spray volume towards the upper end of this range to ensure complete coverage. Use nozzles that will avoid generating a fine mist. For enhanced results with ground application equipment, use flat-fan nozzles. Check spray pattern for uniform distribution of spray droplets.

8.4 Handheld Sprayers

When using a handheld sprayer, apply spray solutions of this product uniformly and completely to foliage of target weeds using a coarse spray droplet spectrum and a spray-to-wet technique; do not spray to the point of runoff. For the appropriate concentration of this product in the spray solution and timing of application to control specific weeds, woody brush, trees and vines, refer to the "WEEDS CONTROLLED" section of this label.

For control of annual weeds, make application when weeds are small and prior to seedhead or bud formation. For control of perennial weeds, woody brush, trees and vines, make application after flowering and before fall color and leaf drop.

When making a low-volume directed spray application to annual and perennial weeds, woody brush, trees and vines using a handheld sprayer, ensure that at least 50 to 75 percent of the foliage or the top one-half of each unwanted plant is sprayed. If a straight stream nozzle is used, start the application at the top of the targeted plant and spray from top to bottom in a lateral zig-zag motion. To ensure uniform and complete coverage, spray both sides of large or tall woody brush, trees and vines, or when foliage is thick and dense, or where there are multiple sprouts. For enhanced results on woody brush, trees and vines, apply to actively growing vegetation after full leaf expansion and flowering, prior to fall color and leaf drop.

The following table summarizes various methods of foliar application using a backpack sprayer with a spray-to-wet or low-volume directed spray technique and high-volume sprayer application using handheld application equipment for control or partial control of herbaceous weeds, woody brush, trees and vines listed in the "WEEDS CONTROLLED" section of this label.

Method of Application	Spray Solution Concentration	Spray Volume
Handgun or Backpack Sprayer	0.75 - 2% by volume	Spray-to-wet technique
Low-Volume Directed Spray (Backpack)	5 to 10% by volume	15 to 25 gallons/acre
Modified High-Volume Spray	3 to 5% by volume	40 to 60 gallons/acre

Low-volume directed spray application with a backpack sprayer works best when applying to weeds and brush less than 10 feet tall. For taller weeds and brush, a high-volume handgun can be modified by reducing the nozzle size and spray pressure to produce a modified high-volume directed spray application.

8.5 Selective Application Equipment

Selective application equipment allows this product to be applied to weeds growing near a crop or other desirable vegetation without killing the desirable vegetation. Selective application equipment must be capable of preventing all contact of the herbicide solution with the desirable vegetation and operated without spray mist escape, leakage or dripping of the herbicide solution.

AVOID CONTACT OF THIS HERBICIDE WITH DESIRABLE VEGETATION. Contact of this product with desirable vegetation could result in unwanted plant damage or destruction. To the extent consistent with applicable law, such damage shall be the sole responsibility of the applicator.

This product may be diluted with water and applied using a recirculating sprayer, shielded sprayer, hooded sprayer, wiper applicator or sponge bar to weeds listed on this label growing on any terrestrial non-food or non-feed crop site described on this label, where feasible. This product may also be used with sprayers equipped with optical weed sensor technology. Other selective equipment that may be used to deliver or apply this product are single and hollow stem injectors, tree injectors, wiper applicators for cut stem and cut stump applications, and spray or squirt bottles for cut stem, cut stump and frill applications to control large stem weeds, brush, trees and vines listed on this label.

Recirculating Sprayer

A recirculating sprayer directs the spray solution onto weeds growing above desirable vegetation, while spray solution that is not intercepted by weeds is collected and returned to the spray tank for reapplication. A recirculating sprayer may be used to apply spray solutions of this product to weeds listed on this label on any terrestrial non-crop site described on this label.

Shielded and Hooded Sprayers

A shielded sprayer directs the herbicide solution to the target weeds while protecting desirable vegetation from coming into contact with the herbicide spray with an impervious material or shield. Use nozzles that provide uniform coverage within the application area. Keep shields properly adjusted to protect desirable vegetation.

A hooded sprayer is a type of shielded sprayer where the spray pattern is fully enclosed, including the top, sides, front and back, thereby shielding desirable vegetation from the spray solution.

This product may be diluted with water and applied using a shielded or hooded sprayer to weeds listed on this label growing on any terrestrial non-crop site described on this label, where feasible, and between rows of plants (row middles) in any cropping system listed on this label.

Properly adjust the hood to protect desirable vegetation. Ensure that the hood is capable of completely enclosing the spray pattern. If necessary when applying around crops grown on raised beds, extend the front and rear flaps of the hooded sprayer downward to reach the ground in deep furrows.

A hooded sprayer must be configured and operated in a manner that minimizes bouncing and avoids raising the hood up off the ground surface at any time. If the hood is raised, spray particles can escape and come into contact with the crop or other desirable vegetation, causing damage to or destruction of the desirable vegetation. Avoid operating this equipment on rough or sloping terrain where the spray hood is likely to rise up off the ground surface.

Use hoods designed to minimize excessive dripping or runoff down the inside of the hood, such as a single, low pressure, low drift, flat-fan nozzle with an 80- to 95-degree spray angle positioned at the top center of the hood, with a spray volume of 20 to 30 gallons per acre

The following procedures will help reduce the potential for injury to desirable vegetation when using a hooded sprayer:

- Operate the sprayer with the hood on the ground or skimming across the ground surface.
- Leave at least an 8-inch untreated strip over the drill row. (For example, if the crop row width is 38 inches, use a sprayer hood with a maximum width of 30 inches.)
- Operate at a ground speed no greater than 5 miles per hour to minimize bouncing of the hooded sprayer.
- Apply when wind speed is 10 miles per hour of less.
- Use low-drift nozzles that provide uniform coverage within the application area.

Injury to a crop or other desirable vegetation can occur when application is made to foliage of weeds that come into direct contact with the desirable vegetation. Do not apply this product when leaves of desirable vegetation are growing in direct contact with weeds. Droplets, mist, foam or splatter of the herbicide solution settling onto desirable vegetation can result in discoloration, stunting or destruction.

Wiper Applicator

A wiper applicator is a device that physically wipes this product or solutions of this product directly onto the weed or cut stump. Any handheld device that is capable of physically wiping this product or solutions of this product directly onto the target weed or cut stump, such as a paint brush, may be used.

A mechanical wiper applicator, such as a rope wick or sponge bar that can be driven through a field over the top of a crop or other desirable vegetation to control tall weeds growing above the desirable vegetation, must be designed, maintained and operated to prevent the herbicide solution from contacting desirable vegetation.

Wiper applicators may be used over the top of food or feed crops ONLY if specifically permitted for use over that crop by this label or by separately published supplemental labeling for this product.

When using a mechanical wiper applicator, adjust the height of the applicator to ensure adequate contact with the weeds and so that the wiper contact point is at least 2 inches above the crop or desirable vegetation. Enhanced results can be obtained when more of the weed is exposed to the herbicide solution and weeds are a minimum of 6 inches above the desirable vegetation. Weeds that do not come into contact with the herbicide solution will not be affected. Poor contact can occur when weeds are growing in dense clumps, when operating in areas of severe weed infestation or when weed height varies dramatically. In these situations, more than one application of this product might be necessary.

Operate wiper applicators at a ground speed of no greater than 5 miles per hour. Performance in areas of heavy weed infestation can be improved by reducing speed, which will provide more time for re-saturation of the wiper with the herbicide solution and more contact time of the wiper with the weed. Enhanced results with a wiper applicator can be obtained when two applications are made traveling in opposite directions across the field.

Keep wiping surfaces clean.

Droplets, mist, foam or splatter of the herbicide solution settling onto desirable vegetation can result in discoloration, stunting or destruction. Avoid leakage or dripping onto desirable vegetation. Be aware that on sloping ground the herbicide solution can migrate to one side, causing dripping on the lower end and drying of the wiper surface on the upper end of the applicator.

Do not apply this product with a wiper applicator when weeds are wet.

For Rope Wick and Sponge Bar Applicators apply solutions ranging from 33 to 75 percent of this product by volume in water.

For Panel Applicators apply solutions ranging from 33 to 100 percent (undiluted) of this product by volume in water.

Mix only the amount of this product that will be used during a 1-day period, as reduced product performance can result from use of solutions held in storage.

Clean wiper parts promptly after using this product by thoroughly flushing with water.

Single and Hollow Stem Injectors

Control of certain weeds listed in the "WEEDS CONTROLLED" section can be obtained by injecting this concentrated product or solutions of this product directly in or onto the target weed. Ensure that the handheld injector being used for this application is capable of accurately delivering the volume specified on the label. When making stem injections, the combined total use of this product must not exceed 10.6 quarts per acre per year. At 6 milliliters of concentrated (undiluted) product per stem, 10.6 quarts will treat approximately 1670 stems per acre per year. The number of stems that can be treated per acre will vary depending on the injection volume and the concentration of this product in the application solution.

8.6 Injection Systems

This product may be used in aerial and ground injection spray systems as a liquid concentrate or diluted prior to injecting into the spray stream. Do not mix this concentrated product with the undiluted concentrate of other products when using injection systems, unless otherwise directed.

8.7 Controlled Droplet Applicator (CDA)

The amount of this product applied per acre using a controlled droplet applicator (CDA) must be no less than the rate specified on this label for application using conventional broadcast application equipment.

A controlled droplet applicator produces a spray pattern that is not easily visible. Use extreme care to avoid spray or drift from contacting foliage or any other green tissue of desirable vegetation, as plant damage or destruction could result.

9.0 TERRESTRIAL USE SITES

This product may be used according to the directions for use described on this label to control weeds, woody brush, trees and vines listed on this label on any terrestrial site described on this label.

This product may be used to control weeds, woody brush, trees and vines on maintained landscapes, on improved and unimproved land, on lawns and turf and around ornamentals on industrial, commercial and residential sites, including airports, apartment complexes, chaparrals, ditch banks, driveways, dry ditches, dry canals, farmsteads, fencerows, forestry sites, golf courses, greenhouses, lumber yards, manufacturing sites, municipal sites, natural areas, nurseries, office complexes, ornamental beds, parks, parking areas, pastures, petroleum tank farms, pumping installations, railroads, rangeland, recreational areas, residential areas, roadsides, schools, shadehouses, sod and turfgrass seed farms, sports complexes, storage areas, substations, utility rights-of-way, utility sites, warehouse areas, wildlife food plots and wildlife management areas.

This product may be used for non-selective control of unwanted vegetation on any site described on this label for trim-and-edge application around objects, including around building foundations, equipment storage areas and trees, along and in fences, and to eliminate unwanted weeds growing in and around established shrub beds and ornamental plantings. This product may also be used for complete elimination of vegetation from a terrestrial site prior to planting ornamentals, flowers, or turfgrass (sod or seed), and prior to land development, including prior to beginning construction projects or the laying of asphalt or other road material. Application of this product may be repeated, as needed, to maintain bare ground, up to a total application of 10.6 quarts per acre per year.

This product may be used for establishment and maintenance of fuel breaks, for establishing fire perimeters and black lines, along fire roads and to facilitate prescribed burning practices on any site described on this label.

This product may also be used for weed control or growth regulation on Christmas tree farms, farmsteads, production nurseries, and sod farms and turfgrass seed farms.

Unless otherwise directed, application of this product may be made according to the directions for use in the sections that follow to any of these sites using any method of application described on this label to control any weeds, woody brush, trees and vines listed in the "WEEDS CONTROLLED" section of this label.

10.0 ADDITIONAL SITE MANAGEMENT INFORMATION

The following sections contain additional use information specifically related to certain use sites. Unless otherwise directed, any application of this product described in the "WEEDS CONTROLLED" section or any other section of this label may be made on the use sites described in the sections that follow, where applicable, using any method of application described on this label that is appropriate.

10.1 Forestry, Hardwood and Christmas Tree Management

This product may be used for control or partial control of woody brush, trees and herbaceous weeds on any tree site, including forestry settings, Christmas tree plantations, and silvicultural and production nursery sites, using any method of application listed on this label. See the "WEEDS CONTROLLED" section of this label for application rates and specific use directions.

Weed Management, Site Preparation

This product may be used to control or partially control undesirable woody brush, trees, vines and herbaceous weeds listed on this label for preparing sites prior to planting any tree species, including Christmas trees, eucalyptus trees and hybrid tree cultivars, and for controlling weeds around established trees, establishing wildlife openings and maintaining roads on any tree site.

TANK MIXTURES: This product may be applied in a tank-mix with the products listed in this section to increase the spectrum of vegetation controlled. Any application rate of this product listed on this label may be used in a tank-mix with the following products for tree site management, including site preparation, provided that the product is labeled for the use on the site of application and prior to planting the desired species. Refer to the individual label of all products used in the tank mixture for approved uses and application rates. Read and follow all directions for use and precautions for each product used, including planting interval restrictions, if any. Use this product according to the most restrictive precautionary statements of any product in the mix.

imazapyr; metsulfuron methyl; sulfometuron methyl; triclopyr
Arsenal; Arsenal Herbicide Applicators Concentrate; Chopper; Chopper Gen2; Escort XP; Forestry Garlon 4 Specialty; Forestry Garlon XRT Specialty; Garlon 3A Specialty; Garlon 4 Specialty; Garlon 4 Ultra Specialty; Landmark; Landmark XP; Oust Extra; Oust XP

For control of herbaceous weeds, apply these tank-mix products at the lower end of the application rate range specified on the product label. For control or partial control of dense stands or for hard-to-control woody brush, trees and vines, apply these products at a rate or spray solution concentration towards the higher end of the given range.

Conifer Release, Mid-Rotation Conifer Release, Hardwood Release, Stand Improvement

This product may be applied as a directed spray using a handheld sprayer or using any selective application equipment described on this label to control woody and herbaceous weeds and other undesirable understory vegetation below the tree crop canopy in conifer plantations, hardwood sites, Christmas tree plantations and silvicultural and ornamental nurseries to facilitate the release and growth of conifer and hardwood trees.

This product may also be applied using ground broadcast equipment or as a directed spray application for mid-rotation release under the canopy of pines, other conifers and hardwoods.

PRECAUTIONS: Avoid contact of spray drift, mist or drips with foliage, green bark or non-woody surface roots of desirable plant species. Use application techniques that prevent or minimize contact of this product with foliage of desired trees or other plants through direct contact or off-target spray movement.

RESTRICTIONS: Do not apply this product as an over-the-top broadcast application for conifer or hardwood release, unless otherwise directed on this label or on separate supplemental labeling for this product.

10.2 Native and Wildlife Habitat Management

This product may be used to control exotic and other undesirable vegetation in wildlife habitat and natural areas, including riparian and estuarine areas, rangeland and wildlife refuges. Application may be made to allow recovery of native plant species or prior to planting desirable native species, and for similar broad-spectrum vegetation control. Spot treatment, cut stump, cut stem, stem injection, wiper applicator and all other methods of application listed on this label may be made to selectively remove unwanted plants for habitat management and enhancement.

This product may also be used to eliminate annual and perennial weeds prior to planting wildlife food plots. Any wildlife food species may be planted after applying this product or native species may be allowed to repopulate the area naturally. If tillage is needed to prepare a seedbed, wait a minimum of 7 days after application before tilling to allow translocation of this product into underground plant parts.

10.3 Ornamental and Production Nursery Management

All uses of this product described on this label may be used in a plant nursery setting using any method of application described.

This product may be used to clear an area of unwanted vegetation prior to planting any ornamental plant, tree, shrub or other plants.

This product may also be used to control weeds growing around established woody ornamental species, such as arborvitae, azalea, boxwood, crabapple, eucalyptus, euonymus, fir, Douglas fir, jojoba, hollies, lilac, magnolia, maple, oak, poplar, privet, pine, spruce and yew, and to trim and edge around potted plants and other objects in a plant nursery.

PRECAUTIONS: Protect desirable plants from the spray solution using shields or coverings made of waterproof material. Take care to avoid contact of spray, drift or mist with foliage, green stems or immature bark of established ornamental species.

Greenhouse/Shadehouse

This product may be used to control weeds growing in and around greenhouses and shadehouses.

RESTRICTIONS: Desirable vegetation must not be present during application in a greenhouse. Turn air circulation fans off before applying this product inside a greenhouse or shadehouse and leave them off until the application solution has dried.

10.4 Commercial, Residential and Recreational Area Management

All applications of this product described on this label may be used in commercial, residential and recreational areas, including parks, schools and athletic fields, using any method of application described on this label, including spot treatment of unwanted vegetation, trim-and-edge application around trees, fences, walking paths, buildings, sidewalks, nature trails and other objects in these areas, to eliminate unwanted weeds growing in established shrub and ornamental beds, for turf management and renovation, and to eliminate vegetation from a site prior to development, including prior to planting an area to ornamentals, flowers or turfgrass (sod or seed), or beginning construction projects.

10.5 Pasture Management

The use of this product in pastures includes use on bahiagrass, bermudagrass, bluegrass, brome, fescue, guinea grass, kikuyu grass, orchardgrass, pangola grass, ryegrass, Timothy, and wheatgrass.

Preplant, Preemergence, Pasture Renovation

This product may be applied prior to planting or emergence of forage or perennial grasses. Refer to the "WEEDS CONTROLLED" section of this label for application rates of this product for control of specific weeds.

RESTRICTIONS: If the total application rate of this product is 3 quarts per acre or less, no waiting period between application and feeding or livestock grazing is required. If the rate is greater than 3 quarts per acre, remove domestic livestock before application and wait a minimum of 8 weeks after application before grazing or harvesting.

Spot Treatment, Wiper Applicator

This product may be applied in pastures as a spot treatment or over the top of desirable grasses using a wiper applicator to control taller growing weeds. For enhanced weed control, remove domestic livestock before application to allow for sufficient plant growth and wait a minimum of 7 days after application before grazing livestock or harvesting for feed. See additional instructions on the use of wiper applicators in the "APPLICATION EQUIPMENT AND TECHNIQUES" section of this label.

RESTRICTIONS: For spot treatment or use with a wiper applicator at rates of 3 quarts per acre or less, this product may be applied over the entire pasture or any portion of it. At rates greater than 3 quarts per acre, this product may be applied over no more than 10 percent of the total pasture at any one time. Application may be repeated in the same area at 30-day intervals.

Weed Suppression in Dormant Pastures

This product may be applied in dormant pastures to suppress competitive growth and seed production of annual weeds and other undesirable vegetation. Apply 12 to 16 fluid ounces of this product per acre using broadcast application equipment on pastures in late-fall after desirable perennial grasses have reached dormancy or in late-winter before desirable perennial grasses break dormancy and initiate green growth.

PRECAUTIONS: Higher application rates may be used for hard-to-control weeds; however, higher rates can cause stand reduction. Some stunting of perennial grasses can occur if broadcast application is made when they are not dormant.

RESTRICTIONS: No waiting period is required between application and grazing or harvesting for feed. Do not apply more than 3 quarts of this product per acre per year onto pasture grasses except for renovation. If reseeding is needed due to severe stand reduction, no waiting period is required after application of this product before seeding the pasture grasses listed at the beginning of this section; for all other pasture grasses, wait a minimum of 30 days after application before seeding.

10.6 Railroad Management

All uses of this product described in the "WEEDS CONTROLLED" or any other section of this label may be used on railroad sites using any method of application described.

Application of this product along railroad rights-of-way may be made in up to 80 gallons of spray solution per acre.

Bare Ground, Ballast and Shoulders, Crossings, Spot Treatment

This product may be used to maintain bare ground on railroad ballast and shoulders, and reduce the need for mowing and mechanical brush removal along railroad rights-of-way. Application of this product may be repeated as weeds continue to emerge in order to maintain bare ground, up to a maximum total application rate of 10.6 quarts of this product per acre per year.

TANK MIXTURES: This product may be applied in a tank mixture with the following products for enhanced control of woody brush and trees for bare ground, ballast and shoulder, crossing and spot treatment applications, and other brush, tree and vine control on railroad sites, provided that the product used is labeled for the application being made. Refer to the individual product label of all products used in the tank mixture for approved uses and application rates. Always read and follow label directions for each product in the mix.

2,4-D; atrazine; bromacil; chlorsulfuron; clopyralid; dicamba; diquat; diuron; hexazinone; imazapyr; metsulfuron methyl; pelargonic acid; simazine; sulfometuron methyl; sulfosulfuron; tebuthiuron; triclopyr

Arsenal; Arsenal Herbicide Applicators Concentrate; Chopper; Chopper Gen2; Escort XP; Forestry Garlon 4 Specialty; Forestry Garlon XRT Specialty; Garlon 3A Specialty; Garlon 4 Specialty; Garlon 4 Ultra Specialty; Habitat; Hyvar X; Hyvar X-L; Krovar I DF; Oust Extra; Oust XP; Outrider®; Princep 4L; Princep Caliber 90; Princep Liquid; Sahara DG; Scythe; Stalker; Spike 20P Specialty; Spike 80DF Specialty; Telar XP; Transline Specialty; Velpar DF CU; Velpar DF VU; Velpar L; Velpar L CU; Velpar L VU; Vastlan Specialty

Brush, Tree and Vine Control

This product may be used to control woody brush, trees and vines along railroad rights-of-way. Apply 4 to 10 quarts of this product in up to 80 gallons of spray solution per acre as a broadcast application using either a boom or boomless sprayer. Apply a 0.75- to 2-percent solution of this product when using high-volume application equipment with a spray-to-wet technique, or a 5- to 10-percent solution when using low volume directed sprays for spot treatment.

TANK MIXTURES: This product may be applied in a tank-mix with one or more of the following products for enhanced control of woody brush, trees and vines along railroad rights-of-way, provided that the product is labeled for use on these sites. Refer to the individual product labels for approved sites and application rates.

chlorsulfuron; clopyralid; dicamba; fosamine; hexazinone; imazapyr; metsulfuron methyl; picloram; triclopyr

Arsenal; Arsenal Herbicide Applicator's Concentrate; Chopper; Chopper Gen2; Escort XP; Forestry Garlon 4 Specialty; Forestry Garlon XRT Specialty; Garlon 3A Specialty; Garlon 4 Specialty; Garlon 4 Ultra Specialty; Habitat; Krenite S Brush Control Agent; Stalker; Telar XP; Tordon 101 Mixture Specialty; Tordon 22K Specialty; Tordon K Herbicide Specialty; Transline Specialty; Vanquish; Velpar DF CU; Velpar DF VU; Velpar L; Velpar L CU; Velpar L VU; Vastlan Specialty

Weed Control in Dormant and Actively Growing Bermudagrass

This product may be used to control or partially control many annual and perennial weeds in dormant and actively growing bermudagrass along railroad rights-of-way. See the "WEEDS CONTROLLED" section of this label for directions for use of this product for weed control in grasses.

10.7 Rangeland Management

This product will control or suppress many annual weeds growing in perennial cool- and warm-season grass rangeland. Slight discoloration of the desirable grasses could occur, but will re-green and resume growing under moist soil conditions as effects of this product wear off.

Preventing seed production is critical to the control of invasive annual grassy weeds on rangeland. Yearly application of this product to eliminate invasive annual weeds before they produce seed will help eliminate viable weed seeds from the soil. Delay grazing of the area after application of this product to allow desirable perennials to grow, flower and re-seed the area.

***Bromus* Control:** A broadcast application of 8 to 16 fluid ounces of this product per acre will control or suppress downy brome *(Bromus tectorum)*, Japanese brome *(Bromus japonicus)*, soft chess *(Bromus mollis)*, cheatgrass *(Bromus secalinus)*, cereal rye and jointed goatgrass on rangeland. For enhanced results, apply this product when most brome plants are in early-flower and before the plants, including seedheads, turn color. Allow for secondary weed flushes to occur after spring rains to further deplete the seed reserve in the soil and encourage perennial grass conversion on weedy sites. Apply this product in the fall in areas where spring moisture is normally limited and fall germination allows for good weed growth and weed seed depletion.

***Medusahead* Control:** To control or suppress medusahead, apply 16 fluid ounces of this product per acre at the 3-leaf stage. Delaying application beyond this stage will result in reduced or unacceptable control. Controlled burning prior to application of this product will eliminate the thatch layer produced by slowly decaying culms. Allow new weed growth to occur before applying this product after a burn. Repeat this application annually to eliminate medusahead seeds in the soil and allow desirable perennial grasses to repopulate the area.

RESTRICTIONS: Do not apply more than 3 quarts of this product per acre per year on rangeland. Do not use ammonium sulfate when applying this product on rangeland grasses. No waiting period between application of this product and livestock grazing is required.

10.8 Roadside Management

All uses of this product described on this label may be used for weed management along roadways, including weed control in dormant and active bermudagrass and bahiagrass, weed control along shoulders and under and around guardrails, signposts and other objects along the road, using any method of application described on this label.

TANK MIXTURES: This product may be tank-mixed with the following products for shoulder, guardrail, spot treatment and maintaining bare ground applications, provided that the product used is labeled for use on these sites. Refer to the individual product labels for approved uses and application rates.

2,4-D; atrazine; bromacil; chlorsulfuron; clopyralid; dicamba; diuron; fosamine; hexazinone; imazapic; imazapyr; metsulfuron methyl; oryzalin; oxadiazon; pendimethalin; picloram; prodiamine; simazine; sulfometuron; sulfosulfuron; triclopyr

AAtrex 4L; AAtrex Nine-0; Banvel; Barricade 65WG; Chopper; Chopper Gen2; Crossbow; Direx 4L; Escort XP; Endurance; Formula 40; Gallery 75 Dry Flowable Specialty; Gallery SC; Garlon 4; Garlon XRT; Hyvar X; Karmex DF; Krenite S Brush Control Agent; Krovar I DF; Landmark; Landmark XP; Oust Extra; Oust XP; Outrider®; Pendulum 3.3 EC; Pendulum AquaCap; Pendimax 3.3; Plateau; Poast; Poast Plus; Princep 4L; Ronstar 50 WSP; Ronstar Flo; Ronstar G; Sahara DG; Surflan AS Specialty; Surflan Flex; Surflan Flex T&O; Surflan Pro; Surflan XL 2G; Telar XP; Tordon K; Vanquish; Vastlan Specialty; Velpar DF CU; Velpar DF VU; Velpar L CU; Velpar L; Velpar L VU; Weedar 64

10.9 Utility Management

This product may be used along electrical power, pipeline and telephone rights-of-way, and on all sites associated with these utility rights-of-way, including substations, access roads and railroads, and along similar rights-of-way that run in conjunction with utilities, for spot treatment of unwanted vegetation, side-trimming, trim-and-edge application around objects, weed control prior to planting a utility site to ornamentals, flowers, or turfgrass (sod or seed), turf management, to eliminate unwanted weeds growing in established shrub or ornamental beds, to prepare or establish wildlife openings and for eliminating vegetation prior to or beginning construction projects. Application of this product may be repeated as needed to maintain bare ground as weeds continue to emerge, up to a maximum application rate of 10.6 quarts per acre per year.

TANK MIXTURES: This product may be tank-mixed with the following products for use on utility sites, provided that the product used is labeled for use on these sites. Refer to the individual product labels for approved sites and application rates. For control of herbaceous weeds, use a lower application rate or spray solution concentration within the given ranges for these tank-mix products and increase the rate or concentration toward the higher end of the ranges for control of dense stands or hard-to-control woody brush, trees and vines.

2,4-D; atrazine; bromacil; chlorsulfuron; clopyralid; dicamba; diuron; fosamine; hexazinone; imazapic; imazapyr; metsulfuron methyl; oryzalin; pendimethalin; prodiamine; simazine; sulfometuron methyl; sulfosulfuron; triclopyr

AAtrex 4L; AAtrex Nine-0; Arsenal Herbicide Applicators Concentrate; Endurance; Escort XP; Forestry Garlon 4 Specialty; Forestry Garlon XLT Specialty; Garlon 3A Specialty; Garlon 4 Specialty; Garlon 4 Ultra Specialty; Hyvar XL; Krenite S Brush Control Agent; Krovar I DF; Oust Extra; Oust XP; Outrider®; Plateau; Sahara DG; Surflan AS Agricultural; Surflan AS Specialty; Surflan Flex; Surflan Flex T&O; Surflan XL 2G; Telar XP; Transline Specialty; Vanquish; Velpar DF CU; Velpar DF VU; Velpar L; Velpar L CU; Velpar L VU; Vastlan Specialty; Weedar 64

Ensure that the Garlon product is thoroughly mixed with water according to label directions before adding this product to the spray mixture. Maintain continuous agitation when adding this product in order to avoid tank-mix incompatibility problems.

For enhanced results with side-trimming, apply this product in a tank-mix with one of the Garlon products listed above.

11.0 WEEDS CONTROLLED

Read the entire label before proceeding to use this product.

Always use a higher application rate or spray solution concentration of this product within a given range when weed growth is heavy or dense, or when weeds are growing in an undisturbed (non-cultivated) area.

Poor weed control could be realized if application is made to weeds covered with dust. For weeds that have been mowed, grazed or cut, allow re-growth to occur prior to application of this product.

Refer to the sections that follow for application rates and timing of application for the control of annual and perennial weeds, woody brush, trees and vines.

11.1 Weed Control, Renovation and Chemical Mowing in Turf

The use of this product described in this section may be applied to turfgrass growing on any terrestrial site listed on this label. Ensure that any tank-mix product applied with this product is labeled for the intended use and on the site of application.

Weed Control in Dormant Bermudagrass and Bahiagrass

This product may be used to control or suppress many winter annual weeds and tall fescue for effective release of dormant bermudagrass and bahiagrass prior to spring green-up in areas where these turfgrasses are desirable ground covers and some temporary injury or discoloration can be tolerated.

Apply 8 to 64 fluid ounces of this product in 10 to 40 gallons of water per acre when bermudagrass and bahiagrass are dormant and prior to spring green-up.

Application of more than 16 fluid ounces of this product per acre on highly maintained bermudagrass and bahiagrass turf, such as golf courses and lawns, could result in injury or delayed green-up in the spring.

For residual weed control in dormant bermudagrass and bahiagrass, this product may be tank-mixed with Outrider®, Oust Extra or Oust XP herbicides. Apply 8 to 64 fluid ounces of this product in a tank-mix with an appropriate rate of Outrider, Oust Extra or Oust XP herbicide in 10 to 40 gallons of water per acre. To avoid delays in green-up and minimize injury, apply no more than 1 ounce of Oust Extra or Oust XP herbicide per acre on bermudagrass and no more than 0.5 ounce on bahiagrass, and avoid application when these grasses are in a semi-dormant condition.

DO NOT apply this product in a tank-mix with Outrider, Oust Extra or Oust XP herbicides on highly maintained bermudagrass and bahiagrass turf, such as on golf courses and lawns.

Weed Control in Actively Growing Bermudagrass

This product may be used to control or partially control many annual and perennial weeds in actively growing bermudagrass. Some bermudagrass injury could result from the application of this product, but the bermudagrass will recover under moist conditions once the effects of the product wear off. Use only on well-established bermudagrass where some temporary injury or discoloration can be tolerated.

Apply 16 to 48 fluid ounces of this product in 10 to 40 gallons of spray solution per acre. Use a lower application rate within this range when controlling annual weeds less than 4 inches tall (or runner length) and increase the rate towards the upper end of the range as weeds increase in size or as they approach flower or seedhead formation. At these application rates, this product will provide partial control of the following perennial weeds in actively growing bermudagrass:

- Bahiagrass
- Bluestem, silver
- Fescue, tall
- Johnsongrass
- Trumpetcreeper
- Vaseygrass

PRECAUTIONS: Applying more than 16 fluid ounces of this product per acre on highly maintained bermudagrass, such as on golf courses and lawns, could cause unacceptable turf injury and discoloration.

For a broader weed control spectrum in actively growing bermudagrass, this product may be tank-mixed with Outrider, Oust Extra or Oust XP herbicides. Apply these tank-mixtures only on well-established bermudagrass where some temporary injury or discoloration can be tolerated. Make no more than one application of this product in these tank mixtures in the same season, otherwise the bermudagrass could be severely injured.

Apply 8 to 32 fluid ounces of this product per acre in a tank-mix with Outrider herbicide for control or partial control of johnsongrass and other weeds listed on the Outrider herbicide label. Apply both products at a rate toward the upper end of the given ranges to control annual or perennial weeds greater than 6 inches tall.

Apply 18 to 32 fluid ounces of this product per acre in a tank-mix with Oust Extra or Oust XP herbicide for enhanced control of weeds listed on those labels. Use a lower application rate of each product within the given ranges to control annual weeds listed on the labels that are less than 4 inches tall (or runner length) and increase the rates toward the upper end of the ranges as annual weeds increase in size and approach the flower or seedhead stage. This tank-mix will provide partial control of the following perennial weeds in actively growing bermudagrass:

- Bahiagrass
- Bluestem, silver
- Broomsedge
- Dallisgrass
- Dock, curly
- Dogfennel
- Fescue, tall
- Johnsongrass
- Poorjoe
- Trumpetcreeper
- Vaseygrass
- Vervain, blue

PRECAUTIONS: Apply these tank mixtures only on well-established bermudagrass where some temporary injury or discoloration can be tolerated. DO NOT apply this product in a tank mixture with Outrider or Oust herbicides on highly maintained bermudagrass, such as on golf courses and lawns.

Weed Control in Actively Growing Bahiagrass

For suppression of vegetative growth and seedhead inhibition of bahiagrass for approximately 45 days, apply 6 fluid ounces of this product in 10 to 40 gallons of water per acre 1 to 2 weeks after full green-up or after mowing to a uniform height of 3 to 4 inches prior to seedhead emergence.

For growth suppression of bahiagrass for up to 120 days, apply 4 fluid ounces of this product per acre, followed by an application of 2 to 4 fluid ounces per acre about 45 days later. Make no more than two growth suppression applications per year.

For broad spectrum weed control in actively growing bahiagrass, this product may be tank-mixed with Outrider®, Oust Extra or Oust XP herbicides.

Apply 6.25 fluid ounces of this product per acre in a tank-mix with an appropriate rate of Outrider herbicide to control perennial weeds or annual weeds greater than 4 inches in height.

Apply 6 fluid ounces of this product per acre in a tank-mix with an appropriate rate of Oust Extra or Oust XP herbicide 1 to 2 weeks following an initial spring mowing for enhanced control of weeds listed on the Oust herbicide label in actively growing bahiagrass. Make this application only once per year.

PRECAUTIONS: Apply these tank mixtures only on well-established bahiagrass where some temporary injury or discoloration can be tolerated.

Turf Renovation

This product controls most existing vegetation prior to renovating turfgrass areas or establishing turfgrass grown for seed or sod. For maximum control of existing vegetation, delay planting or sodding until after determining if any re-growth of underground plant parts will occur. Where repeat applications are necessary, sufficient re-growth must be attained prior to re-application of this product. Summer or fall application provides enhanced control of warm-season grasses, such as bermudagrass. For managed turfgrass, apply this product after omitting at least one regular mowing to allow sufficient growth for good interception of the spray solution.

This product has no residual soil activity and will not affect plants, seed or sod planted back into the area after application.

A handheld sprayer may be used for spot treatment of unwanted vegetation growing in existing turfgrass. Broadcast application or spot treatment using a handheld sprayer may be used to control sod remnants or other unwanted vegetation after sod is harvested.

PRECAUTIONS: Do not disturb soil or underground plant parts before application of this product. Delay tillage and renovation techniques, such as vertical mowing, coring or slicing, a minimum of 7 days after application to allow translocation of this herbicide into underground plant parts.

RESTRICTIONS: If application rates total 3 quarts of this product per acre or less, no waiting period between application and feeding or livestock grazing is required. If the rate is greater than 3 quarts per acre, remove domestic livestock before application and wait 8 weeks after application before grazing or harvesting.

Chemical Mowing

This product may be used to suppress growth of perennial and annual grasses listed in this section to serve as a substitute for mowing.

Perennial Grasses – apply 6 fluid ounces of this product per acre to suppress growth of Kentucky bluegrass, or 8 fluid ounces to suppress tall fescue, fine fescue, orchardgrass, quackgrass or reed canarygrass in 10 to 40 gallons of spray solution per acre after grasses have greened up to at least 75 percent green color in the spring, or 7 to 10 days after mowing when sufficient re-growth has occurred to provide a desirable height for growth regulation. Use chemical mowing only in areas where some temporary injury or discoloration of perennial grasses can be tolerated.

Annual Grasses – apply 4 to 5 fluid ounces of this product in 10 to 40 gallons of spray solution per acre to suppress growth of some annual grasses, such as annual ryegrass, wild barley and wild oats when actively growing in coarse turf on roadsides or other industrial areas and before seedheads are in the boot stage of development. This application could injure the desired annual grasses.

PRECAUTIONS: Use this product for chemical mowing only in areas where some temporary injury or discoloration of perennial and annual grasses can be tolerated.

11.2 Annual Weeds

Annual weeds are easiest to control when they are small and actively growing. New leaf development indicates active growth.

To control or partially control the annual weeds listed in this section when they are less than 6 inches in height or runner length and actively growing, apply 1 quart of this product per acre. If they are over 6 inches in height or runner length, or slowly growing under stressed conditions, increase the application rate to 1.5 to 4 quarts per acre, depending on weed height and the severity of the poor growing conditions.

For application using a handheld sprayer with a spray-to-wet technique, apply a 0.5-percent solution of this product to annual weeds less than 6 inches in height or runner length prior to seedhead formation in grasses or bud formation in broadleaf weeds. To control annual weeds over 6 inches tall, or even smaller weeds growing under stressed conditions, apply a 1- to 2-percent solution. Apply the maximum concentration of this product within this range for hard-to-control weeds or to control weeds over 24 inches tall.

For control of annual weeds using a handheld controlled droplet applicator (CDA), apply a 20-percent solution of this product (25 to 26 fluid ounces of this product per gallon of spray solution) at a flow rate of 2 fluid ounces of spray solution per minute and a walking speed of 1.5 miles per hour (1 quart of spray solution per acre).

When using a vehicle-mounted CDA, apply the appropriate amount of this product in 2 to 15 gallons of water per acre.

For enhanced control, do not mow, cut, till, burn or disturb vegetation in the application area for a minimum of 3 days after application.

This product has no residual soil activity and does not control emergence of new annual weeds from seed. Subsequent applications of this product will be needed to control weeds that continue to emerge.

ANNUAL WEED SPECIES

Anoda, spurred
Balsam apple[1]
Barley
Barley, little
Barnyardgrass
Bassia, fivehook
Bittercress
Bluegrass, annual
Bluegrass, bulbous
Brome, downy
Brome, Japanese
Broomsedge
Buttercup
Castor bean[2]
Cheatgrass
Cheeseweed (*Malva parviflora*)
Chervil
Chickweed
Cocklebur
Copperleaf, hophornbeam
Copperleaf, Virginia
Coreopsis, plains/tickseed
Corn
Crabgrass
Cupgrass, woolly
Dwarf dandelion
Eclipta
False dandelion
False flax, smallseed
Fiddleneck
Filaree
Fleabane, annual
Fleabane, hairy (*Conyza bonariensis*)
Fleabane, rough
Foxtail
Foxtail, Carolina
Geranium, Carolina
Goatgrass, jointed
Goosegrass
Groundsel, common
Henbit
Horseweed / Marestail (*Conyza canadensis*)
Itchgrass
Johnsongrass, seedling
Junglerice
Knotweed
Kochia
Lambsquarters
Lettuce, prickly
Mannagrass, eastern
Mayweed
Medusahead
Morning glory (*Ipomoea* spp)
Mustard, blue
Mustard, tansy
Mustard, tumble
Mustard, wild
Nightshade, black
Oats
Panicum, browntop
Panicum, fall
Panicum, Texas
Pennycress, field
Pepperweed, Virginia
Pigweed
Puncturevine
Purslane, common
Pusley, Florida
Ragweed, common
Ragweed, giant
Rice, red
Rocket, London
Rocket, yellow
Rye
Ryegrass
Sandbur, field
Sesbania, hemp
Shattercane
Shepherd's-purse
Sicklepod
Signalgrass, broadleaf
Smartweed, ladysthumb
Smartweed, Pennsylvania
Sorghum, grain (milo)
Sowthistle, annual
Spanish needles[3]
Speedwell, corn
Speedwell, purslane
Sprangletop
Spurge, annual
Spurge, prostrate
Spurge, spotted
Spurry, umbrella
Starthistle, yellow
Stinkgrass
Sunflower
Teaweed / Prickly sida
Thistle, Russian
Velvetleaf
Wheat
Wild oats
Witchgrass

[1] For control of balsam apple, apply this product using handheld equipment only.

[2] Control of castor bean can also be achieved by injecting 5 milliliters of this concentrated (undiluted) product per plant into the lower portion of the main stem.

[3] For control of Spanish needles, apply 62 fluid ounces of this product per acre

11.3 Perennial Weeds

Enhanced control of perennial weeds can be obtained when this product is applied to target weeds that are small and actively growing. New leaf development indicates active growth. If application must be made to larger weeds or to weeds that are slowly growing under stressful conditions, apply this product at a rate or spray solution concentration towards the upper end of the specified range.

If weeds have been mowed or tilled, do not apply this product until plants have resumed active growth and have reached the specified stage of growth or sufficient growth has been achieved to allow for good interception of the spray solution. For enhanced control, do not mow, cut, till, burn or disturb vegetation in the application area for a minimum of 7 days after application.

For control of perennial weeds listed on this label using backpack or handheld equipment and a low-volume application technique, apply a 5- to 10-percent solution of this product over the crown of the target plant to cover 50 percent of the upper plant foliage.

For control of perennial weeds using a handheld controlled droplet applicator (CDA), apply a 20- to 40-percent solution of this product (25 to 51 fluid ounces of this product per gallon of spray solution) at a flow rate of 2 fluid ounces of spray solution per minute and a walking speed of 0.75 mile per hour (2 to 4 quarts of spray solution per acre). When using a vehicle-mounted CDA, apply the required amount of this product, as indicated in the following table, in 2 to 15 gallons of water per acre.

Application of this product in the fall must be made before a killing frost.

This product has no soil activity and does not control emergence of perennial weeds from seed and dormant underground roots, rhizomes or tubers present in the soil at the time of application. More than one application of this product will be necessary for continued control of weeds that emerge following application.

PERENNIAL WEEDS RATE TABLE

Perennial Weed Species	Broadcast Rate (quarts/acre)	Handheld Spray-to-Wet Concentration (% solution)
Alfalfa*	1	2
Alligatorweed*	4	1.5
Apply this product when most of the target plants are in bloom. More than one application will be needed to achieve control.		
Anise (fennel)	2 – 4	1 – 2
Bahiagrass	3 – 5	2
Beachgrass, European (*Ammophila arenaria*)	–	5
Apply a 5-percent solution of this product using a spray-to-wet technique or a 10-percent solution using a low-volume application technique. Enhanced results can be obtained when application is made onto target weeds that are actively growing at the boot through the full-heading stage of development. Make application prior to the loss of more than 50 percent of green leaf color in the fall. Monitor application site and re-apply this product to any target weeds that were missed, if necessary, before re-seeding the area with desirable vegetation. For selective control of European beachgrass, apply a 33.3-percent solution of this product during period of active growth using a wiper applicator. Maximizing the amount of individual leaf tissue contacted by the wiper applicator and/or making a second pass through the field in the opposite direction will improve control. Avoid contact of the herbicide solution with desirable vegetation.		
Bentgrass*	1.5	2
This product alone will provide only partial control of bentgrass (*Agrostis* spp.). For enhanced control, apply 2 to 4 quarts of this product in a tank-mix with an appropriate rate of Envoy, Fusilade II, Fusion, or Vantage herbicide in a spray volume of 20 to 40 gallons per acre using broadcast application equipment. For enhanced control using a handheld sprayer, apply this product at a concentration of 2.66 fluid ounces per gallon of spray solution in a tank-mix with an appropriate amount of Envoy, Fusilade, Fusion, or Vantage herbicide. More than one application might be needed for complete control.		
Bermudagrass	5	2
Make application when seedheads are present.		
Bermudagrass, water (knotgrass)	1.5	2
Bindweed, field	3 – 5	2
For control, apply 4 to 5 quarts of this product per acre as a broadcast application west of the Mississippi River and 3 to 4 quarts per acre east of the Mississippi River when bindweed is at or beyond full bloom. For enhanced results, apply in late-summer or fall.		
Bittersweet, Oriental	3	2
For control, apply this product as a broadcast application in 30 to 40 gallons of spray solution per acre. For enhanced results, make application in late-summer or fall while leaves are still green and after fruit formation. When making application with handheld equipment using a spray-to-wet technique, ensure complete coverage of the target plant with the spray solution.		
Bluegrass, Kentucky	2	2
Apply when most target plants have reached the boot to head stage of development. When application is made prior to the boot stage, reduced control can result. In the fall, make application before plants have turned brown.		
Blueweed, Texas	3 – 5	2
Apply 4 to 5 quarts of this product per acre west of the Mississippi River and 3 to 4 quarts per acre east of the Mississippi River when most target plants are at or beyond full bloom. For enhanced results, apply in late-summer or fall.		
Brackenfern	3 – 4	1 – 1.5
Apply to fully expanded fronds that are at least 18 inches long.		
Bromegrass, smooth	2	2
Apply this product when most target plants have reached the boot to head stage of development. When application is made prior to the boot stage, reduced control can result. In the fall, make application before plants have turned brown.		
Bursage, woolly-leaf	–	2
Canarygrass, reed	2 – 3	2
Apply this product when most target plants have reached the boot to head stage of development. When application is made prior to the boot stage, reduced control can result. In the fall, make application before plants have turned brown.		
Cattail	3 – 5	2
Apply this product when target plants are actively growing and are at or beyond the early to full bloom stage of development. Enhanced results are achieved when application is made during the summer or fall months.		
Clover; red, white	3 – 5	2
Cogongrass	3 – 5	2
Apply this product in late-summer or fall when cogongrass is at least 18 inches tall and actively growing. Due to uneven stages of growth and the dense nature of cogongrass vegetation, more than one application might be necessary to achieve control.		
Dallisgrass	3 – 5	2
Dandelion	3 – 5	2
Dock, curly	3 – 5	2
Dogbane, hemp	4	2
Apply this product when most target plants have reached the late-bud to flower stage of growth. For enhanced results, make application in late-summer or fall.		
Fescue (except tall)	3 – 5	2
Fescue, tall	1 – 3	2
Apply this product when most target plants have reached the boot to head stage of growth. If applied prior to the boot stage, less than desirable control might be obtained.		
Guinea grass	3	1
Apply this product when most target plants have at least reached the 7-leaf growth stage.		
Hemlock, poison	2 – 4	1 – 2
Control can also be achieved by injecting 6 milliliters of a 5-percent solution of this product using a handheld injection device in one leaf cane per plant, 12 inches above the root crown.[1]		
Hogweed, giant	–	–
Inject 6 milliliters of a 5-percent solution of this product into one leaf cane per plant, 12 inches above the root crown.[1]		
Horsenettle	3 – 5	2
Horseradish	4	2
Apply this product when most target plants have reached the late-bud to flower stage of development. For enhanced results, apply in late-summer or fall.		
Horsetail, field	–	–
Inject 0.6 milliliter of this product per stem directly into the plant stem, one segment above the root crown.[1]		
Iceplant	2	1.5 – 2
Ivy; cape, German	2 – 4	1 – 2
Jerusalem artichoke	3 – 5	2
Johnsongrass	2 – 3	1
Apply this product when most target plants have reached the boot to head stage of development or before plants have turned brown in the fall. When applied prior to the boot stage, reduced control can result.		
Kikuyu grass	2 – 3	2
Knapweed	4	2
Apply this product when most target plants have reached the late-bud to flower stage of growth. For enhanced results, apply in late-summer or fall.		
Knotweed; Bohemian, giant, Japanese	4	2
Apply 4 quarts of this product per acre as a broadcast application in 3 to 40 gallons of spray solution. For application using a backpack sprayer and a spray-to-wet technique, apply a 2-percent solution of this product. For enhanced control, do not disturb vegetation in the application area for a minimum of 7 days after application. Control can also be achieved by cutting stems cleanly just below the 2nd or 3rd node above the ground and immediately apply 0.5 fluid ounce (15 milliliters) of a 50-percent solution of this product in water into the "well" or remaining internode. Ensure that the upper plant material that was removed is gathered and properly discarded to prevent new plants from propagating from sprouting buds. Use of a bio-barrier, such as cardboard, plywood or plastic sheeting, will help guard against the spread of plant material. The combined total application rate of this product must not exceed 10.6 quarts per acre.[1] Control can also be achieved by injecting 6 milliliters of this product per stem into the second or third internode using a handheld injection device.[1]		
Lantana	–	1 – 1.25
Apply this product when most target plants are at or beyond the bloom stage of growth. Use the higher spray solution concentration on plants that have reached the woody stage of growth.		
Lespedeza	3 – 5	2
Loosestrife, purple	3	1.5 – 2
Apply this product when most target plants are at or beyond the bloom stage of growth. Enhanced results can be achieved when application is made during summer or fall months. Fall application must be made before a killing frost.		
Lotus, American	3	1
Apply this product when most target plants are at or beyond the bloom stage of growth. Enhanced results can be achieved when application is made during summer or fall months. Fall application must be made before a killing frost. More than one application of this product might be necessary to control re-growth of underground plant parts and seeds.		
Milkweed, common	3	2
Apply this product when most target plants have reached the late-bud to flower stage of growth.		
Muhly, wirestem	2	2
Make application when most target plants are at least 8 inches in height (3 to 4-leaf stage of development) and actively growing.		
Mullein, common	3 – 5	2
Napiergrass	3 – 5	2
Nightshade, silverleaf	3.5 – 5	2
Apply 4.5 to 5 quarts of this product per acre as a broadcast application west of the Mississippi River and 3.5 to 4.5 quarts per acre east of the Mississippi River when most target plants are at or beyond full bloom. Enhanced results can be obtained when application is made in late-summer or fall after berries have formed.		
Nutsedge; purple, yellow	3	1 – 2
Apply this product to control existing nutsedge plants and attached immature nutlets when target plants are in flower or when new nutlets can be found at rhizome tips. Nutlets that have not germinated will not be controlled and will require repeated application of this product for long-term control.		
Orchardgrass	2	2
Make application when most target plants have reached the boot to head stage of development. When applied prior to the boot stage, less than desirable control could be obtained. In the fall, make application before plants have turned brown.		
Pampas grass	3 – 5	1.5 – 2
Para grass	3 – 5	2
More than one application of this product will be needed to achieve complete control. Allow plants to re-grow to the 7- to 10-leaf stage before making next application.		
Pepperweed, perennial	4	2

Perennial Weed Species	Broadcast Rate (quarts/acre)	Handheld Spray-to-Wet Concentration (% solution)
Phragmites*	3 – 5	1 – 2
For partial control of phragmites in Florida and the counties of other states bordering the Gulf of Mexico, apply 5 quarts of this product per acre as a broadcast application or a 2-percent solution using a handheld sprayer. In other areas of the U.S., apply 3 to 5 quarts per acre as a broadcast application or, for partial control, apply a 1-percent solution using a handheld sprayer. For enhanced results, make application in late-summer or fall when plants are actively growing and in full bloom. Due to the dense nature of this vegetation (which can prevent good spray coverage) and uneven stages of growth, more than one application of this product might be necessary to achieve control. Visual symptoms of control will be slow to develop.		
Quackgrass	2 – 3	2
Apply this product when most target plants are at least 8 inches in height (3- to 4-leaf stage of development) and actively growing.		
Redvine*	2	2
Reed; common, giant	4 – 5	2
For enhanced results, make application in late-summer or fall. Control can also be achieved by injecting 8 milliliters of this concentrated product (undiluted) directly into the second or third internode using a handheld injection device.[1]		
Ryegrass, perennial	2 – 3	1
Apply this product when most target plants have reached the boot to head stage of growth. When applied prior to the boot stage, reduced control can result. In the fall, make application before ryegrass turns brown.		
Smartweed, swamp	3 – 5	2
Spatterdock	4	1
Make application when most target plants are in full bloom. For enhanced results, apply in the summer or fall.		
Sowthistle, perennial	2 – 3	2
Spurge, leafy*	–	2
Starthistle, yellow	2 – 3	2
Sweet potato, wild*	–	2
Make application when most target plants are at or beyond the bloom stage of growth. More than one application will be needed to achieve control.		
Thistle, artichoke	2 – 3	1 – 2
Make application when target plants are at or beyond the bud stage of growth.		
Thistle, Canada	2 – 3	2
Make application when target plants are at or beyond the bud stage of growth. Control can also be achieved by stem-injection. Cut 8 to 9 of tallest plants in a clump at bud stage. Push a cavity needle into the stem center and then slowly remove it as you inject 0.6 milliliter of this concentrated product into the stem.[1]		
Timothy	2 – 3	2
Make application when most target plants have reached the boot to head stage of development. If application is made prior to the boot stage, reduced control can result. In the fall, make application before plants turn brown.		
Torpedograss*	4 – 5	2
Trumpetcreeper*	2 – 3	2
Tules, common	–	2
Make application to target plants at or beyond the seedhead stage of development. Visual symptoms will be slow to appear and might not appear for 3 or more weeks after application.		
Vaseygrass	3 – 5	2
Velvetgrass	3 – 5	2
Wheatgrass, western	2 – 3	2
Make application when most target plants have reached the boot to head stage of development. Application made prior to the boot stage could result in reduced control. In the fall, make application before plants turn brown.		

* Partial control only

[1] When using stem injection, the combined total use of this product must not exceed 10.6 quarts per acre per year. At 6 milliliters of concentrated (undiluted) product per stem, 10.6 quarts will treat approximately 1670 stems per acre per year. The number of stems that can be treated per acre will vary depending on the injection volume and the concentration of this product in the application solution.

11.4 Woody Brush, Trees and Vines

Apply this product to brush and trees that are actively growing after full leaf expansion, unless otherwise directed. Use a higher application rate or spray solution concentration within a given range to control larger brush and trees and/or for application in areas of dense vegetative growth, or for the control of vines that have reached the woody stage of growth.

Enhanced control of woody brush and trees can be obtained when application is made in late-summer or fall after fruit formation; however, in arid areas, enhanced control can be obtained when application is made in the spring to early-summer when brush and trees are at high moisture content and flowering. Poor control can be expected when this product is applied to drought-stressed brush and trees.

Some autumn color on undesirable deciduous species is acceptable when applying this product to brush and trees in the fall, provided no major leaf drop has occurred. Reduced performance of this product could result if application is made following a frost. Symptoms might not appear prior to frost or senescence following a fall application.

For enhanced results, allow 7 or more days after application before mowing, cutting, tilling, burning or removal of woody brush, trees and vines from the application site. Additional applications of this product will be needed to control brush and trees regenerating from underground parts or seed.

TANK MIXTURES: This product may be applied at any rate stated on this label in a tank mixture with the following products to increase the spectrum of control of herbaceous weeds, woody brush, trees and vines. For control of herbaceous weeds, apply the tank-mix product at the lower end of the given application rate or spray solution concentration range. For control of dense stands or hard-to-control woody brush, trees and vines, increase the application rate or spray solution concentration of the tank-mix product towards the higher end of the range. Refer to the individual product labels for approved uses and application rates.

imazapyr; metsulfuron methyl; triclopyr

Arsenal; Arsenal Herbicide Applicators Concentrate; Escort XP; Forestry Garlon 4 Specialty; Forestry Garlon XRT Specialty; Garlon 3A Specialty; Garlon 4 Specialty; Garlon 4 Ultra Specialty; Vastlan Specialty

Ensure that the proper amount of the Garlon herbicide is thoroughly mixed with water in the spray tank before adding this product.

Cut Stump Application

This product may be used to control re-growth and re-sprouting of woody brush and trees on any site listed on this label.

Cut the woody brush or tree close to the soil surface and immediately apply a 50- to 100-percent (undiluted) solution of this product to the freshly-cut surface using an applicator capable of applying this product to the entire cambium. A delay in application could result in reduced performance. For enhanced results, cut the woody brush or tree during period of active growth and full leaf expansion and apply this product.

For control of the Tree of heaven (*Ailanthus altissima*), cut the tree close to the soil surface and immediately apply a 50-percent solution of this product (16 fluid ounces per quart of solution) and 10 percent Arsenal herbicide (3 to 4 fluid ounces per quart of solution) in water to the freshly-cut surface.

DO NOT MAKE A CUT STUMP APPLICATION WHEN THE ROOTS OF DESIRABLE WOODY BRUSH OR TREES MIGHT BE GRAFTED TO THE ROOTS OF THE CUT STUMP, AS INJURY COULD OCCUR IN THE ADJACENT TREES. Some sprouts, stems, or trees can share a common root system. Adjacent trees having a similar age, height and spacing could be an indicator of a shared root system. Whether grafted or shared, injury is likely to occur to adjacent stems or trees when this product is applied to one or more trees sharing a common root system.

Woody Brush and Tree Injection and Frill Application

This product may be used to control woody brush and trees listed in this section by injection or frill application on any site listed on this label.

Inject or apply the equivalent of 1 milliliter (0.04 fluid ounce) of this product for every 2 to 3 inches of trunk diameter at breast height (DBH). If injecting this product into the woody brush or tree, use equipment capable of penetrating into the living plant tissue under the bark.

For frill application, apply a 50- to 100-percent (undiluted) solution of this product in water to either a continuous frill around the tree or to cuts evenly spaced around the tree below all branches. As tree diameter increases, enhanced results can be achieved by applying this product to a continuous frill or to more closely spaced cuttings. Avoid application techniques that allow runoff of this product to occur from frilled or cut areas. In species that freely exude sap, make the frill or cuts at an oblique angle to produce a cupping effect and apply this concentrated product undiluted. For enhanced results, make this application during period of active growth and after full leaf expansion.

Modified High-Volume and Low-Volume Backpack Application

For control and partial control of woody brush, trees and vines listed on this label when using a backpack sprayer or other handheld equipment and a directed low-volume foliar application technique, apply a 5- to 10-percent solution of this product evenly over the plant crown to cover 50 percent of the upper foliage of undesirable vegetation.

WOODY BRUSH, TREES AND VINES RATE TABLE

Species	Broadcast Rate (quarts/acre)	Handheld Spray-to-Wet Concentration (% solution)
Alder	3 – 4	1 – 1.5
Ash*	2 – 5	1 – 2
Aspen, quaking	2 – 3	1 – 1.5
Bearclover (Bearmat)*	2 – 5	1 – 2
Beech*	2 – 5	1 – 2
Birch	2	1
Blackberry	3 – 4	1 – 1.5
Blackgum	2 – 5	1 – 2
Bracken	2 – 5	1 – 2
Broom; French, Scotch	2 – 5	1.5 – 2
Buckwheat, California*	2 – 4	1 – 2
Cascara*	2 – 5	1 – 2
Castor bean	2 – 5	2
Also for control, inject 5 milliliters of this concentrated (undiluted) product per plant directly into the lower portion of the main stem using a handheld injection device.[1]		
Catsclaw*	–	1 – 1.5
For partial control, apply this product when at least 50 percent of the new leaves are fully developed.		
Ceanothus*	2 – 5	1 – 2
Chamise*	2 – 5	1
Cherry; bitter, black, pin	2 – 3	1 – 1.5
Coyote brush	3 – 4	1.5 – 2
For control, apply this product when at least 50 percent of the new leaves are fully developed.		
Deerweed	2 – 5	1
Dogwood*	2 – 5	1 – 2
Elderberry	2	1
Elm*	2 – 5	1 – 2
Eucalyptus, blue gum	–	2
For control of eucalyptus re-sprouts, apply this product using a handheld sprayer when re-sprouts are 6 to 12 feet tall. Ensure complete coverage.		
Gallberry	2 – 5	1 – 2
Gorse*	2 – 5	1 – 2
Hackberry, western	2 – 5	1 – 2
Hasardia*	2 – 4	1 – 2
Hawthorn	2 – 3	1 – 1.5
Hazel	2	1
Hickory*	2 – 5	1 – 2
Honeysuckle	3 – 4	1 – 1.5
Hornbeam, American*	2 – 5	1 – 2
Ivy, poison	3 – 4	2
Kudzu	4	2
Locust, black*	2 – 4	1 – 2
Madrone (re-sprouts)*	–	2
Manzanita*	2 – 5	1 – 2
Maple, red	2 – 4	1 – 1.5
For control, apply a 1- to 1.5-percent solution of this product using a handheld sprayer when leaves are fully developed. For partial control, apply 2 to 4 quarts per acre as a broadcast application.		

Species	Broadcast Rate (quarts/acre)	Handheld Spray-to-Wet Concentration (% solution)
Maple, sugar	–	1 – 1.5
For control, apply this product using a handheld sprayer when at least 50 percent of the new leaves are fully developed.		
Maple, vine*	2 – 5	1 – 2
Monkey flower*	2 – 4	1 – 2
Oak; black, white*	2 – 4	1 – 2
Oak; northern, pin	2 – 4	1 – 1.5
For control, apply this product when at least 50 percent of the new leaves are fully developed.		
Oak, poison	4 – 5	2
Repeat applications might be required to maintain control. Application in the fall must be made before leaves lose green color.		
Oak, post	3 – 4	1 – 1.5
Oak, red	–	1 – 1.5
For control, apply this product using a handheld sprayer when at least 50 percent of the new leaves are fully developed.		
Oak, scrub*	2 – 4	1 – 1.5
Oak, southern red	2 – 3	1 – 1.5
Orange, Osage	2 – 5	1 – 2
Peppertree, Brazilian (Florida holly)*	2 – 5	1 – 2
Persimmon*	2 – 5	1 – 2
Pine	2 – 5	1 – 2
Poplar, yellow*	2 – 5	1 – 2
Redbud, eastern	2 – 5	1 – 2
Rose, multiflora	2	1
Make application prior to leaf deterioration by leaf-feeding insects.		
Russian olive*	2 – 5	1 – 2
Sage, black	2 – 4	1
Sage, white*	2 – 4	1 – 2
Sagebrush, California	2 – 4	1
Salmonberry	2	1
Saltcedar*	2 – 5	1 – 2
For partial control, apply a 1- to 2-percent solution of this product using a handheld sprayer or 2 to 5 quarts per acre as a broadcast application. For control, apply a 1- to 2-percent solution of this product in a tank-mix with Arsenal herbicide or Arsenal Herbicide Applicators Concentrate using a handheld sprayer. For control using broadcast application, apply 2.25 quarts of this product per acre in a tank-mix with an appropriate rate of Arsenal herbicide or Arsenal Herbicide Applicators Concentrate to plants less than 6 feet tall. To control saltcedar greater than 6 feet tall using broadcast application, apply 4.5 quarts of this product per acre in a tank-mix with a higher rate of Arsenal herbicide or Arsenal Herbicide Applicators Concentrate.		
Sassafras*	2 – 5	1 – 2
Sourwood*	2 – 5	1 – 2
Sumac; laurel, poison, smooth, sugarbush, winged*	2 – 4	1 – 2
Sweetgum	2 – 3	1 – 1.5
Swordfern*	2 – 5	1 – 2
Tallowtree, Chinese	–	1
Tan oak (re-sprouts)*	–	2
Thimbleberry	2	1
Tobacco, tree*	2 – 4	1 – 2
Toyon*	–	2
Trumpetcreeper	2 – 3	1 – 1.5
Virginia creeper	2 – 5	1 – 2
Waxmyrtle, southern*	2 – 5	1 – 2
Willow	3	1
Yerba Santa, California*	–	2

*Partial control

12.0 LIMIT OF WARRANTY AND LIABILITY

Bayer CropScience LP ("Company") warrants that this product conforms to the chemical description on the label. TO THE EXTENT CONSISTENT WITH APPLICABLE LAW, NO OTHER EXPRESS WARRANTY OR IMPLIED WARRANTY OF FITNESS FOR PARTICULAR PURPOSE OR MERCHANTABILITY IS MADE. This warranty is also subject to the conditions and limitations stated herein.

Buyer and all users shall use this product only for the purposes of and in accordance with the Complete Directions for Use label ("Directions") and shall promptly notify this Company of any claims whether based in contract, negligence, strict liability, other tort or otherwise.

To the extent consistent with applicable law, buyer and all users are responsible for all loss, injuries or damage from use or handling which results from conditions beyond the control of this Company, including, but not limited to, incompatibility with products other than those set forth in the Directions, application to or contact with desirable vegetation, crop injury or failure of this product to control weed biotypes which develop resistance to glyphosate, unusual weather, weather conditions which are outside the range considered normal at the application site and for the time period when the product is applied, as well as weather conditions which are outside the application ranges set forth in the Directions, use and/or application in any manner not explicitly set forth in or inconsistent with the Directions, moisture conditions outside the moisture range specified in the Directions, or the presence of products other than those set forth in the Directions in or on the soil, crop or treated vegetation.

This Company does not warrant any product reformulated or repackaged from this product except in accordance with this Company's stewardship requirements and with express written permission from this Company.

TO THE EXTENT CONSISTENT WITH APPLICABLE LAW, THE EXCLUSIVE REMEDY OF THE USER OR BUYER, AND THE LIMIT OF THE LIABILITY OF THIS COMPANY OR ANY OTHER SELLER FOR ANY AND ALL LOSSES, INJURIES OR DAMAGES RESULTING FROM THE USE OR HANDLING OF THIS PRODUCT (INCLUDING CLAIMS BASED IN CONTRACT, NEGLIGENCE, STRICT LIABILITY, OTHER TORT OR OTHERWISE) SHALL BE THE PURCHASE PRICE PAID BY THE USER OR BUYER FOR THE QUANTITY OF THIS PRODUCT INVOLVED, OR, AT THE ELECTION OF THIS COMPANY OR ANY OTHER SELLER, THE REPLACEMENT OF SUCH QUANTITY, OR, IF NOT ACQUIRED BY PURCHASE, REPLACEMENT OF SUCH QUANTITY. TO THE FULLEST EXTENT CONSISTENT WITH APPLICABLE LAW, IN NO EVENT SHALL THIS COMPANY OR ANY OTHER SELLER BE LIABLE FOR ANY INCIDENTAL, CONSEQUENTIAL OR SPECIAL DAMAGES.

Upon opening and using this product, buyer and all users are deemed to have accepted the terms of this LIMIT OF WARRANTY AND LIABILITY which may not be varied by any verbal or written agreement. If terms are not acceptable, return at once unopened.

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All other trademarks are the property of their respective owners.

In case of an emergency involving this product, or for medical assistance, call collect, day or night, 1-800-334-7577.

Packed For:
BAYER CROPSCIENCE LP
800 N. LINDBERGH BLVD.
ST. LOUIS, MISSOURI, 63167 U.S.A.

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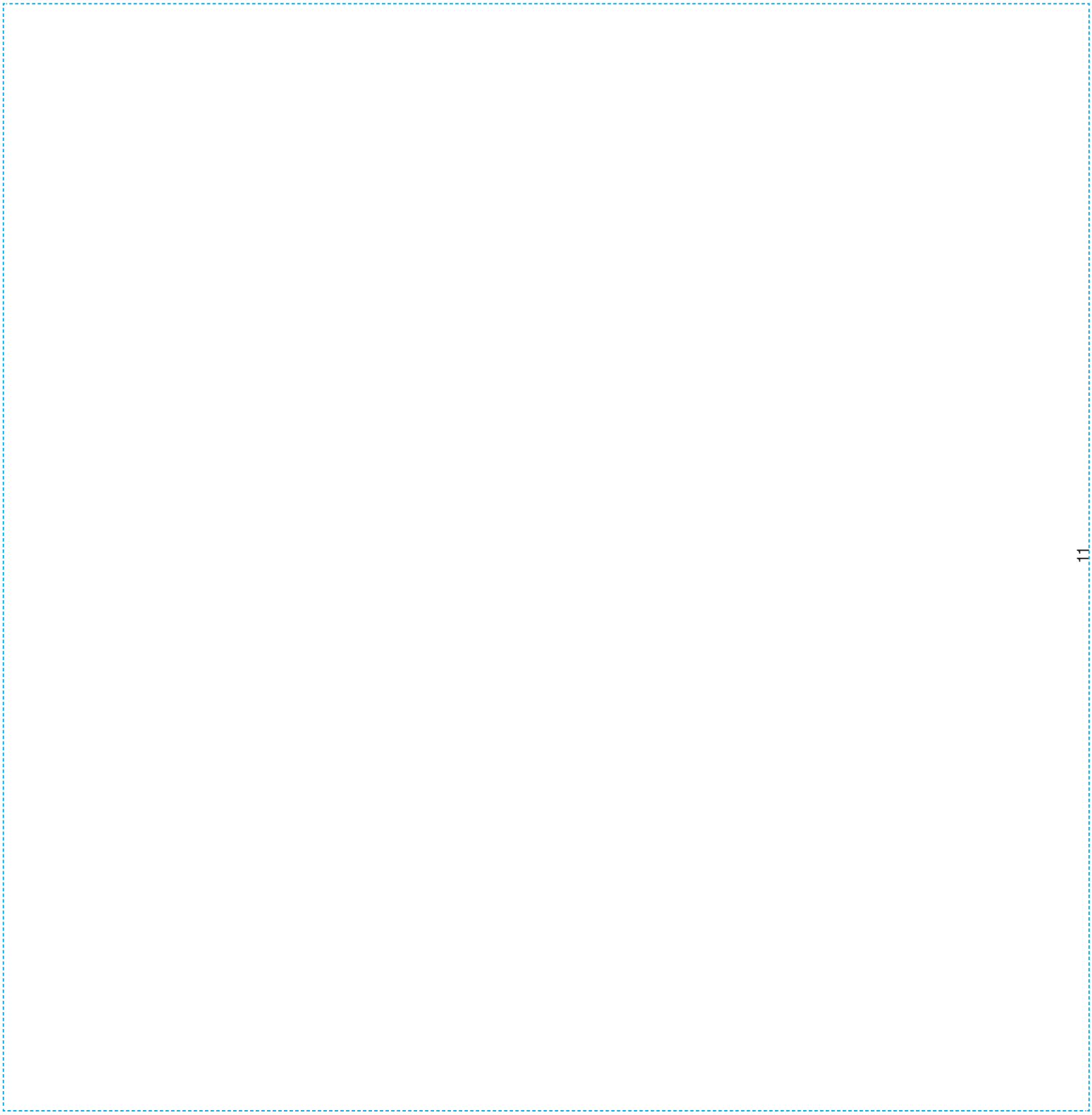
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GRUPO	9	HERBICIDA

Roundup PRO®

Herbicida

Instrucciones de uso completas

Un herbicida completo de amplio espectro para aplicación postemergencia, para el control de malezas industrial, ornamental, en céspedes, forestación, lados de carreteras, servidumbres de paso y otros usos terrestres indicados.

(Para una lista completa de usos terrestres, vea la sección Modo de empleo de esta etiqueta.)

INGREDIENTE ACTIVO:	
*Glifosato, N-(fosfonometil) glicina, en la forma de su sal de isopropilamina	**41.0%**
OTROS INGREDIENTES (incluyendo surfactante):	**59.0%**
	100.0%

*Contiene 480 gramos por litro o 4 libras por galón norteamericano del ingrediente activo glifosato, en la forma de su sal de isopropilamina, lo cual es equivalente a 356 gramos por litro o 3 libras por galón norteamericano (30.4% por peso) del ácido, glifosato.

Manténgase fuera del alcance de los niños

PRECAUCIÓN

Consulte el folleto para obtener información adicional sobre precauciones e instrucciones de uso.

No todos los productos recomendados en esta etiqueta han sido registrados para su uso en California. Antes de utilizar cada producto, compruebe el estado de su registro en California.

ESTE ES UN PRODUCTO PARA USARSE TAL Y COMO ESTÁ PREPARADO. BAYER CROPSCIENCE LP NO LO HA DISEÑADO NI LO HA REGISTRADO PARA QUE SEA REFORMULADO. VEA LA ETIQUETA DEL ENVASE INDIVIDUAL PARA CONOCER LAS LIMITACIONES DE REEMPAQUE.

PARA INFORMACIÓN SOBRE EL PRODUCTO O AYUDA PARA UTILIZAR ESTE PRODUCTO, LLAME GRATIS AL 1-866-99BAYER (1-866-992-2937).

EN CASO DE EMERGENCIA RELACIONADA CON ESTE PRODUCTO O PARA AYUDA MÉDICA, LLAME POR COBRAR, DE DÍA O DE NOCHE, AL 1-800-334-7577.

N.º Reg. EPA 524-475 N.º Est. EPA 524-IA-1

Envasado para:
BAYER CROPSCIENCE LP
800 N. LINDBERGH BLVD.
ST. LOUIS, MISSOURI, 63167 U.S.A.

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EVITE EL CONTACTO DE ESTE HERBICIDA CON EL FOLLAJE, TALLOS VERDES, RAÍCES NO LEÑOSAS EXPUESTAS O FRUTOS EXPUESTOS DE LOS CULTIVOS, PLANTAS Y ÁRBOLES DESEABLES, PORQUE LAS PLANTAS PUEDEN SUFRIR GRAVES DAÑOS O SER DESTRUIDAS.

Lea toda la etiqueta antes de usar este producto.

Use solo según las instrucciones de la etiqueta.

Antes de comprar o usar el producto, lea "LIMITES EN LA GARANTÍA Y EN LA RESPONSABILIDAD" en la última sección de la etiqueta. Si las condiciones son inaceptables, devuelva el producto inmediatamente sin abrir el envase.

CONTENIDO

1.0 INGREDIENTES

INGREDIENTE ACTIVO:	
* Glifosato, N-(fosfonometil) glicina, en la forma de su sal de isopropilamina	**41.0%**
OTROS INGREDIENTES (incluyendo surfactante):	**59.0%**
	100.0%

*Contiene 480 gramos por litro o 4 libras por galón norteamericano del ingrediente activo glifosato, en la forma de su sal de isopropilamina, lo cual es equivalente a 356 gramos por litro o 3 libras por galón norteamericano (30.4% por peso) del ácido, glifosato.

Este producto está protegido por las Patentes de los EE. UU. N.º 5,683,958; 5,703,015; 6,063,733; 6,121,199; 6,121,200. No se han otorgado licencias de uso bajo ninguna patente que no sea de los Estados Unidos de América.

2.0 NÚMEROS DE TELÉFONO IMPORTANTES

1. PARA INFORMACIÓN SOBRE EL PRODUCTO O AYUDA PARA UTILIZAR ESTE PRODUCTO, LLAME GRATIS AL 1-866-99BAYER (1-866-992-2937).
2. EN CASO DE EMERGENCIA RELACIONADA CON ESTE PRODUCTO O PARA AYUDA MÉDICA, LLAME POR COBRAR, DE DÍA O DE NOCHE, AL 1-800-334-7577.

3.0 DECLARACIONES PREVENTIVAS

3.1 Riesgos para los seres humanos y los animales domésticos

Manténgase fuera del alcance de los niños

PRECAUCIÓN

Causa irritación a los ojos

Evite el contacto con los ojos o la ropa

PRIMEROS AUXILIOS	
SI ENTRA EN CONTACTO CON LOS OJOS	• Mantenga los ojos abiertos y enjuague lenta y cuidadosamente con agua durante 15 a 20 minutos. • Si hay lentes de contacto, retírelos después de los primeros 5 minutos, luego continúe enjuagando los ojos. • Llame a un centro de control de envenenamientos o a un médico para que le indique el tratamiento.

- Tenga a mano el envase o la etiqueta del producto cuando llame a un centro de control de envenenamientos o a un médico, o cuando vaya a obtener tratamiento.
- También puede llamar al **1-800-334-7577**, por cobrar, de día o de noche, para información sobe tratamiento médico de urgencia.
- Este producto está identificado como **Roundup PRO Herbicida, Nº de Registro de la EPA 524-475.**

ANIMALES DOMÉSTICOS: Se considera que este producto es relativamente no tóxico para perros y otros animales domésticos, sin embargo, la ingestión de este producto o de abundantes cantidades de vegetación rociada recientemente podría causar irritación gastrointestinal temporal (vómitos, diarrea, cólicos, etc.). Si se observan dichos síntomas, dé al animal suficiente cantidad de líquidos para evitar la deshidratación. Llame a un veterinario si los síntomas persisten por más de 24 horas.

Equipo de protección personal (EPP)

Los usuarios y personas que manipulan este producto deben usar: camisas de mangas largas y pantalones largos, además de zapatos y calcetines.

Respete las instrucciones del fabricante para limpiar y mantener los equipos de protección personal (EPP). En caso de que no haya instrucciones, lave el equipo protector con detergente y agua caliente. Mantenga el EPP aparte del resto de la ropa y lávelo por separado.

Recomendaciones de seguridad para el usuario

Los usuarios deben:

- Lavarse las manos antes de comer, beber, masticar chicle, usar tabaco o usar el baño.
- Quitarse la ropa de inmediato si el pesticida traspasa la ropa. Luego deben lavarse muy bien y ponerse ropa limpia.

3.2 Riesgos para el medio ambiente

No aplique directamente al agua, en áreas donde el agua superficial esté presente o en áreas intermareales por debajo del nivel medio de mareas altas. No contamine el agua cuando limpie el equipo o deseche el agua de lavado y enjuague del equipo.

3.3 Riesgos físicos o químicos

Para mezclar, almacenar y aplicar la solución de rocío de este producto, se pueden usar solamente recipientes de acero inoxidable, fibra de vidrio, plástico o recipientes de acero recubiertos internamente con plástico.

NO MEZCLE, ALMACENE O APLIQUE ESTE PRODUCTO O LAS SOLUCIONES DE ROCÍO DE ESTE PRODUCTO EN ENVASES DE ACERO GALVANIZADO O SIN REVESTIMIENTO (EXCEPTO ACERO INOXIDABLE) O EN TANQUES DE ROCÍO. Si se utiliza en estos envases o tanques, este producto o las soluciones de rocío de este producto reaccionan y producen gas hidrógeno que puede formar una mezcla de gases altamente inflamable. Esta mezcla de gases podría incendiarse o explotar si está en contacto con fuego, chispas, sopletes para soldar, cigarrillos encendidos o cualquier otra fuente de ignición y causar lesiones personales graves.

MODO DE EMPLEO

Se considera una violación a la ley federal usar este producto de una manera que no sea la indicada en la etiqueta. Este producto solo puede utilizarse de acuerdo con las instrucciones de uso en la etiqueta o según las etiquetas complementarias que se publican por separado. También puede solicitar las etiquetas complementarias a su vendedor minorista autorizado de Bayer CropScience LP o a su representante de Bayer CropScience LP.

No aplique este producto de manera que entre en contacto con los trabajadores u otras personas, ya sea directamente o por dispersión. Solamente los aplicadores que usan protección podrán estar en el área durante su aplicación. Para verificar requisitos específicos de su tribu o estado, consulte con la agencia responsable de la regulación del uso de pesticidas.

Requisitos para uso agrícola

Utilice este producto solo de acuerdo con la etiqueta y con las Normas de Protección para Trabajadores, 40 CFR Parte 170. Estas Normas contienen los requisitos para la protección de trabajadores agrícolas en granjas, bosques, viveros e invernaderos y para las personas que manipulan pesticidas agrícolas. Contienen los requisitos para capacitar, descontaminar, notificar y ofrecer asistencia de emergencia. También contienen instrucciones específicas y excepciones relativas a las afirmaciones en esta etiqueta sobre los equipos de protección personal (EPP) y los intervalos de acceso restringido. Los requisitos en esta caja se refieren únicamente a las aplicaciones de este producto cubiertas por las Normas de Protección para Trabajadores.

No entre ni permita la entrada de personal a las áreas tratadas durante el intervalo de entrada restringida (REI, por sus siglas en inglés) de 4 horas.

El EPP que se requiere para el acceso anticipado a zonas tratadas de acuerdo con la Normas de Protección para Trabajadores y que incluye el contacto con material tratado, como plantas, tierra o agua es: overoles, zapatos con calcetines y guantes resistentes a sustancias químicas confeccionados con cualquier tipo de material impermeable.

Requisitos para usos no agrícolas

Los requisitos en esta caja se refieren a las aplicaciones de este producto que NO cubren las Normas de Protección para Trabajadores para pesticidas agrícolas (40 CFR, Parte 170). Las Normas se aplican cuando este producto se utiliza para producir plantas agrícolas en granjas, bosques, viveros o invernaderos.

Mantenga a las personas y a las mascotas fuera de las áreas tratadas hasta que la solución de rocío se haya secado.

4.0 ALMACENAMIENTO Y ELIMINACIÓN

El almacenamiento y la eliminación adecuados de los pesticidas son fundamentales para evitar la exposición de las personas y el medio ambiente a consecuencia de pérdidas y derrames del producto, excedentes o desechos y actos de vandalismo. No permita que este producto contamine el agua, ni los alimentos para personas o animales, ni las semillas por medio del almacenamiento o la eliminación.

ALMACENAMIENTO DEL PESTICIDA: Guarde los pesticidas lejos de los alimentos para personas, los alimentos para mascotas, los alimentos para animales, las semillas, los fertilizantes y los materiales de uso veterinario. Mantenga el envase cerrado para evitar los derrames y la contaminación. Vea la etiqueta del envase individual para conocer las condiciones adicionales de almacenamiento, si las hay.

ELIMINACIÓN DEL PESTICIDA: Para evitar desechos, utilice todo el material contenido en este envase, incluyendo los residuos del enjuague, aplicándolo según las indicaciones de la etiqueta. Si no se pueden evitar los desechos, ofrezca el producto restante a un centro de eliminación de desechos o a un programa de desecho de pesticidas. Estos programas suelen ser manejados por los gobiernos estatales o locales o por la industria. Toda eliminación debe seguir los reglamentos y procedimientos federales, estatales y locales pertinentes.

MANEJO Y ELIMINACIÓN DEL ENVASE: Envase no rellenable. No vuelva a usar este envase para contener materiales que no sean pesticidas o pesticidas diluidos (residuos del enjuague). Después de vaciar y limpiar el envase, puede contener temporalmente residuos del enjuague u otros materiales relacionados con pesticidas. Contacte al organismo de reglamentación de su estado para determinar las prácticas permitidas en su estado.

Enjuague tres veces o enjuague por presión el envase (o equivalente) inmediatamente una vez vacío.

Enjuague tres veces de la siguiente forma: Vacíe el contenido restante del envase en el equipo de aplicación o en un tanque de mezclado y drene durante 10 segundos después de que el flujo comience a gotear. Llene el envase con agua hasta un 1/4 de su capacidad y vuelva a taparlo. Agítelo durante 10 segundos. Vierta los residuos del enjuague en el equipo de aplicación o en un tanque de mezclado o conserve los residuos del enjuague para su uso o eliminación posterior. Continuar a drene durante 10 segundos después de que el flujo comience a gotear. Repita este procedimiento dos veces más.

Para enjuagar por presión proceda como se indica a continuación: Vacíe el contenido restante del envase en el equipo de aplicación o en un tanque mezclador y continúe drenando durante 10 segundos después de que el flujo comience a gotear. Coloque el recipiente de manera que pueda drenar directamente al equipo de aplicación o al tanque de mezcla mientras se enjuaga, o recolecte el enjuague para su uso o eliminación posterior. Inserte la boquilla de enjuague por presión en la parte lateral del envase y enjuague a una presión de aproximadamente 40 PSI durante 30 segundos como mínimo. Continuar a drene durante 10 segundos después de que el flujo comience a gotear.

Una vez enjuagado correctamente, algunos envases de pesticida de plástico pueden llevarse a un centro de acopio de envases o ser recogidos para su reciclaje.

Para encontrar el sitio de recolección más cercano, póngase en contacto con su distribuidor de productos químicos o con Bayer CropScience LP en el 1-800-768-6387.

Si no es posible reciclar el envase, deséchelo de acuerdo con las regulaciones y procedimientos federales, estatales y locales, que pueden incluir perforar el recipiente debidamente enjuagado y desecharlo en un relleno sanitario.

5.0 INFORMACIÓN DEL PRODUCTO

Descripción del producto: Este producto es un herbicida sistémico de aplicación postemergencia, sin actividad residual en el suelo. Este producto proporciona un control de amplio espectro de muchas malezas anuales y perennes, árboles, enredaderas y matorrales leñosos. Está formulado como líquido soluble en agua con un surfactante que se puede aplicar usando un equipo de aplicación de pesticidas estándar y especializado después de diluir y mezclar bien con agua u otros vehículos de acuerdo con las instrucciones en la etiqueta.

Mecanismo de la acción: El ingrediente activo en este producto inhibe una enzima que se encuentra solo en plantas y microorganismos y que es esencial para la formación de aminoácidos específicos.

No tiene actividad en el suelo: Este producto se adhiere con fuerza a las partículas en el suelo y no proporciona control residual de malezas. Las malezas tienen que haber emergido en el momento de la aplicación para que la aplicación foliar de este producto las controle. Este producto no tendrá efecto sobre las semillas de las malezas en el suelo, así que estas continuarán germinando. Este producto tampoco tendrá efecto en los rizomas o raíces de las plantas no conectadas que estén debajo de la superficie del suelo.

Degradación biológica: La degradación de este producto es primariamente un proceso biológico de los microbios de la tierra.

Etapas de malezas: Resulta más fácil controlar las malezas anuales cuando son pequeñas. Se obtiene un mejor control de la mayoría de las malezas perennes cuando el tratamiento se realiza en las últimas etapas de crecimiento antes de la madurez. Consulte la sección "MALEZAS CONTROLADAS" para obtener más información sobre el control de malezas específicas.

Prácticas de cultivo: El control de malezas puede ser inferior cuando se aplica el producto a malezas anuales o perennes que hayan sido segadas, que hayan servido de alimento para animales o hayan sido cortadas, y que no hubiesen crecido nuevamente hasta el nivel recomendado para el tratamiento. Aplique siempre la proporción mayor de este producto dentro del rango indicado cuando las malezas son muy densas o cuando crecen en áreas no tocadas (no cultivadas). El control de malezas puede ser inferior cuando se tratan malezas dañadas por enfermedades o insectos, si están cubiertas con polvo o si las condiciones de crecimiento de las malezas son deficientes.

Cobertura del rocío: Para obtener mejores resultados, la cobertura del rocío debe ser completa y uniforme. No rocíe el follaje hasta el punto de escurrimiento.

Resistencia a la lluvia: La lluvia en un plazo de 4 horas después de su aplicación puede lavar este producto del follaje y puede requerirse una segunda aplicación para el control adecuado de las malezas. Consulte las secciones sobre uso específico en esta etiqueta para obtener información adicional sobre los intervalos mínimos requeridos antes de repetir la aplicación de este producto.

Aparición de los síntomas: Este producto se mueve dentro de la planta desde el punto de aplicación sobre el follaje hasta las raíces. Los efectos visibles son marchitamiento gradual y amarilleo progresivo de la planta hasta el oscurecimiento total de los brotes por encima de la tierra y el deterioro de las partes subterráneas de la planta. En la mayoría de las malezas anuales, los efectos son visibles en 2 a 4 días pero en la mayoría de las malezas perennes los efectos podrían no ser visibles hasta 7 días o más después de la aplicación. El frío extremo o el cielo muy nublado después de la aplicación podrían retardar la actividad del producto y hacer que el efecto visual se demore.

Proporciones de aplicación máxima: Las cantidades de aplicación o uso máximas especificadas en esta etiqueta están expresadas en unidades de volumen (onzas líquidas o cuartos de galón) de este producto por acre. Sin embargo, las proporciones máximas permitidas se aplican a este producto combinado con todos y cada uno de los otros herbicidas que contienen el ingrediente activo glifosato, ya sea que se apliquen por separado o como mezclas de tanque, sobre la base del total de libras de glifosato (equivalentes ácidos) por acre. Si se aplica más de un producto que contiene glifosato en el mismo terreno el mismo año, debe asegurarse de que el total de glifosato empleado (equivalentes de libras de ácido) no exceda el máximo permitido. Consulte la sección "INGREDIENTES" de esta etiqueta para la información necesaria sobre el producto.

A menos que se especifique de otra manera en esta etiqueta, el total combinado de todas las aplicaciones de este producto en un lugar no debe exceder los 10.6 cuartos de galón (8 libras de ácido de glifosato) por acre por año.

6.0 MANEJO DE RESISTENCIA DE MALEZAS

GRUPO	9	HERBICIDA

El glifosato, el ingrediente activo de este producto, es un herbicida del grupo 9 según el sistema de clasificación de modo de acción de la Weed Science Society of America. Cualquier población de malezas puede contener plantas naturalmente resistentes a los herbicidas del Grupo 9. Las malezas resistentes a los herbicidas del grupo 9 pueden tratarse con buenos resultados utilizando un herbicida de otro grupo (ya sea solo en una mezcla de acuerdo a las instrucciones en la etiqueta), adoptando otros métodos de cultivo o mecánicos para el control de malezas, o a través de una combinación de ambos. Consulte con su representante local de la compañía, el agente de extensión cooperativa del estado, un asesor profesional u otra autoridad calificada para determinar las acciones adecuadas para controlar malezas resistentes específicas.

6.1 Prácticas de manejo de malezas

Las poblaciones resistentes surgen cuando una dosis normal de un herbicida determinado no controla a contadas plantas individuales en condiciones ambientales normales. Si no hay otras medidas de control, estos individuos sobreviven, producen semillas y con el tiempo se convierten en el biotipo dominante en el campo a través de la selección continua. La mejor manera de reducir esta selección es usar prácticas diversas de control de malezas, tales como múltiples herbicidas con diferentes mecanismos de acción y, con frecuencia combinados con diversas prácticas de cultivo y mecánicas.

Para minimizar la incidencia de biotipos resistentes a herbicidas, incluyendo los resistentes al glifosato, implemente las siguientes opciones de manejo de malezas que sean prácticas en su situación. Estas prácticas de manejo se aplican para reducir la propagación de biotipos resistentes confirmados (control de biotipos resistentes existentes) y para reducir el potencial para selección de resistencia de nuevas especies (control proactivo de la resistencia).

- Diversifique su enfoque del manejo de malezas concentrándose en evitar la producción de semillas de malezas y en reducir la cantidad de semillas de malezas en la tierra.
- Siembre los cultivos en campos con la menor cantidad de malezas posible y manténgalos así.
- Siembre semillas que tengan la menor cantidad de malezas posible.
- Haga un reconocimiento rutinario de los campos y los sitios de aplicación antes y después de la aplicación del herbicida.
- Use múltiples mecanismos de acción herbicida eficaces contra las malezas más molestas en su lugar de aplicación y contra aquellos de resistencia conocida.
- Aplique los herbicidas en las proporciones de aplicación indicadas en la etiqueta cuando las malezas estén dentro del rango de tamaño indicado en la etiqueta.
- Resalte las prácticas de cultivo que inhiben las malezas usando competencia de cultivos.
- Use prácticas de manejo de malezas mecánicas y biológicas, cuando sea adecuado.
- Evite el movimiento de semillas de malezas o de propágulos vegetativos entre campos o dentro de un campo.
- Controle las semillas de malezas en la cosecha y después de la cosecha para evitar que las semillas se acumulen.

6.2 Manejo de biotipos resistentes al glifosato

Es necesario realizar las pruebas adecuadas para confirmar la resistencia de una maleza al glifosato. Llame al 1-866-99BAYER (1-866-992-2937) o póngase en contacto con su representante de Bayer CropScience LP para determinar si se confirmó la resistencia de algún biotipo de maleza en particular en su región, o visite en Internet www.weedresistancemanagement.com o www.weedscience.org.

Las malezas resistentes al glifosato se pueden controlar o manejar con la aplicación de este producto en combinación con herbicidas residuales de preemergencia y/o otros herbicidas de postemergencia etiquetados para el control de la maleza objetivo en el cultivo en cuestión o en el lugar de la aplicación. Para obtener más información, vea la sección "MALEZAS CONTROLADAS" en esta etiqueta.

Dado que la incidencia de malezas resistentes es difícil de detectar antes de usar, Bayer CropScience LP no será responsable de ninguna pérdida que tenga lugar porque este producto no logre controlar las malezas resistentes.

7.0 MEZCLAS

Para mezclar, almacenar y aplicar la solución de rocío de este producto, se pueden usar solamente recipientes limpios de acero inoxidable, fibra de vidrio, plástico o recipientes de acero recubiertos internamente con plástico.

NO MEZCLE, ALMACENE O APLIQUE ESTE PRODUCTO O LAS SOLUCIONES DE ROCÍO DE ESTE PRODUCTO EN ENVASES DE ACERO GALVANIZADO O SIN REVESTIMIENTO (EXCEPTO ACERO INOXIDABLE) O EN TANQUES DE ROCÍO.

Elimine todo riesgo de que se forme un sifón de retorno de los contenidos del tanque a la fuente de la sustancia vehicular, al preparar la mezcla. Utilice los dispositivos aprobados para evitar la formación de sifones de retorno, cuando corresponda según las reglamentaciones estatales o locales.

Un filtro de malla de 50 hilos para la boquilla o un colador en el equipo de rocío es adecuado.

Limpie las piezas del rociador inmediatamente después de usar este producto lavándolas bien con agua.

7.1 Mezcla con agua

EL RENDIMIENTO DE ESTE PRODUCTO PODRÍA REDUCIRSE CONSIDERABLEMENTE SI SE UTILIZA AGUA CON SEDIMENTOS DE TIERRA COMO SUSTANCIA VEHICULAR. NO MEZCLE ESTE PRODUCTO CON AGUA DE ESTANQUES O ACEQUIAS QUE SE VEA TURBIA O ENFANGADA.

Este producto se mezcla fácilmente con agua. Mezcle las soluciones de rocío de este producto de la siguiente manera. Primero, llene el tanque de mezclado o de rocío con agua limpia. Agregue la cantidad requerida de este producto hacia el final del proceso de llenado y mezcle con cuidado. Es posible que durante la mezcla la solución de rocío produzca espuma. Para prevenir o minimizar la formación de espuma, mezcle con cuidado, tapone las derivaciones y mangueras de retorno en el fondo del tanque y, si es necesario, agregue un agente apropiado a la solución de rocío para evitar la formación de espuma o eliminarla.

7.2 Mezclas de tanque

Este producto no proporciona control residual de malezas. Este producto puede mezclarse en tanques con otros herbicidas para proporcionar control residual de malezas en la tierra, un espectro más amplio de control de malezas o un mecanismo de acción alternativo.

Cuando se use una mezcla de tanque con un ingrediente activo genérico como 2,4-D o dicamba o cualquier otro producto o material indicado en esta etiqueta, el usuario asume la responsabilidad de asegurarse de que la aplicación específica que está preparando y el sitio de uso estén incluidos en la etiqueta del producto utilizado en la mezcla.

Bayer CropScience LP no ha realizado pruebas en todas las fórmulas de producto de la mezcla de tanque para verificar la compatibilidad, antagonismo o reducción en el rendimiento del producto. La mezcla de este producto con herbicidas u otros materiales no recomendados en esta etiqueta puede dar como resultado una reducción en su rendimiento. Hasta el grado que sea compatible con la legislación pertinente, el comprador y todos los usuarios son responsables por todas las pérdidas o daños en relación con el uso o el manejo de mezclas de este producto con herbicidas u otros materiales que no se recomiendan expresamente en esta etiqueta, o en las etiquetas complementarias separadas o en las Fichas Técnicas publicadas para este producto.

Consulte todas las etiquetas de cada uno de los productos, las etiquetas complementarias y las Fichas Técnicas de todos los productos de la mezcla de tanque, y respete todas las precauciones y limitaciones de la etiqueta, incluidas las restricciones de la época de aplicación, las restricciones de la tierra, los intervalos mínimos para volver a cosechar y/o las restricciones de rotación. Utilice conforme

con las declaraciones preventivas más restrictivas de cada producto en la mezcla de tanque.

Este producto puede aplicarse en cualquier proporción indicada en esta etiqueta en una mezcla de tanque con los siguientes productos para proporcionar control preemergencia y/o mejor control postemergencia de las malezas indicadas en las etiquetas de cada producto.

2,4-D; atrazina; dicamba; bromacil; diuron; imazapyr; metsulfuron methyl; oryzalin; pendimethalin, prodiamine; simazine; sulfosulfuron; trichlopyr

Arsenal; Herbicida concentrado para aplicadores Arsenal; Banvel; Banvel 480; Barricade 4L; Barricade 65WG; Certainty® Turf; Chopper Gen2; Crossbow; Endurance; Escort XP; Forestry Garlon 4 Specialty; Forestry Garlon XLT Specialty; Gallery SC; Gallery 75 Dry Flowable Specialty; Garlon; 3A Specialty; Garlon 4 Specialty; Garlon 4 Ultra Specialty; Goal 2XL; GoalTender; Habitat; Hyvar X; Hyvar X-L; Karmex DF; Krenite S Brush Control Agent; Krovar I DF; Landmark; Landmark XP; Oust Extra; Oust XP; Outrider®; Plateau; Poast; Poast Plus; Ronstar 50 WSP; Ronstar Flo; Ronstar G; Sahara DG; Spike 20P Specialty; Spike 80 DF Specialty; Stalker; Surflan AS Specialty; Surflan Flex; Surflan Flex T&O; Surflan XL 2G; Surflan Pro; Telar XP; Tordon 101 Mixture Specialty; Tordon 22K Specialty; Tordon K Herbicide Specialty; Transline Specialty; Vanquish; Velpar DF CU; Velpar DF VU; Velpar L CU; Velpar L; Velpar L VU;

Al usarlo en combinaciones como se describe en esta etiqueta y hasta el grado que sea compatible con la legislación pertinente, la responsabilidad de Bayer CropScience LP de ninguna manera incluirá ninguna pérdida, daño o lesión que no sea exclusiva y directamente causada por incluir el producto de Bayer CropScience LP en dicho uso combinado.

7.3 Procedimiento de mezcla en tanque

Siempre determine con anticipación la compatibilidad de todos los productos de la mezcla de tanque juntos en la sustancia vehicular, mezclando antes pequeñas cantidades proporcionales.

Agregue componentes individuales en la mezcla de tanque en el siguiente orden: polvos mojables, formulaciones fluidas, concentrados emulsionantes, aditivos de reducción de la dispersión, líquidos solubles en agua (este producto). Asegúrese de que los productos en la mezcla de tanque estén bien mezclados en la solución de rocío antes de agregar este producto.

Mezcle solo la cantidad de solución de rocío que aplicará ese día. La aplicación de soluciones de mezcla de tanque que se dejan reposar toda la noche podrían tener un control de malezas reducido.

Continúe agitando suavemente todo el tiempo hasta haber rociado todo el contenido del tanque. Si se deja que la mezcla para rociar se asiente, agite bien para que la mezcla vuelva a estar en suspensión antes de continuar la aplicación.

Mantenga la manguera de retorno en el fondo del tanque, o próximo a este para minimizar la formación de espuma.

Un filtro de malla de 50 hilos para la boquilla o un colador en el equipo de rocío es adecuado.

7.4 Mezcla de concentraciones de solución de rocío

Toda referencia en esta etiqueta a la concentración de este producto en una solución de rocío está basada en un porcentaje de volumen.

Prepare el volumen deseado de solución de rocío en una concentración determinada mezclando en agua la cantidad de este producto, como se indica en la siguiente tabla:

Volumen deseado de solución de rocío	Cantidad de Herbicida Roundup PRO para lograr la concentración indicada en la solución de rocío (porcentaje por volumen)					
	½%	1%	1 ½%	2%	5%	10%
1 galón	2/3 onza líquida	1 1/3 onza líquida	2 onza líquida	2 2/3 onza líquida	6 ½ onza líquida	13 onzas líquidas
25 galones	16 onzas líquidas	1 cuarto de galón	1 ½ cuartos de galón	2 cuartos de galón	5 cuartos de galón	10 cuartos de galón
100 galones	2 cuartos de galón	1 galón	1 ½ galones	2 galones	5 galones	10 galones

2 cucharadas soperas = 1 onza líquida (onz. líq.)

Para llenar los rociadores tipo mochila y de bombeo, recomendamos mezclar la cantidad apropiada de este producto con agua en un envase más grande y luego llenar el rociador con esta solución mezclada.

7.5 Colorantes y tintes

A las soluciones de rocío de este producto se le pueden agregar colorantes o tinturas para marcar, sin embargo estos pueden reducir su rendimiento. Use colorantes o tinturas según las indicaciones del fabricante.

8.0 EQUIPOS Y TÉCNICAS PARA LA APLICACIÓN

Este producto puede aplicarse con los siguientes equipos:

Equipo de aplicación aérea — Con alas fijas y helicóptero

Equipo de aplicación terrestre — Sistemas con brazo o sin brazo, rociadores de arrastre, flotadores, rociadores de captación, cupés de rocío y otros equipos de difusión terrestre

Rociadores manuales — Rociadores de mochila, rociadores con presión de bombeo, pistolas de mano, bastones de mano, sopladores de vaporización*, lanzas y otros equipos rociadores de mano y a motor empleados para dirigir el rocío al follaje no deseado.

* Este producto no está registrado en California ni en Arizona para su uso en sopladores de vaporización.

Equipo de aplicación selectiva — rociadores de recirculación, rociadores con pantalla y campana, aplicador con enjugador, barra con esponja, inyectores de tallo sencillos o huecos, inyectores de árboles, botella rociadora

Sistemas por inyección — Rociadores por inyección aéreos o terrestres

Aplicador por goteo controlado (CDA) — Aplicadores de mano o instalados en brazos que producen un patrón de rocío formado por un estrecho rango de tamaños de gotas

APLIQUE ESTE PRODUCTO UTILIZANDO EQUIPOS DEBIDAMENTE MANTENIDOS Y CALIBRADOS QUE SEAN CAPACES DE ROCIAR CON PRECISIÓN EL VOLUMEN DESEADO. No use ningún sistema de irrigación para aplicar este producto.

8.1 Manejo de la dispersión del rocío

EVITE EL CONTACTO DE ESTE HERBICIDA CON EL FOLLAJE, TALLOS VERDES, RAÍCES NO LEÑOSAS EXPUESTAS O FRUTOS EXPUESTOS DE LOS CULTIVOS, PLANTAS Y ÁRBOLES DESEABLES, PORQUE LAS PLANTAS PUEDEN SUFRIR GRAVES DAÑOS O SER DESTRUIDAS.

No permita que la solución herbicida se vaporice, gotee, disperse o salpique sobre la vegetación deseable ya que incluso cantidades pequeñas de este producto pueden causar daños graves o destruir el cultivo, plantas u otra vegetación que no era el objetivo de la aplicación.

EVITE LA DISPERSIÓN. TENGA SUMO CUIDADO AL APLICAR ESTE PRODUCTO PARA EVITAR DAÑOS A LAS PLANTAS Y CULTIVOS DESEABLES.

Evitar la dispersión del rocío en el lugar de aplicación es responsabilidad del aplicador. La interacción de varios factores relacionados con el clima y el equipo determina la posibilidad de dispersión del rocío. El aplicador y el cultivador son responsables de considerar todos estos factores al tomar decisiones relacionadas con la aplicación de este producto.

Las probabilidades de daño causado por la dispersión del rocío al aplicar este producto aumentan cuando hay viento con ráfagas, cuando la velocidad del viento aumenta, cuando la dirección del viento cambia constantemente o cuando hay otras condiciones meteorológicas que favorecen la dispersión del rocío. Al rociar, evite las combinaciones de presión y tipo de boquillas que resulten en salpicaduras o partículas finas (niebla) que es probable que se dispersen.

PARA EVITAR DAÑAR LA VEGETACIÓN DESEADA ADJUNTA, SE DEBEN MANTENER ZONAS DE TRANSICIÓN ADECUADAS.

EVITE APLICAR ESTE PRODUCTO A ALTA VELOCIDAD O PRESIÓN EXCESIVA.

8.2 Equipo de aplicación aérea

A menos que se prohíba de otra manera, todas las aplicaciones al voleo de este producto indicadas en esta etiqueta se pueden realizar con equipos de aplicación aérea, de ser posible, siempre que la persona que aplica el producto cumpla con las precauciones y restricciones especificadas en esta etiqueta y en las etiquetas complementarias separadas que se publican para este producto.

NO APLIQUE ESTE PRODUCTO CON EQUIPOS AÉREOS EXCEPTO BAJO LAS CONDICIONES QUE SE ESPECIFICAN EN ESTA ETIQUETA O EN LAS ETIQUETAS COMPLEMENTARIAS SEPARADAS QUE SE PUBLICAN PARA ESTE PRODUCTO.

PARA CONOCER LAS INSTRUCCIONES, RESTRICCIONES Y REQUISITOS ESPECÍFICOS RELACIONADOS CON LA APLICACIÓN AÉREA DE ESTE PRODUCTO EN CALIFORNIA, O EN CONDADOS ESPECÍFICOS DE ESE ESTADO, CONSULTE LAS LIMITACIONES DE LA APLICACIÓN AÉREA EN ESE ESTADO O CONDADO QUE SE PRESENTA EN ESTA SECCIÓN.

Aplique este producto en la proporción recomendada en esta etiqueta en 3 a 25 galones de agua por acre, a menos que se indique de otra manera. Use un volumen de rocío mayor dentro de este rango si las malezas, matorrales, árboles y enredaderas son densas o forman varias capas de cobertura.

Evite la aplicación directa en masas de agua.

Pueden usarse aditivos para controlar la dispersión.

Asegúrese de que la aplicación sea uniforme. Para evitar la aplicación en surcos irregular o encimada, utilice dispositivos de señalización apropiados.

Mantenimiento de aviones

Al final de cada día de trabajo, lave muy bien el avión, especialmente el tren de aterrizaje, para quitar los residuos de este producto que se acumulan durante el rocío o por derrames. EL CONTACTO PROLONGADO DE ESTE PRODUCTO CON PARTES DE ACERO SIN REVESTIMIENTO PUEDE CAUSAR CORROSIÓN Y POSIBLEMENTE QUE LAS PARTES FALLEN. LA PARTE MÁS SUSCEPTIBLE ES EL TREN DE ATERRIZAJE. Es posible prevenir la corrosión recubriendo las partes con pintura orgánica que cumpla con las especificaciones aero-espaciales MIL-C-38413.

MANEJO DE DISPERSIÓN DEL ROCÍO AÉREO

Deben seguirse los siguientes requerimientos de manejo de la dispersión para minimizar el movimiento de ésta fuera del objetivo durante la aplicación aérea. Estos requisitos no se aplican para aplicaciones de forestación.

1. La distancia de la boquilla más externa en el brazo no debe exceder 3/4 del largo de la envergadura o rotor.
2. Las boquillas deben siempre apuntar hacia atrás, paralelas a la corriente de aire, nunca hacia abajo más de 45 grados. En los estados que tengan reglamentos más estrictos, deberán observarse estos.

Importancia del tamaño de las gotas

La forma más eficaz de reducir la posibilidad de dispersión es aplicar en gotas grandes. La mejor estrategia de manejo de la dispersión es la aplicación de las gotas más grandes que provean suficiente cobertura y control. La aplicación de gotas más grandes reduce la posibilidad de dispersión, pero no la evitará si las aplicaciones se realizan inadecuadamente o bajo condiciones ambientales desfavorables, como por ejemplo con viento, altas temperaturas y baja humedad y/o condiciones inversas a las descritas antes.

Control del tamaño de las gotas

- **Volumen:** Use boquillas de velocidad de flujo alta para aplicar el mayor volumen de rocío práctico. Las boquillas con mayores velocidades de flujo producen gotas más grandes.
- **Presión:** Opere el rociador a una presión que esté cerca del extremo más bajo del rango indicado para la boquilla. La presión más alta reduce el tamaño de la gota y no mejora la penetración de la cobertura. Cuando sean necesarias velocidades de flujo mayores, use boquillas con mayor velocidad de flujo en lugar de aumentar la presión.
- **Cantidad de boquillas:** Utilice la cantidad mínima de boquillas que brinden una cobertura uniforme.
- **Orientación de la boquilla:** Si orienta las boquillas de modo que liberen el rocío hacia atrás, en sentido paralelo a la circulación del aire, producirán gotas más grandes que si las orienta de otro modo. Cuanto más desviadas estén del plano horizontal, tanto más pequeñas serán las gotas y tanto mayor el potencial de dispersión.
- **Tipo de boquilla:** Utilice un tipo de boquilla diseñado para la aplicación deseada. Con la mayoría de los tipos de boquillas, cuanto menor sea el ángulo de rocío tanto mayor serán las gotas. Considere el uso de boquillas de poca dispersión. Las boquillas de chorro sólido orientadas completamente hacia atrás producen gotas más grandes que otros tipos de boquillas.
- **Longitud del brazo:** En algunos esquemas de uso, la reducción de la longitud efectiva del brazo a menos de 3/4 de la envergadura o de la longitud del rotor puede reducir la dispersión aún más sin reducir el ancho de la franja.
- **Altura de la aplicación:** Las aplicaciones no deben realizarse a una altura mayor de 10 pies por encima de la copa de las plantas más grandes, a menos que se requiera mayor altura por razones de seguridad del avión. Realizar las aplicaciones a la menor altura que sea segura reduce la exposición de las gotas a la evaporación y el viento.

Ajuste de franja

Cuando la aplicación se lleve a cabo ante viento lateral, la franja de aspersión se desplazará a favor del viento. Por ello, en los extremos con o contra el viento del campo, el aplicador debe compensar este desplazamiento ajustando la trayectoria del avión contraria al viento. La distancia de ajuste de la franja debe aumentar, cuando aumenta la posibilidad de dispersión (mayor viento, gotas más pequeñas, etc.).

Viento

El potencial de dispersión es menor cuando la velocidad del viento es de 2 a 10 millas por hora. Sin embargo, muchos factores, incluyendo el tamaño de las gotas y el tipo de equipo determinan la posibilidad de dispersión a una velocidad determinada. Se debe evitar la aplicación cuando la velocidad del viento está por debajo de 2 millas por hora debido a los cambios de dirección del viento y la alta posibilidad de inversión. **NOTA:** El terreno local puede influir en los patrones de viento. Cada aplicador debe conocer los patrones de vientos locales y cómo éstos afectan la dispersión.

Temperatura y humedad

Cuando se realizan aplicaciones con humedad relativa baja, fije el equipo para que produzca gotas más grandes para compensar por la evaporación. La evaporación de gotas es más grave cuando las condiciones son calurosas y secas.

Inversiones de temperatura

Este producto no debe aplicarse durante una inversión de temperatura debido a que la posibilidad de dispersión es alta. Las inversiones de temperatura restringen la mezcla de aire vertical, lo que causa que pequeñas gotas permanezcan suspendidas en una nube concentrada. Esta nube puede moverse en direcciones no predecibles debido a los vientos variables leves que son comunes durante las inversiones. Las inversiones de temperatura están caracterizadas por temperaturas en aumento con altitud y son comunes en las noches con cobertura de nubes limitada y poco o ningún viento. Comienzan a formarse cuando se mete el sol y a menudo continúan en la mañana. Su presencia puede indicarse por neblina en el suelo. Si la neblina no está presente, las inversiones también pueden identificarse por el movimiento del humo desde una fuente del suelo o por el generador de humo de un avión. El humo en capas que se mueve lateralmente en una nube concentrada (bajo condiciones de poco viento) indica una inversión, mientras que el humo que se mueve hacia arriba y se disipa rápidamente indica buena mezcla de aire vertical.

Áreas susceptibles

Este producto solo se debe aplicar cuando la posibilidad de dispersión hacia zonas adyacentes susceptibles (por ejemplo, áreas residenciales, masas de agua, hábitat conocido de especies amenazadas o en peligro de extinción, cultivos que no sean el objetivo) sea mínima (por ejemplo, cuando el viento sople lejos de las áreas susceptibles).

Limitaciones estatales específicas de la aplicación aérea

LIMITACIONES DE LA APLICACIÓN AÉREA SOLAMENTE EN CALIFORNIA

NO aplique este producto usando equipo de aplicación aérea en áreas residenciales.

EVITE LA DISPERSIÓN – NO APLIQUE CUANDO HAYA VIENTO CON RÁFAGAS O BAJO OTRAS CONDICIONES QUE FAVOREZCAN LA DISPERSIÓN. LA DISPERSIÓN DE ESTE PRODUCTO EN CUALQUIER VEGETACIÓN QUE NO SEA EL OBJETIVO DE LA APLICACIÓN PUEDE CAUSAR DAÑOS. PARA EVITAR DAÑOS A LA VEGETACIÓN ADYACENTE DESEADA, USE EL EQUIPO DE APLICACIÓN AÉREA CORRECTO CON LAS BOQUILLAS APROPIADAS Y MANTENGA ZONAS DE TRANSICIÓN ADECUADAS.

Siga las siguientes instrucciones al hacer aplicaciones aéreas cerca de cultivos que no sean el objetivo, vegetación anual deseable o vegetación perenne después de echar brotes y antes de la caída total de las hojas.

1. No aplique este producto a menos de 100 pies de la vegetación deseable o los cultivos que no son el objetivo.
2. Si está soplando un viento de hasta 5 millas por hora HACIA la vegetación deseable o los cultivos que no son el objetivo, no aplique este producto a menos de 500 pies de los cultivos o vegetación deseable.
3. Si están soplando vientos de entre 5 y 10 millas por hora HACIA la vegetación deseable o los cultivos que no son el objetivo, puede que se necesite una zona de transición de más de 500 pies para proteger los cultivos o vegetación deseable.
4. No aplique este producto usando equipo de aplicación aérea cuando soplen vientos de más de 10 millas por hora.
5. No aplique este producto usando equipo de aplicación aérea cuando existan condiciones de inversión.

Al mezclar en tanque este producto con 2,4-D, solo se pueden utilizar formulaciones de 2,4-D amina con equipo de aplicación aérea en California. Las mezclas de tanque de este producto con formulaciones de 2,4-D amina se pueden aplicar por aire en California únicamente en sistemas de labranza reducida o campos con barbecho y para renovación de pastura.

Este producto, al ser mezclado en tanques con dicamba, no se puede aplicar por aire en el estado de California.

LIMITACIONES ADICIONALES PARA LA APLICACIÓN AÉREA SOLAMENTE EN EL CONDADO DE FRESNO, CALIFORNIA

Siempre lea y siga las instrucciones de la etiqueta y las declaraciones preventivas para todos los productos usados en la aplicación aérea.

La siguiente información aplica solo del 15 de febrero al 31 de marzo dentro de los siguientes límites del Condado de Fresno, California:

Norte: Frontera del Condado de Fresno
Sur: Frontera del Condado de Fresno
Este: Autopista estatal 99
Oeste: Frontera del Condado de Fresno

Respete las siguientes instrucciones para minimizar el movimiento fuera del lugar durante la aplicación aérea de este producto. Minimizar el movimiento fuera del lugar es responsabilidad del cultivador, el Asesor en control de plagas y el encargado de la aplicación aérea.

Instrucciones por escrito

El encargado de la aplicación o su representante TIENEN que presentar instrucciones por escrito al Comisionado de Agricultura del Condado de Fresno 24 horas antes de la aplicación. Estas instrucciones por escrito TIENEN que indicar la proximidad de los cultivos en los alrededores, y que se han cumplido las condiciones de esta etiqueta y de todas las etiquetas de los fabricantes de los productos.

Capacitación y equipo del encargado de la aplicación aérea

La aplicación aérea de este producto se limita a los pilotos que hayan completado con éxito un programa de capacitación para la aplicación aérea de herbicidas aprobado por el Comisionado de Agricultura del Condado de Fresno y el Departamento de Regulación de Pesticidas de California. Todos los aviones tienen que ser inspeccionados, revisados en vuelo y certificados por una organización aprobada por el Comisionado de Agricultura del Condado de Fresno. Pruebe y calibre el equipo de rocío a intervalos suficientes para garantizar que se estén aplicando las proporciones adecuadas de herbicidas y adyuvantes durante el uso comercial. El encargado de la aplicación tiene que documentar dichas pruebas y calibraciones. Una demostración de desempeño en una organización aprobada por el Comisionado de Agricultura del Condado de Fresno constituye documentación, además de otros registros por escrito que muestren cálculos y medidas de los parámetros de vuelo y rocío aceptables para el Comisionado de Agricultura del Condado de Fresno.

Aplicaciones de noche – No aplique este producto por aire más de 30 minutos antes del amanecer ni más de 30 minutos después de la puesta del sol sin autorización previa del Comisionado de Agricultura del Condado de Fresno.

Para obtener información adicional sobre la aplicación aérea adecuada de este producto en el Condado de Fresno llame al 1-866-99BAYER (1-866-992-2937).

8.3 Equipo de aplicación terrestre

Aplique este producto en las proporciones apropiadas especificadas en esta etiqueta en 3 a 40 galones de agua por acre cuando se realizan aplicaciones al voleo usando equipos de aplicación terrestre, a menos que se indique de otro modo en esta etiqueta, en las etiquetas complementarias separadas o en las Fichas Técnicas que se publican para este producto. A medida que aumenta la densidad de las malezas, aumente el volumen de rocío hacia al extremo superior dentro de este rango para conseguir una cobertura completa. Use boquillas que eviten generar una niebla fina. Para obtener mejores resultados con el equipo de aplicación terrestre, use boquillas tipo abanico plano. Compruebe la distribución uniforme del patrón de las gotas del rocío.

8.4 Rociadores manuales

Al usar un rociador de mano, aplique soluciones de rocío de este producto de manera completa y uniforme al follaje de la vegetación objetivo, usando un espectro de gotas gruesas y técnica de rocío para mojar; no rocíe hasta el punto de escurrimiento. Consulte la sección "MALEZAS CONTROLADAS" de esta etiqueta para conocer la concentración correcta de este producto en la solución de rocío y el momento de aplicación para controlar malezas específicas, árboles, enredaderas y matorrales leñosos.

Para el control de malezas anuales, aplique cuando las malezas están pequeñas y antes de la formación de inflorescencias o brotes. Para el control de malezas perennes, árboles, enredaderas y matorrales leñosos, aplique después de la floración y antes de la caída de hojas y el color otoñal.

Al hacer una aplicación de rocío dirigido a bajo volumen a malezas anuales y perennes, árboles, enredaderas y matorrales leñosos usando un rociador de mano, asegúrese de rociar por lo menos de 50 a 75 por ciento del follaje o la mitad superior de cada planta no deseada. Si se usa una boquilla de chorro recto, comience la aplicación en la parte superior de la planta objetivo y rocíe de arriba hacia abajo con un movimiento lateral en zigzag. Para asegurar una cobertura uniforme y completa, rocíe ambos lados de los matorrales leñosos grandes o altos, árboles y enredaderas o cuando el follaje es espeso y denso o hay varios brotes. Para obtener mejores resultados en los árboles, enredaderas y matorrales leñosos, aplique a la vegetación en crecimiento activo después de la expansión completa de las hojas y la floración, antes de la caída de las hojas y el color de otoño.

La siguiente tabla resume varios métodos de aplicación foliar usando un rociador de mochila con una técnica de rocío dirigido a bajo volumen o rocío para mojar y una aplicación con rociador de alto volumen usando equipo de aplicación a mano para el control total o parcial de malezas herbáceas, árboles, enredaderas y matorrales leñosos listados en la sección "MALEZAS CONTROLADAS" de esta etiqueta.

Método de aplicación	Concentración de solución de rocío	Volumen de rocío
Pistola de mano o rociador de mochila	0.75 a 2% por volumen	Técnica de rocío para mojar
Rocío dirigido de bajo volumen (mochila)	5 a 10% por volumen	15 a 25 galones por acre
Rocío modificado de alto volumen	3 a 5% por volumen	40 a 60 galones por acre

La aplicación de rocío dirigido a bajo volumen con un rociador de mochila funciona mejor cuando se aplica a las malezas y matorrales con menos de 10 pies de alto. Para las malezas y matorrales más altos, una pistola de mano de alto volumen puede modificarse reduciendo el tamaño de la boquilla y la presión de rocío para producir una aplicación modificada de rocío dirigido de alto volumen.

8.5 Equipo de aplicación selectiva

El equipo de aplicación selectiva permite que este producto se aplique a las malezas que crecen cerca de cultivos o de otra vegetación deseable sin matar la vegetación deseable. El equipo de aplicación selectiva debe evitar todo contacto de la solución herbicida con la vegetación deseable y operarse sin filtración de rocíos de niebla, derrames o goteo de la solución herbicida.

EVITE EL CONTACTO DE ESTE HERBICIDA CON LA VEGETACIÓN DESEABLE. El contacto de este producto con la vegetación deseable podría causar daños o la destrucción de la planta. Hasta el grado que sea compatible con la legislación pertinente, este daño será responsabilidad exclusiva de la persona encargada de la aplicación del producto.

Este producto puede diluirse en agua y aplicarse usando un rociadores de recirculación, rociadores con pantalla, rociadores con campana, aplicadores con enjugador o barras de esponja, a las malezas especificadas en esta etiqueta que crecen en cualquier terreno de cultivo no alimentario especificado en esta etiqueta, donde sea posible. Este producto también puede usarse con rociadores equipados con tecnología de sensor óptico de malezas. Este producto también puede aplicarse con otro equipo selectivo como los inyectores de tallo sencillos o huecos, inyectores de árboles, aplicadores con enjugador para aplicaciones en tallos cortados y tocones cortados y en botellas rociadoras para aplicaciones en tallos cortados, tocones cortados y chorro para controlar malezas de tallo largo, matorrales, árboles y enredaderas indicados en esta etiqueta.

Rociador de recirculación

Los rociadores de recirculación dirigen la solución de rocío hacia los tipos de malezas que crecen sobre vegetación deseable, mientras que la solución de rocío que no ha sido interceptada por las malezas se recoge y se retorna al tanque para volverla a usar. Un rociador de recirculación puede usarse para aplicar soluciones de rocío de este producto a las malezas indicadas en esta etiqueta en cualquier terreno sin cultivo descrito en esta etiqueta.

Rociadores con pantalla y con campana

Un rociador con pantalla dirige la solución herbicida a las malezas objetivo mientras protege la vegetación deseable de entrar en contacto con el rocío herbicida mediante una pantalla o material impermeable. Use boquillas que aseguren una cobertura

uniforme de toda el área tratada. Mantenga las pantallas debidamente colocadas a fin de proteger la vegetación deseada.

Un rociador con campana es un tipo de rociador con pantalla en el que el rocío está totalmente encerrado, y que incluye parte superior, laterales, parte frontal y posterior, de modo que protege la vegetación deseable de la solución de rocío.

Este producto puede diluirse con agua y aplicarse usando un rociador con pantalla o con campana a las malezas indicadas en esta etiqueta que crecen en cualquier terreno sin cultivo descrito en esta etiqueta, donde sea posible, y entre hileras de plantas (en medio de las hileras) en cualquier sistema de cultivo indicado en esta etiqueta.

Coloque correctamente la campana para proteger la vegetación deseable. Asegúrese de que la campana es capaz de encerrar completamente el patrón de rocío. De ser necesario cuando lo aplique alrededor de cultivos en camas elevadas, extienda hacia abajo las solapas frontal y posterior del rociador con campana para llegar a la tierra en surcos profundos.

Los rociadores con campana deben ser configurados y operados de manera que reduzcan al mínimo el rebote, y eviten que sea necesario levantar la campana de la superficie de la tierra en cualquier momento. Si la campana se levanta, pueden escapar partículas de rocío y hacer contacto con el cultivo o con otra vegetación deseable, causándole daño o destrucción. Evite operar este equipo en terreno irregular o en declive, donde la campana de rocío puede levantarse de la superficie del suelo.

Utilice campanas diseñadas para reducir al mínimo el escurrimiento o goteo excesivo por la parte interior de la campana, tales como una única boquilla en abanico de baja presión y poca dispersión con un ángulo de rocío de 80 a 95 grados, colocada en la parte central superior de la campana, con un volumen de rocío de 20 a 30 galones por acre.

Los siguientes procedimientos ayudarán a reducir las posibilidades de daño a la vegetación deseable cuando se usa un rociador con campana:

- Opere el rociador con la campana sobre el terreno o casi rozando la superficie del terreno.
- Deje una franja de al menos 8 pulgadas sin tratar sobre la hilera del surco. (Por ejemplo, si la hilera del cultivo tiene un ancho de 38 pulgadas, use una campana de rocío con un ancho máximo de 30 pulgadas).
- Trabaje a una velocidad terrestre no mayor de 5 millas por hora para minimizar el rebote del rociador con campana.
- Aplique cuando la velocidad del viento sea de 10 millas por hora o menos.
- Utilice boquillas de poca dispersión que ofrecen cobertura uniforme dentro del área de aplicación.

Puede causar daños al cultivo o a otra vegetación deseable si se aplica al follaje de las malezas que tienen contacto directo con la vegetación deseable. No aplique este producto si las hojas de la vegetación deseable crecen en contacto directo con las malezas. Las gotas, la niebla, la espuma o las salpicaduras de la solución herbicida que se depositan en la vegetación deseable pueden causar decoloración, atrofia o destrucción.

Aplicador con enjugador

El aplicador con enjugador es un dispositivo que pasa físicamente este producto o soluciones de este producto directamente a la maleza o los tocones cortados. Puede usarse cualquier dispositivo manual que sea capaz de pasar físicamente este producto o soluciones de este producto directamente en la maleza objetivo o tocones cortados, como por ejemplo una brocha de pintor.

Un aplicador con enjugador mecánico, como una barra de esponja o mecha que pueda llevarse por un campo por encima de un cultivo u otra vegetación deseable para controlar las malezas altas que crecen por encima de la vegetación deseable, debe estar diseñado, mantenerse y operarse de tal manera que evite que la solución herbicida entre en contacto con la vegetación deseable.

Los aplicadores con enjugador pueden usarse sobre los cultivos alimentarios ÚNICAMENTE si su uso sobre ese cultivo está específicamente permitido en esta etiqueta o en las etiquetas complementarias que se publican por separado para este producto.

Al usar un aplicador con enjugador mecánico, ajuste la altura del aplicador para asegurar el contacto adecuado con las malezas, de manera que el punto de contacto del enjugador esté al menos 2 pulgadas por encima del cultivo o la vegetación deseable. Se obtienen mejores resultados cuando una mayor cantidad de maleza entra en contacto con la solución herbicida y las malezas tienen por lo menos 6 pulgadas de altura más que la vegetación deseable. Las malezas que no entran en contacto con la solución herbicida no se afectarán. El contacto puede ser insuficiente cuando las malezas crecen en macizos densos, en las áreas de infestaciones severas de malezas o cuando la altura de las malezas varía considerablemente. En estas situaciones, puede ser necesaria más de una aplicación de este producto.

Opere los aplicadores con enjugador a una velocidad terrestre no mayor de 5 millas por hora. Se puede mejorar el rendimiento en zonas infestadas con muchas malezas si se reduce la velocidad, lo que dará más tiempo para volver a saturar el enjugador con la solución herbicida y más tiempo de contacto del enjugador con la maleza. Se pueden obtener mejores resultados con un aplicador con enjugador si se hacen dos aplicaciones en direcciones opuestas del campo.

Mantenga limpias las superficies de enjugado.

Las gotas, la niebla, la espuma o las salpicaduras de la solución herbicida que se depositan en la vegetación deseable pueden causar decoloración, atrofia o destrucción. Evite las filtraciones o el goteo en la vegetación deseable. Tenga en cuenta que en terreno en declive la solución herbicida puede cambiar de lugar, goteando en el extremo inferior y secando la superficie del enjugador en el extremo superior del aplicador.

No aplique este producto con un aplicador con enjugador cuando las malezas estén mojadas.

Para aplicadores con barra de esponja o mecha aplique soluciones en un rango entre 33 y 75 por ciento de este producto por volumen en agua.

Para aplicadores de panel aplique soluciones en un rango entre 33 y 100 por ciento (sin diluir) de este producto por volumen en agua.

Mezcle solamente la cantidad de este producto que se usará durante el período de un día, ya que el uso de soluciones de días anteriores puede reducir el efecto del producto.

Lave las piezas del enjugador inmediatamente después de utilizar este producto enjuagando con una gran cantidad de agua.

Inyectores de tallo sencillos y huecos

Se puede obtener el control de ciertas malezas indicadas en la sección "MALEZAS CONTROLADAS" inyectando este producto concentrado o soluciones de este producto directamente en la maleza objetivo. Asegúrese de que el inyector de mano que se use para esta aplicación sea capaz de rociar con precisión el volumen especificado en la etiqueta. Al inyectar los tallos, el uso total combinado de este producto no debe exceder 10.6 cuartos de galón por acre por año. A 6 mililitros de producto concentrado (sin diluir) por tallo, 10.6 cuartos de galón tratarán aproximadamente 1670 tallos por acre por año. La cantidad de tallos que pueden tratarse por acre variará dependiendo del volumen de inyección y de la concentración de este producto en la solución de aplicación.

8.6 Sistemas por inyección

Este producto puede usarse con sistemas de rocío por inyección, ya sean aéreos o terrestres, como concentrado líquido o diluido antes de inyectarlo en el chorro de rocío. No mezcle este producto concentrado con concentraciones de otros productos sin diluir cuando use los sistemas por inyección, a menos que se indique lo contrario.

8.7 Aplicador por goteo controlado (CDA)

La cantidad de este producto aplicada por acre con el aplicador por goteo controlado (CDA) no puede ser menos que la proporción indicada en esta etiqueta cuando se aplica con un equipo al voleo convencional.

El aplicador por goteo controlado produce un patrón de rocío que es difícil de ver. Debe tener sumo cuidado de no rociar o hacer contacto por dispersión con el follaje o con cualquier otro tipo de vegetación deseable, ya que esto puede causar daño o la destrucción de la planta.

9.0 SITIOS DE USOS TERRESTRES

Este producto puede utilizarse de acuerdo con las instrucciones de uso en esta etiqueta para controlar malezas, árboles, enredaderas y matorrales leñosos indicados en esta etiqueta en cualquier terreno descrito en esta etiqueta.

Este producto puede utilizarse para controlar malezas, árboles, enredaderas y matorrales leñosos en mantenimiento de jardines, terrenos mejorados y sin mejorar, céspedes y en los alrededores de plantas ornamentales en zonas industriales, comerciales y residenciales, incluyendo aeropuertos, complejos de viviendas, chaparrales, bordes de acequias, caminos de entrada de automóviles, zanjas y canales secos, ranchos, bordes de cercas, bosques, campos de golf, invernaderos, madereras, fábricas, zonas municipales, áreas naturales, viveros, complejos de oficinas, lechos ornamentales, parques, estacionamientos, pasturas, patios de tanques de petróleo, instalaciones de bombeo, ferrocarriles, tierras de pastoreo, áreas recreativas, áreas residenciales, bordes de carretera, escuelas, cobertizos, sitios para la producción de céspedes, complejos deportivos, almacenes, subestaciones, servidumbres de paso de servicios públicos, sitios de servicios públicos, áreas de almacenamiento, parcelas para alimento de la vida silvestre y áreas de preservación de la vida silvestre.

Este producto puede utilizarse para el control no selectivo de vegetación no deseada en cualquier sitio descrito en esta etiqueta para aplicación en recortes y bordes alrededor de objetos, incluyendo alrededor de los cimientos de edificios, áreas donde se guardan equipos, y árboles, a lo largo de cercas, y para eliminar las malezas no deseadas que crecen cerca de lechos de arbustos establecidos y plantaciones ornamentales. Este producto también puede utilizarse para la completa eliminación de la vegetación en un terreno antes de sembrar plantas ornamentales, flores o césped (en tepes o semillas), y antes de desarrollar terrenos, incluso antes de comenzar proyectos de construcción o de cubrir con asfalto u otro material para la construcción de caminos. Se pueden repetir las aplicaciones de este producto cuando sea necesario para mantener el terreno limpio de malezas, hasta un máximo de 10.6 cuartos de galón por acre por año.

Este producto puede utilizarse para el establecimiento y mantenimiento de cortafuegos, para establecer perímetros y pantallas contra fuegos, junto a caminos para bomberos y para facilitar las prácticas de quema recomendadas en cualquier sitio descrito en esta etiqueta.

Este producto también puede utilizarse para el control de malezas o regular el crecimiento en las plantaciones de árboles de Navidad, ranchos, viveros de producción, plantaciones de césped y sitios de producción de semillas de céspedes.

A menos que se indique lo contrario, la aplicación de este producto se puede hacer de acuerdo con las instrucciones de uso en las secciones que siguen en cualquiera de estos sitios, usando cualquier método de aplicación descrito en esta etiqueta para controlar las malezas, árboles, enredaderas y matorrales leñosos indicados en la sección de "MALEZAS CONTROLADAS" de esta etiqueta.

10.0 INFORMACIÓN ADICIONAL SOBRE GERENCIA DEL LUGAR

Las siguientes secciones contienen información adicional sobre uso específicamente relacionada con el uso en ciertas zonas. A menos que se indique lo contrario, cualquier aplicación de este producto descrita en la sección "MALEZAS CONTROLADAS" o en cualquier otra sección de esta etiqueta se puede hacer en las zonas de uso descritos en las secciones que siguen, cuando proceda, usando cualquier método de aplicación descrito en esta etiqueta que sea apropiado.

10.1 Manejo de bosques, árboles de madera y árboles de Navidad

Este producto puede usarse para el control total o parcial de matorrales leñosos, árboles y malezas herbáceas en cualquier zona de árboles, incluyendo bosques, plantaciones de árboles de Navidad y viveros dedicados a la silvicultura y la producción, usando cualquier método de aplicación indicado en esta etiqueta. Vea la sección "MALEZAS CONTROLADAS" de esta etiqueta para conocer las proporciones de aplicación y las instrucciones de uso específicas.

Manejo de malezas, preparación del terreno

Este producto puede utilizarse para controlar total o parcialmente matorrales leñosos, árboles, enredaderas y malezas herbáceas no deseables indicados en esta etiqueta para preparar el terreno antes de sembrar cualquier especie de árbol, incluyendo árboles de Navidad, árboles de eucalipto y cultivos de árboles híbridos, así como para controlar las malezas en los alrededores de árboles establecidos, establecer zonas de reserva de vida silvestre y mantener los caminos en cualquier zona de árboles.

MEZCLAS DE TANQUE: Este producto puede aplicarse en mezcla de tanque con los productos indicados en esta sección para aumentar el espectro de vegetación controlada. Cualquier proporción de aplicación de este producto indicado en esta etiqueta puede usarse en una mezcla de tanque con los siguientes productos para el manejo de la zona de árboles, incluyendo la preparación del terreno, siempre que el producto esté registrado para su uso en el sitio de aplicación y antes de sembrar las especies deseadas. Consulte las etiquetas de cada producto usado en la mezcla de tanque para conocer los usos aprobados y las proporciones de aplicación. Lea y siga todas las instrucciones de uso y las precauciones para cada producto usado, incluyendo las restricciones de intervalos de siembra, si las hay. Use este producto conforme a las precauciones más restrictivas de cada producto en la mezcla.

imazapyr; metsulfuron methyl; sulfometuron methyl; triclopyr
Arsenal; Herbicida concentrado para aplicadores Arsenal; Chopper; Chopper Gen2; Escort XP; Forestry Garlon 4 Specialty; Forestry Garlon XRT Specialty; Garlon 3A Specialty; Garlon 4 Specialty; Garlon 4 Ultra Specialty; Landmark; Landmark XP; Oust Extra; Oust XP

Para el control de las malezas herbáceas, aplique estos productos en mezcla de tanque en la proporción de aplicación más baja dentro del rango especificado en

la etiqueta del producto. Para el control total o parcial de poblaciones densas o para árboles, enredaderas y matorrales leñosos difíciles de controlar, aplique estos productos en una proporción o concentración de solución de rocío más alta dentro del rango dado.

Poda forestal de coníferas, poda de coníferas a mitad de rotación, poda de árboles de madera, mejora del grupo

Este producto puede aplicarse como rocío dirigido usando un rociador manual o cualquier equipo de aplicación selectiva descrito en esta etiqueta para controlar las malezas leñosas y herbáceas y otra vegetación sotobosque no deseada por debajo de la copa de los árboles del cultivo en las plantaciones de coníferas, árboles de madera, árboles de Navidad y viveros ornamentales y de silvicultura para facilitar la poda forestal y el crecimiento de coníferas y árboles de madera.

Este producto también puede aplicarse usando un equipo de difusión terrestre o en aplicación en rocío dirigido para la poda forestal a mitad de rotación bajo la copa de los pinos, otras coníferas y árboles de madera.

PRECAUCIONES: Evite el contacto de la dispersión, niebla o gotas del rocío con el follaje, la corteza verde o las raíces no leñosas expuestas de las especies de plantas deseables. Use técnicas de aplicación que eviten o minimicen el contacto de este producto con el follaje de los árboles u otras plantas deseados a través del contacto directo o del desvío del rocío fuera del objetivo.

RESTRICCIONES: No aplique este producto en aplicaciones al voleo en la parte superior de coníferas o árboles de madera, a menos que se indique lo contrario en esta etiqueta o en otras etiquetas complementarias separadas.

10.2 Manejo de hábitats de vida silvestre y especies nativas

Este producto puede usarse para controlar vegetación exótica y otra no deseada en áreas naturales y hábitats de vida silvestre, incluyendo riberas y estuarios, tierras de pastoreo y refugios de vida silvestre. Pueden hacerse aplicaciones para permitir la recuperación de especies de plantas nativas o antes de plantar especies nativas deseables, y para aplicaciones similares de control de amplio espectro de la vegetación. Puede hacerse tratamiento localizado, aplicación a tocones cortados, tallos cortados, inyección de tallo, aplicador con enjugador y todos los demás métodos indicados en esta etiqueta para eliminar de forma selectiva las plantas no deseadas para el manejo y mejora de hábitats.

Este producto también se puede utilizar para eliminar malezas anuales y perennes antes de sembrar parcelas para alimento de la vida silvestre. Después de aplicar este producto, se puede sembrar cualquier especie de alimento para la vida silvestre o permitir la repoblación natural de la zona con especies nativas. Si debe labrar para preparar un semillero, espere por lo menos 7 días después de la aplicación antes de hacerlo a fin de permitir la absorción adecuada en las partes de la planta que estén bajo tierra.

10.3 Manejo de vivero ornamental y de producción

Todos los usos de este producto descritos en esta etiqueta pueden aplicarse a viveros de plantas usando cualquier método de aplicación descrito.

Este producto puede usarse para limpiar un área de vegetación no deseada antes de sembrar cualquier planta, árbol, arbusto ornamental o de otro tipo.

Este producto también puede utilizarse para controlar malezas que crecen alrededor de especies leñosas ornamentales establecidas, como árbol de la vida, azalea, boj, manzana silvestre, eucalipto, evónimo, abeto, abeto Douglas, jojoba, acebos, lirio, magnolia, arce, roble, álamo blanco o negro, ligustro, pino, abeto de hojas de tejo, así como para recortar bordes alrededores de plantas en maceta y otros objetos en un vivero de plantas.

PRECAUCIONES: Proteja las plantas deseables de la solución de rocío con pantallas o cubiertas de materiales impermeables. Tenga cuidado para evitar que el rocío, la dispersión o la niebla no hagan contacto con el follaje, lo tallos verdes o la corteza inmadura de las especies ornamentales establecidas.

Invernaderos/cobertizos

Este producto se puede usar para controlar las malezas que estén creciendo en o alrededor de los invernaderos y cobertizos.

RESTRICCIONES: La vegetación deseable no debe estar presente durante la aplicación en un invernadero. Apague los equipos de ventilación antes de aplicar este producto dentro de un invernadero o cobertizo y déjelos apagados hasta que la solución aplicada haya secado.

10.4 Manejo de áreas comerciales, residenciales y recreativas

Todas las aplicaciones de este producto descritas en esta etiqueta se pueden usar en áreas comerciales, residenciales y recreativas, incluyendo parques, escuelas y campos de atletismo, usando cualquier método de aplicación descrito en esta etiqueta, incluyendo tratamiento localizado de vegetación no deseada, recorte de bordes alrededor de árboles, cercas, senderos, edificios, aceras, circuitos y otros objetos en estas áreas, para eliminar malezas no deseadas que crecen en lechos ornamentales y de arbustos establecidos, para el manejo y la renovación de céspedes y para eliminar la vegetación de un sitio antes de su desarrollo, incluyendo antes de sembrar un área de flores, plantas ornamentales o césped (en tepes o semillas) o de comenzar proyectos de construcción.

10.5 Manejo de zonas de pasturas

El uso de este producto en pasturas incluye el uso en bahiagrass, bermudagrass, bluegrass, brome, fescue, guinea grass, kikuyu grass, orchardgrass, pangola grass, ryegrass, Timothy y wheatgrass.

Antes de sembrar, preemergencia, renovación de pasturas

Este producto se puede aplicar antes de sembrar o de que emerjan pastos forrajeros o perennes. Consulte la sección "MALEZAS CONTROLADAS" de esta etiqueta para conocer las proporciones de aplicación de este producto para el control de malezas específicas.

RESTRICCIONES: Si la proporción total de aplicación de este producto es 3 cuartos o menos por acre, no se requiere período de espera entre el tratamiento y la utilización como alimento o el pastoreo del ganado. Si la proporción es mayor a 3 cuartos de galón por acre, retire el ganado doméstico antes de aplicar y espere como mínimo 8 semanas después de la aplicación para utilizar como pastura o para cosechar.

Tratamiento localizado, aplicador con enjugador

Este producto se puede aplicar en pasturas como tratamiento localizado o por la parte superior de pastos atractivos, utilizando aplicadores con enjugador para controlar las malezas más altas. Para un mejor control de malezas, retire el ganado doméstico antes de aplicar para permitir suficiente crecimiento de las plantas y espere como mínimo 7 días después de la aplicación antes del pastoreo del ganado o para cosechar como forraje. Vea en la sección "EQUIPO Y TÉCNICAS DE APLICACIÓN" de esta etiqueta las instrucciones adicionales para el empleo de aplicadores con enjugador.

RESTRICCIONES: Para tratamiento localizado o usando un aplicador con enjugador, en proporciones de 3 cuartos de galón o menos por acre, puede aplicar este producto sobre todo el pasto o en cualquier parte de este. En proporciones de más de 3 cuartos de galón por acre, este producto no se puede aplicar sobre más de 10 por ciento del total de la pastura cada vez. Se pueden repetir las aplicaciones en la misma zona con intervalos de 30 días.

Inhibición de malezas en pasturas latentes

Este producto se puede aplicar a pasturas latentes para inhibir el crecimiento competitivo y la producción de semillas de malezas anuales y otra vegetación no deseable. Aplique de 12 a 16 onzas líquidas de este producto por acre usando un equipo de aplicación al voleo en pasturas a finales del otoño después de que los pastos perennes deseables estén latentes o a finales del invierno antes de que los pastos perennes deseables comiencen la actividad e inicien el crecimiento vegetativo.

PRECAUCIONES: Pueden usarse proporciones de aplicación más altas para las malezas difíciles de controlar; sin embargo, las proporciones más altas pueden reducir los grupos. Puede producirse cierta atrofia de los pastos perennes si las aplicaciones al voleo se realizan cuando las plantas están activas.

RESTRICCIONES: No se necesita período de espera entre la aplicación y el pastoreo o para cosechar como forraje. No aplique más de 3 cuartos de galón de este producto por acre por año en pastos para pastura, excepto para renovación. Si necesita volver a sembrar debido a una reducción considerable del grupo, no se requiere período de espera después de aplicar este producto antes de sembrar el pasto para pastura indicado al inicio de esta sección; para todos los demás pastos para pastura, espere por lo menos 30 días después de la aplicación para sembrar.

10.6 Manejo de ferrocarriles

Todos los usos de este producto descritos en la sección "MALEZAS CONTROLADAS" o en cualquiera otra de esta etiqueta se pueden utilizar en las zonas de ferrocarriles con cualquier método de aplicación descrito.

Este producto se puede aplicar a lo largo de las servidumbres de paso de los ferrocarriles en una proporción de hasta 80 galones de solución de rocío por acre.

Suelo limpio, balastos y bordes, cruces, tratamiento localizado

Este producto se puede usar para mantener el suelo limpio en los balastos y bordes de los ferrocarriles, así como para reducir la necesidad de segar y desbrozar mecánicamente a lo largo de las servidumbres de paso de los ferrocarriles. Se pueden repetir las aplicaciones de este producto si las malezas continúan emergiendo para mantener el terreno limpio, hasta una proporción de aplicación total máxima de 10.6 cuartos de galón de este producto por acre por año.

MEZCLAS DE TANQUE: Este producto se puede aplicar en una mezcla de tanque con los siguientes productos para un mejor control de árboles y matorrales leñosos en aplicaciones para suelo limpio, balastos y bordes, cruces y tratamiento localizado, así como control de otros matorrales, árboles y enredaderas en zonas de ferrocarriles, siempre que el producto usado esté registrado para la aplicación que se hace. Consulte las etiquetas de cada producto usado en la mezcla de tanque para conocer los usos aprobados y las proporciones de aplicación. Lea y siga siempre las indicaciones de las etiquetas de cada producto utilizado en la mezcla.

2,4-D; atrazina; bromacil; chlorsulfuron; clopyralid; dicamba; diquat; diuron; hexazinone; imazapyr; metsulfuron methyl; pelargonic acid; simazine; sulfometuron methyl; sulfosulfuron; tebuthiuron; triclopyr

Arsenal; Herbicida concentrado para aplicadores Arsenal; Chopper; Chopper Gen2; Escort XP; Forestry Garlon 4 Specialty; Forestry Garlon XRT Specialty; Garlon 3A Specialty; Garlon 4 Specialty; Garlon 4 Ultra Specialty; Habitat; Hyvar X; Hyvar X-L; Krovar I DF; Oust Extra; Oust XP; Outrider®; Princep 4L; Princep Caliber 90; Princep Liquid; Sahara DG; Scythe; Stalker; Spike 20P Specialty; Spike 80DF Specialty; Telar XP; Transline Specialty; Velpar DF CU; Velpar DF VU; Velpar L; Velpar L CU; Velpar L VU; Vastlan Specialty

Control de matorrales, árboles y enredaderas

Este producto se puede usar para controlar árboles, enredaderas y matorrales leñosos a lo largo de servidumbres de paso de los ferrocarriles. Aplique de 4 a 10 cuartos de galón de este producto en hasta 80 galones de solución de rocío por acre como aplicación al voleo usando un rociador con brazo o sin brazo. Aplique una solución de 0.75 a 2 por ciento de este producto cuando use un equipo de aplicación de alto volumen con una técnica de rocío para mojar o una solución de 5 a 10 por ciento cuando use rocíos dirigidos de bajo volumen para tratamiento localizado.

MEZCLAS DE TANQUE: Este producto se puede aplicar en una mezcla de tanque con uno o más de los siguientes productos para mejorar el control de árboles, enredaderas y matorrales leñosos a lo largo de las servidumbres de paso de los ferrocarriles, siempre que el producto esté registrado para su uso en estos sitios. Consulte las etiquetas de cada producto para conocer los sitios aprobados y las proporciones de aplicación.

chlorsulfuron; clopyralid; dicamba; fosamine; hexazinone; imazapyr; metsulfuron methyl; picloram; triclopyr

Arsenal; Herbicida concentrado para aplicadores Arsenal; Chopper; Chopper Gen2; Escort XP; Forestry Garlon 4 Specialty; Forestry Garlon XRT Specialty; Garlon 3A Specialty; Garlon 4 Specialty; Garlon 4 Ultra Specialty; Habitat; Krenite S Brush Control Agent; Stalker; Telar XP; Tordon 101 Mixture Specialty; Tordon 22K Specialty; Tordon K Herbicide Specialty; Transline Specialty; Vanquish; Velpar DF CU; Velpar DF VU; Velpar L; Velpar L CU; Velpar L VU; Vastlan Specialty

Control de malezas en Bermudagrass latente y en crecimiento activo

Este producto se puede usar para controlar total o parcialmente muchas malezas anuales y perennes en bermudagrass latente y en crecimiento activo a lo largo de la servidumbre de paso de los ferrocarriles. Vea la sección "MALEZAS CONTROLADAS" de esta etiqueta para conocer las instrucciones de uso de este producto para el control de malezas en pastos.

10.7 Manejo de tierras de pastoreo

Este producto controla o inhibe muchas malezas anuales que crecen en tierras de pastoreo de pastos perennes de estaciones fría y cálida. Se podría producir una ligera decoloración del pasto deseable, pero este reverdecerá y volverá a crecer en tierra húmeda a medida que desaparezcan los efectos de este producto.

Para controlar la invasión de malezas de pastos anuales en tierras de pastoreo es esencial prevenir la producción de semillas de malezas. La aplicación anual de este producto para eliminar las malezas anuales invasivas antes de que produzcan semillas ayudará a eliminar las semillas de maleza viables del suelo. Se deberá demorar la utilización del área como pastura después de aplicar este producto para permitir que las plantas perennes deseables crezcan, florezcan y vuelvan a producir semillas.

Control de Bromus: Una aplicación al voleo de 8 a 16 onzas líquidas de este producto por acre controlará o inhibirá malezas como downy brome (*Bromus tectorum*), Japanese brome (*Bromus japonicus*), soft chess (*Bromus mollis*), cheatgrass (*Bromus secalinus*), rye (centeno) para cereal y jointed goatgrass en tierras de pastoreo. Para obtener mejores resultados, aplique cuando la mayoría de las plantas de bromus se encuentren en la etapa de floración temprana y antes de que las plantas, incluidas las inflorescencias, cambien de color. Permita el crecimiento secundario de malezas después de las lluvias de primavera para reducir aún más la reserva de semillas en el suelo y alentar la conversión del pasto perenne en lugares con malezas. Aplique este producto en otoño en las zonas donde la humedad en primavera es habitualmente limitada y la germinación de otoño permite el crecimiento de malezas y la reducción de semillas de malezas.

Control de Medusahead: Para controlar o inhibir las plantas de medusahead (Taeniatherum caput-medusa), aplique 16 onzas líquidas de este producto por acre en la etapa de 3 hojas. La demora de la aplicación después de esta etapa resultará en control inferior o inaceptable. El quemado controlado antes de la aplicación de este producto eliminará la capa seca superficial producida por tallos de gramíneas en descomposición lenta. Permita que las malezas broten nuevamente antes de rociar este producto después de haber quemado. Repite la aplicación anualmente para eliminar las semillas de medusahead en el suelo y permitir al pasto perenne deseable repoblar el área.

RESTRICCIONES: No aplique más de 3 cuartos de galón de este producto por acre por año en tierras de pastoreo. No utilice sulfato de amonio cuando aplique este producto a pastos de tierras de pastoreo. No se requiere período de espera entre la aplicación de este producto y la utilización como pastura para el ganado.

10.8 Manejo de lados de carreteras

Todos los usos de este producto descritos en esta etiqueta pueden utilizarse para el manejo de malezas a lo largo de carreteras, incluyendo el control de malezas en bermudagrass y bahiagrass latente y activo, control de malezas a lo largo de bordes y debajo y alrededor de barandas, postes y otros objetos a lo largo del camino, usando cualquier método de aplicación descrito en esta etiqueta.

MEZCLAS DE TANQUE: Este producto puede mezclarse en tanque con los siguientes productos para aplicaciones a bordes, barandas, tratamiento localizado y mantener el suelo limpio siempre y cuando estos productos estén aprobados para su uso en dichos sitios. Consulte las etiquetas de cada producto para conocer los usos aprobados y las proporciones de aplicación.

2,4-D; atrazine; bromacil; chlorsulfuron; clopyralid; dicamba; diuron; fosamine; hexazinone; imazapic; imazapyr; metsulfuron methyl; oryzalin; oxadiazon; pendimethalin; picloram; prodiamine; simazine; sulfometuron; sulfosulfuron; triclopyr

AAtrex 4L; AAtrex Nine-0; Banvel; Barricade 65WG; Chopper; Chopper Gen2; Crossbow; Direx 4L; Escort XP; Endurance; Formula 40; Gallery 75 Dry Flowable Specialty; Gallery SC; Garlon 4; Garlon XRT; Hyvar X; Karmex DF; Krenite S Brush Control Agent; Krovar I DF; Landmark; Landmark XP; Oust Extra; Oust XP; Outrider®; Pendulum 3.3 EC; Pendulum AquaCap; Pendimax 3.3; Plateau; Poast; Poast Plus; Princep 4L; Ronstar 50 WSP; Ronstar Flo; Ronstar G; Sahara DG; Surflan AS Specialty; Surflan Flex; Surflan Flex T&O; Surflan Pro; Surflan XL 2G; Telar XP; Tordon K; Vanquish; Vastlan Specialty; Velpar DF CU; Velpar DF VU; Velpar L CU; Velpar L; Velpar L VU; Weedar 64

10.9 Manejo de servicios públicos

Este producto se puede usar a lo largo de servidumbres de paso de energía eléctrica, tuberías y líneas telefónicas, así como todos los sitios relacionados con las servidumbres de paso de estos servicios públicos, incluyendo subestaciones, caminos de acceso, ferrocarriles y a lo largo de servidumbres de paso similares en conjunto con servicios públicos, para el tratamiento localizado de vegetación no deseada, recorte lateral, recorte de bordes alrededor de objetos, control de malezas antes de sembrar plantas ornamentales, flores o césped (en tepes o semillas) en un sitio de servicios públicos, manejo de césped, eliminar malezas no deseadas que crecen en lechos ornamentales o arbustos establecidos, preparar o establecer zonas de reserva de vida silvestre y eliminar la vegetación antes de comenzar proyectos de construcción. Se pueden repetir las aplicaciones de este producto cuando sea necesario para mantener el terreno limpio cuando las malezas siguen emergiendo hasta una proporción de aplicación máxima de 10.6 cuartos de galón por acre por año.

MEZCLAS DE TANQUE: Este producto se puede mezclar en tanque con los siguientes productos para su uso en áreas de servicios públicos, siempre y cuando los productos usados estén registrados para su uso en dichos sitios. Consulte las etiquetas de cada producto para conocer los sitios aprobados y las proporciones de aplicación. Para controlar las malezas herbáceas, use una proporción de aplicación o concentración de solución de rocío más baja dentro de los rangos dados para estos productos de mezcla de tanque y aumente la proporción o concentración hacia los extremos más altos de los rangos para controlar grupos densos o árboles, enredaderas y matorrales leñosos difíciles de controlar.

atrazina; bromacil; chlorsulfuron; clopyralid; dicamba; diuron; fosamine; hexazinone; imazapic; imazapyr; metsulfuron methyl; oryzalin; pendimethalin; prodiamine; simazine; sulfometuron methyl; sulfosulfuron; triclopyr

AAtrex 4L; AAtrex Nine-0; Herbicida concentrado para aplicadores Arsenal; Endurance; Escort XP; Forestry Garlon 4 Specialty; Forestry Garlon XLT Specialty; Garlon 3A Specialty; Garlon 4 Specialty; Garlon 4 Ultra Specialty; Hyvar XL; Krenite S Brush Control Agent; Krovar I DF; Oust Extra; Oust XP; Outrider®; Plateau; Sahara DG; Surflan AS Agricultural; Surflan AS Specialty; Surflan Flex; Surflan Flex T&O; Surflan XL 2G; Telar XP; Transline Specialty; Vanquish; Velpar DF CU; Velpar DF VU; Velpar L; Velpar L CU; Velpar L VU; Vastlan Specialty; Weedar 64; 2,4-D Asegúrese de que el producto Garlon esté bien mezclado con agua de acuerdo con las instrucciones en la etiqueta antes de agregar este producto a la mezcla de rocío. Continúe agitando al agregar este producto para evitar problemas de incompatibilidad de la mezcla de tanque.

Para obtener mejores resultados con el recorte lateral, aplique este producto en una mezcla de tanque con uno de los productos Garlon indicados antes.

11.0 MALEZAS CONTROLADAS

Lea toda la etiqueta antes de usar este producto.

Aplique siempre una proporción de aplicación o concentración de solución de rocío mayor de este producto dentro del rango indicado cuando las malezas son muy densas o cuando crecen en áreas no tocadas (no cultivadas).

El control de malezas puede ser deficiente si se aplica a malezas cubiertas de polvo. En el caso de malezas segadas, utilizadas como pastura o cortadas, déjelas crecer nuevamente antes de aplicar este producto.

Consulte las secciones que siguen para conocer las proporciones de aplicación y el momento de aplicación para el control de malezas anuales y perennes, árboles, enredaderas y matorrales leñosos.

11.1 Control de malezas, renovación y segado químico en céspedes

El uso de este producto descrito en esta sección puede aplicarse al césped que crece en cualquier terreno indicado en esta etiqueta. Asegúrese de que cualquier producto de mezcla de tanque aplicado con este producto esté registrado para el uso deseado y en el sitio de la aplicación.

Control de malezas en Bermudagrass y Bahiagrass latentes

Este producto puede usarse para controlar o inhibir muchas malezas anuales y tall fescue (Festuca arundinacea) para el alivio eficaz de céspedes de bermudagrass y bahiagrass latentes antes de reverdecer en primavera las áreas donde estos céspedes son cobertura de terreno deseable y se puede tolerar algún daño o decoloración temporales.

Aplique de 8 a 64 onzas líquidas de este producto en 10 a 40 galones de agua por acre cuando bermudagrass y bahiagrass estén latentes y antes de reverdecer en primavera.

Aplicar más de 16 onzas líquidas de este producto por acre en céspedes bermudagrass y bahiagrass con mucho mantenimiento, como campos de golf y jardines, podría ocasionar daños o que se retrase el reverdecer en primavera.

Para el control residual de malezas en bermudagrass y bahiagrass latentes, este producto se puede mezclar en tanque con los herbicidas Outrider®, Oust Extra o Oust XP. Aplique de 8 a 64 onzas líquidas de este producto en una mezcla de tanque con la proporción apropiada de herbicida Outrider, Oust Extra o Oust XP en 10 a 40 galones de agua por acre. Para evitar que el reverdecer se retrase y minimizar el daño, no aplique más de 1 onza de herbicida Oust Extra o Oust XP por acre sobre bermudagrass y no más de 0.5 onzas sobre bahiagrass, y evite el tratamiento cuando estos pastos se encuentren en estado semilatente.

NO aplique este producto en mezcla de tanque con los herbicidas Outrider, Oust Extra o Oust XP en céspedes bermudagrass y bahiagrass con mucho mantenimiento, como campos de golf y jardines.

Control de malezas en Bermudagrass en crecimiento activo

Este producto se puede usar para controlar total o parcialmente muchas malezas anuales y perennes en bermudagrass en crecimiento activo. La aplicación de este producto podría ocasionar algún daño al bermudagrass, pero este se recuperará en condiciones de humedad una vez desaparezcan los efectos del producto. Utilícelo solo en bermudagrass bien establecido, donde puede tolerarse algún daño o decoloración temporales.

Aplique de 16 a 48 onzas líquidas de este producto en 10 a 40 galones de solución de rocío por acre. Use una proporción de aplicación más baja dentro de este rango para controlar malezas anuales de menos de 4 pulgadas de alto (o longitud de estolón) y aumente la proporción hacia el extremo superior del rango cuando las malezas aumenten de tamaño o se aproximen a la formación de flores o inflorescencias. En estas proporciones de aplicación, este producto proporcionará control parcial de las siguientes malezas perennes en bermudagrass en crecimiento activo:

- Bahiagrass
- Bluestem, silver
- Fescue, tall
- Johnsongrass
- Trumpetcreeper
- Vaseygrass

PRECAUCIONES: Aplicar más de 16 onzas líquidas de este producto por acre en bermudagrass con mucho mantenimiento, como campos de golf y jardines, podría causar daño y decoloración inaceptables del césped.

Para un espectro más amplio de control de malezas en bermudagrass en crecimiento activo, este producto se puede mezclar en tanque con los herbicidas Outrider, Oust Extra o Oust XP. Aplique estas mezclas de tanque solo en bermudagrass bien establecido, donde puede tolerarse algún daño o decoloración temporales. No haga más de una aplicación de este producto en estas mezclas de tanque en la misma temporada, de lo contrario podría causar un daño considerable al bermudagrass.

Aplique de 8 a 32 onzas líquidas de este producto por acre en una mezcla de tanque con el herbicida Outrider para control total o parcial de johnsongrass y otras malezas indicadas en la etiqueta del herbicida Outrider. Aplique ambos productos en una proporción hacia el extremo superior de los rangos dado para controlar malezas anuales o perennes mayores de 6 pulgadas de alto.

Aplique de 18 a 32 onzas líquidas de este producto por acre en una mezcla de tanque con herbicida Oust Extra o Oust XP para un mejor control de las malezas indicadas en dichas etiquetas. Use una proporción de aplicación más baja de cada producto dentro de los rangos dados para controlar malezas anuales indicadas en las etiquetas de menos de 4 pulgadas de alto (o longitud de estolón) y aumente las proporciones hacia el extremo superior de los rangos cuando las malezas anuales aumenten de tamaño y se aproximen a la etapa de flores o inflorescencias. Esta mezcla de tanque proporcionará control parcial de las siguientes malezas perennes en bermudagrass en crecimiento activo:

- Bahiagrass
- Bluestem, silver
- Broomsedge
- Dallisgrass
- Dock, curly
- Dogfennel
- Fescue, tall
- Johnsongrass
- Poorjoe
- Trumpetcreeper
- Vaseygrass
- Vervain, blue

PRECAUCIONES: Aplique estas mezclas de tanque solo en bermudagrass bien establecido, donde puede tolerarse algún daño o decoloración temporales. NO aplique este producto en mezcla de tanque con los herbicidas Outrider o Oust en céspedes bermudagrass con mucho mantenimiento, como campos de golf y jardines.

Control de malezas en Bahiagrass en crecimiento activo

Para inhibir el crecimiento vegetativo y la inflorescencia de bahiagrass durante aproximadamente 45 días, aplique 6 onzas líquidas de este producto en 10 a 40 galones de agua por acre de 1 a 2 semanas después del reverdecer completo o después de cortar a una altura uniforme de 3 a 4 pulgadas antes de la emergencia de las inflorescencias.

Para inhibir el crecimiento de bahiagrass hasta por 120 días, aplique 4 onzas líquidas de este producto por acre, seguido por una aplicación de 2 a 4 onzas líquidas por acre unos 45 días más tarde. No haga más de 2 aplicaciones para inhibir el crecimiento al año.

Para un espectro más amplio de control de malezas en bahiagrass en crecimiento activo, este producto se puede mezclar en tanque con los herbicidas Outrider®, Oust Extra o Oust XP.

Aplique 6.25 onzas líquidas de este producto por acre en una mezcla de tanque con una proporción adecuada de herbicida Outrider para controlar malezas perennes o malezas anuales de más de 4 pulgadas de alto.

Aplique 6 onzas líquidas de este producto por acre en una mezcla de tanque con una proporción adecuada de herbicida Oust Extra o Oust XP de 1 a 2 semanas después de la primera siega de la primavera para un mejor control de las malezas indicadas en la etiqueta del herbicida Oust en bahiagrass en crecimiento activo. Haga esta aplicación una sola vez al año.

PRECAUCIONES: Aplique estas mezclas de tanque solo en bahiagrass bien establecido, donde puede tolerarse algún daño o decoloración temporales.

Renovación de céspedes

Este producto controla la mayoría de la vegetación existente antes de la renovación del césped o de establecer céspedes cultivados para semilla o tepes. Para lograr máximo control de la vegetación existente, demore la siembra o la colocación de césped hasta determinar si se produce algún crecimiento de partes de plantas subterráneas. Cuando se necesita repetir las aplicaciones, debe permitirse el crecimiento suficiente de las plantas antes de volver a aplicar este producto. La aplicación en verano o en otoño proporciona un mejor control de los pastos de estación cálida, como el bermudagrass. Para el césped controlado, aplique este producto después de dejar de cortar el césped regularmente por lo menos una vez de manera que crezca lo suficiente para que la solución de rocío sea interceptada por las plantas.

Este producto no tiene actividad residual en el suelo y no afectará las plantas, semillas o tepes sembrados en el área después de la aplicación.

Puede utilizarse un equipo de mano para el tratamiento localizado de vegetación no deseada que crezca en el césped existente. Se puede usar aplicación al voleo o tratamiento localizado con rociador de mano para controlar restos de tepes o de otra vegetación no deseada después de cosechar los tepes.

PRECAUCIONES: No remueva la tierra ni las partes de la planta que estén bajo tierra antes de aplicar este producto. La labranza y las técnicas de renovación como corte vertical, perforación o rebanado deben esperar por lo menos 7 días después de la aplicación a fin de permitir la absorción adecuada de este herbicida en las partes de la planta que estén bajo tierra.

RESTRICCIONES: Si el total de proporciones de aplicación es 3 cuartos de galón de este producto por acre o menos, no se requiere período de espera entre la aplicación y la utilización como forraje o pastura del ganado. Si la proporción es mayor de 3 cuartos de galón por acre, retire el ganado doméstico antes de aplicar y espere 8 semanas después de la aplicación para utilizar como pastura o para cosechar.

Segado químico

Este producto se puede usar para inhibir el crecimiento de pastos perennes y anuales indicados en esta sección para servir como sustituto de la siega.

Pastos perennes – aplique 6 onzas líquidas de este producto por acre para inhibir el crecimiento de Kentucky bluegrass u 8 onzas líquidas para inhibir tall fescue, fine fescue, orchardgrass, quackgrass o reed canarygrass en 10 a 40 galones de solución de rocío por acre después que los pastos hayan reverdecido hasta por lo menos 75 por ciento de verde en la primavera, o de 7 a 10 días después de segar, cuando haya suficiente recrecimiento para proporcionar una altura deseable para regular el crecimiento. Utilice el segado químico únicamente en las áreas donde se puede tolerar cierto daño o decoloración temporales en pastos perennes.

Pastos anuales – aplique de 4 a 5 onzas líquidas de este producto en 10 a 40 galones de solución de rocío por acre para inhibir el crecimiento de algunos pastos anuales, como annual ryegrass, wild barley y wild oats en crecimiento activo en pasto grueso en bordes de carreteras o en otras áreas industriales y antes de que las inflorescencias estén en la etapa de desarrollo de bota. Esta aplicación puede causar daños a los pastos anuales deseados.

PRECAUCIONES: Utilice este producto para el segado químico únicamente en las áreas donde se puede tolerar cierto daño o decoloración temporales en pastos perennes y anuales.

11.2 Malezas anuales

Resulta más fácil controlar las malezas anuales cuando son pequeñas y están en crecimiento activo. El desarrollo de nuevas hojas indica crecimiento activo.

Para control total o parcial de las malezas anuales indicadas en esta sección cuando tienen menos de 6 pulgadas de alto o longitud de estolón y están en crecimiento activo, aplique 1 cuarto de galón de este producto por acre. Si tienen más de 6 pulgadas de alto o longitud de estolón, o crecen lentamente bajo condiciones de estrés, aumente la proporción de aplicación de 1.5 a 4 cuartos de galón por acre, dependiendo de la altura de la maleza y la gravedad de las malas condiciones de crecimiento.

Para aplicación usando un rociador manual con una técnica de rocío para mojar, aplique una solución de este producto al 0.5 por ciento a malezas anuales de menos de 6 pulgadas de altura o de longitud de estolón antes de la formación de inflorescencias en pasto o de la formación de brotes en malezas de hoja ancha. Para controlar las malezas anuales que tienen más de 6 pulgadas de altura o incluso malezas más pequeñas que crecen en condiciones de estrés, use una solución del 1 al 2 por ciento. Aplique la concentración máxima de este producto dentro de este rango para malezas difíciles de controlar o para controlar malezas con una altura mayor a las 24 pulgadas.

Para controlar malezas anuales usando un aplicador de mano por goteo controlado (CDA), aplique una solución de 20 por ciento de este producto (de 25 a 26 onzas líquidas de este producto por galón de solución de rocío) a una velocidad de flujo de 2 onzas líquidas de solución de rocío por minuto y caminando a una velocidad de 1.5 millas por hora (1 cuarto de galón de solución de rocío por acre).

Si usa el aplicador por goteo controlado montado en un vehículo, aplique la cantidad adecuada de este producto en 2 a 15 galones de agua por acre.

Para obtener mejor control, no pode, corte, labre, queme ni altere la vegetación en el área de aplicación por un mínimo de 3 días después de la aplicación.

Este producto no tiene actividad residual en el suelo y no controla la emergencia de nuevas malezas anuales a partir de semillas. Aplicaciones subsiguientes de este producto serán necesarias para controlar las malezas que continúan emergiendo.

ESPECIES DE MALEZAS ANUALES

Anoda, spurred
Balsam apple[1]
Barley
Barley, little
Barnyardgrass
Bassia, fivehook
Bittercress
Bluegrass, annual
Bluegrass, bulbous
Brome, downy
Brome, Japanese
Broomsedge
Buttercup
Castor bean[2]
Cheatgrass
Cheeseweed (*Malva parviflora*)
Chervil
Chickweed
Cocklebur
Copperleaf, hophornbeam
Copperleaf, Virginia
Coreopsis, plains/tickseed
Corn
Crabgrass
Cupgrass, woolly
Dwarf dandelion
Eclipta
False dandelion
False flax, smallseed
Fiddleneck
Filaree
Fleabane, annual
Fleabane, hairy (*Conyza bonariensis*)
Fleabane, rough
Foxtail
Foxtail, Carolina
Geranium, Carolina
Goatgrass, jointed
Goosegrass
Groundsel, common
Henbit
Horseweed / Marestail (*Conyza canadensis*)
Itchgrass
Johnsongrass, seedling
Junglerice
Knotweed
Kochia
Lambsquarters
Lettuce, prickly
Mannagrass, eastern
Mayweed
Medusahead
Morning glory (*Ipomoea* spp)
Mustard, blue
Mustard, tansy
Mustard, tumble
Mustard, wild
Nightshade, black
Oats
Panicum, browntop
Panicum, fall
Panicum, Texas
Pennycress, field
Pepperweed, Virginia
Pigweed
Puncturevine
Purslane, common
Pusley, Florida
Ragweed, common
Ragweed, giant
Rice, red
Rocket, London
Rocket, yellow
Rye
Ryegrass
Sandbur, field
Sesbania, hemp
Shattercane
Shepherd's-purse
Sicklepod
Signalgrass, broadleaf
Smartweed, ladysthumb
Smartweed, Pennsylvania
Sorghum, grain (milo)
Sowthistle, annual
Spanish needles[3]
Speedwell, corn
Speedwell, purslane
Sprangletop
Spurge, annual
Spurge, prostrate
Spurge, spotted
Spurry, umbrella
Starthistle, yellow
Stinkgrass
Sunflower
Teaweed / Prickly sida
Thistle, Russian
Velvetleaf
Wheat
Wild oats
Witchgrass

[1] Para controlar balsam apple, aplique este producto usando equipo de mano solamente.

[2] Se puede lograr el control de castor bean también inyectando 5 mililitros de este producto concentrado (sin diluir) por planta en la parte inferior del tallo principal.

[3] Para controlar Spanish needles, aplique 62 onzas líquidas de este producto por acre

11.3 Malezas perennes

Se puede obtener un mejor control de las malezas perennes cuando se aplica este producto a las malezas objetivo que están pequeñas y en crecimiento activo. El desarrollo de nuevas hojas indica crecimiento activo. Si debe aplicar a malezas más grandes o a malezas que crecen lentamente bajo condiciones de estrés, aplique este producto en una proporción o concentración de solución de rocío hacia el extremo superior del rango especificado.

Si las malezas fueron segadas o labradas, no aplique este producto hasta que las plantas hayan reanudado el crecimiento activo y llegado a la etapa de crecimiento recomendada o hayan crecido lo suficiente para que la solución de rocío sea interceptada por las plantas. Para obtener mejor control, no pode, corte, labre, queme ni altere la vegetación en el área de aplicación por un mínimo de 7 días después de la aplicación.

Para controlar las malezas perennes indicadas en esta etiqueta usando equipo de mochila o de mano y una técnica de aplicación de bajo volumen, aplique una solución de 5 a 10 por ciento de este producto sobre la corona de la planta objetivo para cubrir el 50 por ciento del follaje superior de la planta.

Para controlar malezas perennes usando un aplicador de mano por goteo controlado (CDA), aplique una solución de 20 a 40 por ciento de este producto (de 25 a 51 onzas líquidas de este producto por galón de solución de rocío) a una velocidad de flujo de 2 onzas líquidas de solución de rocío por minuto y caminando a una velocidad de 0.75 millas por hora (de 2 a 4 cuartos de galón de solución de rocío por acre). Si usa el aplicador por goteo controlado montado en un vehículo, aplique la cantidad requerida de este producto como se indica en la siguiente tabla, en 2 a 15 galones de agua por acre.

Este producto debe aplicarse en otoño antes de una helada agresiva.

Este producto no tiene actividad en el suelo y no controla la emergencia de malezas perennes a partir de semillas, raíces, rizomas o tubérculos subterráneos latentes presentes en el suelo en el momento de la aplicación. Se necesitará más de una aplicación de este producto para el control continuo de malezas que emergen después de la aplicación.

TABLA DE PROPORCIONES PARA MALEZAS PERENNES

Especies de malezas perennes	Proporción por difusión (cuartos de galón/acre)	Manual Rocío para mojar Concentración (% solución)
Alfalfa*	1	2
Alligatorweed*	4	1.5
Aplique este producto cuando la mayoría de las plantas objetivo estén en floración. Puede ser necesaria más de una aplicación para el control total.		
Anise (fennel)	2 – 4	1 – 2
Bahiagrass	3 – 5	2

Especies de malezas perennes	Proporción por difusión (cuartos de galón/acre)	Manual Rocío para mojar Concentración (% solución)
Beachgrass, European (*Ammophila arenaria*)	–	5
Aplique una solución de este producto al 5 por ciento usando la técnica de rocío para mojar o una solución al 10 por ciento usando la técnica de aplicación de bajo volumen. Pueden obtenerse mejores resultados cuando se realiza la aplicación a malezas objetivo que estén en crecimiento activo en etapa de desarrollo de bota a floración. Aplique antes de que las hojas pierdan más del 50 por ciento del color verde en otoño. Observe el sitio de la aplicación y vuelva a aplicar este producto a las malezas objetivo que quedaron, si es necesario, antes de volver a sembrar el área con la vegetación deseada. Para el control selectivo de European beachgrass, aplique una solución de 33.3 por ciento de este producto durante el período de crecimiento activo usando un aplicador con enjugador. Obtendrá un mejor control al maximizar la cantidad de hojas individuales que tienen contacto con el aplicador con enjugador y/o dando una segunda pasada por el campo en sentido contrario. Evite el contacto de la solución herbicida con la vegetación deseable.		
Bentgrass*	1.5	2
Este producto solo proporcionará únicamente un control parcial de bentgrass (*Agrostis* spp.). Para obtener un mejor control, aplique de 2 a 4 cuartos de galón de este producto en una mezcla de tanque con una proporción adecuada de herbicida Envoy, Fusilade II, Fusion o Vantage en un volumen de rocío de 20 a 40 galones por acre usando un equipo de aplicación al voleo. Para obtener un mejor control usando un rociador de mano, aplique este producto en una concentración de 2.66 onzas líquidas por galón de solución de rocío en una mezcla de tanque con una proporción adecuada de herbicida Envoy, Fusilade, Fusion o Vantage. Puede ser necesaria más de una aplicación para lograr el control total.		
Bermudagrass	5	2
Aplique cuando tenga inflorescencias.		
Bermudagrass, water (knotgrass)	1.5	2
Bindweed, field	3 – 5	2
Para controlar, aplique de 4 a 5 cuartos de galón de este producto por acre como aplicación al voleo al oeste del río Mississippi y de 3 a 4 cuartos de galón por acre al este del río Mississippi cuando bindweed esté en plena floración o después. Para obtener mejores resultados, aplique a finales del verano o en otoño.		
Bittersweet, Oriental	3	2
Para controlar, aplique este producto como aplicación al voleo en una solución de rocío de 30 a 40 galones por acre. Para obtener mejores resultados, aplique a finales del verano o en otoño cuando las hojas todavía están verdes y después de la formación de frutas. Al aplicar con equipo de mano usando la técnica de rocío para mojar, asegúrese de conseguir una cobertura completa de la planta objetivo con la solución de rocío.		
Bluegrass, Kentucky	2	2
Aplique cuando la mayoría de las plantas objetivo hayan alcanzado la etapa de desarrollo de bota a floración. Cuando la aplicación se hace antes de la etapa de bota, el control puede verse reducido. En el otoño, aplique el tratamiento antes de que las plantas se oscurezcan.		
Blueweed, Texas	3 – 5	2
Aplique de 4 a 5 cuartos de galón de este producto por acre al oeste del río Mississippi y de 3 a 4 cuartos de galón por acre al este del río Mississippi cuando la mayoría de las plantas objetivo estén en plena floración o después. Para obtener mejores resultados, aplique a finales del verano o en otoño.		
Brackenfern	3 – 4	1 – 1.5
Aplique a las frondas completamente extendidas que tengan por lo menos 18 pulgadas de longitud.		
Bromegrass, smooth	2	2
Aplique este producto cuando la mayoría de las plantas objetivo hayan alcanzado la etapa de desarrollo de bota a floración. Cuando la aplicación se hace antes de la etapa de bota, el control puede verse reducido. En el otoño, aplique el tratamiento antes de que las plantas se oscurezcan.		
Bursage, woolly-leaf	–	2
Canarygrass, reed	2 – 3	2
Aplique este producto cuando la mayoría de las plantas objetivo hayan alcanzado la etapa de desarrollo de bota a floración. Cuando la aplicación se hace antes de la etapa de bota, el control puede verse reducido. En el otoño, aplique el tratamiento antes de que las plantas se oscurezcan.		
Cattail	3 – 5	2
Aplique este producto cuando las plantas objetivo estén en crecimiento activo y estén en la etapa de floración temprana o completa o después de esta. Se obtienen mejores resultados cuando las aplicaciones se realizan durante los meses de verano u otoño.		
Clover; red, white	3 – 5	2
Cogongrass	3 – 5	2
Aplique este producto a finales del verano o en otoño cuando las plantas de cogongrass tengan por lo menos 18 pulgadas de alto y estén en crecimiento activo. Debido a las etapas de crecimientos irregulares y la naturaleza densa de la vegetación de cogongrass, pueden ser necesarias varias aplicaciones para lograr el control.		
Dallisgrass	3 – 5	2
Dandelion	3 – 5	2
Dock, curly	3 – 5	2
Dogbane, hemp	4	2
Aplique este producto cuando la mayoría de las plantas objetivo hayan alcanzado la etapa de desarrollo de brotación tardía a floración. Para obtener mejores resultados, aplique a finales del verano o en otoño.		
Fescue (excepto tall)	3 – 5	2
Fescue, tall	1 – 3	2
Aplique este producto cuando la mayoría de las plantas objetivo hayan alcanzado la etapa de crecimiento de bota a floración. Si se aplica antes de la etapa de bota, puede obtenerse un menor control del deseado.		
Guinea grass	3	1
Aplique este producto cuando la mayoría de las plantas objetivo hayan alcanzado la etapa de crecimiento de 7 hojas.		
Hemlock, poison	2 – 4	1 – 2
También se puede lograr el control inyectando 6 mililitros de una solución al 5 por ciento de este producto usando un dispositivo de inyección manual en una caña de una hoja por planta, 12 pulgadas por encima de la corona de la raíz.[1]		
Hogweed, giant	–	–
Inyecte 6 mililitros de una solución al 5 por ciento de este producto en una caña de una hoja por planta, 12 pulgadas por encima de la corona de la raíz.[1]		
Horsenettle	3 – 5	2
Horseradish	4	2
Aplique este producto cuando la mayoría de las plantas objetivo hayan alcanzado la etapa de desarrollo de brotación tardía a floración. Para obtener mejores resultados, aplique a finales del verano o en otoño.		
Horsetail, field	–	–
Inyecte 0.6 mililitros de este producto por tallo directamente en el tallo de la planta, un segmento por encima de la corona de la raíz.[1]		
Iceplant	2	1.5 – 2
Ivy; cape, German	2 – 4	1 – 2
Jerusalem artichoke	3 – 5	2
Johnsongrass	2 – 3	1
Aplique este producto cuando la mayoría de las plantas objetivo hayan alcanzado la etapa de desarrollo de bota a floración o antes de que las plantas se hayan oscurecido en el otoño. Cuando se aplica antes de la etapa de bota, el control puede verse reducido.		
Kikuyu grass	2 – 3	2
Knapweed	4	2
Aplique este producto cuando la mayoría de las plantas objetivo hayan alcanzado la etapa de desarrollo de brotación tardía a floración. Para obtener mejores resultados, aplique a finales del verano o en otoño.		
Knotweed; Bohemian, giant, Japanese	4	2
Aplique 4 cuartos de galón de este producto por acre como aplicación al voleo en 3 a 40 galones de solución de rocío. Para aplicar usando un rociador de mochila y la técnica de rocío para mojar, aplique una solución al 2 por ciento de este producto. Para obtener mejor control, no altere la vegetación en el área de aplicación por un mínimo de 7 días después de la aplicación. También se puede obtener control al hacer un corte limpio de los tallos justo por debajo del segundo o tercer nodo sobre la superficie y aplicar 0.5 onzas líquidas (15 mililitros) de una solución al 50 por ciento de este producto en agua en el "pozo" o internodo que quede. Asegúrese de que los restos de la parte superior de la planta que se eliminó se recojan y desechen correctamente para evitar que se propaguen nuevas plantas de los retoños. El uso de biobarreras, tales como paneles de cartón, madera contrachapada o plástico, ayudará a evitar la propagación de materia vegetal. La proporción de aplicación total combinada de este producto no puede exceder 10.6 cuartos de galón por acre.[1] También se puede lograr el control inyectando 6 mililitros de este producto por tallo en el segundo o tercer internodo usando un dispositivo de inyección manual.[1]		
Lantana	–	1 – 1.25
Aplique cuando la mayoría de las plantas se encuentren en la etapa de floración o después de ella. Utilice la concentración más alta de solución de rocío para plantas que han alcanzado la etapa de crecimiento leñoso.		
Lespedeza	3 – 5	2
Loosestrife, purple	3	1.5 – 2
Aplique cuando la mayoría de las plantas se encuentren en la etapa de floración o después de ella. Se pueden obtener mejores resultados cuando la aplicación se realiza durante los meses de verano o de otoño. La aplicación en otoño debe hacerse antes de una helada agresiva.		
Lotus, American	3	1
Aplique cuando la mayoría de las plantas se encuentren en la etapa de floración o después de ella. Se pueden obtener mejores resultados cuando la aplicación se realiza durante los meses de verano o de otoño. La aplicación en otoño debe hacerse antes de una helada agresiva. Puede ser necesaria más de una aplicación de este producto para controlar el recrecimiento de semillas y partes de plantas subterráneas.		
Milkweed, común	3	2
Aplique este producto cuando la mayoría de las plantas objetivo hayan alcanzado la etapa de desarrollo de brotación tardía a floración.		
Muhly, wirestem	2	2
Aplique cuando la mayoría de las plantas objetivo tengan por lo menos 8 pulgadas de alto (etapa de desarrollo de 3 a 4 hojas) y estén en crecimiento activo.		
Mullein, común	3 – 5	2
Napiergrass	3 – 5	2
Nightshade, silverleaf	3.5 – 5	2
Aplique de 4.5 a 5 cuartos de galón de este producto por acre como aplicación al voleo al oeste del río Mississippi y de 3.5 a 4.5 cuartos de galón por acre al este del río Mississippi cuando la mayoría de las plantas objetivo estén en plena floración o después. Se pueden obtener mejores resultados cuando la aplicación se realiza a finales del verano o en otoño, después de la formación de frutos.		
Nutsedge; púrpura, amarillo	3	1 – 2
Aplique este producto para controlar las plantas existentes de nutsedge y las nueces inmaduras adjuntas cuando las plantas objetivo están en flor o cuando se pueden encontrar nueces nuevas en las puntas de los rizomas. No se podrán controlar las nueces que todavía no han germinado y será necesario repetir las aplicaciones de este producto para lograr el control a largo plazo.		
Orchardgrass	2	2
Aplique cuando la mayoría de las plantas objetivo hayan alcanzado la etapa de desarrollo de bota a floración. Cuando se aplica antes de la etapa de bota, puede obtenerse un menor control del deseado. En el otoño, aplique el tratamiento antes de que las plantas se oscurezcan.		

Especies de malezas perennes	Proporción por difusión (cuartos de galón/acre)	Manual Rocío para mojar Concentración (% solución)
Pampas grass	3 – 5	1.5 – 2
Para grass	3 – 5	2
Se necesitará más de una aplicación de este producto para lograr el control total. Permita que las plantas crezcan hasta la etapa de 7 a 10 hojas antes de realizar la siguiente aplicación.		
Pepperweed, perenne	4	2
Phragmites*	3 – 5	1 – 2
Para el control parcial de phragmites en Florida y en los condados de otros estados que bordean el Golfo de México, aplique 5 cuartos de galón de este producto por acre como aplicación al voleo o una solución al 2 por ciento usando un rociador de mano. En otras áreas de los EE. UU., aplique de 3 a 5 cuartos de galón por acre como aplicación al voleo o, para control parcial, aplique una solución al 1 por ciento usando un rociador de mano. Para obtener mejores resultados, aplique a finales del verano o en otoño cuando las plantas están en crecimiento activo y en plena floración. Debido a la naturaleza densa de la vegetación (que puede impedir la correcta cobertura del rocío) y a las etapas de crecimiento irregulares, puede ser necesaria más de una aplicación de este producto para lograr el control. Los síntomas visuales de control se desarrollarán con lentitud.		
Quackgrass	2 – 3	2
Aplique este producto cuando la mayoría de las plantas objetivo tengan por lo menos 8 pulgadas de alto (etapa de desarrollo de 3 a 4 hojas) y estén en crecimiento activo.		
Redvine*	2	2
Reed; común, gigante	4 – 5	2
Para obtener mejores resultados, aplique a finales del verano o en otoño. También se puede lograr el control inyectando 8 mililitros de este producto concentrado (sin diluir) directamente en el segundo o tercer internodo usando un dispositivo de inyección manual.[1]		
Ryegrass, perenne	2 – 3	1
Aplique este producto cuando la mayoría de las plantas objetivo hayan alcanzado la etapa de crecimiento de bota a floración. Cuando se aplica antes de la etapa de bota, el control puede verse reducido. En el otoño, aplique el tratamiento antes de que el ryegrass se oscurezca.		
Smartweed, swamp	3 – 5	2
Spatterdock	4	1
Aplique cuando la mayoría de las plantas objetivo estén en plena floración. Para obtener mejores resultados, aplique en verano o en otoño.		
Sowthistle, perenne	2 – 3	2
Spurge, leafy*	–	2
Starthistle, amarillo	2 – 3	2
Sweet potato, wild*	–	2
Aplique cuando la mayoría de las plantas objetivo se encuentren en la etapa de floración o después de ella. Puede ser necesaria más de una aplicación para el control total.		
Thistle, artichoke	2 – 3	1 – 2
Aplique cuando la mayoría de las plantas objetivo se encuentren en la etapa de brotación o después de ella.		
Thistle, Canada	2 – 3	2
Aplique cuando la mayoría de las plantas objetivo se encuentren en la etapa de brotación o después de ella. También puede obtener control con inyecciones al tallo. Corte de 8 a 9 plantas de las más altas en un macizo en la etapa de brotación. Introduzca una aguja inyectora en el centro del tallo y luego retírela lentamente a medida que inyecta 0.6 mililitros de este producto concentrado en el tallo.[1]		
Timothy	2 – 3	2
Aplique cuando la mayoría de las plantas objetivo hayan alcanzado la etapa de desarrollo de bota a floración. Si la aplicación se hace antes de la etapa de bota, el control puede verse reducido. En el otoño, aplique el tratamiento antes de que las plantas se oscurezcan .		
Torpedograss*	4 – 5	2
Trumpetcreeper*	2 – 3	2
Tules, común	–	2
Aplique a las plantas objetivo cuando se encuentren en la etapa de brotación o después de ella. Los síntomas visuales aparecerán lentamente y puede que no aparezcan hasta 3 semanas o más después de la aplicación.		
Vaseygrass	3 – 5	2
Velvetgrass	3 – 5	2
Wheatgrass, western	2 – 3	2
Aplique cuando la mayoría de las plantas objetivo hayan alcanzado la etapa de desarrollo de bota a floración. Las aplicaciones realizadas antes de la etapa de bota podrían tener menor control. En el otoño, aplique el tratamiento antes de que las plantas se oscurezcan.		

* Control parcial solamente

[1] Al usar inyecciones de tallo, el uso total combinado de este producto no debe exceder 10.6 cuartos de galón por acre por año. A 6 mililitros de producto concentrado (sin diluir) por tallo, 10.6 cuartos de galón tratarán aproximadamente 1670 tallos por acre por año. La cantidad de tallos que pueden tratarse por acre variará dependiendo del volumen de inyección y de la concentración de este producto en la solución de aplicación.

11.4 Árboles, enredaderas y matorrales leñosos

Aplique este producto a árboles y matorrales que estén en crecimiento activo después de la expansión completa de las hojas. Use una proporción de aplicación o concentración de solución de rocío mayor dentro del rango especificado para controlar árboles y matorrales más grandes y/o para aplicaciones en áreas de crecimiento vegetativo denso o para controlar enredaderas que han alcanzado la etapa de desarrollo leñoso.

Se puede obtener un mejor control de árboles y matorrales leñosos cuando se realiza la aplicación a finales del verano o en otoño después de la formación de frutas. Sin embargo, en las zonas áridas, se puede obtener un mejor control cuando la aplicación se realiza en la primavera o a comienzos del verano, cuando los árboles y matorrales tienen mayor contenido de humedad y están florecidos. Se puede anticipar un control deficiente cuando este producto se aplica a árboles y matorrales sometidos a estrés por sequía.

Se aceptan algunos colores otoñales en especies de hoja caduca no deseables al aplicar este producto a árboles y matorrales en el otoño, siempre y cuando no se haya producido una importante caída de las hojas. El rendimiento de este producto podría verse reducido si se aplica después de una helada. Después de aplicar en otoño, es posible que los síntomas no aparezcan antes de las heladas o del envejecimiento.

Para obtener mejores resultados, espere 7 días o más después de la aplicación para podar, cortar, labrar, quemar o eliminar los árboles, enredaderas y matorrales leñosos del sitio de la aplicación. Pueden ser necesarias aplicaciones adicionales de este producto para controlar árboles y matorrales que se regeneren a partir de semillas o partes subterráneas.

MEZCLAS DE TANQUE: Este producto puede aplicarse en cualquier proporción indicada en esta etiqueta en una mezcla de tanque con los siguientes productos para aumentar el espectro de control de malezas herbáceas, árboles, enredaderas y matorrales leñosos. Para el control de las malezas herbáceas, aplique el producto de la mezcla de tanque en la proporción de aplicación o concentración de solución de rocío más baja dentro del rango especificado. Para el control de poblaciones densas o de árboles, enredaderas y matorrales leñosos difíciles de controlar, aumente la proporción de aplicación o la concentración de solución de rocío del producto en la mezcla de tanque hacia el extremo más alto del rango. Consulte las etiquetas de cada producto para conocer los usos aprobados y las proporciones de aplicación.

imazapyr; metsulfuron methyl; triclopyr

Arsenal; Arsenal Herbicide Applicators Concentrate; Escort XP; Forestry Garlon 4 Specialty; Forestry Garlon XRT Specialty; Garlon 3A Specialty; Garlon 4 Specialty; Garlon 4 Ultra Specialty; Vastlan Specialty

Asegúrese de que la cantidad correcta del herbicida Garlon esté bien mezclada con agua en el tanque de rociado antes de agregar este producto.

Aplicación a tocones cortados

Este producto se puede usar para controlar rebrotes y retoños de matorrales leñosos y árboles en cualquier sitio indicado en esta etiqueta.

Corte el árbol o matorral leñoso cerca de la superficie de la tierra y aplique inmediatamente una solución de este producto al 50 o 100 por ciento (sin diluir) a la superficie recién cortada utilizando un aplicador capaz de aplicar este producto a todo el cámbium. La demora en la aplicación puede resultar en un rendimiento inferior. Para obtener mejores resultados, corte el árbol o matorral leñoso durante el período de crecimiento activo y expansión completa de las hojas y aplique este producto.

Para controlar Tree of heaven (Ailanthus altissima), corte el árbol cerca de la superficie de la tierra y aplique de inmediato una solución al 50 por ciento de este producto (16 onzas líquidas por cuarto de galón de solución) y un 10 por ciento de herbicida Arsenal (de 3 a 4 onzas líquidas por cuarto de galón de solución) en agua a la superficie recién cortada.

NO REALICE UNA APLICACIÓN EN TOCONES CORTADOS CUANDO LAS RAÍCES DE MATORRALES LEÑOSOS O ÁRBOLES DESEABLES PUEDEN ESTAR INJERTADAS EN LAS RAÍCES DEL TOCÓN CORTADO, PORQUE SE PUEDE CAUSAR DAÑO A LOS ÁRBOLES ADYACENTES. Algunos retoños, tallos o árboles pueden compartir el mismo sistema de raíces. Los árboles adyacentes de edad, altura y espaciado similares pueden tener raíces compartidas. Ya sea injertados o compartidos, es probable que se dañen tallos/árboles no tratados cuando se tratan uno o más árboles que comparten un sistema común de raíces.

Aplicación de inyección y anillado de matorrales leñosos y árboles

Este producto se puede usar para controlar matorrales leñosos y árboles indicados en esta etiqueta por aplicación de inyección o anillado (frill) en cualquier sitio indicado en esta etiqueta.

Inyecte o aplique el equivalente 1 mililitro (0.04 onzas líquidas) de este producto por cada 2 ó 3 pulgadas de diámetro del tronco a la altura del pecho (DBH en inglés). Si inyecta este producto en un matorral leñoso o árbol, use equipo capaz de penetrar el tejido vivo de la planta debajo de la corteza.

Para aplicación con anillado, aplique una solución de 50 a 100 por ciento (sin diluir) de este producto en agua a una incisión anular continua alrededor del árbol o en cortes espaciados uniformemente alrededor del árbol por debajo del nivel de las ramas. A medida que el diámetro del árbol aumenta, pueden obtenerse mejores resultados al aplicar este producto a una incisión anular continua o en cortes menos espaciados. Evite las técnicas de aplicación que permiten que se escurra este producto de las áreas cortadas o con incisiones. En las especies que segregan savia copiosamente, haga los cortes o incisiones en un ángulo oblicuo para producir un efecto de copa y aplicar este producto concentrado sin diluir. Para obtener mejores resultados, realice esta aplicación durante el período de crecimiento activo y después de la expansión completa de las hojas.

Aplicación modificada de alto volumen y bajo volumen con mochila

Para el control total y parcial de árboles, enredaderas y matorrales leñosos indicados en esta etiqueta al usar un rociador de mochila u otro equipo manual y una técnica de aplicación foliar dirigida de bajo volumen, aplique una solución de 5 a 10 por ciento de este producto de forma uniforme sobre la corona de la planta para cubrir el 50 por ciento del follaje superior de la vegetación no deseada.

TABLA DE PROPORCIONES PARA ÁRBOLES, ENREDADERAS Y MATORRALES LEÑOSOS

Especie	Proporción por difusión (cuartos de galón/acre)	Manual Rocío para mojar Concentración (% solución)
Alder	3 – 4	1 – 1.5
Ash*	2 – 5	1 – 2
Aspen, quaking	2 – 3	1 – 1.5
Bearclover (Bearmat)*	2 – 5	1 – 2
Beech*	2 – 5	1 – 2
Birch	2	1
Blackberry	3 – 4	1 – 1.5
Blackgum	2 – 5	1 – 2
Bracken	2 – 5	1 – 2
Broom; French, Scotch	2 – 5	1.5 – 2
Buckwheat, California*	2 – 4	1 – 2

Especie	Proporción por difusión (cuartos de galón/acre)	Manual Rocío para mojar Concentración (% solución)
Cascara*	2 – 5	1 – 2
Castor bean	2 – 5	2
Además, para controlar, inyecte 5 mililitros de este producto concentrado (sin diluir) por planta directamente en la parte inferior del tallo principal con un dispositivo de inyección manual.[1]		
Catsclaw*	–	1 – 1.5
Para control parcial, aplique este producto cuando por lo menos el 50 por ciento de las hojas nuevas estén completamente desarrolladas.		
Ceanothus*	2 – 5	1 – 2
Chamise*	2 – 5	1
Cerezo; amargo, negro, pin	2 – 3	1 – 1.5
Coyote brush	3 – 4	1.5 – 2
Para controlar, aplique este producto cuando por lo menos el 50 por ciento de las hojas nuevas estén completamente desarrolladas.		
Deerweed	2 – 5	1
Dogwood*	2 – 5	1 – 2
Elderberry	2	1
Elm*	2 – 5	1 – 2
Eucalipto, blue gum	–	2
Para controlar nuevos brotes de eucaliptos, aplique este producto usando un rociador manual cuando los nuevos brotes tengan entre 6 a 12 pies de altura. Asegúrese de conseguir una cobertura completa.		
Gallberry	2 – 5	1 – 2
Gorse*	2 – 5	1 – 2
Hackberry, western	2 – 5	1 – 2
Hasardia*	2 – 4	1 – 2
Hawthorn	2 – 3	1 – 1.5
Hazel	2	1
Hickory*	2 – 5	1 – 2
Honeysuckle	3 – 4	1 – 1.5
Hornbeam, American*	2 – 5	1 – 2
Ivy, poison	3 – 4	2
Kudzu	4	2
Locust, black*	2 – 4	1 – 2
Madrone (rebrotes)*	–	2
Manzanita*	2 – 5	1 – 2
Maple, red	2 – 4	1 – 1.5
Para controlar, aplique una solución de 1 a 1.5 por ciento de este producto usando un rociador manual cuando las hojas estén completamente desarrolladas. Para control parcial, aplique de 2 a 4 cuartos de galón por acre en aplicación al voleo.		
Maple, sugar	–	1 – 1.5
Para controlar, aplique este producto con un rociador manual cuando por lo menos el 50 por ciento de las hojas nuevas estén completamente desarrolladas.		
Maple, vine*	2 – 5	1 – 2
Monkey flower*	2 – 4	1 – 2
Oak; black, white*	2 – 4	1 – 2
Oak; northern, pin	2 – 4	1 – 1.5
Para controlar, aplique este producto cuando por lo menos el 50 por ciento de las hojas nuevas estén completamente desarrolladas.		
Oak, poison	4 – 5	2
Puede que tenga que repetir las aplicaciones para lograr el control. La aplicación en otoño debe hacerse antes de que las hojas pierdan su color verde.		
Oak, post	3 – 4	1 – 1.5
Oak, red	–	1 – 1.5
Para controlar, aplique este producto con un rociador manual cuando por lo menos el 50 por ciento de las hojas nuevas estén completamente desarrolladas.		
Oak, scrub*	2 – 4	1 – 1.5
Oak, southern red	2 – 3	1 – 1.5
Orange, Osage	2 – 5	1 – 2
Peppertree, Brazilian (Florida holly)*	2 – 5	1 – 2
Persimmon*	2 – 5	1 – 2
Pine	2 – 5	1 – 2
Poplar, amarillo*	2 – 5	1 – 2
Redbud, eastern	2 – 5	1 – 2
Rose, multiflora	2	1
Realice las aplicaciones antes de que los insectos que se alimentan de hojas deterioren las hojas.		
Russian olive*	2 – 5	1 – 2
Sage, black	2 – 4	1
Sage, white*	2 – 4	1 – 2
Sagebrush, California	2 – 4	1
Salmonberry	2	1
Saltcedar*	2 – 5	1 – 2
Para el control parcial, aplique una solución de 1 a 2 por ciento de este producto usando un rociador manual o de 2 a 5 cuartos de galón por acre en aplicación al voleo. Para controlar, aplique una solución de 1 a 2 por ciento de este producto en una mezcla de tanque con herbicida Arsenal o Herbicida concentrado para aplicadores Arsenal usando un rociador manual. Para controlar con aplicación al voleo, aplique 2.25 cuartos de galón de este producto por acre en una mezcla de tanque con una proporción apropiada de herbicida Arsenal o Herbicida concentrado para aplicadores Arsenal para plantas de hasta 6 pies de alto. Para controlar plantas de saltcedar mayores de 6 pies de alto con aplicación al voleo, aplique 4.5 cuartos de galón de este producto por acre en una mezcla de tanque con una proporción más alta de herbicida Arsenal o Herbicida concentrado para aplicadores Arsenal.		
Sassafras*	2 – 5	1 – 2
Sourwood*	2 – 5	1 – 2
Sumac; laurel, poison, smooth, sugarbush, winged*	2 – 4	1 – 2
Sweetgum	2 – 3	1 – 1.5
Swordfern*	2 – 5	1 – 2
Tallowtree, Chinese	–	1
Tan oak (rebrotes)*	–	2
Thimbleberry	2	1
Tobacco, tree*	2 – 4	1 – 2
Toyon*	–	2
Trumpetcreeper	2 – 3	1 – 1.5
Virginia creeper	2 – 5	1 – 2
Waxmyrtle, southern*	2 – 5	1 – 2
Willow	3	1
Yerba Santa, California*	–	2

*Control parcial

12.0 LIMITES EN LA GARANTÍA Y EN LA RESPONSABILIDAD

Bayer CropScience LP (la "Compañía") garantiza que este producto concuerda con la descripción química de la etiqueta. HASTA EL GRADO QUE SEA COMPATIBLE CON LA LEGISLACIÓN PERTINENTE, NO SE HACE NINGUNA OTRA GARANTÍA EXPRESA O IMPLÍCITA ACERCA DE LA IDONEIDAD PARA UN USO PARTICULAR O COMERCIABILIDAD. Esta garantía está sujeta también a las condiciones y limitaciones que aquí se indican.

El comprador y todos los usuarios utilizarán este producto únicamente con los propósitos y de acuerdo con la etiqueta de las Instrucciones completas para el uso ("Instrucciones") y notificarán de inmediato a la Compañía si tienen alguna reclamación que se base en un contrato, negligencia, estricta responsabilidad u otros derechos extracontractuales.

Hasta el grado que sea compatible con la legislación pertinente, el comprador y todos los usuarios son responsables por todas las pérdidas, lesiones o daños que resultasen por el uso o manipulación en condiciones que estén más allá del control de esta Compañía, incluyendo sin limitarse a: incompatibilidad con productos que no sean los señalados en las Instrucciones, aplicación o contacto con vegetación que no se quiera destruir, daño a cultivos o la incapacidad del producto para controlar los biotipos de malezas que desarrollan resistencia al glifosato, condiciones climáticas inusuales, condiciones climáticas fuera de los límites que se consideran normales en el lugar de la aplicación y para el período de tiempo en el cual se aplica el producto, así como condiciones climáticas que estén fuera de los límites indicados en las Instrucciones, uso y/o aplicación que no estén explícitamente aconsejadas en las Instrucciones o no sean compatibles con estas, condiciones de humedad que estén fuera de los límites establecidos en las Instrucciones, o la presencia de productos en la tierra o sobre ella, en los cultivos o en la vegetación que se está tratando, diferentes a los indicados en las Instrucciones.

Esta Compañía no garantiza ninguno de los productos reformulados o reempacados de este producto, excepto de acuerdo a los requisitos de la administración de esta Compañía y con el permiso escrito expreso de esta Compañía.

HASTA EL GRADO QUE SEA COMPATIBLE CON LA LEGISLACIÓN PERTINENTE, LA ÚNICA Y EXCLUSIVA COMPENSACIÓN AL USUARIO O COMPRADOR Y EL LÍMITE DE RESPONSABILIDAD DE ESTA COMPAÑÍA O DE CUALQUIER OTRO VENDEDOR POR CUALQUIER PÉRDIDA O POR TODAS LAS PÉRDIDAS, PERJUICIOS O DAÑOS QUE RESULTASEN DEL USO O MANEJO DE ESTE PRODUCTO (INCLUYENDO RECLAMOS QUE SE BASEN EN UN CONTRATO, NEGLIGENCIA, ESTRICTA RESPONSABILIDAD U OTROS DERECHOS EXTRACONTRACTUALES), SERÁ EL PRECIO PAGADO POR EL USUARIO O EL COMPRADOR POR LA CANTIDAD INVOLUCRADA DE ESTE PRODUCTO O, A ELECCIÓN DE ESTA COMPAÑÍA O DE OTRO VENDEDOR, EL REEMPLAZO DE DICHA CANTIDAD, O SI NO SE OBTUVO MEDIANTE COMPRA SE REEMPLAZARÁ DICHA CANTIDAD DEL PRODUCTO. HASTA EL GRADO QUE SEA COMPATIBLE CON LA LEGISLACIÓN PERTINENTE, EN NINGÚN CASO ESTA COMPAÑÍA U OTRO VENDEDOR SERÁN RESPONSABLES POR DAÑOS INCIDENTALES, CONSECUENTES O ESPECIALES.

En el momento de abrir y usar el producto, se asume que el comprador y todos los usuarios han aceptado las condiciones de los LIMITES EN LA GARANTÍA Y EN LA RESPONSABILIDAD que no pueden variar por medio de ningún acuerdo verbal o escrito. Si las condiciones son inaceptables, devuelva el producto inmediatamente sin abrir el envase.

Roundup, Roundup PRO y Design, son marcas comerciales registradas del Bayer Group.

Todas las otras marcas registradas son propiedad de sus respectivos dueños.

En caso de emergencia relacionada con este producto o si necesita ayuda médica, llame por cobrar, de día o de noche, al 1-800-334-7577.

Envasado para:
BAYER CROPSCIENCE LP
800 N. LINDBERGH BLVD.
ST. LOUIS, MISSOURI, 63167 U.S.A.

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2D CODE

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GROUP	9	HERBICIDE

Roundup PRO® Herbicide

A complete broad-spectrum postemergence herbicide for industrial, turf, ornamental, forestry, roadside, utility rights-of-way, and other listed terrestrial weed control.

(For a complete list of terrestrial use sites, see the Directions for Use section of this label.)

Not all products listed on this label are registered for use in California. Check the registration status of each product in California before using.

ACTIVE INGREDIENT:	
*Glyphosate, N-(phosphonomethyl) glycine, in the form of its isopropylamine salt . .	**41.0%**
OTHER INGREDIENTS (including surfactant):	**59.0%**
	100.0%

*Contains 480 grams of the active ingredient glyphosate, in the form of its isopropylamine salt, per liter or 4 pounds per U.S. gallon, which is equivalent to 356 grams of the acid, glyphosate, per liter or 3 pounds per U.S. gallon (30.4% by weight).

Please refer to booklet for additional precautionary statements and directions for use.

PRECAUTIONARY STATEMENTS: Hazards to Humans and Domestic Animals

Keep out of reach of children

CAUTION

Causes eye irritation. Avoid contact with eyes or clothing.

FIRST AID	
IF IN EYES	• Hold eye open and rinse slowly and gently with water for 15 to 20 minutes. • Remove contact lenses, if present, after the first 5 minutes then continue rinsing eye. • Call a poison control center or doctor for treatment advice.

- Have the product container or labeling with you when calling a poison control center or doctor, or going for treatment.
- You can also call **1-800-334-7577**, collect, day or night, for emergency medical treatment information.
- This product is identified as **Roundup PRO Herbicide, EPA Registration No. 524-475.**

DIRECTIONS FOR USE

It is a violation of Federal law to use this product in any manner inconsistent with its labeling.

STORAGE AND DISPOSAL

Proper pesticide storage and disposal are essential to protect against exposure to people and the environment due to leaks and spills, excess product or waste, and vandalism. Do not allow this product to contaminate water, foodstuffs, feed or seed by storage or disposal.

PESTICIDE STORAGE: Store pesticides away from food, pet food, feed, seed, fertilizers, and veterinary supplies. Keep container closed to prevent spills and contamination. See individual container label for additional storage conditions, if any.

PESTICIDE DISPOSAL: To avoid wastes, use all material in the container, including rinsate, by application according to label directions. If wastes cannot be avoided, offer remaining product to a waste disposal facility or pesticide disposal program. Such programs are often run by state or local governments or by industry. All disposal must be in accordance with applicable federal, state and local regulations and procedures.

CONTAINER HANDLING AND DISPOSAL: Nonrefillable container. Do not reuse the container to hold materials other than pesticides or dilute pesticides (rinsate). After emptying and cleaning, it may be allowable to temporarily hold rinsate or other pesticide-related materials in the container. Contact your state regulatory agency to determine allowable practices in your state. Triple rinse or pressure rinse (or equivalent) the container promptly after emptying. Triple rinse as follows: Empty the remaining contents into application equipment or mix-tank and continue to drain for 10 seconds after the flow begins to drip. Fill the container 1/4 full with water and recap. Shake for 10 seconds. Pour rinsate into application equipment or mix-tank, or store rinsate for later use or disposal. Continue to drain for 10 seconds after the flow begins to drip. Repeat this procedure two more times. Pressure rinse as follows: Empty the remaining contents into application equipment or mix-tank and continue to drain for 10 seconds after the flow begins to drip. Place container so that it can drain directly into application equipment or mix-tank while rinsing, or collect rinsate for later use or disposal. Insert pressure rinsing nozzle into the side of the container and rinse at about 40 PSI for at least 30 seconds. Continue to drain for 10 seconds after the flow begins to drip. Once properly rinsed, some plastic pesticide containers can be taken to a container collection site or picked up for recycling. If recycling is not available, dispose of in accordance with federal, state and local regulations and procedures, which may include puncturing the properly rinsed container and disposing in a sanitary landfill.

FOR PRODUCT INFORMATION OR ASSISTANCE USING THIS PRODUCT,
CALL TOLL-FREE, 1-866-99BAYER (1-866-992-2937).

IN CASE OF AN EMERGENCY INVOLVING THIS PRODUCT,
OR FOR MEDICAL ASSISTANCE, CALL COLLECT, DAY OR NIGHT, 1-800-334-7577.

EPA Reg. No. 524-475

EPA Est. 524-IA-1

Packed For:
BAYER CROPSCIENCE LP
800 N. LINDBERGH BLVD.
ST. LOUIS, MISSOURI 63167 USA

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BAYER

PLACE BAR CODE HERE
UPC Barcode# 07018388917

NET 2.5 GAL

SECTION 1: IDENTIFICATION OF THE SUBSTANCE/MIXTURE AND OF THE COMPANY/UNDERTAKING

Product identifier

Trade name	ROUNDUP PRO® HERBICIDE
Product code (UVP)	86771497
SDS Number	102000037602
EPA Registration No.	524-475

Relevant identified uses of the substance or mixture and uses advised against

Identified uses	Herbicide
Restrictions on use	See product label for restrictions.

Information on supplier

Supplier	Bayer Environmental Science A division of Bayer CropScience LP 500 Centregreen Way, Suite 400 Cary, NC 27513 USA
Responsible Department	Email: SDSINFO.BCS-NA@bayer.com

Emergency telephone no.

Emergency Telephone Number (24hr/ 7 days)	1-800-334-7577
Product Information Telephone Number	1-800-331-2867

SECTION 2: HAZARDS IDENTIFICATION

Classification in accordance with regulation HCS 29CFR §1910.1200
Acute toxicity(Inhalation): Category 4

Labelling in accordance with regulation HCS 29CFR §1910.1200

Signal word: Warning

Hazard statements
Harmful if inhaled.

Precautionary statements
Avoid breathing mist/ vapours/ spray.
Use only outdoors or in a well-ventilated area.
IF INHALED: Remove person to fresh air and keep comfortable for breathing.
Call a POISON CENTER/doctor/physician if you feel unwell.

Hazards Not Otherwise Classified (HNOC)
No physical hazards not otherwise classified.
No health hazards not otherwise classified.

SECTION 3: COMPOSITION/INFORMATION ON INGREDIENTS

Hazardous Component Name	CAS-No.	Concentration % by weight
Isopropylamine salt of glyphosate	38641-94-0	41.0
Surfactant blend (proprietary)		>=7.0 – <=13.0

The specific chemical identity and/or concentration range is being withheld because it is trade secret information.

SECTION 4: FIRST AID MEASURES

Description of first aid measures

General advice When possible, have the product container or label with you when calling a poison control center or doctor or going for treatment.

Inhalation Move to fresh air. If person is not breathing, call 911 or an ambulance, then give artificial respiration, preferably mouth-to-mouth if possible. Call a physician or poison control center immediately.

Skin contact Wash off immediately with plenty of water for at least 15 minutes. Take off contaminated clothing and shoes immediately. Call a physician or poison control center immediately.

Eye contact Hold eye open and rinse slowly and gently with water for 15-20 minutes. Remove contact lenses, if present, after the first 5 minutes, then continue rinsing eye. Call a physician or poison control center immediately.

Ingestion Call a physician or poison control center immediately. Rinse out mouth and give water in small sips to drink. DO NOT induce vomiting unless directed to do so by a physician or poison control center. Never give anything by mouth to an unconscious person. Do not leave victim unattended.

Most important symptoms and effects, both acute and delayed

Symptoms To date no symptoms are known.

Indication of any immediate medical attention and special treatment needed

Risks This product is not a cholinesterase inhibitor.

Treatment	Treatment with atropine and oximes is not indicated. Appropriate supportive and symptomatic treatment as indicated by the patient's condition is recommended.

SECTION 5: FIREFIGHTING MEASURES

Extinguishing media

Suitable	Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide.
Unsuitable	High volume water jet
Special hazards arising from the substance or mixture	In the event of fire the following may be released:, Carbon monoxide (CO), Carbon dioxide (CO2), Nitrogen oxides (NOx), Oxides of phosphorus

Advice for firefighters

Special protective equipment for firefighters	In the event of fire and/or explosion do not breathe fumes. Firefighters should wear NIOSH approved self-contained breathing apparatus and full protective clothing. Equipment should be thoroughly decontaminated after use.
Further information	Keep out of smoke. Fight fire from upwind position. Cool closed containers exposed to fire with water spray. Do not allow run-off from fire fighting to enter drains or water courses.
Flash point	does not flash
Auto-ignition temperature	452 °C / 845.6 °F
Lower explosion limit	Not applicable
Upper explosion limit	Not applicable
Explosivity	Not explosive

SECTION 6: ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures

Precautions	Use personal protective equipment. Keep unauthorized people away. Avoid contact with spilled product or contaminated surfaces.

Methods and materials for containment and cleaning up

Methods for cleaning up	Soak up with inert absorbent material (e.g. sand, silica gel, acid binder, universal binder, sawdust). Collect and transfer the product into a properly labelled and tightly closed container. Keep in suitable, closed containers for disposal. Clean contaminated floors and objects thoroughly, observing environmental regulations.

Additional advice	Use personal protective equipment. If the product is accidentally spilled, do not allow to enter soil, waterways or waste water canal. Do not allow product to contact non-target plants.
Reference to other sections	Information regarding safe handling, see section 7. Information regarding personal protective equipment, see section 8. Information regarding waste disposal, see section 13.

SECTION 7: HANDLING AND STORAGE

Precautions for safe handling

Advice on safe handling	Avoid contact with skin, eyes and clothing. Ensure adequate ventilation.
Hygiene measures	Wash hands thoroughly with soap and water after handling and before eating, drinking, chewing gum, using tobacco, using the toilet or applying cosmetics. Remove Personal Protective Equipment (PPE) immediately after handling this product. Remove soiled clothing immediately and clean thoroughly before using again. Wash thoroughly and put on clean clothing. Keep working clothes separately. Garments that cannot be cleaned must be destroyed (burnt).

Conditions for safe storage, including any incompatibilities

Requirements for storage areas and containers	Store in original container. Store in a cool, dry place and in such a manner as to prevent cross contamination with other crop protection products, fertilizers, food, and feed. Store in a place accessible by authorized persons only. Reacts with galvanised steel or unlined mild steel to produce hydrogen, a highly flammable gas that could explode. Protect from freezing. Partial crystallization may occur on prolonged storage below the minimum storage temperature. Freezing will affect the physical condition but will not damage the material. Thaw and mix before using.
Advice on common storage	Keep away from food, drink and animal feedingstuffs.

SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

Control parameters

No known occupational limit values.

Exposure controls

Personal protective equipment
In normal use and handling conditions please refer to the label and/or leaflet. In all other cases the following recommendations would apply.

Respiratory protection	When respirators are required, select NIOSH approved equipment based on actual or potential airborne concentrations and in accordance with the appropriate regulatory standards and/or industry recommendations.

Hand protection	Please observe the instructions regarding permeability and breakthrough time which are provided by the supplier of the gloves. Also take into consideration the specific local conditions under which the product is used, such as the danger of cuts, abrasion, and the contact time. Chemical-resistant gloves (barrier laminate, butyl rubber, nitrile rubber or Viton) Wash gloves when contaminated. Dispose of when contaminated inside, when perforated or when contamination on the outside cannot be removed. Wash hands frequently and always before eating, drinking, smoking or using the toilet.
Eye protection	Use tightly sealed goggles and face protection.
Skin and body protection	Wear long-sleeved shirt and long pants and shoes plus socks.
General protective measures	Follow manufacturer's instructions for cleaning/maintaining PPE. If no such instructions for washables, use detergent and warm/tepid water. Keep and wash PPE separately from other laundry.

SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

Information on basic physical and chemical properties

Form	Liquid, clear
Colour	light yellow to amber
Odour	sweet
Odour Threshold	No data available
pH	4.4 - 5.0 (8 %) (23 °C) (deionized water)
Melting point/range	No data available
Boiling Point	No data available
Flash point	does not flash
Flammability	No data available
Auto-ignition temperature	452 °C
Minimum ignition energy	Not applicable
Self-accelarating decomposition temperature (SADT)	No data available
Upper explosion limit	Not applicable
Lower explosion limit	Not applicable
Vapour pressure	25 mmHg (24 °C)

Evaporation rate	No data available
Relative vapour density	No data available
Relative density	1.169 (20 °C)
Density	1.17 g/cm³ (20 °C)
Water solubility	completely miscible
Partition coefficient: n-octanol/water	Glyphosate: log Pow: -3.2
Viscosity, dynamic	73.2 cps
Viscosity, kinematic	62.47 cSt (20 °C)
Oxidizing properties	No data available
Explosivity	Not explosive
Other information	Further safety related physical-chemical data are not known.

SECTION 10: STABILITY AND REACTIVITY

Reactivity	
Thermal decomposition	Stable under normal conditions.
Chemical stability	Stable under recommended storage conditions.
Possibility of hazardous reactions	Reacts with galvanised steel or unlined mild steel to produce hydrogen, a highly flammable gas that could explode.
Conditions to avoid	Extremes of temperature and direct sunlight.
Incompatible materials	Galvanised steel, Unlined mild steel
Hazardous decomposition products	No decomposition products expected under normal conditions of use.

SECTION 11: TOXICOLOGICAL INFORMATION

Exposure routes	Skin contact, Eye contact, Inhalation
Immediate Effects	
Eye	May cause eye irritation.
Skin	Not expected to produce significant adverse effects when recommended use instructions are followed.
Ingestion	Not expected to produce significant adverse effects when recommended use instructions are followed.

Inhalation	May be harmful if inhaled.

Information on toxicological effects

Acute oral toxicity	LD50 (Rat) 5,108 mg/kg
Acute inhalation toxicity	LC50 (Rat) 2.9 mg/l Exposure time: 4 h Determined in the form of liquid aerosol.
Acute dermal toxicity	LD50 (Rat) > 5,000 mg/kg No deaths
Skin corrosion/irritation	No skin irritation (Rabbit)
Serious eye damage/eye irritation	Slight irritant effect - does not require labelling. (Rabbit)
Respiratory or skin sensitisation	Skin: Non-sensitizing. (Guinea pig) OECD Test Guideline 406, Buehler test

Assessment STOT Specific target organ toxicity – single exposure

Glyphosate: Based on available data, the classification criteria are not met.

Assessment STOT Specific target organ toxicity – repeated exposure

Glyphosate did not cause specific target organ toxicity in experimental animal studies.

Assessment mutagenicity

Glyphosate was not mutagenic or genotoxic in a battery of in vitro and in vivo tests.

Assessment carcinogenicity

Glyphosate was not carcinogenic in lifetime feeding studies in rats and mice.
Important comment to IARC Listing:, Our expert opinion is that classification as a carcinogen is not warranted.

ACGIH

None.

NTP

None.

IARC

Isopropylamine salt of glyphosate	38641-94-0	Overall evaluation: 2A

OSHA

None.

Assessment toxicity to reproduction

Glyphosate did not cause reproductive toxicity in a two-generation study in rats.

Assessment developmental toxicity

Glyphosate did not cause developmental toxicity in rats and rabbits.

Aspiration hazard

Based on available data, the classification criteria are not met.

Further information

The toxicological data refer to a similar formulation.

SECTION 12: ECOLOGICAL INFORMATION

Toxicity to fish	LC50 (Oncorhynchus mykiss (rainbow trout)) 5.4 mg/l static test; Exposure time: 96 h
Chronic toxicity to fish	Oncorhynchus mykiss (rainbow trout) flow-through test NOEC: >= 9.63 mg/l The value mentioned relates to the active ingredient glyphosate.
Toxicity to aquatic invertebrates	EC50 (Daphnia magna (Water flea)) 11 mg/l static test; Exposure time: 48 h
Chronic toxicity to aquatic invertebrates	EC50 (Daphnia magna (Water flea)): 12.5 mg/l Exposure time: 21 d The value mentioned relates to the active ingredient glyphosate.
Toxicity to aquatic plants	EbC50 (Raphidocelis subcapitata (freshwater green alga)) 12.4 mg/l static test; Exposure time: 72 h Test conducted with a similar formulation.
	NOEC (Raphidocelis subcapitata (freshwater green alga)) 6.3 mg/l static test; Exposure time: 72 h Test conducted with a similar formulation.
Biodegradability	Glyphosate: Not rapidly biodegradable
Koc	Glyphosate: Koc: 6920
Bioaccumulation	Glyphosate: Does not bioaccumulate.
Mobility in soil	Glyphosate: Immobile in soil

Results of PBT and vPvB assessment

PBT and vPvB assessment	Glyphosate: This substance is not considered to be persistent, bioaccumulative and toxic (PBT). This substance is not considered to be very persistent and very bioaccumulative (vPvB).
Additional ecological information	No further ecological information is available.
Environmental precautions	Apply this product as specified on the label. Do not apply directly to water, to areas where surface water is present or to intertidal areas below the mean high water mark. Do not contaminate surface or ground water by cleaning equipment or disposal of wastes, including equipment wash water. Retain and dispose of contaminated wash water.

SECTION 13: DISPOSAL CONSIDERATIONS

Waste treatment methods

Product	It is best to use all of the product in accordance with label directions. If it is necessary to dispose of unused product, please follow container label instructions and applicable local guidelines. Do not contaminate water, food, or feed by disposal. Follow all local/regional/national/international regulations.
Contaminated packaging	Follow advice on product label and/or leaflet. Do not re-use empty containers. Triple rinse containers. Puncture container to avoid re-use. Completely empty container into application equipment, then dispose of empty container in a sanitary landfill, by incineration or by other procedures approved by state/provincial and local authorities. If burned, stay out of smoke.
RCRA Information	Characterization and proper disposal of this material as a special or hazardous waste is dependent upon Federal, State and local laws and are the user's responsibility. RCRA classification may apply.

SECTION 14: TRANSPORT INFORMATION

According to national and international transport regulations this material is not classified as dangerous goods / hazardous material.

SECTION 15: REGULATORY INFORMATION

EPA Registration No. 524-475
US Federal Regulations
TSCA list

Water	7732-18-5
Polyethylene glycol	25322-68-3

US. Toxic Substances Control Act (TSCA) Section 12(b) Export Notification (40 CFR 707, Subpt D)
No export notification needs to be made.
SARA Title III - Section 302 - Notification and Information
Not applicable.
SARA Title III - Section 313 - Toxic Chemical Release Reporting
None.

US States Regulatory Reporting
CA Prop65
This product does not contain any substances known to the State of California to cause cancer.

This product does not contain any substances known to the State of California to cause reproductive harm.

US State Right-To-Know Ingredients

Polyethylene glycol	25322-68-3	MN

Environmental
CERCLA
None.
Clean Water Section 307(a)(1)
None.
Safe Drinking Water Act Maximum Contaminant Levels
None.

EPA/FIFRA Information:
This chemical is a pesticide product registered by the Environmental Protection Agency and is subject to certain labeling requirements under federal pesticide law. These requirements differ from the classification criteria and hazard information required for safety data sheets, and for workplace labels of non-pesticide chemicals. Following is the hazard information required on the pesticide label:

Signal word: Caution!

Hazard statements: Causes eye irritation.

SECTION 16: OTHER INFORMATION

Abbreviations and acronyms

49CFR	Code of Federal Regulations, Title 49
ACGIH	US. ACGIH Threshold Limit Values
ATE	Acute toxicity estimate
CAS-Nr.	Chemical Abstracts Service number
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
EINECS	European inventory of existing commercial substances
ELINCS	European list of notified chemical substances
IARC	International Agency for Research on Cancer
IATA	International Air Transport Association
IMDG	International Maritime Dangerous Goods
N.O.S.	Not otherwise specified
NTP	US. National Toxicology Program (NTP) Report on Carcinogens
OECD	Organization for Economic Co-operation and Development
TDG	Transportation of Dangerous Goods
TWA	Time weighted average
UN	United Nations
WHO	World health organisation

NFPA 704 (National Fire Protection Association):

Health - 1	Flammability - 1	Instability - 1	Others - none

HMIS (Hazardous Materials Identification System, based on the Third Edition Ratings Guide)

Health - 2	Flammability - 1	Physical Hazard - 1	PPE -

0 = minimal hazard, 1 = slight hazard, 2 = moderate hazard, 3 = severe hazard, 4 = extreme hazard

Reason for Revision: New Safety Data Sheet.

Revision Date: 08/06/2020

This information is provided in good faith but without express or implied warranty. The customer assumes all responsibility for safety and use not in accordance with label instructions. The product names are registered trademarks of Bayer.

GROUP 9 HERBICIDE

Roundup CUSTOM®

FOR AQUATIC & TERRESTRIAL USE

TRUEBLUE ADVANTAGE
PROVEN | RELIABLE | SUPPORTED

A broad-spectrum postemergence herbicide for aquatic and industrial, turf, ornamental, forestry, roadside, utility rights-of-way, select crop, and other listed terrestrial weed control.

(For a complete list of aquatic and terrestrial use sites, see the Directions for Use section of the attached labeling.)

ACTIVE INGREDIENT:	
*Glyphosate, N-(phosphonomethyl)glycine, in the form of its isopropylamine salt	53.8%
OTHER INGREDIENTS:	46.2%
	100.0%

* Contains 648 grams of the active ingredient glyphosate, in the form of its isopropylamine salt per liter, or 5.4 pounds per U.S. gallon, which is equivalent to 480 grams of the acid, glyphosate, per liter or 4.0 pounds per U.S. gallon (39.9% by weight).

EPA Reg. No. 524-343 EPA Est. 524-IA-1

Keep Out of Reach of Children

CAUTION

See inside for additional Precautions.
COMPLETE DIRECTIONS FOR USE

Not all products listed on this label are registered for use in California.
Check the registration status of each product in California before using.

FOR PRODUCT INFORMATION OR ASSISTANCE USING THIS PRODUCT, CALL TOLL-FREE, 1-866-99BAYER (1-866-992-2937)

IN CASE OF AN EMERGENCY INVOLVING THIS PRODUCT OR FOR MEDICAL ASSISTANCE, CALL COLLECT, DAY OR NIGHT, 1-800-334-7577

Packed for:
BAYER CROPSCIENCE LP
800 N. LINDBERGH BLVD.
ST. LOUIS, MISSOURI 63167 USA
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US62217691B 161018By2 10/20

Read the entire label before using this product.

Use only according to label directions.

Read the "LIMIT OF WARRANTY AND LIABILITY" statement at the end of this labeling before buying or using. If terms are not acceptable, return at once unopened.

AVOID CONTACT OF THIS HERBICIDE WITH FOLIAGE, GREEN STEMS, EXPOSED NON-WOODY ROOTS OR FRUIT OF CROPS, DESIRABLE PLANTS AND TREES, AS SEVERE PLANT INJURY OR DESTRUCTION COULD RESULT.

THIS IS AN END-USE PRODUCT. BAYER CROPSCIENCE LP DOES NOT INTEND AND HAS NOT REGISTERED IT FOR REFORMULATION OR REPACKAGING.

CONTENTS

1.0 INGREDIENTS

ACTIVE INGREDIENT:

*Glyphosate, N-(phosphonomethyl)glycine, in the form of its isopropylamine salt	**53.8%**
OTHER INGREDIENTS:	**46.2%**
	100.0%

*Contains 648 grams of the active ingredient glyphosate, in the form of its isopropylamine salt per liter, or 5.4 pounds per U.S. gallon, which is equivalent to 480 grams of the acid, glyphosate, per liter or 4.0 pounds per U.S. gallon (39.9% by weight).

2.0 IMPORTANT PHONE NUMBERS

1. FOR PRODUCT INFORMATION OR ASSISTANCE USING THIS PRODUCT, CALL TOLL-FREE, 1-866-99BAYER (1-866-992-2937)
2. IN CASE OF AN EMERGENCY INVOLVING THIS PRODUCT OR FOR MEDICAL ASSISTANCE, CALL COLLECT, DAY OR NIGHT, 1-800-334-7577

3.0 PRECAUTIONARY STATEMENTS

3.1 Hazards to Humans and Domestic Animals

Keep out of reach of children

CAUTION

DOMESTIC ANIMALS: This product is considered to be relatively nontoxic to dogs and other domestic animals; however, ingestion of this product or large amounts of freshly sprayed vegetation could result in temporary gastrointestinal irritation (vomiting, diarrhea, colic, etc.). If such symptoms are observed, provide the animal with plenty of fluids to prevent dehydration. Call a veterinarian if symptoms persist for more than 24 hours.

Personal Protective Equipment (PPE)

Applicators and other handlers must wear: long-sleeved shirt and long pants, socks and shoes.

Follow manufacturer's instructions for cleaning/maintaining PPE (Personal Protective Equipment). If there are no instructions for washables, use detergent and hot water. Keep and wash PPE separately from other laundry.

User Safety Recommendations:
Users should:
- Wash hands before eating, drinking, chewing gum, using tobacco, or using the toilet.
- Remove clothing immediately if pesticide gets inside. Then wash thoroughly and put on clean clothing.

3.2 Environmental Hazards

Killing aquatic weeds can result in depletion or loss of oxygen in the water due to decomposition of dead plant material. This oxygen loss can cause fish suffocation. Consult with your State agency with primary responsibility for regulating pesticides before applying to public waters to determine if a permit is required. For terrestrial uses, do not apply directly to water, to areas where surface water is present or to intertidal areas below the mean high-water mark, except if applying aerially over the forest canopy. Do not contaminate water when cleaning equipment or disposing of equipment wash waters and rinsate.

3.3 Physical or Chemical Hazards

Spray solutions of this product may be mixed, stored and applied using stainless steel, fiberglass, plastic or plastic-lined steel containers.

DO NOT MIX, STORE OR APPLY THIS PRODUCT OR SPRAY SOLUTIONS OF THIS PRODUCT IN GALVANIZED STEEL OR UNLINED STEEL (EXCEPT STAINLESS STEEL) CONTAINERS OR SPRAY TANKS. This product or spray solutions of this product react with such containers and tanks to produce hydrogen gas, which can form a highly combustible gas mixture. This gas mixture could flash or explode if ignited by open flame, spark, welder's torch, lighted cigarette or other ignition source and cause serious personal injury.

DIRECTIONS FOR USE

It is a violation of Federal law to use this product in any manner inconsistent with its labeling. This product may only be used in accordance with the Directions for Use on this label or on separately published supplemental labeling. Supplemental labeling for this product can be obtained from your Authorized Bayer CropScience LP Retailer or Bayer CropScience LP Representative.

Do not apply this product in a way that will contact workers or other persons, either directly or through drift. Only protected handlers may be in the area during application. For any requirements specific to your State or Tribe, consult the agency responsible for pesticide regulation.

Agricultural Use Requirements

Use this product only in accordance with its labeling and with the Worker Protection Standard, 40 CFR Part 170. This Standard contains requirements for the protection of agricultural workers on farms, forests, nurseries, and greenhouses, and handlers of agricultural pesticides. It contains requirements for training, decontamination, notification, and emergency assistance. It also contains specific instructions and exceptions pertaining to the statements on this label about personal protective equipment (PPE) and restricted entry interval. The requirements in this box only apply to uses of this product that are covered by the Worker Protection Standard.

Do not enter or allow worker entry into treated areas during the restricted entry interval (REI) of 4 hours.

PPE required for early entry to treated areas that is permitted under the Worker Protection Standard and that involves contact with anything that has been treated, such as plants, soil, or water, is: coveralls, shoes plus socks, and chemical-resistant gloves made of any waterproof material.

Non-Agricultural Use Requirements

The requirements in this box apply to uses of this product that are NOT within the scope of the Worker Protection Standard for agricultural pesticides (40 CFR Part 170). The WPS applies when this product is used to produce agricultural plants on farms, forests, nurseries or greenhouses.

Keep people and pets off treated areas until spray solution has dried.

4.0 STORAGE AND DISPOSAL

Proper pesticide storage and disposal are essential to protect against exposure to people and the environment due to leaks and spills, excess product or waste, and vandalism. Do not allow this product to contaminate water, foodstuffs, feed or seed by storage and disposal.

PESTICIDE STORAGE: STORE ABOVE 5°F (-15°C) TO KEEP PRODUCT FROM CRYSTALLIZING. Crystals will settle to the bottom. If allowed to crystallize, warm to 68°F (20°C) to redissolve and roll or shake container or recirculate contents of larger containers to mix well before using. Store pesticides away from food, pet food, feed, seed, fertilizers, and veterinary supplies. Keep container closed to prevent spills and contamination. See individual container label for additional storage conditions, if any.

PESTICIDE DISPOSAL: To avoid wastes, use all material in the container, including rinsate, by application according to label directions. If wastes cannot be avoided, offer remaining product to a waste disposal facility or pesticide disposal program. Such programs are often run by state or local governments or by industry. All disposal must be in accordance with applicable federal, state and local regulations and procedures.

CONTAINER HANDLING AND DISPOSAL: Nonrefillable container. Do not reuse this container to hold materials other than pesticides or dilute pesticides (rinsate). After emptying and cleaning, it may be allowable to temporarily hold rinsate or other pesticide-related materials in this container. Contact your state regulatory agency to determine allowable practices in your state.

Triple rinse or pressure rinse (or equivalent) this container promptly after emptying.

Triple rinse as follows: Empty the remaining contents into application equipment or mix-tank and continue to drain for 10 seconds after the flow begins to drip. Fill the container ¼ full with water and recap. Shake for 10 seconds. Pour rinsate into application equipment or mix-tank, or store rinsate for later use or disposal. Continue to drain for 10 seconds after the flow begins to drip. Repeat this procedure two more times.

Pressure rinse as follows: Empty the remaining contents into application equipment or mix-tank and continue to drain for 10 seconds after the flow begins to drip. Place container so that it can drain directly into application equipment or mix-tank while rinsing, or collect rinsate for later use or disposal. Insert pressure rinsing nozzle into the side of the container and rinse at about 40 PSI for at least 30 seconds. Continue to drain for 10 seconds after the flow begins to drip.

Once properly rinsed, some plastic pesticide containers can be taken to a container collection site or picked up for recycling. To find the nearest collection site, contact your chemical dealer or Bayer CropScience LP at 1-866-99BAYER (1-866-992-2937).

If recycling is not available, dispose of in accordance with federal, state and local regulations and procedures, which may include puncturing the properly rinsed container and disposing in a sanitary landfill.

5.0 PRODUCT INFORMATION

Product Description: This product is a postemergence, systemic herbicide that, when mixed in the spray tank with a surfactant that is approved for aquatic use, may be used for both aquatic and terrestrial weed control. This product provides broad-spectrum control of many annual and perennial weeds, woody brush, trees and vines. This product does not control submerged weeds or provide residual weed control in soil. It is formulated as a water-soluble liquid that, unless otherwise directed, requires dilution with water or another carrier and the addition of a surfactant according to label directions and intended use site before application using standard and specialized pesticide application equipment.

Mechanism of Action: The active ingredient in this product inhibits an enzyme found only in plants and microorganisms that is essential to the formation of specific amino acids.

No Soil Activity: This product binds tightly to soil particles and does not provide residual weed control. Weeds must be emerged at the time of application to be controlled by foliar application of this product. Weed seeds in the soil will not be affected by this product and will continue to germinate. Unattached plant rhizomes and rootstocks beneath the soil surface will also not be affected by this product.

Biological Degradation: Degradation of this product is primarily a biological process carried out by soil microbes.

Stage of Weeds: Aquatic weeds must have foliage above the water surface in order to be controlled by this product. On terrestrial sites, annual and perennial weeds are easiest to control when they are small. See the "WEEDS CONTROLLED" section of this label for more information on the control of specific weeds.

Cultural Considerations: Reduced weed control could result when this product is applied to annual or perennial weeds that have been mowed, grazed or cut, and have not been allowed to re-grow prior to application. Always use the highest application rate of this product within the given range when weed growth is heavy or dense, or when weeds are growing in an undisturbed (non-cultivated) area. Reduced weed control could result when this product is applied to weeds that show signs of disease or insect damage, are covered with dust, or are surviving under poor growing conditions.

Spray Coverage: For enhanced results, spray coverage must be uniform and complete. Do not spray foliage to the point of runoff.

Rainfastness: Rainfall or submersion of aquatic weeds by wave action within 4 hours of application could wash this product off of the foliage and a second application might be needed for acceptable weed control. Refer to specific use sections of this label for additional information on minimum intervals required before re-application of this product.

Time to Symptoms: This product moves through the plant from the point of foliage contact to and into the root system. Visible effects are a gradual wilting and yellowing of the plant that advances to complete browning of aboveground growth and deterioration of underground plant parts. Effects are visible on most annual weeds within 2 to 4 days, but on most perennial weeds, effects might not be visible for 7 or more days after application. Extremely cool or cloudy weather following application could slow activity of this product and delay development of visual symptoms.

Maximum Application Rates: The maximum application or use rates stated throughout this label are given in units of volume (fluid ounces or quarts) of this product per acre. However, the maximum allowable application rates apply to this product combined with the use of any and all other herbicides containing the active ingredient glyphosate, whether applied separately or in a tank mixture, on a basis of total pounds of glyphosate (acid equivalents) per acre. If more than one glyphosate-containing product is applied to the same site within the same year, you must ensure that the total use of glyphosate (pounds acid equivalents) does not exceed the maximum allowed. See the "INGREDIENTS" section of this label for necessary product information.

Unless otherwise specified on this label, the combined total of all applications of this product on a site must not exceed 8 quarts (8 pounds of glyphosate acid) per acre per year.

NOTE: Use of this product in any manner not consistent with this label could result in injury to persons, animals, crops or other desirable vegetation, or have other unintended consequences.

6.0 WEED RESISTANCE MANAGEMENT

GROUP	9	HERBICIDE

Glyphosate, the active ingredient in this product, is a Group 9 herbicide based on the mechanism of action classification system of the Weed Science Society of America. Any weed population can contain plants that are naturally resistant to Group 9 herbicides. Weeds resistant to Group 9 herbicides can be effectively managed by using another herbicide from a different Group (either alone or in a mixture according to label directions), by using other cultural or mechanical methods of weed control, or a combination of the two. Consult your local company representative, state cooperative extension agent, professional consultant or other qualified authority to determine appropriate actions for controlling specific resistant weeds.

6.1 Weed Management Practices

Resistant populations arise when rare individual plants are uncontrolled by a normal dose of a given herbicide under normal environmental conditions. In the absence of other control measures these individuals survive, produce seed, and eventually become the dominant biotype in the field through continuous selection. The best means of reducing this selection is to use diverse weed control practices such as multiple herbicides with different mechanisms of action, and often in combination with various mechanical and cultural practices.

To minimize the occurrence of herbicide-resistant biotypes, including those resistant to glyphosate, implement the following weed management practice options that are practical to your situation. These management practices are applicable to reduce the spread of confirmed resistant biotypes (managing existing resistant biotypes) and to reduce the potential for selecting for resistance in new species (proactive resistance management).

- Use a diversified approach toward weed management focused on preventing weed seed production and reducing the number of weed seeds in the soil.
- Plant crops into fields that are as weed-free as possible and then keep them as weed-free as possible.
- Plant seed that is as weed-free as possible.
- Scout fields and application sites routinely, before and after herbicide application.
- Use multiple herbicide mechanisms of action that are effective against the most troublesome weeds at your application site and against those with known resistance.
- Apply herbicides at application rates listed on the label when weeds are within the size range indicated on the label.
- Emphasize cultural practices that suppress weeds by using crop competitiveness.
- Use mechanical and biological weed management practices, where appropriate.
- Prevent field-to-field and within-field movement of weed seed or vegetative propagules.
- Manage weed seed at harvest and after harvest to prevent a buildup of the weed seedbank.

6.2 Management of Glyphosate-Resistant Biotypes

Appropriate testing is needed to determine if a weed is resistant to glyphosate. Call 1-866-99BAYER (1-866-992-2937) or contact your Bayer CropScience LP representative to determine if resistance in any particular weed biotype has been confirmed in your area, or visit on the Internet at

www.weedresistancemanagement.com or www.weedscience.org.

Glyphosate-resistant weeds can be controlled or managed by applying this product in combination with residual preemergence herbicides and/or other postemergence herbicides labeled for control of the targeted weed in the crop being grown or on the site of application. For more information, see the "WEEDS CONTROLLED" section of this label.

Since the occurrence of resistant weeds is difficult to detect prior to use, Bayer CropScience LP accepts no liability for any losses that result from the failure of this product to control resistant weeds.

7.0 MIXING

Spray solutions of this product may be mixed, stored and applied using clean stainless steel, fiberglass, plastic or plastic-lined steel containers.

DO NOT MIX, STORE OR APPLY THIS PRODUCT OR SPRAY SOLUTIONS OF THIS PRODUCT IN GALVANIZED STEEL OR UNLINED STEEL (EXCEPT STAINLESS STEEL) CONTAINERS OR SPRAY TANKS.

Eliminate any risk of siphoning the contents of the tank back into the carrier source while mixing. Use approved anti-back-siphoning devices where required by state or local regulations.

A 50-mesh nozzle screen or line strainer on the spray equipment is adequate.

Clean sprayer parts promptly after using this product by thoroughly flushing with water.

7.1 Mixing with Water

PERFORMANCE OF THIS PRODUCT CAN BE SIGNIFICANTLY REDUCED IF WATER CONTAINING SOIL SEDIMENT IS USED AS CARRIER. DO NOT MIX THIS PRODUCT WITH WATER FROM PONDS OR DITCHES THAT IS VISIBLY MUDDY OR MURKY.

This product mixes readily with water. Mix spray solutions of this product as follows. Begin filling the mixing tank or spray tank with clean water. Add the required amount of this product near the end of the filling process and mix gently. Foaming of the spray solution can occur during mixing. To prevent or minimize foaming, mix gently, terminate by-pass and return lines at the bottom of the tank and, if necessary, add an appropriate anti-foam or defoaming agent to the spray solution.

7.2 Surfactant

Unless otherwise directed, this product requires the addition of 2 or more quarts of a nonionic surfactant that is labeled for use with herbicides per 100 gallons of spray solution (0.5% or more by volume). Unless otherwise directed, use a higher concentration of surfactant when any of the following conditions apply to the use of this product:

- Adding surfactants that contain less than 70 percent active ingredient
- Making a broadcast application using a high carrier volume or using handheld spray equipment
- Applying under adverse growing conditions or anytime weeds are under stress
- Applying as a tank-mix with other products
- Applying to hard-to-control weeds, woody brush, trees and vines

NOTE: For direct application of spray solutions of this product on emerged aquatic weeds or for use in intertidal areas below the mean high-water mark, or in application areas where a buffer that will ensure no overspray of an adjacent body of water cannot be maintained, a surfactant that is also approved for aquatic use must be used. For terrestrial applications, surfactant is also needed in the spray solution, but does not have to be approved for aquatic use.

RESTRICTION: If a surfactant that is NOT approved for aquatic use is added to the spray solution, DO NOT apply directly to or over water or use in intertidal areas below the mean high-water mark.

Check with your local State agency with primary responsibility for regulating pesticides for additional information about surfactants that are approved for aquatic use.

Read and follow all precautionary statements and directions for use on the surfactant label.

All reference throughout this label to concentration of surfactant in the spray solution is on a percentage-of-volume basis. Refer to the table below to achieve the appropriate concentration of surfactant in the spray solution.

Desired Volume of Spray Solution	Amount of Surfactant to Achieve Indicated Concentration in Spray Solution (percent by volume)					
	0.5%	0.75%	1%	1.5%	4%	8%
1 gallon	2/3 fl oz	1 fl oz	1.3 fl oz	2 fl oz	5 fl oz	10 fl oz
25 gallons	16 fl oz	24 fl oz	1 qt	1.5 qts	4 qts	2 gals
100 gallons	2 qts	3 qts	1 gal	1.5 gals	4 gals	8 gals

2 tablespoons = 1 fluid ounce (fl oz)

7.3 Tank Mixtures

This product does not provide residual weed control. This product may be tank-mixed with other herbicides to provide residual weed control in the soil, a broader weed control spectrum or an alternative mechanism of action.

NOT ALL TANK-MIX PRODUCTS LISTED ON THIS LABEL ARE APPROVED FOR USE ON AQUATIC SITES. Refer to each individual label for all products in the tank mixture for approved use sites and application rates.

When a tank-mix with a generic active ingredient, such as 2,4-D or dicamba, or any other product or material, is listed on this label, the user is responsible for ensuring that the specific application being made and the use site is included on the label of the product used in the mix.

Bayer CropScience LP has not tested all tank-mix product formulations for compatibility, antagonism or reduction in product performance. Mixing this product with herbicides or other materials not specified on this label could result in reduced performance of this product. To the extent consistent with applicable law, buyer and all users are responsible for any loss or damage in connection with the use or handling of mixtures of this product with herbicides or other materials that are not expressly specified on this label, or on separate supplemental labeling or Fact Sheets published for this product.

Refer to all individual product labels, supplemental labeling and Fact Sheets for all products in the tank mixture, and observe all precautions and limitations on the label, including any application timing restrictions, soil restrictions, minimum re-cropping intervals and/or crop rotation restrictions. Use according to the most restrictive precautionary statements for each product in the tank mixture.

This product may be applied at any rate listed on this label in a tank mixture with the following products to provide preemergence and/or improved postemergence control of weeds listed on the individual product labels.

Arsenal; Arsenal Herbicide Applicators Concentrate; Banvel; Banvel 480; Barricade 4L; Barricade 65WG; Certainty® Turf; Chopper Gen2; Crossbow; Endurance; Escort XP; Forestry Garlon 4 Specialty; Forestry Garlon XLT Specialty; Gallery SC; Gallery 75 Dry Flowable Specialty; Garlon 3A Specialty; Garlon 4 Specialty; Garlon 4 Ultra Specialty; Goal 2XL; GoalTender; Habitat; Hyvar X; Hyvar X-L; Karmex DF; Krenite S Brush Control Agent; Krovar I DF; Landmark; Landmark XP; Oust Extra; Oust XP; Outrider®; Plateau; Poast; Poast Plus; Ronstar 50 WSP; Ronstar Flo; Ronstar G; Sahara DG; Spike 20P Specialty; Spike 80 DF Specialty; Stalker; Surflan AS Specialty; Surflan Flex; Surflan Flex T&O; Surflan XL 2G; Surflan Pro; Telar XP; Tordon 101 Mixture Specialty; Tordon 22K Specialty; Tordon K Herbicide Specialty; Transline Specialty; Vanquish; Velpar DF CU; Velpar DF VU; Velpar L CU; Velpar L; Velpar L VU; 2,4-D; atrazine; dicamba; bromacil; diuron; imazapyr; metsulfuron methyl; oryzalin; pendimethalin, prodiamine; simazine; sulfosulfuron; trichlopyr

When used in combination as described on this label and to the extent consistent with applicable law, the liability of Bayer CropScience LP shall in no manner extend to any damage, loss or injury not solely and directly caused by the inclusion of the Bayer CropScience LP product in such combination use.

7.4 Tank-Mixing Procedure

Always predetermine the compatibility of all tank-mix products in the carrier by mixing small proportional quantities in advance.

Add individual tank-mix components to the tank as follows: wettable powders; flowables; emulsifiable concentrates; drift reduction additives; water soluble liquids (this product); nonionic surfactants. Ensure that the tank-mix products are well mixed in the spray solution before adding this product.

Mix only the quantity of spray solution that will be applied that day. Application of tank-mix solutions that are allowed to stand overnight could result in reduced weed control.

Maintain gentile agitation at all times until the contents of the tank are sprayed out. If the spray mixture is allowed to settle, agitate thoroughly to resuspend the mixture before resuming application.

Keep by-pass line on or near the bottom of the tank to minimize foaming.

A 50-mesh nozzle screen or line strainer on the spray equipment is adequate.

7.5 Mixing Spray Solution Concentrations

All reference throughout this label to concentration of this product in a spray solution is on a percentage-of-volume basis.

Prepare the desired volume of spray solution at a given concentration by mixing the amount of this product indicated in the following table with water.

Desired Volume of Spray Solution	Amount of Roundup Custom for Aquatic and Terrestrial Use to Achieve Indicated Concentration in Spray Solution (percent by volume)					
	0.5%	0.75%	1%	1.5%	4%	8%
1 gallon	2/3 fl oz	1 fl oz	1.3 fl oz	2 fl oz	5 fl oz	10 fl oz
25 gallons	16 fl oz	24 fl oz	1 qt	1.5 qts	4 qts	2 gals
100 gallons	2 qts	3 qts	1 gal	1.5 gals	4 gals	8 gals

2 tablespoons = 1 fluid ounce (fl oz)

For filling backpack and pump-up sprayers, consider mixing the appropriate amount of this product with water in a larger container and then filling the sprayer from the larger container.

7.6 Colorants and Dyes

Colorants and marking dyes may be added to spray solutions of this product; however, they could reduce the performance of this product. Use colorants and dyes according to the manufacturer's directions.

7.7 Drift Reduction Additives

Drift reduction additives may be used with all application equipment types, except wiper applicators, sponge bars and controlled droplet applicators (CDA). When a drift reduction additive is used, read and carefully follow all precautions, limitations and all other information appearing on the product label. The use of drift reduction additives can affect spray coverage, which could result in reduced performance of this product.

8.0 APPLICATION EQUIPMENT AND TECHNIQUES

This product may be applied using the following equipment:

Aerial Application Equipment—fixed-wing and helicopter

Ground Application Equipment—boom or boomless systems, pull-type sprayers, floaters, pick-up sprayers, spray coupes and other ground broadcast application equipment

Handheld Sprayers—backpack sprayers, pump-up pressure sprayers, handguns, handwands, mistblowers*, lances and other handheld and motorized spray equipment used to direct the spray onto weed foliage.

*This product is not registered in California or Arizona for use in mistblowers.

Selective Application Equipment—recirculating sprayer, shielded and hooded sprayers, wiper applicator, sponge bar, single or hollow stem injectors, tree injector, spray bottle

Injection Systems—aerial or ground injection sprayers

Controlled Droplet Applicator (CDA)—handheld or boom-mounted applicators that produce a spray consisting of a narrow range of droplet sizes

APPLY THIS PRODUCT USING PROPERLY MAINTAINED AND CALIBRATED EQUIPMENT CAPABLE OF ACCURATELY DELIVERING DESIRED VOLUMES.

Do not apply this product through any type of irrigation system.

8.1 Spray Drift Management

AVOID CONTACT OF THIS HERBICIDE WITH FOLIAGE, GREEN STEMS, EXPOSED NON-WOODY ROOTS OR FRUIT OF CROPS, DESIRABLE PLANTS AND TREES, AS SEVERE PLANT INJURY OR DESTRUCTION COULD RESULT.

Do not allow the herbicide solution to mist, drip, drift, or splash onto desirable vegetation, as even small quantities of this product can cause severe damage or destruction to the crop, plants or other vegetation on which application was not intended.

AVOID DRIFT. USE EXTREME CARE TO PREVENT INJURY TO DESIRABLE PLANTS AND CROPS WHEN APPLYING THIS PRODUCT.

Avoiding spray drift at the application site is the responsibility of the applicator. The interaction of many equipment- and weather-related factors determines the potential for spray drift. The applicator and the grower are

responsible for considering all these factors when making decisions regarding the application of this product.

The likelihood of injury occurring as the result of spray drift while applying this product increases when winds are gusty, as wind velocity increases, when wind direction is constantly changing or when there are other meteorological conditions that favor spray drift. When spraying, avoid combinations of pressure and nozzle type that will result in splatter or generation of fine particles (mist) that are likely to drift.

TO PREVENT INJURY TO ADJACENT DESIRABLE VEGETATION, APPROPRIATE BUFFERS MUST BE MAINTAINED.

AVOID APPLYING THIS PRODUCT AT EXCESSIVE SPEED OR SPRAYER PRESSURE.

8.2 Aerial Application Equipment

Unless otherwise prohibited, all broadcast applications of this product described on this label may be made using aerial application equipment where appropriate, provided that the applicator complies with the precautions and restrictions specified on this label and on separate supplemental labeling published for this product.

DO NOT APPLY THIS PRODUCT USING AERIAL APPLICATION EQUIPMENT EXCEPT UNDER CONDITIONS SPECIFIED ON THIS LABEL OR ON SEPARATELY PUBLISHED SUPPLEMENTAL LABELING FOR THIS PRODUCT.

FOR SPECIFIC USE INSTRUCTIONS, RESTRICTIONS AND REQUIREMENTS RELATED TO THE AERIAL APPLICATION OF THIS PRODUCT IN CALIFORNIA OR SPECIFIC COUNTIES THEREIN, REFER TO THE LIMITATIONS ON AERIAL APPLICATION IN THAT STATE OR COUNTY PRESENTED IN THIS SECTION.

Apply this product at the rate specified on this label in 3 to 25 gallons of water per acre, unless otherwise directed. Use a larger spray volume within this range where weeds, brush, trees and vines are dense or form multiple canopy layers.

Avoid direct application to any body of water.

Drift control reduction additives may be used.

Ensure uniform application. To avoid streaked, uneven or overlapped application, use appropriate marking devices.

Aircraft Maintenance

Thoroughly wash aircraft, especially landing gear, after each day of spraying to remove residues of this product accumulated during spraying or from spills. PROLONGED EXPOSURE OF THIS PRODUCT TO UNCOATED STEEL SURFACES COULD RESULT IN CORROSION AND POSSIBLE FAILURE OF THE PART. LANDING GEAR IS MOST SUSCEPTIBLE. Maintaining an organic coating (paint) that meets aerospace specification MIL-C-38413 can help prevent corrosion.

AERIAL SPRAY DRIFT MANAGEMENT

The following drift management requirements must be followed to minimize off-target drift movement during aerial application. These requirements do not apply to forestry applications.

1. The distance of the outermost nozzles on the boom must not exceed ¾ the length of the wingspan or rotor.
2. Nozzles must always point backwards parallel with the air stream and never be pointed downwards more than 45 degrees. Where states have more stringent regulations, they must be followed.

Importance of Droplet Size

The most effective way to reduce drift potential is to apply large droplets. The best drift management strategy is to apply the largest droplets that provide sufficient coverage and control. Applying larger droplets reduces drift potential, but will not prevent drift if the application is made improperly or under unfavorable environmental conditions, such as in windy, high temperature with low humidity, and/or inversion conditions as described below.

Controlling Droplet Size

- **Volume:** Use high flow rate nozzles to apply the highest practical spray volume. Nozzles with the higher rated flows produce larger droplets.
- **Pressure:** Operate at a spray pressure towards the lower end of the range listed for the nozzle. Higher pressure reduces droplet size and does not improve canopy penetration. When higher flow rates are needed, use higher flow rate nozzles instead of increasing pressure.
- **Number of nozzles:** Use the minimum number of nozzles that provides uniform coverage.
- **Nozzle orientation:** Orienting nozzles so that the spray is released backwards, parallel to the air stream, will produce larger droplets than other orientations. Significant deflection from the horizontal will reduce droplet size and increase drift potential.
- **Nozzle type:** Use a nozzle type that is designed for the intended application. With most nozzle types, narrower spray angles produce larger droplets. Consider using low-drift nozzles. Solid stream nozzles oriented straight back produce larger droplets than other nozzle types.
- **Boom length:** For some use patterns, reducing the effective boom length to less than ¾ of the wingspan or rotor length can further reduce drift without reducing swath width.
- **Application height:** Application must be made at a height of 10 feet or less above the top of the tallest plants, unless a greater height is required for aircraft safety. Making the application at the lowest height that is safe reduces the exposure of the droplets to evaporation and wind.

Swath Adjustment

When an application is made in the presence of a crosswind, the swath will be displaced downwind. Therefore, on the upwind and downwind edges of the field, the applicator must compensate for this displacement by adjusting the path of the aircraft upwind. Increase the swath adjustment distance with increasing drift potential (higher wind, smaller droplets, etc.).

Wind

Drift potential is lowest at wind speeds of between 2 and 10 miles per hour. However, many factors, including droplet size and equipment type, determine drift potential at any given wind speed. Avoid application when wind speeds are below 2 miles per hour due to variable wind direction and high inversion potential. NOTE: Local terrain can influence wind patterns. Every applicator must be familiar with local wind patterns and how they affect drift.

Temperature and Humidity

When making an application in low relative humidity, set application equipment to produce larger droplets to compensate for evaporation. Droplet evaporation is most severe when conditions are both hot and dry.

Temperature Inversions

Do not apply this product during a temperature inversion as drift potential is high under these conditions. Temperature inversions restrict vertical air mixing, which causes small droplets to remain suspended in a concentrated cloud. This cloud can move in unpredictable directions due to the light variable winds common during inversions. Temperature inversions are characterized by increasing temperatures with altitude and are common on nights with limited cloud cover and light to no wind. They begin to form as the sun sets and often continue into the morning. Their presence can be indicated by ground fog; however, if fog is not present, inversions can also be identified by the movement of smoke from a ground source or an aircraft smoke generator. Smoke that layers and moves laterally in a concentrated cloud (under low wind conditions) indicates an inversion, while smoke that moves upward and rapidly dissipates indicates good vertical air mixing.

Sensitive Areas

Apply this product only when the potential for drift to adjacent sensitive non-target areas (e.g., residential areas, known habitat for threatened or endangered species, non-target crops) is minimal (e.g., when wind is blowing away from a sensitive area).

State Specific Limitations on Aerial Application

LIMITATIONS ON AERIAL APPLICATION IN CALIFORNIA ONLY

DO NOT apply this product using aerial application equipment in residential areas.

AVOID DRIFT – DO NOT APPLY WHEN WINDS ARE GUSTY OR UNDER ANY OTHER CONDITION THAT FAVORS DRIFT. DRIFT OF THIS PRODUCT ONTO ANY VEGETATION TO WHICH APPLICATION WAS NOT INTENDED CAN CAUSE DAMAGE. TO PREVENT INJURY TO ADJACENT DESIRABLE VEGETATION, USE PROPER AERIAL APPLICATION EQUIPMENT FITTED WITH APPROPRIATE NOZZLES AND MAINTAIN ADEQAUATE BUFFERS.

Follow the directions below when making an aerial application near non-target crops, desirable annual vegetation, or desirable perennial vegetation after bud break and before total leaf drop.

1. Do not apply this product within 100 feet of all desirable vegetation or non-target crops.
2. If winds are blowing up to 5 miles per hour TOWARD desirable vegetation or non-target crops, do not apply this product within 500 feet of the desirable vegetation or crops.
3. If winds are blowing between 5 and 10 miles per hour TOWARD desirable vegetation or non-target crops, a buffer zone greater than 500 feet might be needed to protect the desirable vegetation or crops.
4. Do not apply this product using aerial application equipment when winds are blowing in excess of 10 miles per hour.
5. Do not apply this product using aerial application equipment when inversion conditions exist.

When tank-mixing this product with 2,4-D, only 2,4-D amine formulations may be applied in California using aerial application equipment. Tank mixtures of this product with 2,4-D amine formulations may be applied by air in California on fallow fields and in reduced tillage systems and for pasture renovation applications only.

This product, when tank-mixed with dicamba, may not be applied by air in California.

ADDITIONAL LIMITATIONS ON AERIAL APPLICATION IN FRESNO COUNTY, CALIFORNIA ONLY

Always read and follow the label directions and precautionary statements for all products used in the aerial application.

The following information applies only from February 15 through March 31 within the following boundaries of Fresno County, California:

North: Fresno County line
South: Fresno County line
East: State Highway 99
West: Fresno County line

Observe the following directions to minimize off-site movement during aerial application of this product. Minimization of off-site movement is the responsibility of the grower, Pest Control Advisor and aerial applicator.

Written Directions

Written directions MUST be submitted by or on behalf of the applicator to the Fresno County Agricultural Commissioner 24 hours prior to the application. These written directions MUST state the proximity of surrounding crops and that conditions of each manufacturer's product label and this label have been satisfied.

Aerial Applicator Training and Equipment

Aerial application of this product is limited to pilots who have successfully completed a Fresno County Agricultural Commissioner and California Department of Pesticide Regulation approved training program for aerial application of herbicides. All aircraft must be inspected, critiqued in flight and certified at a Fresno County Agricultural Commissioner approved fly-in. Test and calibrate spray equipment at intervals sufficient to ensure that proper rates of herbicides and adjuvants are being applied during commercial use. Applicator must document such calibrations and testing. Demonstration of performance at Fresno County Agricultural Commissioner approved fly-ins constitutes such documentation, or other written records showing calculations and measurements of flight and spray parameters acceptable to the Fresno County Agricultural Commissioner.

Applications at Night – Do not apply this product by air earlier than 30 minutes prior to sunrise and/or later than 30 minutes after sunset without prior permission from the Fresno County Agricultural Commissioner.

For additional information on the proper aerial application of this product in Fresno County, call (800) 332-3111.

8.3 Ground Application Equipment

Apply this product at the appropriate rate as specified on this label in 3 to 40 gallons of water per acre when making a broadcast application using ground application equipment, unless otherwise directed on this label or on

separate supplemental labeling or Fact Sheets published for this product. As the weed density increases, increase the spray volume toward the upper end of this range to ensure complete coverage. Use nozzles that will avoid generating a fine mist. For enhanced results with ground application equipment, use flat-fan nozzles. Check spray pattern for uniform distribution of spray droplets.

8.4 Handheld Sprayers

When using a handheld sprayer, apply spray solutions of this product uniformly and completely to the foliage of target weeds using a coarse droplet spectrum and a spray-to-wet technique; do not spray to the point of runoff. For the appropriate concentration of this product in the spray solution and timing of application to control specific weeds, woody brush, trees and vines, refer to the "WEEDS CONTROLLED" section of this label.

For control of annual weeds, make application when weeds are small and prior to seedhead or bud formation. For control of perennial weeds, woody brush, trees and vines, make application after flowering and before fall color and leaf drop.

When making a low-volume directed spray application to annual and perennial weeds, woody brush, trees and vines using a handheld sprayer, ensure that at least 50 to 75 percent of the foliage or the top one-half of each unwanted plant is sprayed. If a straight stream nozzle is used, start the application at the top of the targeted plant and spray from top to bottom in a lateral zig-zag motion. To ensure uniform and complete coverage, spray both sides of large or tall woody brush, trees and vines, or when foliage is thick and dense, or where there are multiple sprouts. For enhanced results on woody brush, trees and vines, apply to actively growing vegetation after full leaf expansion and flowering, prior to fall color and leaf drop.

The following table summarizes various methods of foliar application using a backpack sprayer with a spray-to-wet or low-volume directed spray technique and high-volume sprayer application using handheld application equipment for control or partial control of herbaceous weeds, woody brush, trees and vines listed in the "WEEDS CONTROLLED" section of this label.

Method of Application	Spray Solution Concentration	Spray Volume
Handgun or Backpack Sprayer	0.5 to 1.5% by volume	Spray-to-wet technique
Low-Volume Directed Spray (Backpack)	4 to 8% by volume	15 to 25 gallons/acre
Modified High-Volume Spray	1.5 to 3% by volume	40 to 60 gallons/acre

Low-volume directed spray application with a backpack sprayer works best when applying to weeds and brush less than 10 feet tall. For taller weeds and brush, a high-volume handgun can be modified by reducing the nozzle size and spray pressure to produce a modified high-volume directed spray application.

8.5 Selective Application Equipment

Selective application equipment allows this product to be applied to weeds growing near a crop or other desirable vegetation without killing the desirable vegetation. Selective application equipment must be capable of preventing all contact of the herbicide solution with the desirable vegetation and operated without spray mist escape, leakage or dripping of the herbicide solution.

AVOID CONTACT OF THIS HERBICIDE WITH DESIRABLE VEGETATION. Contact of this product with desirable vegetation could result in unwanted plant damage or destruction. To the extent consistent with applicable law, such damage shall be the sole responsibility of the applicator.

This product may be diluted with water and applied using a recirculating sprayer, shielded sprayer, hooded sprayer, wiper applicator or sponge bar to weeds listed on this label growing in any aquatic or on any terrestrial non-food or non-feed crop site listed on this label, where feasible. This product may also be used with sprayers equipped with optical weed sensor technology. Other selective equipment that may be used to deliver or apply this product are single and hollow stem injectors, tree injectors, wiper applicators for cut stem and cut stump applications, and spray or squirt bottles for cut stem, cut stump and frill applications to control large stem weeds, brush, trees and vines listed on this label.

Recirculating Sprayer

A recirculating sprayer directs the spray solution onto weeds growing above desirable vegetation, while spray solution that is not intercepted by weeds is collected and returned to the spray tank for reapplication. A recirculating sprayer may be used to apply spray solutions of this product to weeds listed on this label in any aquatic or on any terrestrial non-crop site described on this label.

Shielded and Hooded Sprayers

A shielded sprayer directs the herbicide solution to the target weeds while protecting desirable vegetation from coming into contact with the herbicide spray with an impervious material or shield. Use nozzles that provide uniform coverage within the application area. Keep shields properly adjusted to protect desirable vegetation.

A hooded sprayer is a type of shielded sprayer where the spray pattern is fully enclosed, including the top, sides, front and back, thereby shielding desirable vegetation from the spray solution.

This product may be diluted with water and, unless otherwise directed, mixed with a surfactant and applied using a shielded or hooded sprayer to weeds listed on this label growing in any aquatic or on any terrestrial non-crop site listed on this label, where feasible, and between rows of plants (row middles) in any cropping system listed on this label.

Properly adjust the hood to protect desirable vegetation. Ensure that the hood is capable of completely enclosing the spray pattern. If necessary when applying around crops grown on raised beds, extend the front and rear flaps of the hooded sprayer downward to reach the ground in deep furrows.

A hooded sprayer must be configured and operated in a manner that minimizes bouncing and avoids raising the hood up off the ground surface at any time. If the hood is raised, spray particles can escape and come into contact with the crop or other desirable vegetation, causing damage to or destruction of the desirable vegetation. Avoid operating this equipment on rough or sloping terrain where the spray hood is likely to rise up off the ground surface.

Use hoods designed to minimize excessive dripping or runoff down the inside of the hood, such as a single, low pressure, low drift, flat-fan nozzle with an 80- to 95-degree spray angle positioned at the top center of the hood, with a spray volume of 20 to 30 gallons per acre.

The following procedures will help reduce the potential for injury to desirable vegetation when using a hooded sprayer:

- Operate the sprayer with the hood on the ground or skimming across the ground surface.
- Leave at least an 8-inch untreated strip over the drill row. (For example, if a crop row width is 38 inches, use a sprayer hood with a maximum width of 30 inches.)
- Operate at a ground speed no greater than 5 miles per hour to minimize bouncing of the hooded sprayer.
- Apply when wind speed is 10 miles per hour of less.
- Use low-drift nozzles that provide uniform coverage within the application area.

Injury to a crop or other desirable vegetation can occur when application is made to foliage of weeds that come into direct contact with the desirable vegetation. Do not apply this product when leaves of desirable vegetation are growing in direct contact with weeds. Droplets, mist, foam or splatter of the herbicide solution settling onto desirable vegetation can result in discoloration, stunting or destruction.

Wiper Applicator

A wiper applicator is a device that physically wipes this product or solutions of this product directly onto the weed or cut stump. Any handheld device that is capable of physically wiping this product or solutions of this product directly onto the target weed or stump, such as a paint brush, may be used.

A mechanical wiper applicator, such as a rope wick or sponge bar that can be driven through a field over the top of a crop or other desirable vegetation to control weeds that are taller than the desirable vegetation, must be designed, maintained and operated to prevent the herbicide solution from coming into contact with desirable vegetation.

Wiper applicators may be used over the top of food or feed crops ONLY if specifically permitted for use over that crop by this label or by separately published supplemental labeling for this product.

When using a mechanical wiper applicator, adjust the height of the applicator to ensure adequate contact with the weeds and so that the wiper contact point is at least 2 inches above the crop or desirable vegetation. Enhanced results can be obtained when more of the weed is exposed to the herbicide solution and weeds are a minimum of 6 inches above the desirable vegetation. Weeds that do not come into contact with the herbicide solution will not be affected. Poor contact can occur when weeds are growing in dense clumps, when operating in areas of severe weed infestation, or when weed height varies dramatically. In these situations, more than one application of this product might be necessary.

Operate wiper applicators at a ground speed of no greater than 5 miles per hour. Performance in areas of heavy weed infestation can be improved by reducing speed, which will provide more time for re-saturation of the wiper with the herbicide solution and more contact time of the wiper with the weed. Enhanced results with a wiper applicator can be obtained when two applications are made traveling in opposite directions in the field.

Keep wiper surfaces clean.

Droplets, mist, foam or splatter of the herbicide solution settling onto desirable vegetation can result in discoloration, stunting or destruction. Avoid leakage or dripping onto desirable vegetation. Be aware that on sloping ground the herbicide solution can migrate to one side, causing dripping on the lower end and drying of the wiper on the upper end of the applicator.

Do not apply this product using a wiper applicator when weeds are wet.

Add a nonionic surfactant to a concentration of 10 percent by volume of the total applicator solution (one gallon of surfactant for every 10 gallons of solution) for use in a wiper applicator. See the "MIXING" section of this label for more information on the use of surfactants.

For Rope Wick and Sponge Bar Applicators-apply solutions ranging from 33 to 75 percent of this product by volume in water.

For Panel Applicators-apply solutions ranging from 33 to 90 percent of this product by volume in water.

Mix only the amount of this product that will be used during a 1-day period, as reduced product performance can result from the use of solutions held in storage.

Clean wiper parts promptly after using this product by thoroughly flushing with water.

Single and Hollow Stem Injectors

Control of certain weeds listed in the "WEEDS CONTROLLED" section can be obtained by injecting this concentrated product or solutions of this product directly in or onto the target weed. Ensure that the handheld injector being used for this application is capable of accurately delivering the volume specified on the label. When making stem injections, the combined total use of this product must not exceed 8 quarts per acre per year. At 5 milliliters of concentrated (undiluted) product per stem, 8 quarts will treat approximately 1500 stems per acre per year. The number of stems that can be treated per acre will vary depending on the injection volume and the concentration of this product in the application solution.

8.6 Injection Systems

This product may be used in aerial and ground injection spray systems as a liquid concentrate or diluted prior to injecting into the spray stream. Do not mix this concentrated product with the undiluted concentrate of other products when using injection systems, unless otherwise directed. A non-ionic surfactant concentration of 0.5% or more in the spray stream is required for use of this product in injection systems.

8.7 Controlled Droplet Applicator (CDA)

The amount of this product applied per acre using a controlled droplet applicator (CDA) must be no less than the rate specified on this label for application using conventional broadcast application equipment.

A controlled droplet applicator produces a spray pattern that is not easily visible. Use extreme care to avoid spray or drift from contacting the foliage or any other tissue of desirable vegetation, as plant damage or destruction could result.

9.0 AQUATIC AND TERRESTRIAL USE SITES

This product may be used according to the directions for use described on this label to control weeds, woody brush, trees and vines listed on this label growing in aquatic environments and on any terrestrial site described on this label.

9.1 Aquatic Sites

This product may be used to control emerged weeds, brush, trees and vines in all flowing, non-flowing or transient bodies of fresh and brackish surface water. These bodies of water include lakes, rivers, streams, ponds, estuaries, rice levees, seeps, irrigation and drainage ditches, canals, reservoirs, wetlands and wastewater treatment facilities. This product may also be used to control weeds in intertidal areas below the mean high-water mark and on terrestrial sites where bodies of water may be present and a buffer that will ensure no overspray of the water cannot be maintained.

When applying spray solutions of this product in or near aquatic sites, a nonionic surfactant that is labeled for use with herbicides and approved for direct application to bodies of water must be used. See the "MIXING" section of this label for more information on the use of surfactants with this product.

Before using this product for aquatic weed control or for terrestrial weed control near aquatic sites, read the following information carefully.

- This product does not control plants that are completely submerged or have a majority of their foliage under water.
- There is no restriction on the use of water for irrigation, recreation or domestic purposes following direct application of this product to emerged aquatic plants.
- Consult your local State agency with primary responsibility for regulating pesticides, State fish and wildlife agency and/or water control authority before applying this product to vegetation growing in public waters to determine if a permit is required.
- Do not apply this product directly to water within 0.5 mile upstream of an active potable water intake in flowing water (i.e., river, stream, etc.) or within 0.5 mile of an active potable water intake in a standing body of water, such as a lake, pond or reservoir. To make aquatic applications around and within 0.5 mile of active potable water intakes, the water intake must be turned off for a minimum period of 48 hours after the application. The water intake may be turned on prior to 48 hours if the glyphosate level in the intake water is below 0.7 parts per million as determined by laboratory analysis. These aquatic applications may be made ONLY in those cases where there are alternative water sources or holding ponds that would permit the turning off of an active potable water intake for a minimum period of 48 hours after the application. This restriction does NOT apply to intermittent inadvertent overspray of water on terrestrial use sites.
- To achieve maximum weed control in dry ditches, apply this product within 1 day after water drawdown to ensure application to actively growing weeds and allow a minimum of 7 days after application before reintroduction of water
- Floating mats of vegetation could require more than one application of this product for control. Avoid washing this product off of foliage after application by boat backwash or rainfall within 4 hours of application. Wait a minimum of 24 hours before re-applying this product to the same vegetation.
- Application of this product to moving bodies of water must be made while traveling upstream to prevent concentration of this herbicide in the water.
- When making a bankside application, do not overlap more than 1 foot into open water.
- Do not apply this product to bodies of water where emerged weeds do not exist.
- If applying this product to more than 20 percent of the total area of a body of water, do not apply more than 3.75 quarts per acre in any single broadcast application. If applying to less than 20 percent of the total area of a body of water, any rate listed on this label may be applied. This single application rate restriction does not apply to stream crossings in utility rights-of-way.
- When emerged weed infestations cover the total surface area of an impounded waterbody, apply this product to the emerged vegetation in strips to help avoid oxygen depletion in the water due to decaying vegetation. Oxygen depletion in the water can result in increased fish mortality.

TANK MIXTURES: This product may be applied in a tank mixture with one or more of the following products for enhanced control of aquatic weeds, woody brush, trees and vines in aquatic sites, provided that the product used is labeled for aquatic use. Refer to the individual label of all products used in the tank mixture for approved uses and application rates. Always read and follow label directions for each product in the mix.

Clipper; Garlon 3A Specialty; Habitat; 2,4-D amine; imazapyr; flumioxazin; triclopyr

9.2 Terrestrial Sites

This product may be used according to the directions for use described on this label to control weeds, woody brush, trees and vines listed on this label on any terrestrial site described on this label.

This product may be used to control weeds, woody brush, trees and vines on maintained landscapes, on improved and unimproved land, on lawns and turf and around ornamentals on industrial, commercial and residential sites, including airports, apartment complexes, chaparrals, ditch banks, driveways, dry ditches, dry canals, farmsteads, fencerows, forestry sites, golf courses, greenhouses, lumber yards, manufacturing sites, municipal sites, natural areas, nurseries, office complexes, ornamental beds, parks, parking areas, pastures, petroleum tank farms, pumping installations, railroads, rangeland, recreational areas, residential areas, roadsides, schools, shadehouses, sod and turfgrass seed farms, sports complexes, storage areas, substations, utility rights-of-way, utility sites, warehouse areas, wildlife food plots and wildlife management areas.

This product may be used for non-selective control of unwanted vegetation on any site listed on this label for trim-and-edge application around objects, including around building foundations, equipment storage areas and trees, and along and in fences, and to eliminate unwanted weeds growing in and around established shrub beds and ornamental plantings. This product may also be used for complete elimination of vegetation from a terrestrial site prior to planting ornamentals, flowers, or turfgrass (sod or seed), and prior to land development, including prior to beginning construction projects or the laying of asphalt or other road material. Application of this product may be repeated, as needed, to maintain bare ground, up to a total application of 8 quarts per acre per year.

This product may be used for establishment and maintenance of fuel breaks, for establishing fire perimeters and black lines, along fire roads and to facilitate prescribed burning practices on any site described on this label.

This product may also be used for weed control or growth regulation on Christmas tree farms, citrus orchards, farmsteads, production nurseries, sugarcane fields, sod farms and turfgrass seed farms.

This product requires the addition of a nonionic surfactant to the spray solution labeled for herbicide application. See the "MIXING" section of this label for more information on the use of surfactants with this product.

Unless otherwise directed, application of this product may be made according to the directions for use in the sections that follow on any of these sites using any method of application described on this label to control any weeds, woody brush, trees and vines listed in the "WEEDS CONTROLLED" section of this label.

10.0 ADDITIONAL SITE MANAGEMENT INFORMATION

The following sections contain additional use information specifically related to certain use sites. Unless otherwise directed, any application of this product described in the "WEEDS CONTROLLED" section or any other section of this label may be made on the use sites described in the sections that follow, where applicable, using any method of application described on this label that is appropriate.

10.1 Forestry, Hardwood and Christmas Tree Site Management

This product may be used for control or partial control of woody brush, trees and herbaceous weeds on any tree site, including forestry settings, Christmas tree plantations, and silvicultural and production nursery sties, using any method of application listed on this label. See the "WEEDS CONTROLLED" section of this label for application rates and specific use directions.

Unless otherwise directed, this product requires a nonionic surfactant that is labeled for the intended use on the site of application to be added to the spray mixture. Use of this product without a surfactant will result in reduced performance. See the "MIXING" section of this label for more information on the use of surfactants with this product.

IMPORTANT: SOME SURFACTANTS CAN CAUSE TREE INJURY WHEN DIRECTLY APPLIED TO SOME SPECIES. READ AND FULLY UNDERSTAND ALL APPROVED USES, PRECAUTIONS AND LIMITATIONS OF THE SURFACTANT BEFORE USING.

Weed Management, Site Preparation

This product may be used to control or partially control undesirable woody brush, trees, vines and herbaceous weeds listed on this label for preparing sites prior to planting any tree species, including Christmas trees, eucalyptus trees and hybrid tree cultivars, and for controlling weeds around established trees, for the release of conifer and hardwood trees, establishing wildlife openings and maintaining roads on any tree site.

TANK MIXTURES: This product may be applied in a tank-mix with the products listed in this section to increase the spectrum of vegetation controlled. Any application rate of this product listed on this label may be used in a tank-mix with the following products for tree site management, including site preparation, provided that the product is labeled for the use on the site of application and prior to planting the desired species. Refer to the individual label of all products used in the tank mixture for approved uses and application rates. Read and follow all directions for use and precautions for each product used, including planting interval restrictions, if any. Use this product according to the most restrictive precautionary statements of any product in the mix.

Arsenal; Arsenal Herbicide Applicators Concentrate; Chopper; Chopper GEN2; Escort XP; Forestry Garlon 4 Specialty; Forestry Garlon XRT Specialty; Garlon 3A Specialty; Garlon 4 Specialty; Garlon 4 Ultra Specialty; Landmark; Landmark XP; Oust Extra; Oust XP; imazapyr; metsulfuron methyl; sulfometuron methyl; triclopyr

For control of herbaceous weeds, apply these tank-mix products at the lower end of the application rate range specified on the product label. For control or partial control of dense stands or for hard-to-control woody brush, trees and vines, apply these products at a rate or spray solution concentration towards the higher end of the given range.

Conifer Release, Mid-Rotation Conifer Release, Hardwood Release, Timber Stand Improvement

This product may be applied as a directed spray using a handheld sprayer or using any selective application equipment described on this label to control woody and herbaceous weeds and other undesirable understory vegetation below the tree crop canopy in conifer plantations, hardwood sites, Christmas tree plantations and silvicultural and ornamental nurseries to facilitate the release and growth of conifer and hardwood trees.

This product may also be applied using ground broadcast equipment or as a directed spray application for mid-rotation release under the canopy of pines, other conifers and hardwoods.

PRECAUTIONS: Avoid contact of spray drift, mist or drips with foliage, green bark or non-woody surface roots of desirable plant species. Use application

techniques that prevent or minimize contact of this product with foliage of desired trees or other plants through direct contact or off-target spray movement.

Conifer Release – Broadcast Application

This product may be broadly applied over the top of conifer tree species listed in this section after formation of final conifer resting buds in the fall or prior to initial bud swelling in the spring for control, partial control or suppression of herbaceous weeds and hardwoods listed in the "WEEDS CONTROLLED" section of this label to facilitate the release of these tree species in a forestry, plantation or nursery setting. Unless otherwise directed, make this application only where conifers have been established for a minimum of one growing season.

PRECAUTIONS: Conifer injury can occur when this product is applied at rates higher than prescribed on this label, where spray applications overlap, if application is made when conifers are actively growing, or when they are growing under stress from drought, flood, improper planting or insect, animal or disease damage.

Conifer Release Outside the Southeastern United States

For release of the following conifer species growing for a minimum of one growing season in most areas outside the southeastern United States, apply 24 to 48 fluid ounces of this product per acre as a broadcast application over the top of the conifer trees.

- Douglas Fir
- Fir species
- Hemlock
- Pines*
- California redwood
- Spruce

** Includes all species except loblolly pine, longleaf pine, shortleaf pine or slash pine.*

Apply 24 to 40 fluid ounces of this product for release of Douglas fir, pine and spruce that have been established for only one growing season (except in California).

For release of spruce (*Picea spp.*) in Maine, Michigan, Minnesota, New Hampshire and Wisconsin, up to 2.25 quarts of this product may be applied after formation of final resting buds in the fall for control of woody brush and tree species.

PRECAUTIONS: Ensure that the conifers are well hardened off before application of this product. Some nonionic surfactants can cause tree injury when broadly applied over the top of hemlock and California redwood and in mixed conifer stands. Test the nonionic surfactant to be used for tree safety before using.

Conifer Release in the Southeastern United States

For release of the following conifer species established for more than one growing season in the southeastern United States, apply 36 to 60 fluid ounces of this product per acre in the fall as a broadcast application over the top of the trees. For release of these species after only one growing season, apply only 24 fluid ounces of this product per acre.

- Eastern white pine
- Loblolly pine
- Longleaf pine
- Shortleaf pine
- Slash pine
- Virginia pine

TANK MIXTURES: This product may be applied for conifer release in a tank-mix with the following products to provide a broader spectrum of postemergence weed control and for residual control of weeds listed on the label of those products. Only apply these tank mixtures over the top of conifer species that are approved for this use for all products in the mix. Refer to the individual product labels for approved uses and application rates. Read and follow all directions for use and precautions for each product used. Use this product according to the most restrictive precautionary statements of any product in the mixture.

Arsenal; Arsenal Herbicide Applicators Concentrate; Oust Extra; Oust XP; atrazine; imazapyr; metsulfuron methyl; sulfometuron methyl

For release of Douglas fir established for a minimum of one growing season prior to bud swell in early spring, apply 24 fluid ounces of this product in a tank-mix with an appropriate rate of atrazine. Do not add surfactant for this application.

For herbaceous release of loblolly pine, Virginia pine and longleaf pine in the spring and early summer, apply 12 to 18 fluid ounces of this product per acre in a tank-mix with an appropriate rate of Oust Extra or Oust XP.

Late-Summer and Fall after Resting Bud Formation

For release of jack pine, white pine and white spruce, apply 24 to 48 fluid ounces of this product per acre in a tank-mix with an appropriate rate of Oust Extra or Oust XP that will not harm these conifer species.

For release of Douglas fir, apply 24 to 36 fluid ounces of this product per acre in a tank-mix with an appropriate rate of Arsenal or Arsenal Herbicide Applicators Concentrate.

For release of balsam fir and red spruce, apply 48 fluid ounces of this product per acre in a tank-mix with an appropriate rate of Arsenal or Arsenal Herbicide Applicators Concentrate.

10.2 Native and Wildlife Habitat Management

This product may be used to control exotic and other undesirable vegetation in wildlife habitat and natural areas, including riparian and estuarine areas, rangeland, and wildlife refuges. Application may be made to allow recovery of native plant species or prior to planting desirable native species, and for similar broad-spectrum vegetation control. Spot treatment, cut stump, cut stem, stem injection, wiper applicator and all other methods of application listed on this label may be used to selectively remove unwanted plants for habitat management and enhancement.

This product may also be used to eliminate annual and perennial weeds prior to planting wildlife food plots. Any wildlife food species may be planted after applying this product or native species may be allowed to repopulate the area naturally. If tillage is needed to prepare a seedbed, wait a minimum of 7 days after application before tilling to allow translocation of this product into underground plant parts.

10.3 Ornamental and Production Nursery Management

All uses of this product described on this label may be used in a plant nursery setting using any method of application described.

This product may be used to clear an area of unwanted vegetation prior to planting any ornamental plant, tree, shrub or other plants.

This product may also be used to control weeds growing around established woody ornamental species, such as arborvitae, azalea, boxwood, crabapple, eucalyptus, euonymus, fir, Douglas fir, jojoba, hollies, lilac, magnolia, maple, oak, poplar, privet, pine, spruce and yew. This product may also be used to trim and edge around potted plants and other objects in a plant nursery.

PRECAUTIONS: Protect desirable plants from the spray solution using shields or coverings made of waterproof material. Take care to avoid contact of spray, drift or mist with foliage, green stems or immature bark of established ornamental species.

Greenhouse/Shadehouse

This product may be used to control weeds growing in and around greenhouses and shadehouses.

RESTRICTIONS: Desirable vegetation must not be present during application in a greenhouse. Turn air circulation fans off before applying this product inside a greenhouse or shadehouse and leave them off until the application solution has dried.

10.4 Commercial, Residential and Recreational Area Management

All applications of this product described on this label may be used on commercial, residential and recreational areas, including parks, schools and athletic fields, using any method of application described on this label, including spot treatment of unwanted vegetation, trim-and-edge application around trees, fences, walking paths, buildings, sidewalks, nature trails and other objects in these areas, to eliminate unwanted weeds growing in established shrub and ornamental beds, for turf management and renovation, and to eliminate vegetation from a site prior to development, including prior to planting an area to ornamentals, flowers or turfgrass (sod or seed), or beginning construction projects.

10.5 Pasture Management

The use of this product in pastures includes use on bahiagrass, bermudagrass, bluegrass, brome, fescue, guineagrass, kikuyugrass, orchardgrass, pangola grass, ryegrass, Timothy, and wheatgrass.

Preplant, Preemergence, Pasture Renovation

This product may be applied prior to planting or emergence of forage or perennial grasses. Refer to the "WEEDS CONTROLLED" section of this label for application rates of this product for control of specific weeds.

RESTRICTIONS: If the total application rate of this product is 2.25 quarts per acre or less, no waiting period between application and feeding or livestock grazing is required. If the rate is greater than 2.25 quarts per acre, remove domestic livestock before application and wait a minimum of 8 weeks after application before grazing or harvesting.

Spot Treatment, Wiper Applicator

This product may be applied in pastures as a spot treatment or over the top of desirable grasses using a wiper applicator to control taller growing weeds. For enhanced weed control, remove domestic livestock before application to allow for sufficient plant growth and wait a minimum of 7 days after application before grazing livestock or harvesting for feed. See additional instructions on the use of wiper applicators in the "APPLICATION EQUIPMENT AND TECHNIQUES" section of this label.

RESTRICTIONS: For spot treatment or use with a wiper applicator at rates of 2.25 quarts per acre or less, this product may be applied over the entire pasture or any portion of it. At rates greater than 2.25 quarts per acre, this product may be applied over no more than 10 percent of the total pasture at any one time. Application may be repeated in the same area at 30-day intervals.

Weed Suppression in Dormant Pastures

This product may be applied in dormant pastures to suppress competitive growth and seed production of annual weeds and other undesirable vegetation. Apply 9 to 12 fluid ounces of this product per acre using broadcast application equipment on pastures in late-fall after desirable perennial grasses have reached dormancy or in late-winter before desirable perennial grasses break dormancy and initiate green growth.

PRECAUTIONS: Higher application rates may be used for hard-to-control weeds; however, higher rates can cause stand reduction. Some stunting of perennial grasses can occur if broadcast application is made when they are not dormant.

RESTRICTIONS: No waiting period is required between application and grazing or harvesting for feed. Do not apply more than 2.25 quarts of this product per acre per year onto pasture grasses except for renovation. If reseeding is needed due to severe stand reduction, no waiting period is required after application of this product before seeding the pasture grasses listed at the beginning of this section; for all other pasture grasses, wait a minimum of 30 days after application before seeding.

10.6 Railroad Management

All uses of this product described in the "WEEDS CONTROLLED" or any other section of this label may be used on railroad sites using any method of application described.

This product requires a nonionic surfactant that is labeled for the intended use on the site of application to be added to the spray mixture. If application is to be made where aquatic sites might be directly sprayed or inadvertently oversprayed, the surfactant must be labeled for aquatic use. Use of this product without a surfactant will result in reduced performance. See the "MIXING" section of this label for more information on the use of surfactants with this product.

Application of this product along railroad rights-of-way may be made in up to 80 gallons of spray solution per acre.

Bare Ground, Ballast and Shoulders, Crossings, Spot Treatment

This product may be used to maintain bare ground on railroad ballast and shoulders and reduce the need for mowing and mechanical brush removal along railroad rights-of-way. Application of this product may be repeated as weeds continue to emerge in order to maintain bare ground, up to a maximum total application rate of 8 quarts of this product per acre per year.

TANK MIXTURES: This product may be applied in a tank mixture with the following products for enhanced control of woody brush and trees for bare ground, ballast and shoulder, crossing and spot treatment applications, and other brush, tree and vine control on railroad sites, provided that the product used is labeled for these applications. Not all tank-mix products listed are labeled for aquatic use. Refer to the individual label of all products used in the tank mixture for approved uses and application rates. Always read and follow label directions for each product in the mix.

Arsenal; Arsenal Herbicide Applicators Concentrate; Chopper; Chopper Gen2; Escort XP; Forestry Garlon 4 Specialty; Forestry Garlon XRT Specialty; Garlon 3A Specialty; Garlon 4 Specialty; Garlon 4 Ultra Specialty; Habitat; Hyvar X; Hyvar X-L; Krovar I DF; Oust Extra; Oust XP; Outrider®; Princep 4L; Princep Caliber 90; Princep Liquid; Sahara DG; Scythe; Stalker; Spike 20P Specialty; Spike 80DF Specialty; Telar XP; Transline Specialty; Velpar DF CU; Velpar DF VU; Velpar L; Velpar L CU; Velpar L VU; Vastlan Specialty; 2,4-D; atrazine; bromacil; chlorsulfuron; clopyralid; dicamba; diquat; diuron; hexazinone; imazapyr; metsulfuron methyl; pelargonic acid; simazine; sulfometuron methyl; sulfosulfuron; tebuthiuron; triclopyr

Brush, Tree and Vine Control

This product may be used to control woody brush, trees and vines along railroad rights-of-way. Apply 3 to 8 quarts of this product per acre in up to 80 gallons of spray solution containing 0.5% or more by volume of a nonionic surfactant as a broadcast application using either a boom or boomless sprayer. Apply a 0.75- to 1.5-percent solution of this product when using high-volume application equipment with a spray-to-wet technique, or a 4- to 8-percent solution when using low-volume directed spray for spot treatment.

TANK MIXTURES: This product may be applied in a tank-mix with one or more of the following products for enhanced control of woody brush, trees and vines along railroad rights-of-way, provided that the product is labeled for use on these sites. Refer to the individual product label for approved sites and application rates.

Arsenal; Arsenal Herbicide Applicator's Concentrate; Chopper; Chopper Gen2; Escort XP; Forestry Garlon 4 Specialty; Forestry Garlon XRT Specialty; Garlon 3A Specialty; Garlon 4 Specialty; Garlon 4 Ultra Specialty; Habitat; Krenite S Brush Control Agent; Stalker; Telar XP; Tordon 101 Mixture Specialty; Tordon 22K Specialty; Tordon K Herbicide Specialty; Transline Specialty; Vanquish; Velpar DF CU; Velpar DF VU; Velpar L; Velpar L CU; Velpar L VU; Vastlan Specialty; chlorsulfuron; clopyralid; dicamba; fosamine; hexazinone; imazapyr; metsulfuron methyl; picloram; triclopyr

Weed Control in Dormant and Actively Growing Bermudagrass

This product may be used to control or partially control many annual and perennial weeds in dormant and actively growing bermudagrass along railroad rights-of-way. See the "WEEDS CONTROLLED" section of this label for directions for use of this product for weed control in grasses.

10.7 Rangeland Management

This product will control or suppress many annual weeds growing on perennial cool- and warm-season grass rangeland. Slight discoloration of the desirable grasses could occur, but will re-green and resume growing under moist soil conditions as effects of this product wear off.

Preventing seed production is critical to the control of invasive annual grassy weeds on rangeland. Yearly application of this product to eliminate invasive annual weeds before they produce seed will help eliminate viable weed seeds from the soil. Delay grazing of the area after application of this product to allow desirable perennials to grow, flower and re-seed the area.

***Bromus* Control:** A broadcast application of 9 to 12 fluid ounces of this product per acre will control or suppress downy brome (*Bromus tectorum*), Japanese brome (*Bromus japonicus*), soft chess (*Bromus mollis*), cheatgrass (*Bromus secalinus*), cereal rye and jointed goatgrass on rangeland. For enhanced results, apply this product when most brome plants are in early-flower and before the plants, including seedheads, turn color. Allow for secondary weed flushes to occur after spring rains to further deplete the seed reserve in the soil and encourage perennial grass conversion on weedy sites. Apply this product in the fall in areas where spring moisture is normally limited and fall germination allows for good weed growth and weed seed depletion.

***Medusahead* Control:** To control or suppress medusahead, apply 12 fluid ounces of this product per acre at the 3-leaf stage. Delaying application beyond this stage will result in reduced or unacceptable control. Controlled burning prior to application of this product will eliminate the thatch layer produced by slowly decaying culms. Allow new weed growth to occur before applying this product after a burn. Repeat this application annually to eliminate medusahead seeds in the soil and allow desirable perennial grasses to repopulate the area.

RESTRICTIONS: Do not apply more than 2.25 quarts of this product per acre per year on rangeland. Do not use ammonium sulfate when applying this product on rangeland grasses. No waiting period between application of this product and feeding or livestock grazing is required.

10.8 Roadside Management

All uses of this product described on this label may be used for weed management along roadways, including weed control in dormant and active bermudagrass and bahiagrass, weed control along shoulders and under and around guardrails, signposts and other objects along the road, using any method of application described on this label. If applying this product in areas where the spray solution could inadvertently overspray a body of surface water, a non-ionic surfactant approved for aquatic use must be used. See the "MIXING" section of this label for more information on the use of surfactants with this product.

TANK MIXTURES: This product may be tank-mixed with the following products for shoulder, guardrail, spot treatment and maintaining bare ground applications, provided that the product used is labeled for use on these sites. Not all tank-mix products listed are labeled for aquatic use. Refer to the individual product labels for approved uses and application rates.

AAtrex 4L; AAtrex Nine-0; Banvel; Barricade 65WG; Chopper; Chopper Gen2; Crossbow; Direx 4L; Escort XP; Endurance; Formula 40; Gallery 75 Dry Flowable Specialty; Gallery SC; Garlon 4; Garlon XRT; Hyvar X; Karmex DF; Krenite S Brush Control Agent; Krovar I DF; Landmark; Landmark XP; Oust Extra; Oust XP; Outrider®; Pendulum 3.3 EC; Pendulum AquaCap; Pendimax 3.3; Plateau; Poast; Poast Plus; Princep 4L; Ronstar 50 WSP; Ronstar Flo; Ronstar G; Sahara DG; Surflan AS Specialty; Surflan Flex; Surflan Flex T&O; Surflan Pro; Surflan XL 2G; Telar XP; Tordon K; Vanquish; Vastlan Specialty; Velpar DF CU; Velpar DF VU; Velpar L; Velpar L CU; Velpar L VU; Weedar 64; 2,4-D; atrazine; bromacil; chlorsulfuron; clopyralid; dicamba; diuron; fosamine; hexazinone; imazapic; imazapyr; metsulfuron methyl; oryzalin; oxadiazon; pendimethalin; picloram; prodiamine; simazine; sulfometuron; sulfosulfuron; triclopyr

10.9 Utility Management

This product may be used along electrical power, pipeline and telephone rights-of-way, and on all sites associated with these utility rights-of-way, including substations, access roads and railroads, and along similar rights-of-way that run in conjunction with utilities, for spot treatment of unwanted vegetation, side-trimming, trim-and-edge application around objects, weed control prior to planting a utility site to ornamentals, flowers or turfgrass (sod or seed), turf management, to eliminate unwanted weeds growing in established shrub or ornamental beds, to prepare or establishing wildlife openings and for eliminating vegetation prior to beginning construction projects. Application of this product may be repeated as needed to maintain bare ground as weeds continue to emerge, up to a maximum application rate of 8 quarts per acre per year.

TANK MIXTURES: This product may be tank-mixed with the following products for use on utility sites, provided that the product is labeled for use on these sites. Not all tank-mix products listed are labeled for aquatic use. Refer to the individual product label for approved uses and application rates. For control of herbaceous weeds, use a lower application rate or spray solution concentration within the given ranges for these tank-mix products and increase the rate or concentration toward the higher end of the ranges for control of dense stands or hard-to-control woody brush, trees and vines.

AAtrex 4L; AAtrex Nine-0; Arsenal Herbicide Applicators Concentrate; Endurance; Escort XP; Forestry Garlon 4 Specialty; Forestry Garlon XLT Specialty; Garlon 3A Specialty; Garlon 4 Specialty; Garlon 4 Ultra Specialty; Hyvar XL; Krenite S Brush Control Agent; Krovar I DF; Oust Extra; Oust XP; Outrider®; Plateau; Sahara DG; Surflan AS Agricultural; Surflan AS Specialty; Surflan Flex; Surflan Flex T&O; Surflan XL 2G; Telar XP; Transline Specialty; Vanquish; Velpar DF CU; Velpar DF VU; Velpar L; Velpar L CU; Velpar L VU; Vastlan Specialty; Weedar 64; 2,4-D; atrazine; bromacil; chlorsulfuron; clopyralid; dicamba; diuron; fosamine; hexazinone; imazapic; imazapyr; metsulfuron methyl; oryzalin; pendimethalin; prodiamine; simazine; sulfometuron methyl; sulfosulfuron; triclopyr

Ensure that the Garlon product is thoroughly mixed with water according to label directions before adding this product to the spray mixture. Maintain continuous agitation when adding this product in order to avoid tank-mix compatibility problems.

For enhanced results with side-trimming, apply this product in a tank-mix with one of the Garlon products listed above.

11.0 CROP USES

11.1 Tree, Vine and Shrub Crops

THIS SECTION PROVIDES DIRECTIONS FOR USE THAT APPLY TO ALL TREE, VINE AND SHRUB CROPS LISTED IN THE FOLLOWING SECTIONS. SEE THE INDIVIDUAL CROP SECTIONS FOR SPECIFIC DIRECTIONS FOR USE, PREHARVEST INTERVALS, PRECAUTIONS AND RESTRICTIONS.

TYPES OF APPLICATION: Preplant (site preparation); Broadcast Spray, Selective Equipment (shielded sprayer, wiper applicator), Directed Spray and Spot Treatment in Middles (between rows of trees, vines or bushes) and Strips (within rows of trees, vines or bushes); Site Weed Control; Perennial Grass Suppression; Cut Stump Application

USE INSTRUCTIONS: Unless specifically prohibited in the individual crop sections that follow, this product may be applied using a boom sprayer, controlled droplet applicator (CDA), shielded sprayer, wiper applicator, handheld or backpack sprayer, lance or orchard gun, in middles (between rows of trees, vines or bushes) and strips (within rows of trees, vines or bushes), for weed control or perennial grass suppression in established tree fruit and nut groves, orchards and vineyards. It may also be used for site preparation prior to planting or transplanting these crops.

Apply 12 fluid ounces to 4 quarts of this product per acre as directed in the "WEEDS CONTROLLED" section of this label. Use a higher application rate within a given range when weeds are stressed, growing in dense populations or greater than 12 inches tall. Application may be repeated as needed up to a maximum of 8 quarts of this product per acre per year. See the "PRODUCT INFORMATION" section of this label for more information on Maximum Application Rates.

PRECAUTIONS: Use extreme care to avoid contact of this herbicide solution, spray, drift or mist with foliage or green bark of trunk, branches, suckers, fruit or other parts of desirable trees, canes and vines. Avoid application when recent pruning wounds or other mechanical injury have occurred. Contact of this product with other than matured brown bark could result in serious crop damage or destruction. Only shielded or directed sprayers may be used in crops where potential for crop contact is high, and then only where there is sufficient clearance. For application in strips (within rows of trees), only selective equipment (directed sprayer, hooded sprayer, shielded sprayer or wiper applicator) may be used in order to minimize the potential for overspray or drift of this product onto the crop. For berry crops, hooded sprayers must be fully enclosed including top, sides, front and back. Only wiper applicators or shielded sprayers capable of preventing all contact of this product with the crop may be used. See additional use instructions and precautions in the "APPLICATION EQUIPMENT AND TECHNIQUES" section of this label.

RESTRICTIONS: Allow a minimum of 3 days between application of this product and transplanting.

Middles (between rows)

USE INSTRUCTIONS: This product will control or suppress annual and perennial weeds and ground covers growing between rows of tree, vine and shrub crops listed on this label. If weeds are under drought stress, irrigate prior to application. Reduced weed control could result if weeds have been recently mowed at the time of application.

TANK MIXTURES: A tank mixture of this product with Goal 2XL may be applied for annual weed control between rows (middles) of a variety of tree, vine and shrub crops when weeds are stressed or growing in dense populations. Application of 12 to 24 fluid ounces of this product per acre plus an appropriate rate of Goal 2XL will control annual weeds with a maximum height or length of 6 inches, including crabgrass, common groundsel, junglerice, common lambsquarters, redroot pigweed, London rocket, common ryegrass, shepherd's-purse, annual sowthistle, filaree (suppression), horseweed/marestail, stinging nettle and common purslane (suppression). This tank-mix will also control common cheeseweed (malva) or hairy fleabane with a maximum height or length of 3 inches.

This product may also be applied to row middles in tank mixtures with the following products.

2,4-D; bromacil; clethodim; diuron; fluazifop-P-butyl; flumioxazin; glufosinate-ammonium; indaziflam; napropamide; norflurazon; oryzalin; oxyfluorfen; pendimethalin; penoxsulam; pyraflufen ethyl; rimsulfuron; saflufenacil; sethoxydim; simazine; thiazopyr
Alion; Chateau Herbicide SW; Devrinol 2-XT; Devrinol 50-DF; Devrinol 50-DF Ornamental; Devrinol DF-XT; Devrinol DF-XT Ornamental; Direx 4L; Dri-Clean; Fusilade II Turf & Ornamental; Fusilade DX; Goal 2XL; GoalTender; Karmex DF; Matrix FNV; Matrix SG; Orchard Master Broadleaf; Orchard Master CA; Pindar GT; Poast; Poast Plus; Prowl 3.3 EC; Prowl H2O; Princep 4L; Princep Caliber 90; Princep Liquid; Rely 280; Select; Select 2 EC; Select Max Herbicide with Inside Technology; Simazine 4L; Simazine 4L Flowable; Simazine 90DF; Simazine 90 WDG; Sim-Trol 4L; Sim-Trol DF; Solicam DF; Surflan AS Agricultural; Surflan AS Specialty; Surflan Flex; Surflan Flex T&O; Surflan XL 2G; Treevix Powered by Kixor; Venue; Visor Broadcrop

Ensure that the product used is labeled for application within the crop being grown. Read and follow label directions for all products in the tank mixture.

Strips (within rows)

TANK MIXTURES: This product may be applied within rows of tree, vine and shrub crops in tank mixtures with the following products.

2,4-D; bromacil; clethodim; diuron; fluazifop-P-butyl; flumioxazin; glufosinate-ammonium; indaziflam; napropamide; norflurazon; oryzalin; oxyfluorfen; pendimethalin; penoxsulam; pyraflufen ethyl; rimsulfuron; saflufenacil; sethoxydim; simazine; thiazopyr
Alion; Chateau Herbicide SW; Devrinol 2-XT; Devrinol 50-DF; Devrinol 50-DF Ornamental; Devrinol DF-XT; Devrinol DF-XT Ornamental; Direx 4L; Dri-Clean; Fusilade II Turf & Ornamental Fusilade DX; Goal 2XL; GoalTender; Karmex DF; Matrix FNV; Matrix SG; Orchard Master Broadleaf; Orchard Master CA; Pindar GT; Poast; Poast Plus; Prowl 3.3 EC; Prowl H2O; Princep 4L; Princep Caliber 90; Princep Liquid; Rely 280; Select; Select 2 EC; Select Max Herbicide with Inside Technology; Simazine 4L; Simazine 4L Flowable; Simazine 90DF; Simazine 90 WDG; Sim-Trol 4L; Sim-Trol DF; Solicam DF; Surflan AS Agricultural; Surflan AS Specialty; Surflan Flex; Surflan Flex T&O; Surflan XL 2G; Treevix Powered by Kixor; Venue; Visor Broadcrop

Ensure that the product used is labeled for application within the crop being grown. Read and follow label directions for all products in the tank mixture.

RESTRICTIONS: Do not apply these tank mixtures in Puerto Rico.

Perennial Grass Suppression

This product will suppress perennial grasses such as bahiagrass, bermudagrass, tall fescue, orchardgrass, Kentucky bluegrass and quackgrass that are grown as ground covers in tree, vine and shrub crops.

For suppression of tall fescue, fine fescue, orchardgrass and quackgrass, apply 6 fluid ounces of this product in 10 to 20 gallons of water per acre.

For suppression of Kentucky bluegrass covers, apply 4.5 fluid ounces of this product per acre. Do not add ammonium sulfate to the spray mix.

For enhanced results, mow cool-season grass covers in the spring to even their height and then apply this product 3 to 4 days after mowing.

For suppression of vegetative growth and seedhead inhibition of bahiagrass for approximately 45 days, apply 4.5 fluid ounces of this product in 10 to 25 gallons of water per acre 1 to 2 weeks after full green-up or after mowing to a uniform height of 3 to 4 inches prior to seedhead emergence. For suppression for up to 120 days, apply 3 fluid ounces of this product per acre, followed by an application of 1.5 to 3 fluid ounces per acre about 45 days later. Make no more than two applications per year.

For burndown of bermudagrass, apply 24 to 48 fluid ounces of this product in 3 to 20 gallons of water per acre. Make this application only if a reduction of the bermudagrass stand can be tolerated. When burndown is required prior to harvest, make the application a minimum of 21 days prior to harvest to allow sufficient time for burndown to occur.

For suppression of bermudagrass, apply 4.5 to 12 fluid ounces of this product per acre east of the Rocky Mountains and 12 fluid ounces west of the Rocky Mountains in a total spray volume of 3 to 20 gallons per acre no sooner than 1 to 2 weeks after full green-up. If the bermudagrass is mowed prior to application, maintain a minimum of 3 inches in height. Sequential applications may be made when re-growth occurs and bermudagrass injury and stand reduction can be tolerated. East of the Rocky Mountains, apply 4.5 to 7.5 fluid ounces of this product per acre under shaded conditions or where a lesser degree of suppression is desired.

Cut Stump Application

Application of this product to a freshly cut tree stump may be made during site preparation or site renovation to control regrowth and re-sprouting of stumps of many tree species, some of which are listed below.

Citrus Trees: Calamondin, Chironja, Citron, Citrus hybrids, Grapefruit, Kumquat, Lemon, Lime, Mandarin (Tangerine), Orange (all), Pummelo, Tangelo, Tangor

Fruit Trees: Apple, Apricot, Cherry (sweet, sour), Crabapple, Loquat, Mayhaw, Nectarine, Olive, Peach, Pear, Plum/Prune (all), Quince

Nut Trees: Almond, Beechnut, Brazil nut, Butternut, Cashew, Chestnut, Chinquapin, Filbert (hazelnut), Hickory nut, Macadamia, Pecan, Pistachio, Walnut (black, English)

USE INSTRUCTIONS: Cut the tree close to the soil surface and immediately apply a 50- to 100-percent (undiluted) solution of this product to the freshly cut surface using application equipment capable of covering the entire cambium. A delay in application could result in reduced performance. For enhanced results, cut the tree during period of active growth and full leaf expansion and apply this product.

PRECAUTIONS: DO NOT MAKE A CUT STUMP APPLICATION WHEN THE ROOTS OF ADJACENT DESIRABLE TREES MIGHT BE GRAFTED TO THE ROOTS OF THE CUT STUMP, AS INJURY COULD OCCUR IN ADJACENT TREES. Some sprouts, stems or trees can share a common root system. Adjacent trees having a similar age, height and spacing could be an indicator of a shared root system. Whether grafted or shared, injury is likely to occur to adjacent stems or trees when this product is applied to one or more trees sharing a common root system.

11.1.1 Citrus Fruit Crops

LABELED CROPS: All cultivars, varieties and/or hybrids of Calamondin; Chironja; Citron; Citrus Hybrids; Grapefruit (including Japanese summer); Kumquat; Lemon; Lime (including Australian desert lime, Australian finger lime, Australian round lime, Brown river finger lime, Mount white, New Guinea wild, Russell river, sweet, and Tahiti); Mandarin (including Mediterranean, Satsuma); Orange (all); Pummelo; Tangelo (ugli); Tangerine (Mandarin); Tangor; Uniq Fruit (ugli)

TYPES OF APPLICATION: Preplant (site preparation); Broadcast Spray, Selective Equipment (shielded sprayer, wiper applicator), Directed Spray or Spot Treatment in Middles (between rows of trees) or Strips (within rows of trees); Perennial Grass Suppression; Cut Stump Application

USE INSTRUCTIONS: The following use instructions pertain to application in Florida and Texas only.

For burndown or control of the weeds listed below, apply this product at the specified rate in 3 to 30 gallons of water per acre. Where weed foliage is dense, use 10 to 30 gallons of water per acre.

To control goatweed, apply 48 to 72 fluid ounces of this product in 20 to 30 gallons of water per acre when plants are actively growing. Apply 48 fluid ounces per acre when plants are less than 8 inches tall and 72 fluid ounces per acre when plants are greater than 8 inches tall. If goatweed is greater than 8 inches tall, the use of this product in a tank-mix with Krovar I or Karmex could improve weed control. Refer to the individual product labels for specific crops, rates, geographic restrictions and precautionary statements.

Weed Species	Level of Perennial Weed Control at Various Application Rates (amount of this product per acre)			
	24 fl oz	48 fl oz	2.25 quarts	3.75 quarts
Bermudagrass	B	–	PC	C
Guinea grass				
Texas and Florida Ridge	B	C	C	C
Florida Flatwoods	–	B	C	C
Para grass	B	C	C	C
Torpedograss	S	–	PC	C

S = Suppression, PC = Partial Control, B = Burndown, C = Control

RESTRICTIONS: Allow a minimum of 1 day between application and harvest of citrus fruit crops. For citron groves, apply as a directed spray only.

11.2 Annual and Perennial Crops

THIS SECTION PROVIDES DIRECTIONS FOR USE OF THIS PRODUCT THAT APPLY TO ALL CROPS LISTED IN THE FOLLOWING SECTIONS. SEE THE INDIVIDUAL CROP SECTIONS FOR SPECIFIC USE INSTRUCTIONS, PREHARVEST INTERVALS, AND ADDITIONAL PRECAUTIONS AND RESTRICTIONS.

TYPES OF APPLICATION: Chemical Fallow; Preplant Fallow Beds; Preplant; At-Planting; Preemergence; Hooded Sprayer in Row Middles; Shielded Sprayer in Row Middles; Wiper Applicator in Row Middles; Post-Harvest

USE INSTRUCTIONS: This product may be applied during fallow intervals preceding planting, prior to planting or transplanting, at-planting, or preemergence to annual and perennial crops listed on this label, except where specifically limited. For any crop not listed on this label, application must be made a minimum of 30 days prior to planting. Unless otherwise directed, apply this product according to the rates listed in the "WEEDS CONTROLLED" section of this label. Application rates specified on this label for hard-to-control weeds, or those specified on separate supplemental labeling for this product, supersede the rates in the "WEEDS CONTROLLED" section of this label. Additional information on hard-to-control weeds can be found on Fact Sheets published for this product.

Application of this product may be repeated as needed up to a maximum of 6 quarts per acre per year. Refer to specific use sections of this label for additional information on minimum intervals required before re-application of this product.

Hooded sprayers and wiper applicators capable of preventing all contact of the herbicide solution with the crop may be used in mulched or unmulched row middles after crop establishment. Wiper applicators may be used over the top of crops to control tall weeds only when specifically directed in the individual crop sections that follow. Crop injury is possible with these methods of application. Refer to the "APPLICATION EQUIPMENT AND TECHNIQUES" section of this label for information regarding the potential for crop injury using selective application equipment.

Spot treatment application of this product for weed control in a cropping system may be made only when specifically directed in the individual crop sections that follow.

Unless otherwise prohibited, all applications of this product described in the sections that follow may be made using aerial application equipment where appropriate, provided that the applicator complies with the precautions and restrictions specified on this label and on all supplemental labeling published for this product. Refer to the "APPLICATION EQUIPMENT AND TECHNIQUES" section of this label for information on aerial application and procedures for avoiding spray drift that could cause injury to any vegetation not intended for application. Use of appropriate buffers will help prevent injury to adjacent vegetation.

TANK MIXTURES: This product may be tank-mixed with other herbicides to provide residual weed control, a broader weed control spectrum or an alternate mechanism of action. Always read and follow label directions for all products in the tank mixture. Use all products according to rates and timing specified on the label. Some tank-mix products have the potential to cause crop injury. Read the label for all products in the tank mixture prior to use to determine the potential for crop injury. Always predetermine the compatibility of tank-mix products together in the carrier by mixing small proportional quantities in advance. Mixing other products with this herbicide in the spray tank can cause incompatibility, antagonism, or a reduction in the efficacy of this product. Bayer CropScience LP has not tested all product formulations for compatibility or performance in a tank-mix with this product. To the extent consistent with applicable law, buyer and all users are responsible for any and all loss or damage in connection with the use or handling of mixtures of this product with herbicides or other materials that are not specifically identified on this label or on separate supplemental labeling or Fact Sheets for this product. See the "MIXING" section of this label for more information on tank mixtures.

PRECAUTIONS: Avoid contact of this herbicide with foliage, green shoots or stems, bark, exposed roots (including those emerging from plastic mulch), or fruit of crops, as severe crop injury or destruction could result. Transplant seedlings coming into contact with weeds that are still wet with a spray solution of this product could result in significant crop injury. When making preemergence applications, application must be made before crop emergence to avoid severe crop injury. Broadcast application of this product at emergence will result in injury or death of emerged seedlings. Apply before seed germination in coarse sandy soils to further minimize the risk of crop injury. In crops where spot treatment is allowed, the crop sprayed with this product will be killed along with the weeds. Take care not to spray or allow spray to drift outside the target area in order to avoid unwanted crop destruction. See the "APPLICATION EQUIPMENT AND TECHNIQUES" section of this label for additional information.

Preharvest application on crops grown for seed could result in a reduction in germination or vigor. To the extent consistent with applicable law, buyer and all users are responsible for any and all loss or damage in connection with the preharvest use of this product on any crop grown for seed.

RESTRICTIONS: Observe the maximum application rates stated throughout this label. Maximum application rates apply to the use of this product combined with the use of any and all other herbicides containing glyphosate as the active ingredient, whether applied separately or as mixtures. Calculate the application rates (glyphosate acid equivalents) and ensure that the total use of this and other glyphosate-containing products does not exceed the stated maximum rate. See the "PRODUCT INFORMATION" section of this label for more information on Maximum Application Rates.

Unless otherwise directed on this label, application using selective equipment, including wiper applicators and hooded sprayers, must be made a minimum of 14 days prior to harvest. In crops where spot treatment is allowed, do not apply this product to more than 10 percent of the total field to be harvested, unless otherwise directed. Post-harvest and fallow application must be made a minimum of 30 days prior to the planting of any crop not listed on this label.

Do not harvest or feed vegetation from an area for 8 weeks following broadcast postemergence application, unless otherwise directed.

When applying this product as a tank mixture with one or more products, refer to each individual tank-mix product label for restrictions and apply the mixture in accordance with the most restrictive statements for each product in the tank.

11.2.1 Sugarcane

TYPES OF APPLICATION: Chemical Fallow; Preplant; At-Planting; Preemergence; Hooded Sprayer in Row Middles; Shielded Sprayer in Row Middles; Wiper Applicator in Row Middles; Spot Treatment; Plant Growth Regulator; Post-Harvest

Preplant, At-Planting, Preemergence

USE INSTRUCTIONS: This product may be applied in or around sugarcane fields, or in fields prior to the emergence of plant cane.

RESTRICTIONS: Do not apply to vegetation in or around ditches, canals or ponds containing water to be used for irrigation unless the surfactant added to the spray solution is labeled for herbicide use and approved for aquatic application.

Spot Treatment

USE INSTRUCTIONS: This product may be applied as a spot treatment in sugarcane. For control of volunteer or diseased sugarcane, apply a 1-percent solution of this product in water using a handheld sprayer and a spray-to-wet technique. Enhanced results can be obtained on volunteer or diseased sugarcane when application is made when there are at least 7 new leaves. Avoid contact of this herbicide with healthy sugarcane plants as severe damage or destruction could result.

RESTRICTIONS: Do not feed or graze treated sugarcane foliage within the application area.

Hooded Sprayer

USE INSTRUCTIONS: This product may be applied using a hooded sprayer for weed control in between rows of sugarcane. See additional instructions on the use of hooded sprayers in the "APPLICATION EQUIPMENT AND TECHNIQUES" section of this label.

PRECAUTIONS: Do not allow weeds within the application area to come into contact with the crop.

Plant Growth Regulation

USE INSTRUCTIONS: This product may be used as a foliar-applied plant growth regulator to hasten ripening and extend the period of high sucrose level in both low- and high-tonnage sugarcane. Most of the sucrose increase is concentrated in the top nodes of the cane stalk. To maximize sugar recovery where topping is practiced at harvest, top at the base of the fourth leaf. Consult your state sugarcane authority or local Bayer CropScience LP representative regarding the degree of sucrose response that can be anticipated prior to application of this product.

As a result of leaf desiccation, improved trash burn can be expected.

Apply this product at the following rates and timing according to the State in which the sugarcane is grown. Use a higher application rate within the given range when applying to sugarcane under adverse ripening conditions or to less responsive varieties.

FLORIDA – Apply 6 to 14 fluid ounces of this product per acre 3 to 5 weeks before harvest of LAST RATOON CANE ONLY.

HAWAII – Apply 10 to 24 fluid ounces of this product per acre 4 to 10 weeks before harvest.

LOUISIANA – Apply 4 to 14 fluid ounces of this product per acre 3 to 7 weeks before harvest of RATOON CANE ONLY.

PUERTO RICO – Apply 6 fluid ounces of this product per acre 3 to 5 weeks before harvest of RATOON CANE ONLY.

TEXAS – Apply 6 to 14 fluid ounces of this product per acre 3 to 5 weeks before harvest of RATOON CANE ONLY.

PRECAUTIONS: Application of this product can initiate development of shooting eyes. This product might not increase the sucrose content of sugarcane under conditions of good natural ripening. Within 2 to 3 weeks after application, this product could produce a slight yellowing to a pronounced browning and drying of leaves, and a shortening of upper internodes. Spindle death could occur.

Rainfall within 6 hours after application could reduce the effectiveness of this product.

Application to sugarcane grown for seed could result in a reduction in germination or vigor. To the extent consistent with applicable law, buyer and all users are responsible for any and all loss or damage in connection with the preharvest use of this product on sugarcane grown for seed.

RESTRICTIONS: Do not feed or graze sugarcane forage following application. Do not plant subsequent crops within 30 days after application of this product other than the following: alfalfa or other forage legumes, beans (all types), corn (all types), cotton, melons (all types), pasture grasses, peanuts, potatoes (Irish or sweet), sorghum (milo), soybean, squash (all types) or wheat.

Do not apply for enhanced ripening to any crops other than sugarcane. Use of this product in any manner not consistent with this label could result in injury to persons, animals or crops, or other unintended consequences.

Fallow Treatment

USE INSTRUCTIONS: This product may be used as a replacement for tillage in fields that are lying fallow between sugarcane crops. This product may also be used to remove the last stubble of ratoon cane by applying 3 to 3.75 quarts of this product in 10 to 40 gallons of water per acre to new growth having at least 7 new leaves. Allow a minimum of 7 days after application before tillage. Aerial application of up to 72 fluid ounces per acre may be made onto fallow sites where there is sufficient buffer to prevent drift onto adjacent crops. Tank mixtures with 2,4-D or dicamba may be used. Ensure that the product used is labeled for this application in sugarcane. Read and follow label directions for all products in the tank mixture.

11.3 Grass Seed and Sod Production

USE INSTRUCTIONS: Refer to the "WEEDS CONTROLLED" section of this label for application rates of this product for specific weeds. When applied as directed, this product will control those annual and perennial grasses and broadleaf weeds listed. Application rates specified on this label for hard-to-control weeds, or those specified on separate supplemental labeling for this product, supersede rates listed in the "WEEDS CONTROLLED" section of this label. Additional information on hard-to-control weeds can be found on Fact Sheets published for this product.

LABELED CROPS: Any grass (*Gramineae* family) except Corn; Sorghum; Sugarcane; Barley; Buckwheat; Millet (pearl, proso); Oats; Rice; Rye; Quinoa; Teff; Teosinte; Triticale; Wheat (all types); Wild rice

TYPES OF APPLICATION: Preplant; At-Planting; Preemergence; Renovation; Removal of Established Stands; Site Preparation; Shielded Sprayer; Wiper Application; Spot Treatment; Creating Rows in Annual Ryegrass

Preplant, At-Planting, Preemergence, Renovation, Removal of Established Stand, Site Preparation

USE INSTRUCTIONS: This product controls most existing vegetation for purposes of renovating turf or forage grass seed production areas, or for establishing turfgrass grown for sod. This product may be used to destroy undesirable grass vegetation when production fields are converted to alternative species or crops. Do not disturb soil or underground plant parts before application and delay tillage or renovation techniques, including vertical mowing, coring and slicing, for a minimum of 7 days after application to allow for herbicide translocation into underground plant parts.

Apply before, during or after planting, or for renovation purposes. Where existing vegetation is growing under mowed turfgrass management, apply this product after omitting at least one regular mowing to allow sufficient growth for good interception of the herbicide spray. For maximum control of existing vegetation, delay planting until determining if any re-growth of underground plant parts will occur. Where repeat applications are necessary, sufficient re-growth must be attained prior to application. For warm-season grasses, such as bermudagrass, summer or fall application provides enhanced control. Broadcast application of this product may be used to control sod remnants or other unwanted vegetation after sod is harvested. Application rates of up to 3.75 quarts per acre may be used to totally remove an established stand of hard-to-kill grass species.

RESTRICTIONS: If application rate is 2.25 quarts of this product per acre or less, no waiting period between application and feeding or livestock grazing is required. If the rate is greater than 2.25 quarts per acre, remove domestic livestock before application and wait 8 weeks after application before grazing or harvesting. Crops listed on this label may be planted into the area at any time; all other crops may be planted 30 days after application.

Shielded Sprayer

USE INSTRUCTIONS: Apply 24 to 72 fluid ounces of this product in 10 to 20 gallons of water per acre using a shielded sprayer to control weeds between grass seed rows. Uniform planting in straight rows will aid shielded sprayer application. Enhanced results can be obtained when the grass seed crop is small enough to easily pass by the protective shields. See additional instructions on the use of shielded sprayers in the "APPLICATION EQUIPMENT AND TECHNIQUES" section of this label.

PRECAUTIONS: Contact of this product in any manner to any vegetation to which application is not intended could cause damage.

Wiper Applicator

USE INSTRUCTIONS: This product may be applied over the top of desirable grasses using a wiper applicator for the control of tall weeds. See additional instructions on the use of wiper applicators in the "APPLICATION EQUIPMENT AND TECHNIQUES" section of this label.

PRECAUTIONS: Droplets, mist, foam or splatter of the herbicide solution settling onto desirable vegetation could result in discoloration, stunting or destruction.

Spot Treatment

USE INSTRUCTIONS: Apply a 1-percent solution of this product using a handheld sprayer to control weeds within established vegetation prior to heading of grasses grown for seed or to control sod remnants or other unwanted vegetation after sod is harvested.

PRECAUTIONS: This product will kill the desirable grasses along with the weeds. Take care not to spray or allow spray to drift outside the target area in order to avoid unwanted crop destruction.

Creating Rows in Annual Ryegrass

USE INSTRUCTIONS: Use low-pressure nozzles or drop nozzles designed to target the application over a narrow band. Set nozzle height to establish the desired row spacing and apply 12 to 24 fluid ounces of this product per acre. Enhanced results can be obtained when application is made before ryegrass reaches 6 inches in height. Use the higher application rate within this range when ryegrass is greater than 6 inches in height.

PRECAUTIONS: Take care not to spray or allow spray to drift outside target area in order to avoid unwanted crop destruction. To the extent consistent with applicable law, grower assumes all responsibility for crop losses resulting from misapplication of this product.

12.0 WEEDS CONTROLLED

Read the entire label before proceeding to use this product.

Unless otherwise directed, this product requires the addition of a nonionic surfactant that is labeled for use with herbicides to the spray solution. See the "MIXING" section of this label for more information on the use of surfactants with this product.

Always use the higher application rate or spray solution concentration of this product within a given range when weed growth is heavy or dense, or when weeds are growing in an undisturbed (non-cultivated) area.

Poor weed control could be realized if application is made to weeds covered with dust. For weeds that have been mowed, grazed or cut, allow re-growth to occur prior to application of this product.

Refer to the sections that follow for application rates and timing of application for the control of annual and perennial weeds and woody brush, trees and vines.

12.1 Weed Control, Renovation and Chemical Mowing in Turf

The use of this product described in this section may be applied to turfgrass growing on any terrestrial site listed on this label. Ensure that any tank-mix product applied with this product is labeled for the intended use and on the site of application.

Weed Control in Dormant Bermudagrass and Bahiagrass

This product may be used to control or suppress many winter annual weeds and tall fescue for effective release of dormant bermudagrass and bahiagrass prior to spring green-up in areas where these turfgrasses are desirable ground covers and some temporary injury or discoloration can be tolerated.

Apply 6 to 48 fluid ounces of this product in 10 to 40 gallons of water per acre when bermudagrass and bahiagrass are dormant and prior to spring green-up.

Application of more than 12 fluid ounces of this product per acre on highly maintained bermudagrass and bahiagrass turf, such as golf courses and lawns, could result in injury or delayed green-up in the spring.

For residual weed control in dormant bermudagrass and bahiagrass, this product may be tank-mixed with Outrider®, Oust Extra or Oust XP herbicides. Apply 6 to 48 fluid ounces of this product in a tank-mix with an appropriate rate of Outrider, Oust Extra or Oust XP herbicide in 10 to 40 gallons of water per acre. To avoid delays in green-up and minimize injury, apply no more than 1 ounce of Oust Extra or Oust XP herbicide per acre on bermudagrass and no more than 0.5 ounce on bahiagrass, and avoid application when these grasses are in a semi-dormant condition.

DO NOT apply this product in a tank-mix with Outrider, Oust Extra or Oust XP herbicides on highly maintained bermudagrass and bahiagrass turf, such as on golf courses and lawns.

Weed Control in Actively Growing Bermudagrass

This product may be used to control or partially control many annual and perennial weeds in actively growing bermudagrass. Some bermudagrass injury could result from the application of this product, but the bermudagrass will recover under moist conditions once the effects of the product wear off. Use only on well-established bermudagrass where some temporary injury or discoloration can be tolerated.

Apply 12 to 36 fluid ounces of this product in 10 to 40 gallons of spray solution per acre. Use a lower application rate within this range when controlling annual weeds less than 4 inches tall (or runner length) and increase the rate towards the upper end of the range as weeds increase in size or as they approach flower or seedhead formation. At these application rates, this product will provide partial control of the following perennial weeds in actively growing bermudagrass:

- Bahiagrass
- Bluestem, silver
- Fescue, tall
- Johnsongrass
- Trumpetcreeper
- Vaseygrass

PRECAUTIONS: Applying more than 12 fluid ounces of this product per acre on highly maintained bermudagrass, such as on golf courses and lawns, could cause unacceptable turf injury and discoloration.

For a broader weed control spectrum in actively growing bermudagrass, this product may be tank-mixed with Outrider, Oust Extra or Oust XP herbicides. Apply these tank-mixtures only on well-established bermudagrass where some temporary injury or discoloration can be tolerated. Make no more than one application of this product in these tank mixtures in the same season, otherwise the bermudagrass could be severely injured.

Apply 6 to 24 fluid ounces of this product per acre in a tank-mix with Outrider herbicide for control or partial control of Johnsongrass and other weeds listed on the Outrider herbicide label. Use a higher application rate of both products within the given ranges for control of annual or perennial weeds greater than 6 inches tall.

Apply 12 to 24 fluid ounces of this product per acre in a tank-mix with Oust Extra or Oust XP herbicide per acre for enhanced control of weeds listed on those labels. Use a lower application rate of each product within the given ranges to control annual weeds listed on the labels that are less than 4 inches tall (or runner length) and increase the rates toward the upper end of the ranges as annual weeds increase in size and approach the flower or seedhead stage. This tank-mix will provide partial control of the following perennial weeds in actively growing bermudagrass:

- Bahiagrass
- Bluestem, silver
- Broomsedge
- Dallisgrass
- Dock, curly
- Dogfennel
- Fescue, tall
- Johnsongrass
- Poorjoe
- Trumpetcreeper
- Vaseygrass
- Vervain, blue

PRECAUTIONS: Apply these tank mixtures only on well-established bermudagrass where some temporary injury or discoloration can be tolerated. DO NOT apply this product in a tank mixture with Outrider or Oust herbicides on highly maintained bermudagrass, such as on golf courses and lawns.

Weed Control in Actively Growing Bahiagrass

For suppression of vegetative growth and seedhead inhibition of bahiagrass for approximately 45 days, apply 4 fluid ounces of this product in 10 to 40 gallons of water per acre 1 to 2 weeks after full green-up or after mowing to a uniform height of 3 to 4 inches prior to seedhead emergence.

For growth suppression of bahiagrass for up to 120 days, apply 3 fluid ounces of this product per acre, followed by an application of 2 to 3 fluid ounces per acre about 45 days later. Make no more than two growth suppression applications per year.

For broad spectrum weed control in actively growing bahiagrass, this product may be tank-mixed with Outrider®, Oust Extra or Oust XP herbicides.

Apply 1.5 to 3.5 fluid ounces of this product per acre in a tank-mix with an appropriate rate of Outrider herbicide per acre to control perennial weeds or annual weeds greater than 4 inches in height.

Apply 4 fluid ounces of this product per acre in a tank-mix with an appropriate rate of Oust Extra or Oust XP herbicide 1 to 2 weeks following an initial spring mowing for enhanced control of weeds listed on the Oust herbicide label in actively growing bahiagrass. Make this application only once per year.

PRECAUTIONS: Apply these tank mixtures only on well-established bahiagrass where some temporary injury or discoloration can be tolerated.

Turf Renovation

This product controls most existing vegetation prior to renovating turfgrass areas or establishing turfgrass grown for seed or sod. For maximum control of existing vegetation, delay planting or sodding until after determining if any re-growth of underground plant parts will occur. Where repeat applications are necessary, sufficient re-growth must be attained prior to re-application of this product. Summer or fall application provides enhanced control of warm-season grasses, such as bermudagrass. For managed turfgrass, apply this product after omitting at least one regular mowing to allow sufficient growth for good interception of the spray solution.

This product has no residual soil activity and will not affect plants, seed or sod planted back into the area after application.

A handheld sprayer may be used for spot treatment of unwanted vegetation growing in existing turfgrass. Broadcast application or spot treatment using a handheld sprayer may be used to control sod remnants or other unwanted vegetation after sod is harvested.

PRECAUTIONS: Do not disturb soil or underground plant parts before application of this product. Delay tillage and renovation techniques, such as vertical mowing, coring or slicing, a minimum of 7 days after application to allow translocation of this herbicide into underground plant parts.

RESTRICTIONS: If application rates total 2.25 quarts of this product per acre or less, no waiting period between application and feeding or livestock grazing is required. If the rate is greater than 2.25 quarts per acre, remove domestic livestock before application and wait 8 weeks after application before grazing or harvesting.

Chemical Mowing

This product may be used to suppress growth of perennial and annual grasses to serve as a substitute for mowing.

Perennial Grasses – apply 5 fluid ounces of this product per acre to suppress growth of Kentucky bluegrass, or 6 fluid ounces to suppress tall fescue, fine fescue, orchardgrass, quackgrass or reed canarygrass in 10 to 40 gallons of spray solution per acre after grasses have greened up to at least 75 percent green color in the spring, or 7 to 10 days after mowing when sufficient

re-growth has occurred to provide a desirable height for growth regulation. Use chemical mowing only in areas where some temporary injury or discoloration of perennial grasses can be tolerated.

Annual Grasses – apply 3 to 4 fluid ounces of this product in 10 to 40 gallons of spray solution per acre to suppress growth of some annual grasses, such as annual ryegrass, wild barley and wild oats when actively growing in coarse turf on roadsides or other industrial areas and before the seedheads are in the boot stage of development. This application could injure the desired annual grasses.

PRECAUTIONS: Use this product for chemical mowing only in areas where some temporary injury or discoloration of perennial and annual grasses can be tolerated.

12.2 Annual Weeds

Annual weeds are easiest to control when they are small and actively growing. New leaf development indicates active growth.

To control or partially control the annual weeds listed in this section when they are less than 6 inches in height or runner length and actively growing, apply 24 fluid ounces of this product per acre. If they are over 6 inches in height or runner length, or slowly growing under stressed conditions, increase the application rate to 1 to 4 quarts per acre, depending on weed height and the severity of the poor growing conditions.

For application using a handheld sprayer with a spray-to-wet technique, apply a 0.5-percent solution of this product to annual weeds less than 6 inches in height or runner length prior to seedhead formation in grasses or bud formation in broadleaf weeds. To control annual weeds over 6 inches tall, or even smaller weeds growing under stressed conditions, apply a 0.75 to 1.5-percent solution. Apply the maximum concentration of this product within this range for hard-to-control weeds or to control weeds over 24 inches tall.

For control of annual weeds using a handheld controlled droplet applicator (CDA), apply a 15-percent solution of this product (19 to 20 fluid ounces of this product per gallon of spray solution) at a flow rate of 2 fluid ounces of spray solution per minute and a walking speed of 1.5 miles per hour (1 quart of spray solution per acre). When using a vehicle-mounted CDA, apply the required amount of this product, as indicated in this section, in 2 to 15 gallons of water per acre.

For enhanced control, do not mow, cut, till, burn or disturb vegetation in the application area for a minimum of 3 days after application.

This product has no residual soil activity and does not control emergence of new annual weeds from seed. Subsequent applications of this product will be needed to control weeds that continue to emerge.

WEED SPECIES

Anoda, spurred
Balsam apple[1]
Barley
Barley, little
Barnyardgrass
Bassia, fivehook
Bittercress
Bluegrass, annual
Bluegrass, bulbous
Brome, downy
Brome, Japanese
Broomsedge
Buttercup
Castor bean[2]
Cheatgrass
Cheeseweed (Malva parviflora)
Chervil
Chickweed
Cocklebur
Copperleaf, hophornbeam
Copperleaf, Virginia
Coreopsis, plains/tickseed
Corn
Crabgrass
Cupgrass, woolly
Dwarf dandelion
Eclipta
False dandelion
False flax, small-seed
Fiddleneck
Filaree
Fleabane, annual
Fleabane, hairy (Conyza bonariensis)
Fleabane, rough
Foxtail
Foxtail, Carolina
Geranium, Carolina
Goatgrass, jointed
Goosegrass
Groundsel, common
Henbit
Horseweed/Marestail (Conyza canadensis)
Itchgrass
Johnsongrass, seedling
Junglerice
Knotweed
Kochia
Lambsquarters
Lettuce, prickly
Mannagrass, eastern
Mayweed
Medusahead
Morning glory (Ipomoea spp)
Mustard, blue
Mustard, tansy
Mustard, tumble
Mustard, wild
Nightshade, black
Oats
Panicum, browntop
Panicum, fall
Panicum, Texas
Pennycress, field
Pepperweed, Virginia
Pigweed
Puncturevine
Purslane, common
Pusley, Florida
Ragweed, common
Ragweed, giant
Rice, red
Rocket, London
Rocket, yellow
Rye
Ryegrass
Sandbur, field
Sesbania, hemp
Shattercane
Shepherd's-purse
Sicklepod
Signalgrass, broadleaf
Smartweed, ladysthumb
Smartweed, Pennsylvania
Sorghum, grain (milo)
Sowthistle, annual
Spanish needles[3]
Speedwell, corn
Speedwell, purslane
Sprangletop
Spurge, annual
Spurge, prostrate
Spurge, spotted
Spurry, umbrella
Starthistle, yellow
Stinkgrass
Sunflower
Teaweed / Prickly sida
Thistle, Russian
Velvetleaf
Wheat
Wild oats
Witchgrass

[1] For control of balsam apple, apply this product using handheld equipment only.
[2] Control of castor bean can also be achieved by injecting 4 milliliters of this concentrated (undiluted) product per plant into the lower portion of the main stem.
[3] For control of Spanish needles, apply 48 fluid ounces of this product per acre.

12.3 Perennial Weeds

Enhanced control of perennial weeds can be obtained when this product is applied when target weeds are small and actively growing. New leaf development indicates active growth. If application of this product must be made to larger weeds or to weeds that are slowly growing under stressful conditions, apply at a rate or spray solution concentration towards the upper end of the specified range.

If weeds have been mowed or tilled, do not apply this product until plants have resumed active growth and have reached the specified stage of growth or sufficient growth has been achieved to allow for good interception of the spray solution. For enhanced control, do not mow, cut, till, burn or disturb vegetation in the application area for a minimum of 7 days after application.

For control of perennial weeds listed on this label using backpack or handheld equipment and a low-volume application technique, apply a 4 to 8-percent solution of this product over the crown of the target plant to cover 50 percent of the upper plant foliage.

For control of perennial weeds using a handheld controlled droplet applicator (CDA), apply a 15 to 30-percent solution of this product (19 to 38 fluid ounces of this product per gallon of spray solution) at a flow rate of 2 fluid ounces of spray solution per minute and a walking speed of 0.75 mile per hour (2 to 4 quarts of spray solution per acre). When using a vehicle-mounted CDA, apply the required amount of this product, as indicated in the following table, in 2 to 15 gallons of water per acre.

Application of this product in the fall must be made before a killing frost.

This product has no soil activity and does not control emergence of perennial weeds from seed and dormant underground roots, rhizomes or tubers present in the soil at the time of application. More than one application of this product will be necessary for continued control of weeds that emerge following application.

PERENNIAL WEEDS RATE TABLE

Weed Species	Broadcast Rate (quarts/ acre)	Handheld Spray-to-Wet Concentration (% solution)
Alfalfa*	0.7	1.5
Alligatorweed*	3	1.3
Apply this product when most of the target plants are in bloom. More than one application will be needed to achieve control.		
Anise (fennel)	1.5 – 3	1 – 1.5
Bahiagrass	2.3 – 3.75	1.5
Beachgrass, European	–	3.5
Apply a 3.5-percent solution of this product using a spray-to-wet technique or an 8-percent solution using a low-volume application technique. Enhanced results can be obtained when application is made onto target weeds that are actively growing at the boot through the full-heading stage of development. Make application prior to the loss of more than 50 percent of green leaf color in the fall. Monitor application site and re-apply this product to any target weeds that were missed, if necessary, before re-seeding the area with desirable vegetation. For selective control of European beachgrass, apply a 33.3-percent solution of this product containing 1 to 2.5 percent of a nonionic surfactant during period of active growth using a wiper applicator. Maximizing the amount of individual leaf tissue contacted by the wiper applicator or making a second pass in the opposite direction will improve control. Avoid contact of the herbicide solution with desirable vegetation.		
Bentgrass*	1	1.5
Bermudagrass	4	1.5
Make application when seedheads are present.		
Bermudagrass, water (knotgrass)	1	1.5
Bindweed, field	2.3 – 3.75	1.5
For control, apply 3 to 3.75 quarts of this product per acre as a broadcast application west of the Mississippi River and 2.3 to 3 quarts per acre east of the Mississippi River when bindweed is at or beyond full bloom. For enhanced results, apply in late-summer or fall.		
Bittersweet, Oriental	2.25	2
For control of oriental bittersweet, apply this product as a broadcast spray in 30 to 40 gallons of spray solution containing 0.25 percent of a nonionic surfactant and 0.1 percent nonionic organosilicone per acre. Use a nonionic surfactant concentration of 0.5 to 2 percent by volume when using a handheld sprayer and a spray-to-wet application. For enhanced results, ensure complete coverage of the target plant with the spray solution.		
Bluegrass, Kentucky	1.5 – 2.3	0.75
Apply when most target plants have reached the boot to head stage of development. When application is made prior to the boot stage, reduced control can result. In the fall, make application before plants have turned brown.		
Blueweed, Texas	2.3 – 3.75	1.5
Apply 3 to 3.75 quarts of this product per acre west of the Mississippi River and 2.3 to 3 quarts per acre east of the Mississippi River when most target plants are at or beyond full bloom. For enhanced results, apply in late-summer or fall.		
Brackenfern	2.3 – 3	0.75 – 1
Apply to fully expanded fronds that are at least 18 inches long.		

PERENNIAL WEEDS RATE TABLE		
Weed Species	**Broadcast Rate** (quarts/ acre)	**Handheld Spray-to-Wet Concentration** (% solution)
Bromegrass, smooth	1.5 – 2.3	0.75
Apply this product when most target plants have reached the boot to head stage of development. When application is made prior to the boot stage, reduced control can result. In the fall, make application before plants have turned brown.		
Bursage, woolly-leaf	–	1.5
Canarygrass, reed	1.5 – 2.3	0.75
Apply this product when most target plants have reached the boot to head stage of development. When application is made prior to the boot stage, reduced control can result. In the fall, make application before plants have turned brown.		
Cattail	2.3 – 3.75	0.75
Apply this product when target plants are actively growing and are at or beyond the early to full bloom stage of development. Enhanced results are achieved when application is made during the summer or fall months.		
Clover; red, white	2.3 – 3.75	1.5
Cogongrass	2.3 – 3.75	1.5
Apply this product in late-summer or fall when cogongrass is at least 18 inches tall and actively growing. Due to uneven stages of growth and the dense nature of cogongrass vegetation, more than one application might be necessary to achieve control.		
Cordgrass	2 – 8	5 – 8

Prior to application of this product for control of cordgrass, survey the area to determine if shellfish beds exist within the application area. If shellfish are intended to be harvested in the area, delay application of this product until after harvest or maintain a 50-foot buffer between the application area and commercial shellfish beds, or do not harvest shellfish for a minimum of 14 days following application of this product. See restrictions below.

Ideal conditions for control of cordgrass are when target plants are free of silt and debris and actively growing, and good spray coverage is achievable. The presence of debris or silt on the surface of cordgrass will reduce the performance of this product. To improve herbicide uptake, wash targeted plants prior to application and allow a minimum of 4 hours for plants to dry before applying this product. Where cordgrass has been cut or mowed prior to application, allow for sufficient re-growth before applying this product to ensure adequate interception and uptake of this product. Rainfall or immersion of the plant in tidewater within 4 hours after application could reduce the effectiveness of this product.

Apply 2 to 8 quarts of this product per acre using ground broadcast application or optical sensor equipment in 5 to 100 gallons of spray solution, or in 5 to 10 gallons of spray solution per acre when using aerial application equipment.

Apply a 5- to 8-percent solution of this product when using a handheld backpack sprayer or high-volume sprayer. Make all applications of this product for the control of cordgrass in a spray solution containing 0.25% or more (1 or more quarts per 100 gallons of spray solution) of a nonionic surfactant or other adjuvant that is compatible with this product and labeled for use with herbicides and approved for use on aquatic sites. For enhanced results, ensure complete coverage of cordgrass clumps.

RESTRICTIONS: If a minimum 50-foot buffer is maintained between the application area and commercial shellfish beds, there is no restriction on shellfish harvest. If application is made within 50 feet of commercial shellfish beds, DO NOT harvest shellfish for a minimum of 14 days following application of this product.

PERENNIAL WEEDS RATE TABLE		
Weed Species	**Broadcast Rate** (quarts/ acre)	**Handheld Spray-to-Wet Concentration** (% solution)
Cutgrass, giant*	3	1
More than one application of this product will be required to achieve control, especially where vegetation is partially submerged in water. Allow target weeds to re-grow to the 7- to 10-leaf stage before making next application.		
Dallisgrass	2.3 – 3.75	1.5
Dandelion	2.3 – 3.75	1.5
Dock, curly	2.3 – 3.75	1.5
Dogbane, hemp	3	1.5
Apply this product when most target plants have reached the late-bud to flower stage of growth. For enhanced results, make application in late-summer or fall.		
Fescue (except tall)	2.3 – 3.75	1.5
Fescue, tall	2.3	1
Apply this product when most target plants have reached the boot to head stage of growth. If applied prior to the boot stage, less than desirable control might be obtained.		
Guinea grass	2.3	0.75
Apply this product when most target plants have at least reached the 7-leaf growth stage.		
Hemlock, poison	1.5 – 3	0.75 – 1.5
Control can also be achieved by injecting 5 milliliters of a 5-percent solution of this product using a handheld injection device in one leaf cane per plant, 12 inches above the root crown.[1] No surfactant is required.		
Hogweed, giant	–	–
Inject 5 milliliters of a 5-percent solution of this product into one leaf cane per plant, 12 inches above the root crown.[1] No surfactant is required.		
Horsenettle	2.3 – 3.75	1.5
Horseradish	3	1.5
Apply this product when most target plants have reached the late-bud to flower stage of development. For enhanced results, apply in late-summer or fall.		
Horsetail, field	–	–
Inject 0.5 milliliter of this product per stem directly into the plant stem, one segment above the root crown.[1] No surfactant is required.		
Iceplant	1.5	1.5
Iris, yellow flag	–	–
Cut flower stems 8 to 9 inches above the root crown. Push a cavity needle into the stem center and then slowly remove it as you inject 0.5 milliliter of this product using a handheld injector.[1] No surfactant is required.		
Ivy; cape, German	1.5 – 3	0.75 – 1.5
Jerusalem artichoke	2.3 – 3.75	1.5
Johnsongrass	1.5 – 2.3	0.75
Apply this product when most target plants have reached the boot to head stage of development or before plants have turned brown in the fall. When applied prior to the boot stage, reduced control can result.		
Kikuyu grass	1.5 – 2.3	0.75

PERENNIAL WEEDS RATE TABLE		
Weed Species	**Broadcast Rate** (quarts/ acre)	**Handheld Spray-to-Wet Concentration** (% solution)
Knapweed	3	1.5
Apply this product when most target plants have reached the late-bud to flower stage of growth. For enhanced results, apply in late-summer or fall.		
Knotweed; Bohemian, giant, Japanese	3	2
Apply 3 quarts of this product per acre as a broadcast application in 3 to 40 gallons of spray solution with 0.5 to 1 percent by volume of a nonionic surfactant. For application using a backpack sprayer and a spray-to-wet technique, apply a 2-percent solution of this product containing 0.5 to 2 percent by volume of a nonionic surfactant. For enhanced control, do not disturb vegetation in the application area for a minimum of 7 days after application.		
Control can also be achieved by cutting stems cleanly just below the 2nd or 3rd node above the ground and immediately apply 0.36 fluid ounce (10 milliliters) of a 50-percent solution of this product in water into the "well" or remaining internode. Ensure that the upper plant material that was removed is gathered and properly discarded to prevent new plants from propagating from sprouting buds. Use of a bio-barrier, such as cardboard, plywood or plastic sheeting, will help guard against the spread of plant material. The combined total application rate of this product must not exceed 8 quarts per acre.[1] Control can also be achieved by injecting 5 milliliters of this product per stem into the second or third internode using a handheld injection device.[1] No surfactant is required.		
Lantana	–	0.75 – 1
Apply this product when most target plants are at or beyond the bloom stage of growth. Use the higher spray solution concentration on plants that have reached the woody stage of growth.		
Lespedeza	2.3 – 3.75	1.5
Loosestrife, purple	2	1 – 1.5
Apply this product when most target plants are at or beyond the bloom stage of growth. Enhanced results can be achieved when application is made during summer or fall months. Fall application must be made before a killing frost.		
Lotus, American	2	0.75
Apply this product when most target plants are at or beyond the bloom stage of growth. Enhanced results can be achieved when application is made during summer or fall months. Fall application must be made before a killing frost. More than one application of this product might be necessary to control re-growth of underground plant parts and seeds.		
Maidencane	3	0.75
More than one application of this product will be needed for control, especially for vegetation partially submerged in water. Allow plants to re-grow to the 7- to10-leaf stage before making next application.		
Milkweed, common	2.3	1.5
Apply this product when most target plants have reached the late-bud to flower stage of growth.		
Muhly, wirestem	1.5 – 2.3	0.75
Make application when most target plants are at least 8 inches in height (3- to 4-leaf stage of development) and actively growing.		
Mullein, common	2.3 – 3.75	1.5
Napiergrass	2.3 – 3.75	1.5

PERENNIAL WEEDS RATE TABLE		
Weed Species	**Broadcast Rate** (quarts/ acre)	**Handheld Spray-to-Wet Concentration** (% solution)
Nightshade, silverleaf	2.3 – 3.75	1.5
Apply 3 to 3.75 quarts of this product per acre as a broadcast application west of the Mississippi River and 2.3 to 3 quarts per acre east of the Mississippi River when most target plants are at or beyond full bloom. Enhanced results can be obtained when application is made in late-summer or fall after berries have formed.		
Nutsedge; purple, yellow	2.3	0.75
Apply this product to control existing nutsedge plants and attached immature nutlets when target plants are in flower or when new nutlets can be found at rhizome tips. Nutlets that have not germinated will not be controlled and will require repeated application of this product for long-term control.		
Orchardgrass	1.5 – 2.3	0.75
Make application when most target plants have reached the boot to head stage of development. When applied prior to the boot stage, less than desirable control could be obtained. In the fall, make application before plants have turned brown.		
Pampas grass	2.3 – 3.75	1.5
Para grass	3	0.75
More than one application of this product will be needed to achieve complete control. Allow plants to re-grow to the 7- to10-leaf stage before making next application.		
Pepperweed, perennial	3	1.5
Phragmites*	2 – 3.75	0.75 – 1.5
For partial control of phragmites in Florida and the counties of other states bordering the Gulf of Mexico, apply 3.75 quarts of this product per acre as a broadcast application or a 1.5-percent solution using a handheld sprayer. In other areas of the U.S., apply 2 to 3 quarts per acre as a broadcast application or, for partial control, apply a 0.75-percent solution using a handheld sprayer. For enhanced results, make application in late-summer or fall when plants are actively growing and in full bloom. Due to the dense nature of this vegetation (which can prevent good spray coverage) and uneven stages of growth, more than one application of this product might be necessary to achieve control. Visual symptoms of control will be slow to develop.		
Quackgrass	1.5 – 2.3	0.75
Apply this product when most target plants are at least 8 inches in height (3- to 4-leaf stage of development) and actively growing.		
Redvine*	1.5	1.5
Reed; common, giant	3 – 3.75	1.5
For enhanced results make application in late-summer or fall. Control can also be achieved by injecting 5 milliliters of this concentrated product (undiluted) directly into the second or third internode using a handheld injection device.[1] No surfactant is required.		
Ryegrass, perennial	1.5 – 2.3	0.75
Apply this product when most target plants have reached the boot to head stage of growth. When applied prior to the boot stage, reduced control can result. In the fall, make application before ryegrass turns brown.		

PERENNIAL WEEDS RATE TABLE		
Weed Species	**Broadcast Rate** (quarts/ acre)	**Handheld Spray-to-Wet Concentration** (% solution)
Salvinia, giant	3 – 3.75	2
Apply a 2-percent solution of this product containing 0.5 to 2 percent by volume of a nonionic surfactant approved for aquatic use and containing at least 70 percent active ingredient using spray-to-wet technique. For broadcast application, apply 3 to 3.75 quarts of this product per acre in 3 to 40 gallons of spray solution containing 0.1 percent by volume nonionic organosilicone and 0.25 percent nonionic spreader sticker surfactant approved for aquatic use. Allow a minimum of 3 days after application before disturbing vegetation in the application site. This product will not control plants that are completely submerged or have a majority of foliage under water.		
Smartweed, swamp	2.3 – 3.75	1.5
Spatterdock	3	0.75
Make application when most target plants are in full bloom. For enhanced results, apply in the summer or fall.		
Spurge, leafy*	–	1.5
Starthistle, yellow	–	1.5
Sweet potato, wild*	–	1.5
Make application when most target plants are at or beyond the bloom stage of growth. More than one application will be needed to achieve control.		
Thistle, artichoke	1.5 – 2.3	2
Make application when target plants are at or beyond the bud stage of growth.		
Thistle, Canada	1.5 – 2.3	1.5
Make application when target plants are at or beyond the bud stage of growth. Control can also be achieved by stem-injection. Cut 8 to 9 of tallest plants in a clump at bud stage. Push a cavity needle into the stem center and then slowly remove it as you inject 0.5 milliliter of this concentrated product into the stem.[1] No surfactant required.		
Timothy	1.5 – 2.3	1.5
Make application when most target plants have reached the boot to head stage of development. If application is made prior to the boot stage, reduced control can result. In the fall, make application before plants turn brown.		
Torpedograss*	3 – 3.75	0.75 – 1.5
Apply this product at a lower rate or spray solution concentration within the specified range when torpedograss is growing on terrestrial sites and at a higher rate or concentration within the range when partially submerged under water or growing as a floating mat. Additional applications of this product will be needed to maintain control.		
Trumpetcreeper*	1.5 – 2.3	1.5
Tules, common	–	1.5
Make application to target plants at or beyond the seedhead stage of development. Visual symptoms will be slow to appear and might not appear for 3 or more weeks after application.		
Vaseygrass	2.3 – 3.75	1.5
Velvetgrass	2.3 – 3.75	1.5

PERENNIAL WEEDS RATE TABLE		
Weed Species	**Broadcast Rate** (quarts/ acre)	**Handheld Spray-to-Wet Concentration** (% solution)
Waterhyacinth	2.5 – 3	0.75 – 1
Make application when target plants are at or beyond the early bloom stage of development. Visual symptoms might require 3 or more weeks after application to appear, with complete necrosis and decomposition not occurring until 60 to 90 days after application. Use a higher application rate within the given range when more rapid visual effects are desired.		
Waterlettuce	–	0.75 – 1
Apply a 1-percent solution of this product in areas of heavy infestation. Enhanced results can be obtained when applied from mid-summer through winter. Application in the spring could require more than one application to achieve control.		
Waterprimrose	–	0.75
Make application to target plants that are at or beyond the bloom stage of growth, but before fall color changes occur. Thorough coverage is necessary for enhanced control.		
Wheatgrass, western	1.5 – 2.3	0.75
Make application when most target plants have reached the boot to head stage of development. Application made prior to the boot stage could result in reduced control. In the fall, make application before plants turn brown.		

* Partial control

[1] When using stem injection, the combined total use of this product must not exceed 8 quarts per acre per year. At 5 milliliters of concentrated (undiluted) product per stem, 8 quarts will treat approximately 1500 stems per acre per year. The number of stems that can be treated per acre will vary depending on the injection volume and the concentration of this product in the application solution.

Other perennials listed on this label – Apply 2.3 to 3.75 quarts of this product per acre as a broadcast application or a 0.75 to 1.5-percent solution using a handheld sprayer.

12.4 Woody Brush, Trees and Vines

Apply this product to brush and trees that are actively growing after full leaf expansion, unless otherwise directed. Use a higher application rate within a given range for larger brush and trees and/or application in areas of dense vegetative growth. For control of vines, apply this product at a higher application rate or spray solution concentration within the given range when target plants have reached the woody stage of growth.

Enhanced control of woody brush and trees is obtained when application is made in late-summer or fall after fruit formation; however, in arid areas, enhanced control can be obtained when application is made in the spring to early-summer when brush and trees are at high moisture content and flowering. Poor control can be expected when this product is applied to drought-stressed brush and trees.

Some autumn color on undesirable deciduous species is acceptable when applying this product to brush and trees in the fall, provided no major leaf drop has occurred. Reduced performance of this product could result if fall application is made following a frost. Symptoms might not appear prior to frost or senescence following fall application.

For enhanced results, allow 7 or more days after application before mowing, cutting, tilling, burning or removal of woody brush, trees and vines from the application site. Additional applications of this product will be needed to control brush and trees regenerating from underground parts or seed.

TANK MIXTURES: This product may be applied at any rate stated on this label in a tank mixture with the following products to increase the spectrum of control of herbaceous weeds, woody brush, trees and vines. For control of herbaceous weeds, apply the tank-mix product at the lower end of the given application rate or spray solution concentration range. For control of dense stands or tough-to-control woody brush, trees and vines, increase

the application rate or spray solution concentration of the tank-mix product towards the higher end of the range. Refer to the individual product labels for approved uses and application rates. Not all tank-mix products listed are labeled for aquatic use.

Arsenal; Arsenal Herbicide Applicators Concentrate; Escort XP; Forestry Garlon 4 Specialty; Forestry Garlon XRT Specialty; Garlon 3A Specialty; Garlon 4 Specialty; Garlon 4 Ultra Specialty; Vastlan Specialty; imazapyr; metsulfuron methyl; triclopyr

Ensure that the proper amount of the Garlon herbicide is thoroughly mixed with water in the spray tank before adding this product.

Cut Stump Application

This product may be used to control re-growth and re-sprouting of woody brush and trees on any site listed on this label.

Cut the woody brush or tree close to the soil or water surface and immediately apply a 50- to 100-percent (undiluted) solution of this product to the freshly-cut surface using an applicator capable of applying this product to the entire cambium. A delay in application could result in reduced performance. For enhanced results, cut the woody brush or tree during period of active growth and full leaf expansion and apply this product. No surfactant is needed for cut stump application.

For control of the tree of heaven (Ailanthus altissima), cut the tree close to the soil surface and immediately apply a 50-percent solution of this product (16 fluid ounces per quart of solution) and 10 percent Arsenal herbicide (3 to 4 fluid ounces per quart of solution) in water to the freshly-cut surface.

DO NOT MAKE A CUT STUMP APPLICATION WHEN THE ROOTS OF DESIRABLE WOODY BRUSH OR TREES MAY BE GRAFTED TO THE ROOTS OF THE CUT STUMP, AS INJURY COULD OCCUR IN THE ADJACENT TREES. Some sprouts, stems, or trees can share a common root system. Adjacent trees having a similar age, height and spacing could be an indicator of a shared root system. Whether grafted or shared, injury is likely to occur to adjacent stems or trees when this product is applied to one or more trees sharing common root system.

Woody Brush and Tree Injection and Frill Application

This product may be used to control woody brush and trees listed in this section by injection or frill application on any aquatic and terrestrial site listed on this label.

Inject or apply the equivalent of 1 milliliter (0.04 fluid once) of this product for every 2 to 3 inches of trunk diameter at breast height (DBH). If injecting this product into the woody brush or tree, use equipment capable of penetrating into the living plant tissue under the bark. No surfactant is required for direct injection of this product into woody brush and trees.

For frill application, apply a 50 to 95-percent solution of this product in water, with 0.5% or more by volume of a nonionic surfactant, to either a continuous frill around the tree or to cuts evenly spaced around the tree below all branches. As tree diameter increases, enhanced results can be achieved by applying this product to a continuous frill or more closely spaced cuttings. Avoid application techniques that allow this product to run out of the frill or cut areas. In species that freely exude sap, make the frill or cuts at an oblique angle to produce a cupping effect and apply a 95-percent solution of this product with a nonionic surfactant as described above. For enhanced results, make this application during period of active growth and after full leaf expansion.

Modified High-Volume and Low-Volume Backpack Application

For control and partial control of woody bush, trees and vines listed on this label when using a backpack sprayer or other handheld equipment and a directed low-volume foliar application technique, apply a 4 to 8-percent solution of this product containing 0.5 to 1 percent by volume of a nonionic surfactant evenly over the plant crown to cover 50 percent of the upper foliage of undesirable woody brush, trees and vines.

WOODY BRUSH, TREES AND VINES RATE TABLE

Species	Broadcast Rate (quarts/acre)	Handheld Spray-to-Wet Concentration (% solution)
Alder	2.3 – 3	0.75 – 1.2
Ash*	1.5 – 3.75	0.75 – 1.5
Aspen, quaking	1.5 – 2.3	0.75 – 1.2
Bearclover (Bearmat)*	1.5 – 3.75	0.75 – 1.5
Beech*	1.5 – 3.75	0.75 – 1.5
Birch	1.5	0.75
Blackberry	2.3 – 3	0.75 – 1.2
Blackgum	1.5 – 3.75	0.75 – 1.5
Bracken	1.5 – 3.75	0.75 – 1.5
Broom; French, Scotch	1.5 – 3.75	1.2 – 1.5
Buckwheat, California*	1.5 – 3	0.75 – 1.5
Cascara*	1.5 – 3.75	0.75 – 1.5
Castor bean	1.5 – 3.75	1.5
Also for control, inject 4 milliliters of this concentrated (undiluted) product per plant directly into the lower portion of the main stem using a handheld injection device.[1] No surfactant is required.		
Catsclaw*	–	1.2 – 1.5
For partial control, apply this product when at least 50 percent of the new leaves are fully developed.		
Ceanothus*	1.5 – 3.75	0.75 – 1.5
Chamise*	1.5 – 3.75	0.75
Cherry; bitter, black, pin	1.5 – 3.75	1 – 1.5
Cottonwood, eastern	1.5 – 3.75	0.75 – 1.5
Coyote brush	2.3 – 3	1.2 – 1.5
For control, apply this product when at least 50 percent of the new leaves are fully developed.		
Cypress; swamp, bald	1.5 – 3.75	0.75 – 1.5
Deerweed	1.5 – 3.75	0.75 – 1.5
Dewberry	2.3 – 3	0.75 – 1.2
Dogwood*	3 – 3.75	1 – 2
Elderberry	1.5	0.75
Elm*	1.5 – 3.75	0.75 – 1.5
Eucalyptus, blue gum	–	1.5
For control of eucalyptus re-sprouts, apply this product using a handheld sprayer when re-sprouts are 6 to 12 feet tall. Ensure complete coverage.		
Gallberry	1.5 – 3.75	0.75 – 1.5
Gorse*	1.5 – 3.75	0.75 – 1.5
Hackberry, western	1.5 – 3.75	0.75 – 1.5
Hasardia*	1.5 – 3	0.75 – 1.5
Hawthorn	1.5 – 2.3	0.75 – 1.2
Hazel	1.5	0.75
Hickory*	3 – 3.75	1 – 2
Honeysuckle	2.3 – 3	0.75 – 1.2
Hornbeam, American*	1.5 – 3.75	0.75 – 1.5
Huckleberry	1.5 – 3.75	0.75 – 1.5
Ivy, poison	3 – 3.75	1.5

WOODY BRUSH, TREES AND VINES RATE TABLE

Species	Broadcast Rate (quarts/acre)	Handheld Spray-to-Wet Concentration (% solution)
Kudzu	3	1.5
Locust, black*	1.5 – 3	0.75 – 1.5
Madrone resprouts*	–	1.5
Magnolia, sweetbay	1.5 – 3.75	0.75 – 1.5
Manzanita*	1.5 – 3.75	0.75 – 1.5
Maple, red	1 – 3.75	0.75 – 1.2
For control, apply a 0.75- to 1.2-percent solution of this product using a handheld sprayer when leaves are fully developed. For partial control, apply 1 to 3.75 quarts per acre as a broadcast application.		
Maple, sugar	–	0.75 – 1.2
For control, apply this product using a handheld sprayer when at least 50 percent of the new leaves are fully developed.		
Maple, vine*	1.5 – 3.75	0.75 – 1.5
Monkey flower*	1.5 – 3	0.75 – 1.5
Oak; black, white*	1.5 – 3	0.75 – 1.5
Oak; northern pin	1.5 – 3	0.75 – 1.2
For control, apply this product when at least 50 percent of the new leaves are fully developed.		
Oak, poison	3 - 3.75	1.5
Repeat applications might be required to maintain control. Application in the fall must be made before leaves lose green color.		
Oak, post	2.3 – 3	0.75 – 1.2
Oak, red	–	0.75 – 1.2
For control, apply this product using a handheld sprayer when at least 50 percent of the new leaves are fully developed.		
Oak, scrub*	1.5 – 3	0.75 – 1.5
Oak, southern red	1.5 – 3.75	1 – 1.5
Orange, Osage	1.5 – 3.75	0.75 – 1.5
Peppertree, Brazilian (Florida holly)*	1.5 – 3.75	1.5
Persimmon*	1.5 – 3.75	0.75 – 1.5
Pine	1.5 – 3.75	0.75 – 1.5
Poplar, yellow*	1.5 – 3.75	0.75 – 1.5
Prunus	1.5 – 3.75	1 – 1.5
Raspberry	2.3 – 3	0.75 – 1.2
Redbud, eastern	1.5 - 3.75	0.75 - 1.5
Redcedar, eastern	1.5 – 3.75	0.75 – 1.5
Rose, multiflora	1.5	0.75
Make application prior to leaf deterioration by leaf-feeding insects.		
Russian olive*	1.5 – 3.75	0.75 – 1.5
Sage, black	1.5 – 3	0.75
Sage, white*	1.5 – 3	0.75 – 1.5
Sagebrush, California	1.5 – 3	0.75
Salmonberry	1.5	0.75
Saltbush	–	1

WOODY BRUSH, TREES AND VINES RATE TABLE

Species	Broadcast Rate (quarts/acre)	Handheld Spray-to-Wet Concentration (% solution)
Saltcedar*	3 – 3.75	1 – 2
For partial control, apply a 1- to 2-percent solution of this product using a handheld sprayer or 3 to 3.75 quarts per acre as a broadcast application. For control, apply a 1- to 1.5-percent solution of this product in a tank-mix with Arsenal herbicide or Arsenal Herbicide Applicators Concentrate using a handheld sprayer. For control using broadcast application, apply 1.5 quarts of this product per acre in a tank-mix with an appropriate rate of Arsenal herbicide or Arsenal Herbicide Applicators Concentrate to plants less than 6 feet tall. To control saltcedar greater than 6 feet tall using broadcast application, apply 3 quarts of this product per acre in a tank-mix with a higher rate of Arsenal herbicide or Arsenal Herbicide Applicators Concentrate.		
Sassafras*	1.5 – 3.75	0.75 – 1.5
Sea Myrtle	–	1
Sourwood*	1.5 – 3.75	0.75 – 1.5
Sumac; laurel, poison, smooth, sugarbush, winged*	1.5 – 3	0.75 – 1.5
Sweetgum	1.5 – 2.3	0.75 – 1.5
Swordfern*	1.5 – 3.75	0.75 – 1.5
Tallowtree, Chinese	–	0.75
Tan oak re-sprouts*	–	1.5
Thimbleberry	1.5	0.75
Tobacco, tree*	1.5 – 3	0.75 – 1.5
Toyon*	–	1.5
Trumpetcreeper	1.5 – 2.3	0.75 – 1.2
Vine maple*	1.5 – 3.75	0.75 – 1.5
Virginia creeper	1.5 – 3.75	0.75 – 1.5
Waxmyrtle, southern*	1.5 – 3.75	1.5
Willow	2.3	0.75
Yerba Santa, California*	–	1.5

* Partial control

Other woody brush and trees listed on this label – For partial control, apply 1.5 to 3.75 quarts of this product per acre as a broadcast application or a 0.75- to 1.5-percent solution using a handheld sprayer and a spray-to-wet application technique.

13.0 LIMIT OF WARRANTY AND LIABILITY

Bayer CropScience LP ("Company") warrants that this product conforms to the chemical description on the label. TO THE EXTENT CONSISTENT WITH APPLICABLE LAW, NO OTHER EXPRESS WARRANTY OR IMPLIED WARRANTY OF FITNESS FOR PARTICULAR PURPOSE OR MERCHANTABILITY IS MADE. This warranty is also subject to the conditions and limitations stated herein.

Buyer and all users shall use this product only for the purposes of and in accordance with the Complete Directions for Use label ("Directions") and shall promptly notify this Company of any claims whether based in contract, negligence, strict liability, other tort or otherwise.

To the extent consistent with applicable law, buyer and all users are responsible for all loss, injuries or damage from use or handling which results from conditions beyond the control of this Company, including, but not limited to, incompatibility with products other than those set forth in the Directions, application to or contact with desirable vegetation, crop injury or failure of this product to control weed biotypes which develop resistance to glyphosate, unusual weather, weather conditions which are outside the range considered normal at the application site and for the time period when the product is applied, as well as weather conditions which are outside the application ranges set forth in the Directions, use and/or application in any manner not explicitly set forth in or inconsistent with the Directions, moisture conditions outside the moisture range specified in the Directions, or the presence of products other than those set forth in the Directions in or on the soil, crop or treated vegetation.

This Company does not warrant any product reformulated or repackaged from this product except in accordance with this Company's stewardship requirements and with express written permission from this Company.

TO THE EXTENT CONSISTENT WITH APPLICABLE LAW, THE EXCLUSIVE REMEDY OF THE USER OR BUYER, AND THE LIMIT OF THE LIABILITY OF THIS COMPANY OR ANY OTHER SELLER FOR ANY AND ALL LOSSES, INJURIES OR DAMAGES RESULTING FROM THE USE OR HANDLING OF THIS PRODUCT (INCLUDING CLAIMS BASED IN CONTRACT, NEGLIGENCE, STRICT LIABILITY, OTHER TORT OR OTHERWISE) SHALL BE THE PURCHASE PRICE PAID BY THE USER OR BUYER FOR THE QUANTITY OF THIS PRODUCT INVOLVED, OR, AT THE ELECTION OF THIS COMPANY OR ANY OTHER SELLER, THE REPLACEMENT OF SUCH QUANTITY, OR, IF NOT ACQUIRED BY PURCHASE, REPLACEMENT OF SUCH QUANTITY. TO THE EXTENT CONSISTENT WITH APPLICABLE LAW, IN NO EVENT SHALL THIS COMPANY OR ANY OTHER SELLER BE LIABLE FOR ANY INCIDENTAL, CONSEQUENTIAL OR SPECIAL DAMAGES.

Upon opening and using this product, buyer and all users are deemed to have accepted the terms of this LIMIT OF WARRANTY AND LIABILITY which may not be varied by any verbal or written agreement. If terms are not acceptable, return at once unopened.

In case of an emergency involving this product, or for medical assistance, call collect, day or night, 1-800-334-7577.

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Packed for:
BAYER CROPSCIENCE LP
800 N. LINDBERGH BLVD.
ST. LOUIS, MISSOURI, 63167 U.S.A.

GRUPO 9 HERBICIDA

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(Para una lista completa de aplicaciones acuáticas y terrestres, vea la sección Modo de empleo de esta etiqueta).

INGREDIENTE ACTIVO:	
*Glifosato, N-(fosfonometil) glicina, en la forma de su sal de isopropilamina	53.8%
OTROS INGREDIENTES:	46.2%
	100.0%

* Contiene 648 gramos por litro o 5.4 libras por galón norteamericano del ingrediente activo glifosato, en la forma de su sal de isopropilamina, lo cual es equivalente a 480 gramos por litro o 4.0 libras por galón norteamericano (39.9% por peso) del ácido, glifosato.

Nº. Reg. EPA 524-343 EPA Est. 524-IA-1

Manténgase Fuera del Alcance de los Niños

PRECAUCIÓN

Consulte el interior para conocer las precauciones adicionales.
INSTRUCCIONES DE USO COMPLETAS

No todos los productos recomendados en esta etiqueta han sido registrados para su uso en California. Verifique el estado de registro de cada producto en California antes de utilizarlo.

PARA INFORMACIÓN SOBRE EL PRODUCTO O AYUDA PARA UTILIZAR ESTE PRODUCTO, LLAME GRATIS AL 1-866-99BAYER (1-866-992-2937)

EN CASO DE EMERGENCIA RELACIONADA CON ESTE PRODUCTO O PARA AYUDA MÉDICA, LLAME POR COBRAR, DE DÍA O DE NOCHE, AL 1-800-334-7577

Envasado para:
BAYER CROPSCIENCE LP
800 N. LINDBERGH BLVD.
ST. LOUIS, MISSOURI 63167 USA
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Lea toda la etiqueta antes de usar este producto.

Use solo de acuerdo con las instrucciones de la etiqueta.

Lea la declaración "LÍMITE DE GARANTÍA Y RESPONSABILIDAD" al final de esta etiqueta antes de comprar o usar. Si los términos no son aceptables, devuélvalos de inmediato sin abrir.

EVITE EL CONTACTO DE ESTE HERBICIDA CON FOLLAJE, TALLOS VERDES, RAÍCES NO LEÑOSAS EXPUESTAS O FRUTAS DE CULTIVOS, PLANTAS Y ÁRBOLES DESEABLES, COMO PODRÍA PRODUCIRSE UNA LESIÓN GRAVE A LA PLANTA O LA DESTRUCCIÓN.

ESTE ES UN PRODUCTO DE USO FINAL. BAYER CROPSCIENCE LP NO TIENE LA INTENCIÓN Y NO LO HA REGISTRADO PARA SU REFORMULACIÓN O REEMBALAJE.

CONTENIDO

1.0 INGREDIENTES

INGREDIENTE ACTIVO:

*Glifosato, N-(fosfonometil) glicina, en la forma de su sal de isopropilamina	53.8%
OTROS INGREDIENTES:	46.2%
	100.0%

*Contiene 648 gramos por litro o 5.4 libras por galón norteamericano del ingrediente activo glifosato, en la forma de su sal de isopropilamina, lo cual es equivalente a 480 gramos por litro o 4.0 libras por galón norteamericano (39.9% por peso) del ácido, glifosato.

2.0 NÚMEROS DE TELÉFONO IMPORTANTES

1. PARA INFORMACIÓN SOBRE EL PRODUCTO O AYUDA PARA UTILIZAR ESTE PRODUCTO, LLAME GRATIS AL 1-866-99BAYER (1-866-992-2937)
2. EN CASO DE EMERGENCIA RELACIONADA CON ESTE PRODUCTO O PARA AYUDA MÉDICA, LLAME POR COBRAR, DE DÍA O DE NOCHE, AL 1-800-334-7577

3.0 DECLARACIONES PREVENTIVAS

3.1 Riesgos para los seres humanos y los animales domésticos

Manténgase Fuera del Alcance de los Niños

PRECAUCIÓN

ANIMALES DOMÉSTICOS: Se considera que este producto es relativamente no tóxico para perros y otros animales domésticos, sin embargo, la ingestión de este producto o de abundantes cantidades de vegetación rociada recientemente podría causar irritación gastrointestinal temporal (vómitos, diarrea, cólicos, etc.). Si se observan dichos síntomas, dé al animal suficiente cantidad de líquidos para evitar la deshidratación. Llame a un veterinario si los síntomas persisten por más de 24 horas.

Equipo de protección personal (EPP)

Los usuarios y personas que manipulan este producto deben usar: camisa de mangas largas y pantalones largos, zapatos y calcetines.

Respete las instrucciones del fabricante para limpiar y mantener los equipos de protección personal (EPP). En caso de que no haya instrucciones, use detergente y agua caliente. Mantenga el EPP aparte del resto de la ropa y lávelo por separado.

Recomendaciones de seguridad para el usuario:

Los usuarios deben:

- Lavarse las manos antes de comer, beber, masticar chicle, usar tabaco o usar el baño.
- Quitarse la ropa de inmediato si el pesticida traspasa la ropa. Luego deben lavarse muy bien y ponerse ropa limpia.

3.2 Riesgos para el medio ambiente

Matar las malezas acuáticas puede dar lugar a una reducción o pérdida de oxígeno en el agua debido a la descomposición de material vegetal muerto. Esta pérdida de oxígeno puede causar que los peces se asfixien. Antes de aplicar pesticidas a aguas públicas, consulte con la agencia de su estado que sea la principal responsable de su regulación para determinar si se necesita un permiso. Para usos terrestres, no aplique directamente al agua, en áreas donde el agua superficial esté presente o en áreas intermareales por debajo del nivel medio de mareas altas, excepto si se aplica por aire por encima de la cobertura forestal. No contamine el agua cuando limpie el equipo o deseche el agua de lavado y enjuague del equipo.

3.3 Riesgos físicos o químicos

Para mezclar, almacenar y aplicar la solución de rocío de este producto, se pueden usar recipientes de acero inoxidable, fibra de vidrio, plástico o recipientes de acero recubiertos internamente con plástico.

NO MEZCLE, ALMACENE O APLIQUE ESTE PRODUCTO O LAS SOLUCIONES DE ROCÍO DE ESTE PRODUCTO EN ENVASES DE ACERO GALVANIZADO O SIN REVESTIMIENTO (EXCEPTO ACERO INOXIDABLE) O EN TANQUES DE ROCÍO. Si se utiliza en estos envases o tanques, este producto o las soluciones de rocío de este producto reaccionan y producen gas hidrógeno que puede formar una mezcla de gases altamente inflamable. Esta mezcla de gases podría incendiarse o explotar si está en contacto con fuego, chispas, sopletes para soldar, cigarrillos encendidos o cualquier otra fuente de ignición y causar lesiones personales graves.

INSTRUCCIONES DE USO

Se considera una violación a la ley federal usar este producto de una manera que no sea la indicada en la etiqueta. Este producto solo puede utilizarse de acuerdo con las instrucciones de uso en la etiqueta o según las etiquetas complementarias que se publican por separado. Puede solicitar las etiquetas complementarias para este producto a su vendedor minorista autorizado de Bayer CropScience LP o a su representante de Bayer CropScience LP.

No aplique este producto de manera que entre en contacto con los trabajadores u otras personas, ya sea directamente o por arrastre. Solamente los aplicadores que usan protección podrán estar en el área durante su aplicación. Para verificar requisitos específicos de su tribu o estado, consulte con la agencia responsable de la regulación del uso de pesticidas.

Requisitos para uso agrícola

Utilice este producto solo de acuerdo con la etiqueta y con las Normas de Protección para Trabajadores, 40 CFR Parte 170. Estas Normas contienen los requisitos para la protección de trabajadores agrícolas en granjas, bosques, viveros e invernaderos y para las personas que manipulan pesticidas agrícolas. Contienen los requisitos para capacitar, descontaminar, notificar y ofrecer asistencia de emergencia. También contienen instrucciones específicas y excepciones relativas a las afirmaciones en esta etiqueta sobre los equipos de protección personal (EPP) y los intervalos de acceso restringido. Los requisitos en esta caja se refieren únicamente a las aplicaciones de este producto cubiertas por las Normas de Protección para Trabajadores.

No entre ni permita la entrada de personal a las áreas tratadas durante el intervalo de entrada restringida (REI, por sus siglas en inglés) de 4 horas. El EPP que se requiere para el acceso anticipado a zonas tratadas de acuerdo con las Normas de Protección para Trabajadores y que incluye el contacto con material tratado, como plantas, tierra o agua es: overoles, zapatos con calcetines y guantes resistentes a sustancias químicas confeccionados con cualquier tipo de material impermeable.

Requisitos para usos no agrícolas

Los requisitos en esta caja se refieren a las aplicaciones de este producto que NO cubren las Normas de Protección para Trabajadores para pesticidas agrícolas (40 CFR, Parte 170). Las Normas se aplican cuando este producto se utiliza para producir plantas agrícolas en granjas, bosques, viveros o invernaderos.

Mantenga a las personas y a las mascotas fuera de las áreas tratadas hasta que la solución de rocío se haya secado.

4.0 ALMACENAMIENTO Y ELIMINACIÓN

El almacenamiento y la eliminación adecuados de los pesticidas son fundamentales para evitar la exposición de las personas y el medio ambiente a consecuencia de pérdidas y derrames del producto, excedentes o desechos y actos de vandalismo. No permita que este producto contamine el agua, ni los alimentos para personas o animales, ni las semillas, por medio del almacenamiento y la eliminación.

ALMACENAMIENTO DEL PESTICIDA: CONSERVE POR ENCIMA DE 5 ° F (-15 ° C) PARA EVITAR QUE EL PRODUCTO SE CRISTALICE. Los cristales se depositarán en el fondo. Si se deja cristalizar, caliente a 68 ° F (20 ° C) para redisolver y hacer rodar o agitar el recipiente o recircular el contenido de recipientes más grandes para mezclar bien antes de usar. Almacene los pesticidas lejos de alimentos, alimentos para mascotas, piensos, semillas, fertilizantes y suministros veterinarios. Mantenga el recipiente cerrado para evitar derrames y contaminación. Consulte la etiqueta del recipiente individual para conocer las condiciones de almacenamiento adicionales, si las hubiera.

ELIMINACIÓN DEL PESTICIDA: Para evitar desechos, utilice todo el material contenido en este envase, incluyendo los residuos del enjuague, aplicándolo según las indicaciones de la etiqueta. Si no se pueden evitar los desechos, ofrezca el producto restante a un centro de eliminación de desechos o a un programa de desecho de pesticidas. Estos programas suelen ser manejados por los gobiernos estatales o locales o por la industria. Toda eliminación debe seguir los reglamentos y procedimientos federales, estatales y locales pertinentes.

MANEJO Y ELIMINACIÓN DEL ENVASE: Envase no rellenable. No reutilice este recipiente para contener materiales que no sean pesticidas o pesticidas diluidos (enjuague). Después de vaciar y limpiar, es posible que se permita retener temporalmente enjuague u otros materiales relacionados con pesticidas en este recipiente. Comuníquese con su agencia reguladora estatal para determinar las prácticas permitidas en su estado.

Enjuague tres veces o enjuague a presión (o equivalente) este recipiente inmediatamente después de vaciarlo.

Enjuague tres veces de la siguiente manera: Vacíe el contenido restante en el equipo de aplicación o tanque de mezcla y continúe drenando durante 10 segundos después de que el flujo comience a gotear. Llene el recipiente ¼ de su capacidad con agua y vuelva a tapar. Agite durante 10 segundos. Vierta el enjuague en el equipo de aplicación o en el tanque de mezcla, o almacene el enjuague para su uso o eliminación posterior. Continúe drenando durante 10 segundos después de que el flujo comience a gotear. Repita este procedimiento dos veces mas.

Enjuague a presión de la siguiente manera: Vacíe el contenido restante en el equipo de aplicación o tanque de mezcla y continúe drenando durante 10 segundos después de que el flujo comience a gotear. Coloque el recipiente de modo que pueda drenar directamente al equipo de aplicación o al tanque de mezcla mientras se enjuaga, o recolecte el enjuague para su uso o eliminación posterior. Inserte la boquilla de enjuague a presión en el costado del recipiente y enjuague a aproximadamente 40 PSI durante al menos 30 segundos. Continúe drenando durante 10 segundos después de que el flujo comience a gotear.

Una vez enjuagados correctamente, algunos envases plásticos de plaguicidas pueden llevarse a un sitio de recolección de envases o recogerse para reciclarlos. Para encontrar el sitio de recolección más cercano, comuníquese con su distribuidor de productos químicos o con Bayer CropScience LP al 1-866-99BAYER (1-866-992-2937).

Si el reciclaje no está disponible, deséchelo de acuerdo con las regulaciones y procedimientos federales, estatales y locales, que pueden incluir perforar el recipiente debidamente enjuagado y desecharlo en un relleno sanitario.

5.0 INFORMACIÓN DEL PRODUCTO

Descripción del producto: Este producto es un herbicida sistémico para aplicar postemergencia que, mezclado en el tanque de rociado con un surfactante aprobado para uso acuático, se puede usar para el control de malezas tanto acuático como terrestre. Este producto proporciona un control de amplio espectro de muchas malezas anuales y perennes, árboles, enredaderas y matorrales leñosos. Este producto no controla malezas sumergidas ni proporciona control residual de malezas en el suelo. Está formulado como líquido soluble en agua que, a menos que se indique lo contrario, requiere diluirse con agua u otra sustancia vehicular y agregar un surfactante de acuerdo con las instrucciones en la etiqueta y con el lugar donde se pretende usar antes de la aplicación, usando un equipo estándar y especializado para aplicar pesticidas.

Mecanismo de la acción: El ingrediente activo en este producto inhibe una enzima que se encuentra solo en plantas y microorganismos y que es esencial para la formación de aminoácidos específicos.

No tiene actividad en el suelo: Este producto se adhiere con fuerza a las partículas en el suelo y no proporciona control residual de malezas. Las malezas tienen que haber emergido en el momento de la aplicación para que la aplicación foliar de este producto las controle. Este producto no tendrá efecto sobre las semillas de las malezas en el suelo, así que estas continuarán germinando. Este producto tampoco tendrá efecto en los rizomas o raíces de las plantas no conectadas que estén debajo de la superficie del suelo.

Degradación biológica: La degradación de este producto es primariamente un proceso biológico de los microbios de la tierra.

Etapas de malezas: Las malezas acuáticas deben tener follaje por encima de la superficie del agua para que este producto pueda controlarlas. En los lugares terrestres, resulta más fácil controlar las malezas anuales y perennes cuando son pequeñas. Consulte la sección "MALEZAS CONTROLADAS" en esta etiqueta para obtener más información sobre el control de malezas específicas.

Prácticas de cultivo: El control de malezas puede ser inferior cuando se aplica el producto a malezas anuales o perennes que hayan sido segadas, que hayan servido de alimento para animales o hayan sido cortadas, y que no hubiesen crecido nuevamente hasta el nivel recomendado para el tratamiento. Aplique siempre la proporción mayor de este producto dentro del rango indicado cuando las malezas son muy densas o cuando crecen en áreas no tocadas (no cultivadas). El control de malezas puede ser inferior cuando se tratan malezas dañadas por enfermedades o insectos, si están cubiertas con polvo o si las condiciones de crecimiento de las malezas son deficientes.

Cobertura del rocío: Para obtener mejores resultados, la cobertura del rocío debe ser completa y uniforme. No rocíe el follaje hasta el punto de escurrimiento.

Resistencia a la lluvia: La lluvia o la inmersión de las malezas acuáticas por acción de las olas en un plazo de 4 horas después de su aplicación puede lavar este producto del follaje y puede requerirse una segunda aplicación para el control adecuado de las malezas. Consulte las secciones sobre uso específico en esta etiqueta para obtener información adicional sobre los intervalos mínimos requeridos antes de repetir la aplicación de este producto.

Aparición de los síntomas: Este producto se mueve dentro de la planta desde el punto de aplicación sobre el follaje hasta las raíces. Los efectos visibles son marchitamiento gradual y amarilleo progresivo de la planta hasta el oscurecimiento total de los brotes por encima de la tierra y el deterioro de las partes subterráneas de la planta. En la mayoría de las malezas anuales, los efectos son visibles en 2 a 4 días pero en la mayoría de las malezas perennes los efectos podrían no ser visibles hasta 7 días o más después de la aplicación. El frío extremo o el cielo muy nublado después de la aplicación podrían retardar la actividad del producto y hacer que el efecto visual se demore.

Proporciones de aplicación máxima: Las cantidades de aplicación o uso máximas especificadas en esta etiqueta están expresadas en unidades de volumen (onzas líquidas o cuartos de galón) de este producto por acre. Sin embargo, las proporciones máximas permitidas se aplican a este producto combinado con todos y cada uno de los otros herbicidas que contienen el ingrediente activo glifosato, ya sea que se apliquen por separado o como mezclas de tanque, sobre la base del total de libras de glifosato (equivalentes ácidos) por acre. Si se aplica más de un producto que contiene glifosato en el mismo terreno el mismo año, debe asegurarse de que el total de glifosato empleado (equivalentes de libras de ácido) no exceda el máximo permitido. Consulte la sección "INGREDIENTES" de esta etiqueta para la información necesaria sobre el producto.

A menos que se especifique de otra manera en esta etiqueta, el total combinado de todas las aplicaciones de este producto en un lugar no debe exceder los 8 cuartos de galón (8 libras de ácido de glifosato) por acre por año.

NOTA: El uso de este producto de cualquier manera contraria a las indicaciones contenidas en esta etiqueta, puede causar lesiones a personas, animales, cultivos u otra vegetación deseada o pueden ocurrir otras consecuencias no deseadas.

6.0 MANEJO DE RESISTENCIA DE MALEZAS

GRUPO	9	HERBICIDA

El glifosato, el ingrediente activo de este producto, es un herbicida del grupo 9 según el sistema de clasificación de modo de acción de la Weed Science Society of America. Cualquier población de malezas puede contener plantas naturalmente resistentes a los herbicidas del Grupo 9. Las malezas resistentes a los herbicidas del Grupo 9 pueden tratarse con buenos resultados utilizando un herbicida de otro grupo (ya sea solo o en una mezcla de acuerdo a las instrucciones en la etiqueta), adoptando otros métodos de cultivo o mecánicos para el control de malezas, o a través de una combinación de ambos. Consulte con su representante local de la compañía, el agente de extensión cooperativa del estado, un asesor profesional u otra autoridad calificada para determinar las acciones adecuadas para controlar malezas resistentes específicas.

6.1 Prácticas de manejo de malezas

Las poblaciones resistentes surgen cuando una dosis normal de un herbicida determinado no controla a contadas plantas individuales en condiciones ambientales normales. Si no hay otras medidas de control, estos individuos sobreviven, producen semillas y con el tiempo se convierten en el biotipo dominante en el campo a través de la selección continua. La mejor manera de reducir esta selección es usar prácticas diversas de control de malezas, tales como múltiples herbicidas con diferentes mecanismos de acción y, con frecuencia, combinados con diversas prácticas de cultivo y mecánicas.

Para minimizar la incidencia de biotipos resistentes a herbicidas, incluyendo los resistentes al glifosato, implemente las siguientes opciones de manejo de malezas que sean prácticas en su situación. Estas prácticas de manejo se aplican para reducir la propagación de biotipos resistentes confirmados (control de biotipos resistentes existentes) y para reducir el potencial para selección de resistencia de nuevas especies (control proactivo de la resistencia).

- Diversifique su enfoque del manejo de malezas concentrándose en evitar la producción de semillas de malezas y en reducir la cantidad de semillas de malezas en la tierra.
- Siembre los cultivos en campos con la menor cantidad de malezas posible y manténgalos así.
- Siembre semillas que tengan la menor cantidad de malezas posible.
- Haga un reconocimiento rutinario de los campos y los sitios de aplicación antes y después de la aplicación del herbicida.
- Use múltiples mecanismos de acción herbicida eficaces contra las malezas más molestas en su lugar de aplicación y contra aquellas de resistencia conocida.
- Aplique los herbicidas en las proporciones de aplicación indicadas en la etiqueta cuando las malezas estén dentro del rango de tamaño indicado en la etiqueta.
- Resalte las prácticas de cultivo que inhiben las malezas usando competencia de cultivos.
- Use prácticas de manejo de malezas mecánicas y biológicas, cuando sea adecuado.
- Evite el movimiento de semillas de malezas o de propágulos vegetativos entre campos o dentro de un campo.
- Controle las semillas de malezas en la cosecha y después de la cosecha para evitar que las semillas se acumulen.

6.2 Manejo de biotipos resistentes al glifosato

Es necesario realizar las pruebas adecuadas para confirmar la resistencia de una maleza al glifosato. Llame al 1-866-99BAYER (1-866-992-2937) o póngase en contacto con su representante de Bayer CropScience LP para determinar si se confirmó la resistencia de algún biotipo de maleza en particular en su región, o visite en Internet

www.weedresistancemanagement.com o www.weedscience.org.

Las malezas resistentes al glifosato se pueden controlar o manejar con la aplicación de este producto en combinación con herbicidas residuales de preemergencia y/o otros herbicidas de postemergencia etiquetados para el control de la maleza objetivo en el cultivo en cuestión o en el lugar de la aplicación. Para obtener más información, vea la sección "MALEZAS CONTROLADAS" en esta etiqueta.

Dado que la incidencia de malezas resistentes es difícil de detectar antes de usar, Bayer CropScience LP no será responsable de ninguna pérdida que tenga lugar porque este producto no logre controlar las malezas resistentes.

7.0 MEZCLAS

Para mezclar, almacenar y aplicar la solución de rocío de este producto, se pueden usar recipientes limpios de acero inoxidable, fibra de vidrio, plástico o recipientes de acero recubiertos internamente con plástico.

NO MEZCLE, ALMACENE O APLIQUE ESTE PRODUCTO O LAS SOLUCIONES DE ROCÍO DE ESTE PRODUCTO EN ENVASES DE ACERO GALVANIZADO O SIN REVESTIMIENTO (EXCEPTO ACERO INOXIDABLE) O EN TANQUES DE ROCÍO.

Elimine todo riesgo de que se forme un sifón de retorno de los contenidos del tanque a la fuente de la sustancia vehicular, al preparar la mezcla. Utilice aparatos aprobados para evitar la formación de sifones de retorno en lugares donde lo exijan las normas locales o estatales.

Un filtro de malla de 50 hilos para la boquilla o un colador en el equipo de rocío es adecuado.

Limpie las piezas del rociador inmediatamente después de su utilización lavándolas bien con agua.

7.1 Mezcla con agua

EL RENDIMIENTO DE ESTE PRODUCTO PODRÍA REDUCIRSE CONSIDERABLEMENTE SI SE UTILIZA AGUA CON SEDIMENTOS DE TIERRA COMO SUSTANCIA VEHICULAR. NO MEZCLE ESTE PRODUCTO CON AGUA DE ESTANQUES O ACEQUIAS QUE SE VEA TURBIA O ENFANGADA.

Este producto se mezcla fácilmente con agua. Mezcle las soluciones de rocío de este producto de la siguiente manera. Primero, llene el tanque de mezclado o de rocío con agua limpia. Agregue la cantidad requerida de este producto hacia el final del proceso de llenado y mezcle con cuidado. Es posible que durante la mezcla la solución de rocío produzca espuma. Para prevenir o minimizar la formación de espuma, mezcle con cuidado, tapone las derivaciones y mangueras de retorno en el fondo del tanque y, si es necesario, agregue un agente apropiado a la solución de rocío para evitar la formación de espuma o eliminarla.

7.2 Surfactantes

A menos que se indique lo contrario, este producto requiere que se agreguen 2 o más cuartos de galón de un surfactante no iónico cuyo uso con herbicidas esté recomendado en la etiqueta por cada 100 galones de solución de rocío (0.5% o más por volumen). A menos que se indique lo contrario, use una concentración mayor de surfactante cuando alguna de las siguientes condiciones aplique al uso de este producto:

- Se agregan surfactantes que contienen menos del 70 por ciento del ingrediente activo
- Se aplica al voleo usando un alto volumen de sustancia vehicular o usando equipo de rociado manual
- Se aplica en condiciones de crecimiento adversas o en cualquier momento en que las malezas están bajo estrés
- Se aplica como mezcla de tanque con otros productos
- Se aplica a malezas, matorrales leñosos, árboles y enredaderas difíciles de controlar

NOTA: Para la aplicación directa de soluciones de rocío de este producto en malezas acuáticas emergidas o para usar en áreas intermareales por debajo del nivel medio de mareas altas, o en áreas de aplicación donde una zona de transición asegurará que un rocío excesivo de un cuerpo de agua adyacente no se puede mantener, debe usar un surfactante que esté aprobado también para uso acuático. Para las aplicaciones terrestres, también se requiere un surfactante en la solución de rocío, pero no tiene que estar aprobado para uso acuático.

RESTRICCIÓN: Si se agrega un surfactante que NO esté aprobado para uso acuático a la solución de rocío, NO lo aplique directamente al agua o sobre esta ni use en áreas intermareales por debajo del nivel medio de mareas altas.

Consulte con la principal agencia reguladora de pesticidas de su estado si necesita información adicional sobre los surfactantes que están aprobados para uso acuático.

Lea y siga todas las declaraciones preventivas e instrucciones de modo de empleo en la etiqueta del surfactante.

Toda referencia en esta etiqueta a la concentración de surfactante en la solución de rocío está basada en un porcentaje de volumen. Vea la tabla a continuación para obtener la concentración adecuada de surfactante en la solución de rocío.

Volumen deseado de solución de rocío	Cantidad de surfactante para obtener la concentración indicada en la solución de rocío (porcentaje por volumen)					
	0.5%	0.75%	1%	1.5%	4%	8%
1 galón	2/3 onza líquida	1 cuarto de galón	1.3 onzas líquidas	2 onzas líquidas	5 onzas líquidas	10 onzas líquidas
25 galones	16 onzas líquidas	24 onzas líquidas	1 cuarto de galón	1.5 cuartos de galón	4 cuartos de galón	2 galones
100 galones	2 cuartos de galón	3 cuartos de galón	1 cuarto de galón	1.5 galones	4 galones	8 galones

2 cucharadas soperas = 1 onza líquida (onz. líq.)

7.3 Mezclas de tanque

Este producto no proporciona control residual de malezas. Este producto puede mezclarse en tanques con otros herbicidas para proporcionar control residual de malezas en la tierra, un espectro más amplio de control de malezas o un mecanismo de acción alternativo.

NO TODOS LOS PRODUCTOS PARA MEZCLA DE TANQUE INDICADOS EN ESTA ETIQUETA ESTÁN APROBADOS PARA USO EN SITIOS ACUÁTICOS. Consulte las etiquetas individuales de todos los productos usados en la mezcla de tanque para conocer los usos aprobados y las proporciones de aplicación.

Cuando en esta etiqueta se indica una mezcla de tanque con un ingrediente activo genérico como 2,4-D, o dicamba o cualquier otro producto o material, el usuario asume la responsabilidad de asegurarse de que la aplicación específica que está preparando y el sitio de uso estén incluidos en la etiqueta del producto utilizado en la mezcla.

Bayer CropScience LP no ha realizado pruebas en todas las fórmulas de producto de la mezcla de tanque para verificar la compatibilidad, antagonismo o reducción en el rendimiento del producto. La mezcla de este producto con herbicidas u otros materiales no recomendados en esta etiqueta puede dar como resultado una reducción en su rendimiento. Hasta el grado que sea compatible con la legislación pertinente, el comprador y todos los usuarios son responsables por todas las pérdidas o daños en relación con el uso o el manejo de mezclas de este producto con herbicidas u otros materiales que no se recomiendan expresamente en esta etiqueta o en las etiquetas complementarias separadas o en las Fichas Técnicas publicadas para este producto.

Consulte todas las etiquetas de cada uno de los productos, las etiquetas complementarias y las Fichas Técnicas de todos los productos de la mezcla de tanque, y respete todas las precauciones y limitaciones de la etiqueta, incluidas las restricciones de la época de aplicación, las restricciones de suelo, los intervalos mínimos para volver a cosechar y/o las restricciones de rotación. Utilice conforme con las declaraciones preventivas más restrictivas de cada producto en la mezcla de tanque.

Este producto puede aplicarse en cualquier proporción indicada en esta etiqueta en una mezcla de tanque con los siguientes productos para proporcionar control preemergencia y/o mejor control postemergencia de las malezas indicadas en las etiquetas de cada producto.

Arsenal; Herbicida concentrado para aplicadores Arsenal; Banvel; Banvel 480; Barricade 4L; Barricade 65WG; Certainty® Turf; Chopper Gen2; Crossbow; Endurance; Escort XP; Forestry Garlon 4 Specialty; Forestry Garlon XLT Specialty; Gallery SC; Gallery 75 Dry Flowable Specialty; Garlon; 3A Specialty; Garlon 4 Specialty; Garlon 4 Ultra Specialty; Goal 2XL; GoalTender; Habitat; Hyvar X; Hyvar X-L; Karmex DF; Krenite S Brush Control Agent; Krovar I DF; Landmark; Landmark XP; Oust Extra; Oust XP; Outrider®; Plateau; Poast; Poast Plus; Ronstar 50 WSP; Ronstar Flo; Ronstar G; Sahara DG; Spike 20P Specialty; Spike 80 DF Specialty; Stalker; Surflan AS Specialty; Surflan Flex; Surflan Flex T&O; Surflan XL 2G; Surflan Pro; Telar XP; Tordon 101 Mixture Specialty; Tordon 22K Specialty; Tordon K Herbicide Specialty; Transline Specialty; Vanquish; Velpar DF CU; Velpar DF VU; Velpar L CU; Velpar L; Velpar L VU; 2,4-D; atrazina; dicamba; bromacil; diuron; imazapyr; metsulfuron methyl; oryzalin; pendimethalin, prodiamine; simazine; sulfosulfuron; trichlopyr

Al usarlo en combinaciones como se describe en esta etiqueta y hasta el grado que sea compatible con la legislación pertinente, la responsabilidad de Bayer CropScience LP de ninguna manera incluirá ninguna pérdida, daño o lesión que no sea exclusiva y directamente causada por incluir el producto de Bayer CropScience LP en dicho uso combinado.

7.4 Procedimiento de mezcla en tanque

Siempre determine con anticipación la compatibilidad de todos los productos de la mezcla de tanque en la sustancia vehicular, mezclando antes pequeñas cantidades proporcionales.

Agregue componentes individuales en la mezcla de tanque en el siguiente orden: polvos mojables, formulaciones fluidas, concentrados emulsionantes, aditivos de reducción de la dispersión, líquidos solubles en agua (este producto), surfactantes no iónicos. Asegúrese de que los productos en la mezcla de tanque estén bien mezclados en la solución de rocío antes de agregar este producto.

Mezcle solo la cantidad de solución de rocío que aplicará ese día. La aplicación de soluciones de mezcla de tanque que se dejan reposar toda la noche podrían tener un control de malezas reducido.

Continúe agitando suavemente todo el tiempo hasta haber rociado todo el contenido del tanque. Si se deja que la mezcla para rociar se asiente, agite bien para que la mezcla vuelva a estar en suspensión antes de continuar la aplicación.

Mantenga la manguera de retorno en el fondo del tanque, o próximo a este para minimizar la formación de espuma.

Un filtro de malla de 50 hilos para la boquilla o un colador en el equipo de rocío es adecuado.

7.5 Mezcla de concentraciones de solución de rocío

Toda referencia en esta etiqueta a la concentración de este producto en una solución de rocío está basada en un porcentaje de volumen.

Prepare el volumen deseado de solución de rocío en una concentración determinada mezclando con agua la cantidad de este producto que se indica en la siguiente tabla.

Volumen deseado de solución de rocío	Cantidad de Roundup Custom para uso acuático y terrestre para lograr la concentración indicada en la solución de rocío (porcentaje por volumen)					
	0.5%	0.75%	1%	1.5%	4%	8%
1 galón	2/3 onza líquida	1 cuarto de galón	1.3 onzas líquidas	2 onzas líquidas	5 onzas líquidas	10 onzas líquidas
25 galones	16 onzas líquidas	24 onzas líquidas	1 cuarto de galón	1.5 cuartos de galón	4 cuartos de galón	2 galones
100 galones	2 cuartos de galón	3 cuartos de galón	1 cuarto de galón	1.5 galones	4 galones	8 galones

2 cucharadas soperas = 1 onza líquida (onz. líq.)

Para llenar los rociadores tipo mochila y de bombeo, recomendamos mezclar la cantidad apropiada de este producto con agua en un envase más grande y luego llenar el rociador con esta solución mezclada.

7.6 Colorantes y tintes

A las soluciones de rocío de este producto se le pueden agregar colorantes o tinturas para marcar, sin embargo estos podrían reducir su rendimiento. Use colorantes o tinturas según las indicaciones del fabricante.

7.7 Aditivos de reducción de dispersión

Se pueden utilizar aditivos para reducir la dispersión en todos los tipos de equipo de aplicación, a excepción de aplicadores con enjugador, barras de esponja y aplicación por goteo controlado (CDA). Cuando se use un aditivo para reducir la dispersión, lea y siga cuidadosamente todas las precauciones, limitaciones y el resto de la información de la etiqueta del producto. El uso de aditivos de reducción del arrastre puede afectar la cobertura de rocío, lo cual puede dar lugar a que se reduzca la eficacia de este producto.

8.0 EQUIPOS Y TÉCNICAS PARA LA APLICACIÓN

Este producto puede aplicarse usando los siguientes equipos:

Equipo de aplicación aérea— con alas fijas y helicóptero

Equipo de aplicación terrestre— sistemas con brazo o sin brazo, rociadores de arrastre, flotadores, rociadores de captación, cupés de rocío y otros equipos de aplicación terrestre al voleo

Rociadores manuales— rociadores de mochila, rociadores con presión de bombeo, pistolas de mano, bastones de mano, sopladores de vaporización*, lanzas y otros equipos rociadores de mano y a motor empleados para dirigir el rocío al follaje de la maleza.

* Este producto no está registrado en California ni en Arizona para su uso en sopladores de vaporización.

Equipo de aplicación selectiva— rociadores de recirculación, rociadores con pantalla y campana, aplicador con enjugador, barra con esponja, inyectores de tallo sencillos o huecos, inyectores de árboles, botella rociadora

Sistemas por inyección—rociadores por inyección aéreos o terrestres

Aplicador por goteo controlado (CDA)— aplicadores de mano o instalados en brazos que producen un rocío formado por un estrecho rango de tamaños de gotas

APLIQUE ESTE PRODUCTO UTILIZANDO EQUIPOS DEBIDAMENTE MANTENIDOS Y CALIBRADOS QUE SEAN CAPACES DE ROCIAR CON PRECISIÓN EL VOLUMEN DESEADO.

No use ningún sistema de irrigación para aplicar este producto.

8.1 Manejo de la dispersión del rocío

EVITE EL CONTACTO DE ESTE HERBICIDA CON EL FOLLAJE, TALLOS VERDES, RAÍCES NO LEÑOSAS EXPUESTAS O FRUTOS EXPUESTOS DE LOS CULTIVOS, PLANTAS Y ÁRBOLES DESEABLES, PORQUE LAS PLANTAS PUEDEN SUFRIR GRAVES DAÑOS O SER DESTRUIDAS.

No permita que la solución herbicida se vaporice, gotee, disperse o salpique sobre la vegetación deseable ya que incluso cantidades pequeñas de este producto pueden causar daños graves o destruir el cultivo, plantas u otra vegetación que no era el objetivo de la aplicación.

EVITE LA DISPERSIÓN. TENGA SUMO CUIDADO AL APLICAR ESTE PRODUCTO PARA EVITAR DAÑOS A LAS PLANTAS Y CULTIVOS DESEABLES.

Evitar la dispersión del rocío en el lugar de aplicación es responsabilidad del aplicador. La interacción de varios factores relacionados con el clima y el equipo determina la posibilidad de dispersión del rocío. El aplicador y el cultivador son responsables de considerar todos estos factores al tomar decisiones relacionadas con la aplicación de este producto.

Las probabilidades de daño causado por la dispersión del rocío al aplicar este producto aumentan cuando hay viento con ráfagas, cuando la velocidad del viento aumenta, cuando la dirección del viento cambia constantemente o cuando hay otras condiciones meteorológicas que favorecen la dispersión del rocío. Al rociar, evite las combinaciones de presión y tipo de boquillas que resulten en salpicaduras o partículas finas (niebla) que es probable que se dispersen.

PARA EVITAR DAÑAR LA VEGETACIÓN DESEADA ADJUNTA, SE DEBEN MANTENER ZONAS DE TRANSICIÓN ADECUADAS.

EVITE APLICAR ESTE PRODUCTO A ALTA VELOCIDAD O PRESIÓN EXCESIVA.

8.2 Equipo de aplicación aérea

A menos que se prohíba de otra manera, todas las aplicaciones al voleo de este producto indicadas en esta etiqueta se pueden realizar con equipos de aplicación aérea, de ser posible, siempre que la persona que aplica el producto cumpla con las precauciones y restricciones especificadas en esta etiqueta y en las etiquetas complementarias separadas que se publican para este producto.

NO APLIQUE ESTE PRODUCTO CON EQUIPOS AÉREOS EXCEPTO BAJO LAS CONDICIONES QUE SE ESPECIFICAN EN ESTA ETIQUETA O EN LAS ETIQUETAS COMPLEMENTARIAS SEPARADAS QUE SE PUBLICAN PARA ESTE PRODUCTO.

PARA CONOCER LAS INSTRUCCIONES, RESTRICCIONES Y REQUISITOS ESPECÍFICOS RELACIONADOS CON LA APLICACIÓN AÉREA DE ESTE PRODUCTO EN CALIFORNIA, O EN CONDADOS ESPECÍFICOS DE ESE ESTADO, CONSULTE LAS LIMITACIONES DE LA APLICACIÓN AÉREA EN ESE ESTADO O CONDADO QUE SE PRESENTA EN ESTA SECCIÓN.

Aplique este producto en la proporción recomendada en esta etiqueta en 3 a 25 galones de agua por acre, a menos que se indique de otra manera. Use un volumen de rocío mayor dentro de este rango si las malezas, matorrales, árboles y enredaderas son densas o forman varias capas de cobertura.

Evite la aplicación directa en masas de agua.

Pueden usarse aditivos para controlar o reducir la dispersión.

Asegúrese de que la aplicación sea uniforme. Para evitar la aplicación en surcos, irregular o encimada, utilice dispositivos de señalización apropiados.

Mantenimiento de aviones

Al final de cada día de trabajo, lave muy bien el avión, especialmente el tren de aterrizaje, para quitar los residuos de este producto que se acumulan durante el rocío o por derrames. EL CONTACTO PROLONGADO DE ESTE PRODUCTO CON PARTES DE ACERO SIN REVESTIMIENTO PUEDE CAUSAR CORROSIÓN Y POSIBLEMENTE QUE LAS PARTES FALLEN. LA PARTE MÁS SUSCEPTIBLE ES EL TREN DE ATERRIZAJE. Es posible prevenir la corrosión recubriendo las partes con pintura orgánica que cumpla con las especificaciones aeroespaciales MIL-C-38413.

MANEJO DE LA DISPERSIÓN DEL ROCÍO AÉREO

Deben seguirse los siguientes requerimientos de manejo de la dispersión para minimizar el movimiento de esta fuera del objetivo durante la aplicación aérea. Estos requisitos no se aplican para aplicaciones de forestación.

1. La distancia de la boquilla más externa en el brazo no debe exceder 3/4 del largo de la envergadura o rotor.
2. Las boquillas deben siempre apuntar hacia atrás, paralelas a la corriente de aire, nunca hacia abajo más de 45 grados. En los estados que tengan reglamentos más estrictos, deberán observarse estos.

Importancia del tamaño de las gotas

La forma más eficaz de reducir la posibilidad de dispersión es aplicar en gotas grandes. La mejor estrategia de manejo de la dispersión es la aplicación de las gotas más grandes que provean suficiente cobertura y control. La aplicación de gotas más grandes reduce la posibilidad de dispersión, pero no la evitará si la aplicación se hace de forma incorrecta o bajo condiciones ambientales desfavorables, como por ejemplo con viento, altas temperaturas y baja humedad y/o condiciones de inversión como se describe más adelante.

Control del tamaño de las gotas

- **Volumen:** Use boquillas de velocidad de flujo alta para aplicar el mayor volumen de rocío práctico. Las boquillas con mayores velocidades de flujo producen gotas más grandes.
- **Presión:** Opere a una presión de rocío que esté cerca del extremo más bajo del rango indicado para la boquilla. La presión más alta reduce el tamaño de la gota y no mejora la penetración de la cobertura. Cuando sean necesarias velocidades de flujo mayores, use boquillas con mayor velocidad de flujo en lugar de aumentar la presión.
- **Cantidad de boquillas:** Utilice la cantidad mínima de boquillas que proporcionen una cobertura uniforme.
- **Orientación de la boquilla:** Si orienta las boquillas de modo que liberen el rocío hacia atrás, en sentido paralelo a la circulación del aire, producirán gotas más grandes que si las orienta de otro modo. Cuanto más desviadas estén del plano horizontal, tanto más pequeñas serán las gotas y tanto mayor el potencial de dispersión.
- **Tipo de boquilla:** Utilice un tipo de boquilla diseñado para la aplicación deseada. Con la mayoría de los tipos de boquillas, cuanto menor sea el ángulo de rocío tanto mayor serán las gotas. Considere el uso de boquillas de poca dispersión. Las boquillas de chorro sólido orientadas completamente hacia atrás producen gotas más grandes que otros tipos de boquillas.
- **Longitud del brazo:** En algunos esquemas de uso, la reducción de la longitud efectiva del brazo a menos de 3/4 de la envergadura o de la longitud del rotor puede reducir la dispersión aún más sin reducir el ancho de la franja.
- **Altura de la aplicación:** Las aplicaciones deben realizarse a una altura de 10 pies o menos por encima de la copa de las plantas más grandes, a menos que se requiera mayor altura por razones de seguridad del avión. Realizar las aplicaciones a la menor altura que sea segura reduce la exposición de las gotas a la evaporación y el viento.

Ajuste de franja

Cuando la aplicación se lleve a cabo ante viento lateral, la franja de aspersión se desplazará a favor del viento. Por ello, en los extremos con o contra el viento del campo, el aplicador debe compensar este desplazamiento ajustando la trayectoria del avión contraria al viento. La distancia de ajuste de la franja debe aumentar, cuando aumenta la posibilidad de arrastre (mayor viento, gotitas más pequeñas, etc.).

Viento

El potencial de dispersión es menor cuando la velocidad del viento es de 2 a 10 millas por hora. Sin embargo, muchos factores, incluyendo el tamaño de las gotas y el tipo de equipo, determinan la posibilidad de dispersión a una velocidad determinada. Se debe evitar la aplicación cuando la velocidad del viento está por debajo de 2 millas por hora debido a los cambios de dirección del viento y la alta posibilidad de inversión. NOTA: El terreno local puede influir en los patrones de viento. Cada aplicador debe conocer los patrones de vientos locales y cómo éstos afectan la dispersión.

Temperatura y humedad

Cuando se realizan aplicaciones con humedad relativa baja, fije el equipo para que produzca gotas más grandes para compensar por la evaporación. La evaporación de gotas es más grave cuando las condiciones son calurosas y secas.

Inversiones de temperatura

Este producto no debe aplicarse durante una inversión de temperatura debido a que la posibilidad de dispersión es alta. Las inversiones de temperatura restringen la mezcla de aire vertical, lo que causa que pequeñas gotas permanezcan suspendidas en una nube concentrada. Esta nube puede moverse en direcciones no predecibles debido a los vientos variables leves que son comunes durante las inversiones. Las inversiones de temperatura están caracterizadas por temperaturas en aumento con la altitud y son comunes en las noches con cobertura de nubes limitada y poco o ningún viento. Comienzan a formarse cuando se mete el sol y a menudo continúan en la mañana. Su presencia puede indicarse por neblina en el suelo; sin embargo, si la neblina no está presente, las inversiones también pueden identificarse por el movimiento del humo desde una fuente del suelo o por el generador de humo de un avión. El humo en capas que se mueve lateralmente en una nube concentrada (bajo condiciones de poco viento) indica una inversión, mientras que el humo que se mueve hacia arriba y se disipa rápidamente indica buena mezcla de aire vertical.

Áreas susceptibles

Este producto solo se debe aplicar cuando la posibilidad de dispersión hacia zonas adyacentes susceptibles que no sean el objetivo (por ejemplo, áreas residenciales, hábitat conocido de especies amenazadas o en peligro de

extinción, cultivos que no sean el objetivo) sea mínima (por ejemplo, cuando el viento sople lejos de las áreas susceptibles).

Limitaciones estatales específicas de la aplicación aérea

LIMITACIONES DE LA APLICACIÓN AÉREA SOLAMENTE EN CALIFORNIA

NO aplique este producto usando equipo de aplicación aérea en áreas residenciales.

EVITE LA DISPERSIÓN – NO APLIQUE CUANDO HAYA VIENTO CON RÁFAGAS O BAJO OTRAS CONDICIONES QUE FAVOREZCAN LA DISPERSIÓN. LA DISPERSIÓN DE ESTE PRODUCTO EN CUALQUIER VEGETACIÓN QUE NO SEA EL OBJETIVO DE LA APLICACIÓN PUEDE CAUSAR DAÑOS. PARA EVITAR DAÑOS A LA VEGETACIÓN ADYACENTE DESEADA, USE EL EQUIPO DE APLICACIÓN AÉREA CORRECTO CON LAS BOQUILLAS APROPIADAS Y MANTENGA ZONAS DE TRANSICIÓN ADECUADAS.

Siga las siguientes instrucciones al hacer aplicaciones aéreas cerca de cultivos que no sean el objetivo, vegetación anual deseable o vegetación perenne deseable después de echar brotes y antes de la caída total de las hojas.

1. No aplique este producto a menos de 100 pies de la vegetación deseable o los cultivos que no son el objetivo.
2. Si está soplando un viento de hasta 5 millas por hora HACIA la vegetación deseable o los cultivos que no son el objetivo, no aplique este producto a menos de 500 pies de los cultivos o vegetación deseable.
3. Si están soplando vientos de entre 5 y 10 millas por hora HACIA la vegetación deseable o los cultivos que no son el objetivo, puede que se necesite una zona de transición de más de 500 pies para proteger los cultivos o vegetación deseable.
4. No aplique este producto usando equipo de aplicación aérea cuando soplen vientos de más de 10 millas por hora.
5. No aplique este producto usando equipo de aplicación aérea cuando existan condiciones de inversión.

Al mezclar en tanque este producto con 2,4-D, solo se pueden utilizar formulaciones de 2,4-D amina con equipo de aplicación aérea en California. Las mezclas de tanque de este producto con formulaciones de 2,4-D amina se pueden aplicar por aire en California únicamente en sistemas de labranza reducida o campos con barbecho y para renovación de pastura.

Este producto, al ser mezclado en tanques con dicamba, no se puede aplicar por aire en el estado de California.

LIMITACIONES ADICIONALES PARA LA APLICACIÓN AÉREA SOLAMENTE EN EL CONDADO DE FRESNO, CALIFORNIA

Siempre lea y siga las instrucciones de la etiqueta y las declaraciones preventivas para todos los productos usados en la aplicación aérea.

La siguiente información aplica solo del 15 de febrero al 31 de marzo dentro de los siguientes límites del Condado de Fresno, California:

Norte: Frontera del Condado de Fresno
Sur: Frontera del Condado de Fresno
Este: Autopista estatal 99
Oeste: Frontera del Condado de Fresno

Respete las siguientes instrucciones para minimizar el movimiento fuera del lugar durante la aplicación aérea de este producto. Minimizar el movimiento fuera del lugar es responsabilidad del cultivador, el Asesor en control de plagas y el encargado de la aplicación aérea.

Instrucciones por escrito

El encargado de la aplicación o su representante TIENEN que presentar instrucciones por escrito al Comisionado de Agricultura del Condado de Fresno 24 horas antes de la aplicación. Estas instrucciones por escrito TIENEN que indicar la proximidad de los cultivos en los alrededores y que se han cumplido las condiciones de esta etiqueta y de todas las etiquetas de los fabricantes de los productos.

Capacitación y equipo del encargado de la aplicación aérea

La aplicación aérea de este producto se limita a los pilotos que hayan completado con éxito un programa de capacitación para la aplicación aérea de herbicidas aprobado por el Comisionado de Agricultura del Condado de Fresno y el Departamento de Regulación de Pesticidas de California. Todos los aviones tienen que ser inspeccionados, revisados en vuelo y certificados por una organización aprobada por el Comisionado de Agricultura del Condado de Fresno. Pruebe y calibre el equipo de rocío a intervalos suficientes para garantizar que se estén aplicando las proporciones adecuadas de herbicidas y adyuvantes durante el uso comercial. El encargado de la aplicación tiene que documentar dichas pruebas y calibraciones. Una demostración de desempeño en una organización aprobada por el Comisionado de Agricultura del Condado de Fresno constituye documentación, además de otros registros por escrito que muestren cálculos y medidas de los parámetros de vuelo y rocío aceptables para el Comisionado de Agricultura del Condado de Fresno.

Aplicaciones de noche – No aplique este producto por aire más de 30 minutos antes del amanecer ni más de 30 minutos después de la puesta del sol sin autorización previa del Comisionado de Agricultura del Condado de Fresno.

Para obtener información adicional sobre la aplicación aérea adecuada de este producto en el Condado de Fresno llame al (800) 332-3111.

8.3 Equipo de aplicación terrestre

Aplique este producto en las proporciones apropiadas como se especifica en esta etiqueta en 3 a 40 galones de agua por acre cuando se realizan aplicaciones al voleo usando equipos de aplicación terrestre, a menos que se indique de otro modo en esta etiqueta, en las etiquetas complementarias separadas o en las Fichas Técnicas que se publican para este producto. A medida que aumenta la densidad de las malezas, aumente el volumen de rocío hacia al extremo superior dentro de este rango para conseguir una cobertura completa. Use boquillas que eviten generar una niebla fina. Para obtener mejores resultados con el equipo de aplicación terrestre, use boquillas tipo abanico plano. Compruebe la distribución uniforme del patrón de las gotas del rocío.

8.4 Rociadores manuales

Al usar un rociador de mano, aplique soluciones de rocío de este producto de manera completa y uniforme al follaje de la vegetación objetivo, usando un espectro de gotas gruesas y técnica de rocío para mojar; no rocíe hasta el punto de escurrimiento. Consulte la sección "MALEZAS CONTROLADAS" de esta etiqueta para conocer la concentración correcta de este producto en la solución de rocío y el momento de aplicación para controlar malezas específicas, árboles, enredaderas y matorrales leñosos.

Para el control de malezas anuales, aplique cuando las malezas están pequeñas y antes de la formación de inflorescencias o brotes. Para el control de malezas perennes, árboles, enredaderas y matorrales leñosos, aplique después de la floración y antes de la caída de hojas y el color otoñal.

Al hacer una aplicación de rocío dirigido a bajo volumen a malezas anuales y perennes, árboles, enredaderas y matorrales leñosos usando un rociador de mano, asegúrese de rociar por lo menos de 50 a 75 por ciento del follaje o la mitad superior de cada planta no deseada. Si se usa una boquilla de chorro recto, comience la aplicación en la parte superior de la planta objetivo y rocíe de arriba hacia abajo con un movimiento lateral en zigzag. Para asegurar una cobertura uniforme y completa, rocíe ambos lados de los matorrales leñosos grandes o altos, árboles y enredaderas o cuando el follaje es espeso y denso o hay varios brotes. Para obtener mejores resultados en los árboles, enredaderas y matorrales leñosos, aplique a la vegetación en crecimiento activo después de la expansión completa de las hojas y la floración, antes de la caída de las hojas y el color de otoño.

La siguiente tabla resume varios métodos de aplicación foliar usando un rociador de mochila con una técnica de rocío dirigido a bajo volumen o rocío para mojar y una aplicación con rociador de alto volumen usando equipo de aplicación a mano para el control total o parcial de malezas herbáceas, árboles, enredaderas y matorrales leñosos listados en la sección "MALEZAS CONTROLADAS" de esta etiqueta.

Método de aplicación	Concentración de solución de rocío	Volumen de rocío
Pistola de mano o rociador de mochila	0.5 a 1.5% por volumen	Técnica de rocío para mojar
Rocío dirigido de bajo volumen (mochila)	4 a 8% por volumen	15 a 25 galones por acre
Rocío modificado de alto volumen	1.5 a 3% por volumen	40 a 60 galones por acre

La aplicación de rocío dirigido a bajo volumen con un rociador de mochila funciona mejor cuando se aplica a las malezas y matorrales con menos de 10 pies de alto. Para las malezas y matorrales más altos, una pistola de mano de alto volumen puede modificarse reduciendo el tamaño de la boquilla y la presión de rocío para producir una aplicación modificada de rocío dirigido de alto volumen.

8.5 Equipo de aplicación selectiva

El equipo de aplicación selectiva permite que este producto se aplique a las malezas que crecen cerca de cultivos o de otra vegetación deseable sin matar la vegetación deseable. El equipo de aplicación selectiva debe evitar todo contacto de la solución herbicida con la vegetación deseable y operarse sin filtración de rocíos de niebla, derrames o goteo de la solución herbicida.

EVITE EL CONTACTO DE ESTE HERBICIDA CON LA VEGETACIÓN DESEABLE. El contacto de este producto con la vegetación deseable podría causar daños o la destrucción de la planta. Hasta el grado que sea compatible con la legislación pertinente, este daño será responsabilidad exclusiva de la persona encargada de la aplicación del producto.

Este producto puede diluirse en agua y aplicarse usando rociadores de recirculación, rociadores con pantalla, rociadores con campana, aplicadores con enjugador o barras de esponja, a las malezas especificadas en esta etiqueta que crecen en cualquier sitio acuático o terreno de cultivo no alimentario indicado en esta etiqueta, donde sea posible. Este producto también puede usarse con rociadores equipados con tecnología de sensor óptico de malezas. Este producto también puede aplicarse con otro equipo selectivo como los inyectores de tallo sencillos o huecos, inyectores de árboles, aplicadores con enjugador para aplicaciones en tallos cortados y tocones cortados y en botellas rociadoras para aplicaciones en tallos cortados, tocones cortados y chorro para controlar malezas de tallo largo, matorrales, árboles y enredaderas indicados en esta etiqueta.

Rociador de recirculación

Los rociadores de recirculación dirigen la solución de rocío hacia los tipos de malezas que crecen sobre vegetación deseable, mientras que la solución de rocío que no ha sido interceptada por las malezas se recoge y se retorna al tanque para volverla a usar. Un rociador de recirculación puede usarse para aplicar soluciones de rocío de este producto a las malezas indicadas en esta etiqueta en cualquier sitio acuático o terreno sin cultivo descrito en esta etiqueta.

Rociadores con pantalla y con campana

Un rociador con pantalla dirige la solución herbicida a las malezas objetivo mientras protege la vegetación deseable de entrar en contacto con el rocío herbicida mediante una pantalla o material impermeable. Use boquillas que aseguren una cobertura uniforme de toda el área tratada. Mantenga las pantallas debidamente colocadas a fin de proteger la vegetación deseada.

Un rociador con campana es un tipo de rociador con pantalla en el que el rocío está totalmente encerrado, y que incluye parte superior, laterales, parte frontal y posterior, de modo que protege la vegetación deseable de la solución de rocío.

Este producto puede diluirse con agua y aplicarse, a menos que se indique lo contrario, mezclado con un surfactante, usando un rociador con pantalla o con campana a las malezas indicadas en esta etiqueta que crecen en cualquier sitio acuático o terreno sin cultivo descrito en esta etiqueta, donde sea posible, y entre hileras de plantas (en medio de las hileras) en cualquier sistema de cultivo indicado en esta etiqueta.

Coloque correctamente la campana para proteger la vegetación deseable. Asegúrese de que la campana es capaz de encerrar completamente el patrón

de rocío. De ser necesario cuando lo aplique alrededor de cultivos en camas elevadas, extienda hacia abajo las solapas frontal y posterior del rociador con campana para llegar a la tierra en surcos profundos.

Los rociadores con campana deben ser configurados y operados de manera que reduzcan al mínimo el rebote, y eviten que sea necesario levantar la campana de la superficie de la tierra en cualquier momento. Si la campana se levanta, pueden escapar partículas de rocío y hacer contacto con el cultivo o con otra vegetación deseable, causándole daño o destrucción. Evite operar este equipo en terreno irregular o en declive, donde la campana de rocío puede levantarse de la superficie del suelo.

Utilice campanas diseñadas para reducir al mínimo el escurrimiento o goteo excesivo por la parte interior de la campana, tales como una única boquilla en abanico de baja presión y poca dispersión con un ángulo de rocío de 80 a 95 grados, colocada en la parte central superior de la campana, con un volumen de rocío de 20 a 30 galones por acre.

Los siguientes procedimientos ayudarán a reducir las posibilidades de daño a la vegetación deseable cuando se usa un rociador con campana:

- Opere el rociador con la campana sobre el terreno o casi rozando la superficie del terreno.
- Deje una franja de al menos 8 pulgadas sin tratar sobre la hilera del surco. (Por ejemplo, si una hilera del cultivo tiene un ancho de 38 pulgadas, use una campana de rocío con un ancho máximo de 30 pulgadas).
- Trabaje a una velocidad terrestre no mayor de 5 millas por hora para minimizar el rebote del rociador con campana.
- Aplique cuando la velocidad del viento sea de 10 millas por hora o menos.
- Utilice boquillas de poca dispersión que ofrecen cobertura uniforme dentro del área de aplicación.

Puede causar daños al cultivo o a otra vegetación deseable si se aplica al follaje de las malezas que tienen contacto directo con la vegetación deseable. No aplique este producto si las hojas de la vegetación deseable crecen en contacto directo con las malezas. Las gotas, la niebla, la espuma o las salpicaduras de la solución herbicida que se depositan en la vegetación deseable pueden causar decoloración, atrofia o destrucción.

Aplicador con enjugador

El aplicador con enjugador es un dispositivo que pasa físicamente este producto o soluciones de este producto directamente a la maleza o los tocones cortados. Puede usarse cualquier dispositivo manual que sea capaz de pasar físicamente este producto o soluciones de este producto directamente en la maleza objetivo o tocón, como por ejemplo una brocha de pintor.

Un aplicador con enjugador mecánico, como una barra de esponja o mecha que pueda llevarse por un campo por encima de un cultivo u otra vegetación deseable para controlar las malezas que son más altas que la vegetación deseable, debe estar diseñado, mantenerse y operarse de tal manera que evite que la solución herbicida entre en contacto con la vegetación deseable.

Los aplicadores con enjugador pueden usarse sobre los cultivos alimentarios ÚNICAMENTE si su uso sobre ese cultivo está específicamente permitido en esta etiqueta o en las etiquetas complementarias que se publican por separado para este producto.

Al usar un aplicador con enjugador mecánico, ajuste la altura del aplicador para asegurar el contacto adecuado con las malezas, de manera que el punto de contacto del enjugador esté al menos 2 pulgadas por encima del cultivo o la vegetación deseable. Se obtienen mejores resultados cuando una mayor cantidad de maleza entra en contacto con la solución herbicida y las malezas tienen por lo menos 6 pulgadas de altura más que la vegetación deseable. Las malezas que no entran en contacto con la solución herbicida no se afectarán. El contacto puede ser insuficiente cuando las malezas crecen en macizos densos, en las áreas de infestaciones severas de malezas o cuando la altura de las malezas varía considerablemente. En estas situaciones, puede ser necesaria más de una aplicación de este producto.

Opere los aplicadores con enjugador a una velocidad terrestre no mayor de 5 millas por hora. Se puede mejorar el rendimiento en zonas infestadas con muchas malezas si se reduce la velocidad, lo que dará más tiempo para volver a saturar el enjugador con la solución herbicida y más tiempo de contacto del enjugador con la maleza. Se pueden obtener mejores resultados con un aplicador con enjugador si se hacen dos aplicaciones en direcciones opuestas del campo.

Mantenga limpias las superficies del enjugador.

Las gotas, la niebla, la espuma o las salpicaduras de la solución herbicida que se depositan en la vegetación deseable pueden causar decoloración, atrofia o destrucción. Evite las filtraciones o el goteo en la vegetación deseable. Tenga en cuenta que en terreno en declive la solución herbicida puede cambiar de lugar, goteando en el extremo inferior y secando el enjugador en el extremo superior del aplicador.

No aplique este producto con un aplicador con enjugador cuando las malezas estén mojadas.

Agregue un surfactante no iónico a una concentración de 10 por ciento por volumen de la solución total del aplicador (un galón de surfactante por cada 10 galones de solución) para usar en un aplicador con enjugador. Consulte la sección "MEZCLA" de esta etiqueta para obtener información adicional sobre el uso de surfactantes.

Para aplicadores con barra de esponja o mecha: aplique soluciones en un rango entre 33 y 75 por ciento de este producto por volumen en agua.

Para aplicadores de panel: aplique soluciones en un rango entre 33 y 90 por ciento de este producto por volumen en agua.

Mezcle solamente la cantidad de este producto que se usará durante el período de un día, debido a que el uso de soluciones de días anteriores puede reducir el efecto del producto.

Lave las piezas del enjugador inmediatamente después de utilizar este producto enjuagando con una gran cantidad de agua.

Inyectores de tallo sencillos y huecos

Se puede obtener el control de ciertas malezas indicadas en la sección "MALEZAS CONTROLADAS" inyectando este producto concentrado o soluciones de este producto directamente en la maleza objetivo. Asegúrese de que el inyector de mano que se use para esta aplicación sea capaz de rociar con precisión el volumen especificado en la etiqueta. Al inyectar los tallos, el uso total combinado de este producto no debe exceder 8 cuartos de galón por acre por año. A 5 mililitros de producto concentrado (sin diluir) por tallo, 8 cuartos de galón tratarán aproximadamente 1500 tallos por acre por año. La cantidad de tallos que pueden tratarse por acre variará dependiendo del volumen de inyección y de la concentración de este producto en la solución de aplicación.

8.6 Sistemas por inyección

Este producto puede usarse con sistemas de rocío por inyección, ya sean aéreos o terrestres, como concentrado líquido o diluido antes de inyectarlo en el chorro de rocío. No mezcle este producto concentrado con concentraciones de otros productos sin diluir cuando use los sistemas por inyección, a menos que se indique lo contrario. Para usar este producto en sistemas por inyección, se requiere una concentración de surfactante no iónico de 0.5% o más en el chorro de rocío.

8.7 Aplicador por goteo controlado (CDA)

La cantidad de este producto aplicada por acre con el aplicador por goteo controlado (CDA) no puede ser menos que la proporción indicada en esta etiqueta cuando se aplica con un equipo al voleo convencional.

El aplicador por goteo controlado produce un patrón de rocío que es difícil de ver. Debe tener sumo cuidado de no rociar o hacer contacto por dispersión con el follaje o con cualquier otro tipo de vegetación deseable, ya que esto puede causar daño o la destrucción de la planta.

9.0 SITIOS DE USO ACUÁTICO Y TERRESTRE

Este producto puede utilizarse de acuerdo con las instrucciones de uso en esta etiqueta para controlar malezas, árboles, enredaderas y matorrales leñosos indicados en esta etiqueta que crezcan en ambientes acuáticos o en cualquier terreno descrito en esta etiqueta.

9.1 Sitios acuáticos

Este producto puede usarse para controlar malezas, matorrales, árboles y enredaderas emergidas en todos los cuerpos de agua superficial fresca y salobre, fluyentes, estancados o transitorios. Estos cuerpos de agua incluyen lagos, ríos, arroyos, estanques, estuarios, diques de arroz, rezumaderos, acequias, canales, represas, tierras pantanosas e instalaciones para tratamiento de aguas usadas. Este producto puede usarse también para controlar malezas en zonas intermareales por debajo del nivel promedio de la marea alta y en terrenos donde pueda haber cuerpos de agua y una zona de transición que asegurará que un rocío excesivo del agua no se puede mantener.

Al aplicar soluciones de rocío de este producto en sitios acuáticos o cerca de estos, debe usarse un surfactante no iónico indicado para uso con herbicidas y aprobado para aplicación directa a los cuerpos de agua. Consulte la sección "MEZCLA" de esta etiqueta para obtener más información sobre el uso de surfactantes con este producto.

Antes de usar este producto para el control de malezas acuáticas o para control terrestre cerca de sitios acuáticos, lea cuidadosamente la siguiente información.

- Este producto no controla plantas que estén completamente sumergidas o que tienen la mayoría de su follaje debajo del agua.
- No hay restricciones al uso de agua para riego, recreación o fines domésticos después de la aplicación directa de este producto a plantas acuáticas emergidas.
- Consulte con la principal agencia reguladora de pesticidas de su estado, la agencia estatal de pesca y vida silvestre y/o la autoridad para el control de las aguas antes de aplicar este producto a la vegetación que crezca en aguas públicas para determinar si se requiere un permiso.
- No aplique este producto directamente al agua dentro de 0.5 millas aguas arriba de una toma activa de agua potable en corrientes de agua (esto es, ríos, arroyos, etc.) o dentro de 0.5 millas de una toma activa de agua potable en un cuerpo de agua estancada, como un lago, estanque o represa. Para aplicaciones acuáticas cerca y dentro de 0.5 millas de una toma activa de agua potable, la toma tiene que cerrarse por un período mínimo de 48 horas después de la aplicación. La toma de agua puede abrirse antes de las 48 horas si el nivel de glifosato en el agua de la toma está por debajo de 0.7 partes por millón según lo determina un análisis de laboratorio. Estas aplicaciones acuáticas pueden hacerse ÚNICAMENTE en aquellos casos donde existen fuentes de agua alternas o embalses que permitan cerrar una toma activa de agua potable por un período mínimo de 48 horas después de la aplicación. Esta restricción NO aplica al rocío excesivo accidental e intermitente del agua en sitios de uso terrestre.
- Para alcanzar el control máximo de malezas en zanjas secas, aplique este producto 1 día después de interrumpir el suministro de agua para asegurar la aplicación en las malezas con crecimiento activo y deje transcurrir 7 días o más después del tratamiento para volver a restaurar el agua.
- Puede ser necesario más de una aplicación de este producto para el control de matas de vegetación flotante. Evite que la lluvia o el oleaje levantado por los botes laven este producto del follaje en un plazo de 4 horas después de la aplicación. Espere por lo menos 24 horas antes de volver a aplicar este producto a la misma vegetación.
- La aplicación de este producto a cuerpos de agua en movimiento debe hacerse mientras se mueve contracorriente para evitar la concentración del herbicida en el agua.
- Al aplicar en las márgenes de cuerpos de agua, evite superponer más de un pie dentro del agua.
- No aplique este producto a cuerpos de agua donde no existan malezas emergidas.
- Si aplica este producto a más del 20 por ciento del área total de un cuerpo de agua, no aplique más de 3.75 cuartos de galón por acre en una sola aplicación al voleo. Si aplica a menos del 20 por ciento del área total de un cuerpo de agua, puede aplicar cualquier proporción indicada en esta etiqueta. Esta restricción de proporción en aplicación única no aplica

a cruces de corrientes de agua en servidumbres de paso de servicios públicos.

- Cuando la infestación de malezas emergidas cubre la superficie total de un cuerpo de agua en un embalse o represa, aplique este producto a la vegetación emergida en franjas para evitar la pérdida de oxígeno en el agua causada por la vegetación en descomposición. La pérdida de oxígeno en el agua puede dar lugar a un aumento en la mortalidad de los peces.

MEZCLAS DE TANQUE: Este producto se puede aplicar en una mezcla de tanque con uno o más de los siguientes productos para mejorar el control de malezas acuáticas, árboles, enredaderas y matorrales leñosos en sitios acuáticos, siempre que el producto usado esté registrado para uso acuático. Consulte las etiquetas de cada producto usado en la mezcla de tanque para conocer los usos aprobados y las proporciones de aplicación. Lea y siga siempre las indicaciones de las etiquetas de cada producto utilizado en la mezcla.

Clipper; Garlon 3A Specialty; Habitat; 2,4-D amina; imazapyr; flumioxazin; triclopyr

9.2 Sitios terrestres

Este producto puede utilizarse de acuerdo con las instrucciones de uso en esta etiqueta para controlar malezas, árboles, enredaderas y matorrales leñosos indicados en esta etiqueta en cualquier terreno descrito en esta etiqueta.

Este producto puede utilizarse para controlar malezas, árboles, enredaderas y matorrales leñosos en mantenimiento de jardines, terrenos mejorados y sin mejorar, céspedes y en los alrededores de plantas ornamentales en zonas industriales, comerciales y residenciales, incluyendo aeropuertos, complejos de viviendas, chaparrales, bordes de acequias, caminos de entrada de automóviles, zanjas y canales secos, ranchos, bordes de cercas, bosques, campos de golf, invernaderos, madereras, fábricas, zonas municipales, áreas naturales, viveros, complejos de oficinas, lechos ornamentales, parques, estacionamientos, pasturas, patios de tanques de petróleo, instalaciones de bombeo, ferrocarriles, tierras de pastoreo, áreas recreativas, áreas residenciales, bordes de carretera, escuelas, cobertizos, sitios para la producción de céspedes, complejos deportivos, almacenes, subestaciones, servidumbres de paso de servicios públicos, sitios de servicios públicos, áreas de almacenamiento, parcelas para alimento de la vida silvestre y áreas de preservación de la vida silvestre.

Este producto puede utilizarse para el control no selectivo de vegetación no deseada en cualquier sitio indicado en esta etiqueta para aplicación en recortes y bordes alrededor de objetos, incluyendo alrededor de los cimientos de edificios, áreas donde se guardan equipos, y árboles, a lo largo de cercas, y para eliminar las malezas no deseadas que crecen cerca de lechos de arbustos establecidos y plantaciones ornamentales. Este producto también puede utilizarse para la completa eliminación de la vegetación en un terreno antes de sembrar plantas ornamentales, flores o césped (en tepes o semillas), y antes de desarrollar terrenos, incluso antes de comenzar proyectos de construcción o de cubrir con asfalto u otro material para la construcción de caminos. Se pueden repetir las aplicaciones de este producto cuando sea necesario para mantener el terreno limpio de malezas, hasta un máximo de 8 cuartos de galón por acre por año.

Este producto puede utilizarse para el establecimiento y mantenimiento de cortafuegos, para establecer perímetros y pantallas contra fuegos, junto a caminos para bomberos y para facilitar las prácticas de quema recomendadas en cualquier sitio descrito en esta etiqueta.

Este producto también puede utilizarse para el control de malezas o para regular el crecimiento en las plantaciones de árboles de Navidad, huertos de cítricos, ranchos, viveros de producción, cañaverales de azúcar, plantaciones de césped y sitios de producción de semillas de céspedes.

Este producto requiere la adición de un surfactante no iónico a la solución de rocío indicada para aplicación herbicida. Consulte la sección "MEZCLA" de esta etiqueta para obtener más información sobre el uso de surfactantes con este producto.

A menos que se indique lo contrario, la aplicación de este producto se puede hacer de acuerdo con las instrucciones de uso en las secciones que siguen en cualquiera de estos sitios, usando cualquier método de aplicación descrito en esta etiqueta para controlar las malezas, árboles, enredaderas y matorrales leñosos indicados en la sección de "MALEZAS CONTROLADAS" de esta etiqueta.

10.0 INFORMACIÓN ADICIONAL SOBRE MANEJO DEL LUGAR

Las siguientes secciones contienen información adicional sobre uso específicamente relacionada con el uso en ciertas zonas. A menos que se indique lo contrario, cualquier aplicación de este producto descrita en la sección "MALEZAS CONTROLADAS" o en cualquier otra sección de esta etiqueta se puede hacer en las zonas de uso descritos en las secciones que siguen, cuando proceda, usando cualquier método de aplicación descrito en esta etiqueta que sea apropiado.

10.1 Manejo de bosques, árboles de madera y árboles de Navidad

Este producto puede usarse para el control total o parcial de matorrales leñosos, árboles y malezas herbáceas en cualquier zona de árboles, incluyendo bosques, plantaciones de árboles de Navidad y viveros dedicados a la silvicultura y la producción, usando cualquier método de aplicación indicado en esta etiqueta. Vea la sección "MALEZAS CONTROLADAS" de esta etiqueta para conocer las proporciones de aplicación y las instrucciones de uso específicas.

A menos que se indique lo contrario, este producto requiere que se agregue a la mezcla de rocío un surfactante no iónico aprobado para el uso deseado en el sitio de la aplicación. El uso de este producto sin un surfactante dará lugar a un rendimiento inferior. Consulte la sección "MEZCLA" de esta etiqueta para obtener más información sobre el uso de surfactantes con este producto.

IMPORTANTE: ALGUNOS SURFACTANTES PUEDEN CAUSAR DAÑOS A LOS ÁRBOLES SI SE APLICAN DIRECTAMENTE A ALGUNAS ESPECIES. LEA Y ENTIENDA COMPLETAMENTE TODOS LOS USOS APROBADOS, LAS PRECAUCIONES Y LIMITACIONES DEL SURFACTANTE ANTES DE USARLO.

Manejo de malezas, preparación del terreno

Este producto puede utilizarse para controlar total o parcialmente matorrales leñosos, árboles, enredaderas y malezas herbáceas no deseables indicados en esta etiqueta para preparar el terreno antes de sembrar cualquier especie de árbol, incluyendo árboles de Navidad, árboles de eucalipto y cultivos de árboles híbridos, así como para controlar las malezas en los alrededores de árboles establecidos, para la poda de coníferas y árboles de madera, establecer zonas de reserva de vida silvestre y mantener los caminos en cualquier zona de árboles.

MEZCLAS DE TANQUE: Este producto puede aplicarse en mezcla de tanque con los productos indicados en esta sección para aumentar el espectro de vegetación controlada. Cualquier proporción de aplicación de este producto indicado en esta etiqueta puede usarse en una mezcla de tanque con los siguientes productos para el manejo de la zona de árboles, incluyendo la preparación del terreno, siempre que el producto esté registrado para su uso en el sitio de aplicación y antes de sembrar las especies deseadas. Consulte las etiquetas de cada producto usado en la mezcla de tanque para conocer los usos aprobados y las proporciones de aplicación. Lea y siga todas las instrucciones de uso y las precauciones para cada producto usado, incluyendo las restricciones de intervalos de siembra, si las hay. Use este producto conforme a las precauciones más restrictivas de cada producto en la mezcla.

Arsenal; Herbicida concentrado para aplicadores Arsenal; Chopper; Chopper GEN2; Escort XP; Forestry Garlon 4 Specialty; Forestry Garlon XRT Specialty; Garlon 3A Specialty; Garlon 4 Specialty; Garlon 4 Ultra Specialty; Landmark; Landmark XP; Oust Extra; Oust XP; imazapyr; metsulfuron methyl; sulfometuron methyl; triclopyr

Para el control de las malezas herbáceas, aplique estos productos en mezcla de tanque en la proporción de aplicación más baja dentro del rango especificado en la etiqueta del producto. Para el control total o parcial de poblaciones densas o para árboles, enredaderas y matorrales leñosos difíciles de controlar, aplique estos productos en una proporción o concentración de solución de rocío más alta dentro del rango dado.

Poda forestal de coníferas, poda de coníferas a mitad de rotación, poda de árboles de madera, mejora del grupo de madera

Este producto puede aplicarse como rocío dirigido usando un rociador manual o cualquier equipo de aplicación selectiva descrito en esta etiqueta para controlar las malezas leñosas y herbáceas y otra vegetación sotobosque no deseada por debajo de la copa de los árboles del cultivo en las plantaciones de coníferas, árboles de madera, árboles de Navidad y viveros ornamentales y de silvicultura para facilitar la poda forestal y el crecimiento de coníferas y árboles de madera.

Este producto también puede aplicarse usando un equipo de aplicación terrestre al voleo o en aplicación en rocío dirigido para la poda forestal a mitad de rotación bajo la copa de los pinos, otras coníferas y árboles de madera.

PRECAUCIONES: Evite el contacto de la dispersión, niebla o gotas del rocío con el follaje, la corteza verde o las raíces no leñosas expuestas de las especies de plantas deseables. Use técnicas de aplicación que eviten o minimicen el contacto de este producto con el follaje de los árboles u otras plantas deseados a través del contacto directo o del desvío del rocío fuera del objetivo.

Poda de coníferas – Aplicación al voleo

Este producto se puede aplicar ampliamente por encima de la copa de las especies de coníferas indicadas en esta sección, después de la formación de los brotes latentes finales en el otoño o antes de la expansión inicial de los brotes en la primavera, para el control total o parcial o la supresión de las malezas herbáceas y los árboles de madera indicados en la sección "MALEZAS CONTROLADAS" de esta etiqueta para facilitar la poda de estas especies de árboles en viveros, plantaciones y bosques. A menos que se indique lo contrario, aplique únicamente cuando las coníferas lleven establecidas por lo menos una temporada de crecimiento.

PRECAUCIONES: Se puede causar daño a las coníferas si se aplica este producto en proporciones mayores que las recomendadas en esta etiqueta, donde las aplicaciones se superponen, si se realiza la aplicación cuando las coníferas están en crecimiento activo o cuando crecen bajo estrés por sequía, inundaciones, siembra incorrecta o daños por insectos, animales o enfermedades.

Poda de coníferas fuera del sureste de los Estados Unidos

Para la poda de las siguientes especies de coníferas que hayan crecido como mínimo por una temporada de crecimiento en la mayor parte de las áreas fuera del sureste de los Estados Unidos, aplique de 24 a 48 onzas fluidas de este producto por acre en aplicación al voleo por encima de la copa de los árboles de coníferas.

- Abeto Douglas
- Especies de abeto
- Hemlock
- Pinos*
- Secoya de California
- Spruce

* Incluye todas las especies excepto pino loblolly, pino amarillo (longleaf), pino shortleaf o pino slash.

Aplique de 24 a 40 onzas líquidas de este producto para la poda de abeto de Douglas, pino y spruce que hayan estado establecidos por solo una temporada de crecimiento (excepto en California).

Para poda de spruce (Picea spp.) en Maine, Michigan, Minnesota, New Hampshire y Wisconsin, hasta 2.25 cuartos de galón de este producto se puede aplicar después de la formación de los brotes latentes finales en otoño para controlar las especies de árboles y matorrales leñosos.

PRECAUCIONES: Asegúrese de que las coníferas estén bien endurecidas antes de aplicar este producto. Algunos surfactantes no iónicos pueden dañar los árboles si se aplican ampliamente sobre la copa de hemlock y secoya de California y en grupos mixtos de coníferas. Pruebe el surfactante no iónico antes de usarlo para evitar dañar el árbol.

Poda de coníferas en el sureste de los Estados Unidos

Para la poda de las siguientes especies de coníferas establecidas por más de una temporada de crecimiento en el sureste de los Estados Unidos, aplique de 36 a 60 onzas fluidas de este producto por acre en el otoño con aplicación al voleo por encima de la copa de los árboles. Para la poda de estas especies después de una sola temporada de crecimiento, aplique solo 24 onzas líquidas de este producto por acre.

- Pino blanco del este
- Pino loblolly
- Pino amarillo (Longleaf)
- Pino shortleaf
- Pino slash
- Pino de Virginia

MEZCLAS DE TANQUE: Este producto se puede aplicar para la poda de coníferas en una mezcla de tanque con los siguientes productos para proporcionar un espectro más amplio de control de maleza postemergencia y para el control residual de malezas indicadas en la etiqueta de esos productos. Aplique estas mezclas de tanque solamente sobre la copa de las especies de coníferas que estén aprobadas para este uso para todos los productos en la mezcla. Consulte las etiquetas de cada producto para conocer los usos aprobados y las proporciones de aplicación. Lea y siga todas las instrucciones de uso y las precauciones para cada producto usado. Use este producto conforme a las precauciones más restrictivas de cada producto en la mezcla.

Arsenal; Herbicida concentrado para aplicadores Arsenal; Oust Extra; Oust XP; atrazina; imazapyr; metsulfuron methyl; sulfometuron methyl

Para la poda de abeto Douglas establecido como mínimo por una temporada de crecimiento antes de la formación de brotes a principios de primavera, aplique 24 onzas líquidas de este producto en mezcla de tanque con una proporción apropiada de atrazina. No agregue surfactantes para esta aplicación.

Para la poda herbácea de pino loblolly, pino de Virginia y pino longleaf en la primavera y a principios de verano, aplique de 12 a 18 onzas líquidas de este producto por acre en una mezcla de tanque con una proporción apropiada de Oust Extra u Oust XP.

Fines de verano y otoño después de la formación de brotes

Para la poda de pino jack, pino blanco y spruce blanco, aplique de 24 a 48 onzas líquidas de este producto por acre en mezcla de tanque con una proporción apropiada de Oust Extra u Oust XP que no dañará estas especies de coníferas.

Para la poda de abeto Douglas, aplique de 24 a 36 onzas líquidas de este producto por acre en una mezcla de tanque con una proporción apropiada de Arsenal o Herbicida concentrado para aplicadores Arsenal.

Para la poda de abeto balsam y spruce rojo, aplique 48 onzas líquidas de este producto por acre en una mezcla de tanque con una proporción apropiada de Arsenal o Herbicida concentrado para aplicadores Arsenal.

10.2 Manejo de hábitats de vida silvestre y especies nativas

Este producto puede usarse para controlar vegetación exótica y otra no deseada en áreas naturales y hábitats de vida silvestre, incluyendo riberas y estuarios, tierras de pastoreo y refugios de vida silvestre. Pueden hacerse aplicaciones para permitir la recuperación de especies de plantas nativas o antes de plantar especies nativas deseables, y para aplicaciones similares de control de amplio espectro de la vegetación. Puede hacerse tratamiento localizado, aplicación a tocones cortados, tallos cortados, inyección de tallo, aplicador con enjugador y todos los demás métodos indicados en esta etiqueta para eliminar de forma selectiva las plantas no deseadas para el manejo y mejora de hábitats.

Este producto también se puede utilizar para eliminar malezas anuales y perennes antes de sembrar parcelas para alimento de la vida silvestre.

Después de aplicar este producto, se puede sembrar cualquier especie de alimento para la vida silvestre o permitir la repoblación natural de la zona con especies nativas. Si debe labrar para preparar un semillero, espere por lo menos 7 días después de la aplicación antes de hacerlo a fin de permitir la absorción adecuada en las partes de la planta que estén bajo tierra.

10.3 Manejo de vivero ornamental y de producción

Todos los usos de este producto descritos en esta etiqueta pueden aplicarse a viveros de plantas usando cualquier método de aplicación descrito.

Este producto puede usarse para limpiar un área de vegetación no deseada antes de sembrar cualquier planta, árbol, arbusto ornamental o de otro tipo.

Este producto también puede utilizarse para controlar malezas que crecen alrededor de especies leñosas ornamentales establecidas, como árbol de la vida, azalea, boj, manzana silvestre, eucalipto, evónimo, abeto, abeto Douglas, jojoba, acebos, lirio, magnolia, arce, roble, álamo blanco o negro, ligustro, pino, abeto picea (spruce) y tejo. Este producto también puede ser utilizado para recortado de bordes alrededor de plantas en macetas y otros objetos en un vivero de plantas.

PRECAUCIONES: Proteja las plantas deseables de la solución de rocío con pantallas o cubiertas de materiales impermeables. Tenga cuidado para evitar que el rocío, la dispersión o la niebla no hagan contacto con el follaje, lo tallos verdes o la corteza inmadura de las especies ornamentales establecidas.

Invernaderos/cobertizos

Este producto se puede usar para controlar las malezas que estén creciendo en o alrededor de los invernaderos y cobertizos.

RESTRICCIONES: La vegetación deseable no debe estar presente durante la aplicación en un invernadero. Apague los equipos de ventilación antes de aplicar este producto dentro de un invernadero o cobertizo y déjelos apagados hasta que la solución aplicada haya secado.

10.4 Manejo de áreas comerciales, residenciales y recreativas

Todas las aplicaciones de este producto descritas en esta etiqueta se pueden usar en áreas comerciales, residenciales y recreativas, incluyendo parques, escuelas y campos de atletismo, usando cualquier método de aplicación descrito en esta etiqueta, incluyendo tratamiento localizado de vegetación no deseada, recorte de bordes alrededor de árboles, cercas, senderos, edificios, aceras, circuitos y otros objetos en estas áreas, para eliminar malezas no deseadas que crecen en lechos ornamentales y de arbustos establecidos, para el manejo y la renovación de céspedes y para eliminar la vegetación de un sitio antes de su desarrollo, incluyendo antes de sembrar un área de flores, plantas ornamentales o césped (en tepes o semillas) o de comenzar proyectos de construcción.

10.5 Manejo de zonas de pasturas

El uso de este producto en pasturas incluye el uso en bahiagrass, bermudagrass, bluegrass, brome, fescue, guineagrass, kikuyugrass, orchardgrass, pangola grass, ryegrass, Timothy y wheatgrass.

Antes de sembrar, preemergencia, renovación de pasturas

Este producto se puede aplicar antes de sembrar o de que emerjan pastos forrajeros o perennes. Consulte la sección "MALEZAS CONTROLADAS" de esta etiqueta para conocer las proporciones de aplicación de este producto para el control de malezas específicas.

RESTRICCIONES: Si la proporción total de aplicación de este producto es 2.25 cuartos o menos por acre, no se requiere período de espera entre el tratamiento y la utilización como alimento o el pastoreo del ganado. Si la proporción es mayor a 2.25 cuartos de galón por acre, retire el ganado doméstico antes de aplicar y espere como mínimo 8 semanas después de la aplicación para utilizar como pastura o para cosechar.

Tratamiento localizado, aplicador con enjugador

Este producto se puede aplicar en pasturas como tratamiento localizado o por la parte superior de pastos atractivos, utilizando aplicadores con enjugador para controlar las malezas más altas. Para un mejor control de malezas, retire el ganado doméstico antes de aplicar para permitir suficiente crecimiento de las plantas y espere como mínimo 7 días después de la aplicación antes del pastoreo del ganado o para cosechar como forraje. Vea en la sección "EQUIPO Y TÉCNICAS DE APLICACIÓN" de esta etiqueta las instrucciones adicionales para el empleo de aplicadores con enjugador.

RESTRICCIONES: Para tratamiento localizado o usando un aplicador con enjugador, en proporciones de 2.25 cuartos de galón o menos por acre, puede aplicar este producto sobre todo el pasto o en cualquier parte de este. En proporciones de más de 2.25 cuartos de galón por acre, este producto no se puede aplicar sobre más de 10 por ciento del total de la pastura cada vez. Se pueden repetir las aplicaciones en la misma zona con intervalos de 30 días.

Inhibición de malezas en pasturas latentes

Este producto se puede aplicar a pasturas latentes para inhibir el crecimiento competitivo y la producción de semillas de malezas anuales y otra vegetación no deseable. Aplique de 9 a 12 onzas líquidas de este producto por acre usando un equipo de aplicación al voleo en pasturas a finales del otoño después de que los pastos perennes deseables estén latentes o a finales del invierno antes de que los pastos perennes deseables comiencen la actividad e inicien el crecimiento vegetativo.

PRECAUCIONES: Pueden usarse proporciones de aplicación más altas para las malezas difíciles de controlar; sin embargo, las proporciones más altas pueden reducir los grupos. Puede producirse cierta atrofia de los pastos perennes si las aplicaciones al voleo se realizan cuando las plantas están activas.

RESTRICCIONES: No se necesita período de espera entre la aplicación y el pastoreo o para cosechar como forraje. No aplique más de 2.25 cuartos de galón de este producto por acre por año en pastos para pastura, excepto para renovación. Si necesita volver a sembrar debido a una reducción considerable del grupo, no se requiere período de espera después de aplicar este producto antes de sembrar el pasto para pastura indicado al inicio de esta sección; para todos los demás pastos para pastura, espere por lo menos 30 días después de la aplicación para sembrar.

10.6 Manejo de ferrocarriles

Todos los usos de este producto descritos en la sección "MALEZAS CONTROLADAS" o en cualquiera otra de esta etiqueta se pueden utilizar en las zonas de ferrocarriles con cualquier método de aplicación descrito.

Este producto requiere que se agregue a la mezcla de rocío un surfactante no iónico aprobado para el uso deseado en el sitio de la aplicación. Si se va a realizar la aplicación donde los sitios acuáticos puedan ser rociados directamente o rociados en exceso accidentalmente, el surfactante tiene que estar aprobado para uso acuático. El uso de este producto sin un surfactante dará lugar a un rendimiento inferior. Consulte la sección "MEZCLA" de esta etiqueta para obtener más información sobre el uso de surfactantes con este producto.

Este producto se puede aplicar a lo largo de las servidumbres de paso de los ferrocarriles en una proporción de hasta 80 galones de solución de rocío por acre.

Suelo limpio, balastos y bordes, cruces, tratamiento localizado

Este producto se puede usar para mantener el suelo limpio en los balastos y bordes de los ferrocarriles y reducir la necesidad de segar y desbrozar mecánicamente a lo largo de las servidumbres de paso de los ferrocarriles. Se pueden repetir las aplicaciones de este producto si las malezas continúan emergiendo para mantener el terreno limpio, hasta una proporción de aplicación total máxima de 8 cuartos de galón de este producto por acre por año.

MEZCLAS DE TANQUE: Este producto se puede aplicar en una mezcla de tanque con los siguientes productos para un mejor control de árboles y matorrales leñosos en aplicaciones para suelo limpio, balastos y bordes, cruces y tratamiento localizado, así como control de otros matorrales, árboles y enredaderas en zonas de ferrocarriles, siempre que el producto usado esté aprobado para estas aplicaciones. No todos los productos en mezcla de tanque están aprobados para uso acuático. Consulte las etiquetas de cada producto usado en la mezcla de tanque para conocer los usos aprobados y las proporciones de aplicación. Lea y siga siempre las indicaciones de las etiquetas de cada producto utilizado en la mezcla.

Arsenal; Herbicida concentrado para aplicadores Arsenal; Chopper; Chopper Gen2; Escort XP; Forestry Garlon 4 Specialty; Forestry Garlon XRT Specialty; Garlon 3A Specialty; Garlon 4 Specialty; Garlon 4 Ultra Specialty; Habitat; Hyvar X; Hyvar X-L; Krovar I DF; Oust Extra; Oust XP; Outrider®; Princep 4L; Princep Caliber 90; Princep Liquid; Sahara DG; Scythe; Stalker; Spike 20P Specialty; Spike 80DF Specialty; Telar XP; Transline Specialty; Velpar DF CU; Velpar DF VU; Velpar L; Velpar L CU; Velpar L VU; Vastlan Specialty; 2,4-D; atrazina; bromacil; chlorsulfuron; clopyralid; dicamba; diquat; diuron; hexazinone; imazapyr; metsulfuron methyl; pelargonic acid; simazine; sulfometuron methyl; sulfosulfuron; tebuthiuron; triclopyr

Control de matorrales, árboles y enredaderas

Este producto se puede usar para controlar árboles, enredaderas y matorrales leñosos a lo largo de servidumbres de paso de los ferrocarriles. Aplique de 3 a 8 cuartos de galón de este producto por acre en hasta 80 galones de solución de rocío que contenga 0.5% o más por volumen de un surfactante no iónico como aplicación al voleo usando un rociador con brazo o sin brazo. Aplique una solución de 0.75 a 1.5 por ciento de este producto cuando use un equipo de aplicación de alto volumen con una técnica de rocío para mojar o una solución de 4 a 8 por ciento cuando use rocío dirigido de bajo volumen para tratamiento localizado.

MEZCLAS DE TANQUE: Este producto se puede aplicar en una mezcla de tanque con uno o más de los siguientes productos para mejorar el control de árboles, enredaderas y matorrales leñosos a lo largo de las servidumbres de paso de los ferrocarriles, siempre que el producto esté registrado para su uso en estos sitios. Consulte la etiqueta de cada producto para conocer los sitios aprobados y las proporciones de aplicación.

Arsenal; Herbicida concentrado para aplicadores Arsenal; Chopper; Chopper Gen2; Escort XP; Forestry Garlon 4 Specialty; Forestry Garlon XRT Specialty; Garlon 3A Specialty; Garlon 4 Specialty; Garlon 4 Ultra Specialty; Habitat; Krenite S Brush Control Agent; Stalker; Telar XP; Tordon 101 Mixture Specialty; Tordon 22K Specialty; Tordon K Herbicide Specialty; Transline Specialty; Vanquish; Velpar DF CU; Velpar DF VU; Velpar L; Velpar L CU; Velpar L VU; Vastlan Specialty; chlorsulfuron; clopyralid; dicamba; fosamine; hexazinone; imazapyr; metsulfuron methyl; picloram; triclopyr

Control de malezas en Bermudagrass latente y en crecimiento activo

Este producto se puede usar para controlar total o parcialmente muchas malezas anuales y perennes en bermudagrass latente y en crecimiento activo a lo largo de la servidumbre de paso de los ferrocarriles. Vea la sección "MALEZAS CONTROLADAS" de esta etiqueta para conocer las instrucciones de uso de este producto para el control de malezas en pastos.

10.7 Manejo de tierras de pastoreo

Este producto controla o inhibe muchas malezas anuales que crecen en tierras de pastoreo de pastos perennes de estaciones fría y cálida. Se podría producir una ligera decoloración del pasto deseable, pero este reverdecerá y volverá a crecer en tierra húmeda a medida que desaparezcan los efectos de este producto.

Para controlar la invasión de malezas de pastos anuales en tierras de pastoreo es esencial prevenir la producción de semillas de malezas. La aplicación anual de este producto para eliminar las malezas anuales invasivas antes de que produzcan semillas ayudará a eliminar las semillas de maleza viables del suelo. Se deberá demorar la utilización del área como pastura después de aplicar este producto para permitir que las plantas perennes deseables crezcan, florezcan y vuelvan a producir semillas.

Control de *Bromus*: Una aplicación al voleo de 9 a 12 onzas líquidas de este producto por acre controlará o inhibirá malezas como downy brome (*Bromus tectorum*), Japanese brome (*Bromus japonicus*), soft chess (*Bromus mollis*), cheatgrass (*Bromus secalinus*), rye (centeno) para cereal y jointed goatgrass en tierras de pastoreo. Para obtener mejores resultados, aplique cuando la mayoría de las plantas de bromus se encuentren en la etapa de floración temprana y antes de que las plantas, incluidas las inflorescencias, cambien de color. Permita el crecimiento secundario de malezas después de las lluvias de primavera para reducir aún más la reserva de semillas en el suelo y alentar la conversión del pasto perenne en lugares con malezas. Aplique este producto en otoño en las zonas donde la humedad en primavera es habitualmente limitada y la germinación de otoño permite el crecimiento de malezas y la reducción de semillas de malezas.

Control de *Medusahead*: Para controlar o inhibir las plantas de medusahead (Taeniatherum caput-medusa), aplique 12 onzas líquidas de este producto por acre en la etapa de 3 hojas. La demora de la aplicación después de esta etapa resultará en un control inferior o inaceptable. El quemado controlado antes de la aplicación de este producto eliminará la capa seca superficial producida por tallos de gramíneas en descomposición lenta. Permita que las malezas broten nuevamente antes de rociar este producto después de haber quemado. Repite la aplicación anualmente para eliminar las semillas de medusahead en el suelo y permitir al pasto perenne deseable repoblar el área.

RESTRICCIONES: No aplique más de 2.25 cuartos de galón de este producto por acre por año en tierras de pastoreo. No utilice sulfato de amonio cuando aplique este producto a pastos de tierras de pastoreo. No se requiere período de espera entre la aplicación de este producto y la utilización como pastura o alimento para el ganado.

10.8 Manejo de lados de carreteras

Todos los usos de este producto descritos en esta etiqueta pueden utilizarse para el manejo de malezas a lo largo de carreteras, incluyendo el control de malezas en bermudagrass y bahiagrass latente y activo, control de malezas a lo largo de bordes y debajo y alrededor de barandas, postes y otros objetos a lo largo del camino, usando cualquier método de aplicación descrito en esta etiqueta. Si se aplica este producto en zonas donde podría rociarse en exceso accidentalmente la solución de rocío en un cuerpo de agua, tiene que usarse un surfactante no iónico aprobado para uso acuático. Consulte la sección "MEZCLA" de esta etiqueta para obtener más información sobre el uso de surfactantes con este producto.

MEZCLAS DE TANQUE: Este producto puede mezclarse en tanque con los siguientes productos para aplicaciones a bordes, barandas, tratamiento localizado y mantener el suelo limpio siempre y cuando estos productos estén aprobados para su uso en dichos sitios. No todos los productos en mezcla de tanque están aprobados para uso acuático. Consulte las etiquetas de cada producto para conocer los usos aprobados y las proporciones de aplicación.

AAtrex 4L; AAtrex Nine-O; Banvel; Barricade 65WG; Chopper; Chopper Gen2; Crossbow; Direx 4L; Escort XP; Endurance; Formula 40; Gallery 75 Dry Flowable Specialty; Gallery SC; Garlon 4; Garlon XRT; Hyvar X; Karmex DF; Krenite S Brush Control Agent; Krovar I DF; Landmark; Landmark XP; Oust Extra; Oust XP; Outrider®; Pendulum 3.3 EC; Pendulum AquaCap; Pendimax 3.3; Plateau; Poast; Poast Plus; Princep 4L; Ronstar 50 WSP; Ronstar Flo; Ronstar G; Sahara DG; Surflan AS Specialty; Surflan Flex; Surflan Flex T&O; Surflan Pro; Surflan XL 2G; Telar XP; Tordon K; Vanquish; Vastlan Specialty; Velpar DF CU; Velpar DF VU; Velpar L; Velpar L CU; Velpar L VU; Weedar 64; 2,4-D; atrazina; bromacil; chlorsulfuron; clopyralid; dicamba; diuron; fosamine; hexazinone; imazapic; imazapyr; metsulfuron methyl; oryzalin; oxadiazon; pendimethalin; picloram; prodiamine; simazine; sulfometuron; sulfosulfuron; triclopyr

10.9 Manejo de servicios públicos

Este producto se puede usar a lo largo de servidumbres de paso de energía eléctrica, tuberías y líneas telefónicas, así como todos los sitios relacionados con las servidumbres de paso de estos servicios públicos, incluyendo subestaciones, caminos de acceso, ferrocarriles y a lo largo de servidumbres de paso similares en conjunto con servicios públicos, para el tratamiento localizado de vegetación no deseada, recorte lateral, recorte de bordes alrededor de objetos, control de malezas antes de sembrar plantas ornamentales, flores o césped (en tepes o semillas) en un sitio de servicios públicos, manejo de césped, eliminar malezas no deseadas que crecen en lechos ornamentales o arbustos establecidos, preparar o establecer zonas de reserva de vida silvestre y eliminar la vegetación antes de comenzar proyectos de construcción. Se pueden repetir las aplicaciones de este producto cuando sea necesario para mantener el terreno limpio cuando las malezas siguen emergiendo hasta una proporción de aplicación máxima de 8 cuartos de galón por acre por año.

MEZCLAS DE TANQUE: Este producto se puede mezclar en tanque con los siguientes productos para su uso en áreas de servicios públicos, siempre y cuando el producto esté aprobado para su uso en dichos sitios. No todos los productos en mezcla de tanque están aprobados para uso acuático. Consulte la etiqueta de cada producto para conocer los usos aprobados y las proporciones de aplicación. Para controlar las malezas herbáceas, use una proporción de aplicación o concentración de solución de rocío más baja dentro de los rangos dados para estos productos de mezcla de tanque y aumente la proporción o concentración hacia los extremos más altos de los rangos para controlar grupos densos o árboles, enredaderas y matorrales leñosos difíciles de controlar.

AAtrex 4L; AAtrex Nine-O; Herbicida concentrado para aplicadores Arsenal; Endurance; Escort XP; Forestry Garlon 4 Specialty; Forestry Garlon XLT Specialty; Garlon 3A Specialty; Garlon 4 Specialty; Garlon 4 Ultra Specialty; Hyvar XL; Krenite S Brush Control Agent; Krovar I DF; Oust Extra; Oust XP; Outrider®; Plateau; Sahara DG; Surflan AS Agricultural; Surflan AS Specialty; Surflan Flex; Surflan Flex T&O; Surflan XL 2G; Telar XP; Transline Specialty; Vanquish; Velpar DF CU; Velpar DF VU; Velpar L; Velpar L CU; Velpar L VU; Vastlan Specialty; Weedar 64; 2,4-D; atrazina; bromacil; chlorsulfuron; clopyralid; dicamba; diuron; fosamine; hexazinone; imazapic; imazapyr; metsulfuron methyl; oryzalin; pendimethalin; prodiamine; simazine; sulfometuron methyl; sulfosulfuron; triclopyr

Asegúrese de que el producto Garlon esté bien mezclado con agua de acuerdo con las instrucciones en la etiqueta antes de agregar este producto a la mezcla de rocío. Continúe agitando al agregar este producto para evitar problemas de compatibilidad de la mezcla de tanque.

Para obtener mejores resultados con el recorte lateral, aplique este producto en una mezcla de tanque con uno de los productos Garlon indicados antes.

11.0 USOS EN CULTIVOS

11.1 Cultivos de árboles, enredaderas y arbustos

ESTA SECCIÓN OFRECE INSTRUCCIONES DE USO QUE APLICAN A TODOS LOS CULTIVOS DE ÁRBOLES, ENREDADERAS Y ARBUSTOS INDICADOS EN LAS SIGUIENTES SECCIONES. VEA LAS SECCIONES DE CULTIVOS INDIVIDUALES SI NECESITA INSTRUCCIONES ESPECÍFICAS DE USO, INTERVALOS ANTES DE LA COSECHA, PRECAUCIONES Y RESTRICCIONES.

TIPOS DE APLICACIONES: Antes de sembrar (preparación del lugar); aplicaciones al voleo; equipo selectivo (rociador con pantalla, aplicador con enjugador); rocío dirigido y tratamiento localizado en hileras (entre las hileras de árboles, enredaderas o arbustos) y franjas (en hileras de árboles, enredaderas o arbustos); control localizado de malezas; inhibición de pasto perenne; aplicación a tocones cortados

INSTRUCCIONES DE USO: A menos que se prohíba específicamente en las secciones de cultivo individuales que siguen, este producto se puede aplicar usando rociadores con brazo, aplicador por goteo controlado (CDA), rociadores con pantalla, aplicadores con enjugador, rociadores de mano o de mochila, lanzas o pistolas para huerto, en hileras (entre las hileras de árboles, enredaderas o arbustos) y franjas (en hileras de árboles, enredaderas o arbustos), para el control de malezas o inhibición de pasto perenne, en arboledas establecidas de árboles frutales y de frutos secos, huertos y viñedos. También se puede usar para preparar el lugar antes de sembrar o de trasplantar estos cultivos.

Aplique 12 onzas líquidas a 4 cuartos de galón de este producto por acre, como se indica en la sección "MALEZAS CONTROLADAS" de esta etiqueta. Utilice una proporción de aplicación más alta dentro del rango recomendado cuando las malezas están bajo estrés, crecen en poblaciones densas o tienen más de 12 pulgadas de altura. Se pueden repetir las aplicaciones de este producto cuando sea necesario, hasta un máximo de 8 cuartos de galón por acre por año. Consulte la sección "INFORMACIÓN DEL PRODUCTO" de esta etiqueta para más información sobre las proporciones de aplicación máximas.

PRECAUCIONES: Debe tener sumo cuidado para evitar que la solución herbicida, el rocío, arrastre o niebla de este producto entre en contacto con el follaje o la corteza verde de troncos, ramas, retoños, frutos u otras partes de árboles, cañas y enredaderas deseables. Evite aplicar cuando los cultivos tienen heridas por podas recientes o alguna otra lesión mecánica. El contacto de este producto con corteza que no está madura y oscura puede resultar en daño o destrucción del cultivo. Solo se pueden utilizar rociadores con pantalla o dirigidos en aquellos cultivos con alto potencial de contacto con el cultivo y solo cuando hay espacio libre suficiente. Para aplicaciones en franjas (en las mismas hileras de los árboles), solo se debe utilizar equipo selectivo (rociador dirigido, rociador con campana, rociador con pantalla o aplicador con enjugador) a fin de reducir al mínimo el potencial de rocío excesivo o arrastre de este producto al cultivo. En el caso de cultivos de bayas, los rociadores con campana deben estar completamente cerrados por la parte superior, lateral, frontal y posterior. Solo se pueden emplear aplicadores con enjugadores o rociadores con pantalla que pueden evitar todo contacto de este producto con los cultivos. Vea instrucciones adicionales sobre uso y precauciones en la sección "EQUIPO Y TÉCNICAS DE APLICACIÓN" de esta etiqueta.

RESTRICCIONES: Deje transcurrir al menos 3 días entre la aplicación de este producto y el trasplante.

Entre hileras

INSTRUCCIONES DE USO: Este producto controlará o inhibirá las malezas anuales y perennes, así como las coberturas de terreno en medio de las hileras de cultivo de árboles, enredaderas y arbustos indicados en esta etiqueta. Si las malezas sufren estrés por sequía, riegue antes de aplicar. El control de malezas puede ser inferior si estas se han cortado recientemente en el momento de la aplicación.

MEZCLAS DE TANQUE: Se puede aplicar una mezcla de tanque de este producto con Goal 2XL para el control de malezas anuales entre las hileras de una variedad de cultivos de árboles, enredaderas y arbustos cuando las malezas están bajo estrés o crecen en poblaciones densas. La aplicación de 12 a 24 onzas líquidas de este producto por acre más una proporción apropiada de Goal 2XL controlará malezas anuales con una altura o longitud máxima de 6 pulgadas, incluyendo crabgrass, groundsel común, junglerice, lambsquarters común, redroot pigweed, London rocket, ryegrass común, shepherd's-purse, sowthistle anual, filaree (inhibición), horseweed/marestail, stinging nettle y purslane común (inhibición). Esta mezcla de tanque controlará también el cheeseweed común (malva) o el hairy fleabane con una altura o longitud máxima de 3 pulgadas.

Este producto también se puede aplicar en el medio de las hileras en mezclas de tanque con los siguientes productos.

2,4-D; bromacil; clethodim; diuron; fluazifop-P-butyl; flumioxazin; glufosinate-ammonium; indaziflam; napropamide; norflurazon; oryzalin; oxyfluorfen; pendimethalin; penoxsulam; pyraflufen ethyl; rimsulfuron; saflufenacil; sethoxydim; simazine; thiazopyr
Alion; Chateau Herbicide SW; Devrinol 2-XT; Devrinol 50-DF; Devrinol 50-DF Ornamental; Devrinol DF-XT; Devrinol DF-XT Ornamental; Direx 4L; Dri-Clean; Fusilade II Turf & Ornamental; Fusilade DX; Goal 2XL; GoalTender; Karmex DF; Matrix FNV; Matrix SG; Orchard Master Broadleaf; Orchard Master CA; Pindar GT; Poast; Poast Plus; Prowl 3.3 EC; Prowl H2O; Princep 4L; Princep Caliber 90; Princep Liquid; Rely 280; Select; Select 2 EC; Select Max Herbicide con Tecnología Inside; Simazine 4L; Simazine 4L Flowable; Simazine 90DF; Simazine 90 WDG; Sim-Trol 4L; Sim-Trol DF; Solicam DF; Surflan AS Agricultural; Surflan AS Specialty; Surflan Flex; Surflan Flex T&O; Surflan XL 2G; Treevix Powered by Kixor; Venue; Visor Broadcrop

Asegúrese de que el producto que use esté aprobado para la aplicación en el cultivo a tratar. Lea y siga las instrucciones de la etiqueta para todos los productos en la mezcla de tanque.

Franjas (en hileras)

MEZCLAS DE TANQUE: Este producto se puede aplicar entre hileras de cultivos de árboles, enredaderas y arbustos en mezclas de tanque con los siguientes productos.

2,4-D; bromacil; clethodim; diuron; fluazifop-P-butyl; flumioxazin; glufosinate-ammonium; indaziflam; napropamide; norflurazon; oryzalin; oxyfluorfen; pendimethalin; penoxsulam; pyraflufen ethyl; rimsulfuron; saflufenacil; sethoxydim; simazine; thiazopyr
Alion; Chateau Herbicide SW; Devrinol 2-XT; Devrinol 50-DF; Devrinol 50-DF Ornamental; Devrinol DF-XT; Devrinol DF-XT Ornamental; Direx 4L; Dri-Clean; Fusilade II Turf & Ornamental; Fusilade DX; Goal 2XL; GoalTender; Karmex DF; Matrix FNV; Matrix SG; Orchard Master Broadleaf; Orchard Master CA; Pindar GT; Poast; Poast Plus; Prowl 3.3 EC; Prowl H2O; Princep 4L; Princep Caliber 90; Princep Liquid; Rely 280; Select; Select 2 EC; Select Max Herbicide con Tecnología Inside; Simazine 4L; Simazine 4L Flowable; Simazine 90DF; Simazine 90 WDG; Sim-Trol 4L; Sim-Trol DF; Solicam DF; Surflan AS Agricultural; Surflan AS Specialty; Surflan Flex; Surflan Flex T&O; Surflan XL 2G; Treevix Powered by Kixor; Venue; Visor Broadcrop

Asegúrese de que el producto que use esté aprobado para la aplicación en el cultivo a tratar. Lea y siga las instrucciones de la etiqueta para todos los productos en la mezcla de tanque.

RESTRICCIONES: No aplique estas mezclas de tanque en Puerto Rico.

Inhibición de pasto perenne

Este producto inhibe el crecimiento de pastos perennes como bahiagrass, bermudagrass, tall fescue, orchardgrass (Dactylis glomerata), Kentucky bluegrass (Poa pratensis) y quackgrass que se cultivan como cobertura del terreno en cultivos de árboles, enredaderas y arbustos.

Para la inhibición de tall fescue, fine fescue, orchardgrass y quackgrass, aplique 6 onzas líquidas de este producto en 10 a 20 galones de agua por acre.

Para inhibir las coberturas de Kentucky bluegrass, aplique 4.5 onzas líquidas de este producto por acre. No añada sulfato de amonio a la mezcla de rocío.

Para obtener mejores resultados, corte la cobertura de pasto de temporada fría en primavera para emparejar la altura y luego aplique este producto de 3 a 4 días después de cortar.

Para inhibir el crecimiento vegetativo y la inflorescencia de bahiagrass durante aproximadamente 45 días, aplique 4.5 onzas líquidas de este producto en 10 a 25 galones de agua por acre de 1 a 2 semanas después del reverdecer completo o después de cortar a una altura uniforme de 3 a 4 pulgadas antes de la emergencia de las inflorescencias. Para inhibir hasta por 120 días, aplique 3 onzas líquidas de este producto por acre, y luego una aplicación de 1.5 a 3 onzas líquidas por acre unos 45 días más tarde. No haga más de dos aplicaciones al año.

Para quemar bermudagrass, aplique de 24 a 48 onzas líquidas de este producto en 3 a 20 galones de agua por acre. Utilice este tratamiento solo si se puede tolerar la reducción del grupo de plantas de bermudagrass. Cuando se necesita quemar antes de la cosecha, realice la aplicación al menos 21 días antes de la cosecha para asegurarse de tener tiempo suficiente para que se produzca el quemado.

Para inhibir el bermudagrass, aplique de 4.5 a 12 onzas líquidas de este producto por acre al este de las Montañas Rocosas, y 12 onzas líquidas al oeste de las Montañas Rocosas, en un volumen de rocío total de 3 a 20 galones por acre de 1 a 2 semanas después de reverdecer completo. Si se corta el bermudagrass antes de la aplicación, mantenga como mínimo 3 pulgadas de altura. Se pueden realizar aplicaciones secuenciales si hay nuevo crecimiento y si se puede tolerar el daño y la reducción del grupo de plantas de bermudagrass. Al este de las Montañas Rocosas, aplique de 4.5 a 7.5 onzas líquidas de este producto por acre en condiciones de sombra o donde se desee un menor grado de inhibición.

Aplicación a tocones cortados

Este producto se puede aplicar a tocones recién cortados durante la preparación del lugar o la renovación del terreno para controlar rebrotes y retoños de tocones de muchas especies de árboles, algunas de las cuales se detallan abajo.

Árboles cítricos: Calamondin, Chironja, Citron, Citrus hybrids, Grapefruit, Kumquat, Lemon, Lime, Mandarin (tangerine), Orange (todos), Pummelo, Tangelo (ugli), Tangor

Árboles frutales: Apple, Apricot, Cherry (dulce, amargo), Crabapple, Loquat, Mayhaw, Nectarine, Olive, Peach, Pear, Plum/Prune (todos), Quince

Árboles de nueces: Almond, Beechnut, Brazil nut, Butternut, Cashew, Chestnut, Chinquapin, Filbert (hazelnut), Hickory nut, Macadamia, Pecan, Pistachio, Walnut (negro, inglés)

INSTRUCCIONES DE USO: Corte el árbol cerca de la superficie de la tierra y aplique inmediatamente una solución de este producto al 50 o 100 por ciento (sin diluir) a la superficie recientemente cortada utilizando el equipo de aplicación adecuado para asegurar la cobertura de la totalidad del cámbium. La demora en la aplicación puede resultar en un rendimiento inferior. Para obtener mejores resultados, corte el árbol durante el período de crecimiento activo y expansión completa de las hojas y aplique este producto.

PRECAUCIONES: NO REALICE UNA APLICACIÓN EN TOCONES CORTADOS CUANDO LAS RAÍCES DE ÁRBOLES DESEABLES ADYACENTES PUEDEN ESTAR INJERTADAS EN LAS RAÍCES DEL TOCÓN CORTADO, PORQUE SE PUEDE CAUSAR DAÑO A LOS ÁRBOLES ADYACENTES. Algunos retoños, tallos o árboles pueden compartir el mismo sistema de raíces. Los árboles adyacentes de edad, altura y espaciado similares pueden tener raíces compartidas. Ya sea injertados o compartidos, es probable que se dañen tallos/árboles no tratados cuando se tratan uno o más árboles que comparten un sistema común de raíces.

11.1.1 Cultivos de frutas cítricas

CULTIVOS RECOMENDADOS: Todos los cultivos, variedades y/o híbridos de Calamondin; Chironja; Citron; Citrus Hybrids; Grapefruit (incluye Japanese summer); Kumquat; Lemon; Lime (incluye Australian desert lime, Australian finger lime, Australian round lime, Brown river finger lime, Mount white, New Guinea wild, Russell river, sweet, and Tahiti); Mandarin (incluye Mediterranean, Satsuma); Orange (todas); Pummelo; Tangelo (ugli); Tangerine (Mandarin); Tangor; Uniq Fruit (ugli)

TIPOS DE APLICACIONES: Antes de sembrar (preparación del lugar); aplicaciones al voleo; equipo selectivo (rociador con pantalla, aplicador con enjugador); rocío dirigido y tratamiento localizado en hileras (entre las hileras de árboles) o franjas (en hileras de árboles); inhibición de pasto perenne; aplicación a tocones cortados

INSTRUCCIONES DE USO: Las siguientes instrucciones de uso se refieren únicamente a las aplicaciones en Florida y Texas.

Para quemar o controlar las malezas indicadas abajo, aplique las proporciones recomendadas de este producto en 3 a 30 galones de agua por acre. Cuando la maleza tiene follaje denso, utilice de 10 a 30 galones de agua por acre.

Para quemar goatweed, aplique de 48 a 72 onzas líquidas de este producto en 20 a 30 galones de agua por acre cuando las plantas estén en crecimiento activo. Aplique 48 onzas líquidas por acre cuando las plantas tengan menos de 8 pulgadas de altura, y 72 onzas líquidas por acre cuando las plantas tengan más de 8 pulgadas de altura. Si la maleza goatweed tiene una altura mayor de 8 pulgadas, el uso de este producto en mezcla de tanque con Krovar I o Karmex podría mejorar el control. Consulte las etiquetas de los productos individuales para información específica sobre cultivos, dosis, restricciones geográficas y declaraciones preventivas.

	Nivel de control de malezas perennes en varias proporciones de aplicación (cantidad de este producto por acre)			
Especies de maleza	24 onzas líquidas	48 onzas líquidas	2.25 cuartos de galón	3.75 cuartos de galón
Bermudagrass	B	–	PC	C
Guinea grass				
Texas y Florida Ridge	B	C	C	C
Florida Flatwoods	–	B	C	C
Para grass	B	C	C	C
Torpedograss	S	–	PC	C

S = Inhibición, PC = Control parcial, B = Quemado, C = Control

RESTRICCIONES: Deje transcurrir al menos 1 día entre la aplicación y la cosecha de cultivos de frutas cítricas. Para huertos de citrus medica (cidro), aplique solamente como rocío dirigido.

11.2 Cultivos anuales y perennes

ESTA SECCIÓN OFRECE INSTRUCCIONES PARA EL USO DE ESTE PRODUCTO QUE APLICA A TODOS LOS CULTIVOS INDICADOS EN LAS SIGUIENTES SECCIONES. VEA LAS SECCIONES DE CULTIVOS INDIVIDUALES SI NECESITA INSTRUCCIONES ESPECÍFICAS DE USO, INTERVALOS ANTES DE LA COSECHA, Y PRECAUCIONES Y RESTRICCIONES ADICIONALES.

TIPOS DE APLICACIONES: Barbecho químico; camas de barbecho antes de sembrar; antes de sembrar; al momento de sembrar; preemergencia; rociador con campana entre hileras; rociador con pantalla entre hileras; aplicador con enjugador entre hileras; posterior a la cosecha

INSTRUCCIONES DE USO: Este producto se puede aplicar durante los intervalos de barbecho que preceden a la siembra, antes de sembrar o de trasplantar, al momento de sembrar, o preemergencia de los cultivos anuales y perennes indicados en esta etiqueta, excepto cuando se limita específicamente. Para todos los cultivos no indicados en esta etiqueta,

las aplicaciones se deben realizar al menos 30 días antes de sembrar. A menos que se indique lo contrario, aplique este producto de acuerdo con las proporciones indicadas en la sección "MALEZAS CONTROLADAS" de esta etiqueta. Las proporciones de aplicación especificadas en esta etiqueta para el control de malezas difíciles, o las especificadas en las etiquetas complementarias separadas de este producto, reemplazan las proporciones en la sección "MALEZAS CONTROLADAS" de esta etiqueta. Puede encontrar información adicional acerca del control de malezas difíciles, en las Fichas Técnicas publicadas para este producto.

Se pueden repetir las aplicaciones de este producto cuando sea necesario, hasta un máximo de 6 cuartos de galón por acre por año. Consulte las secciones sobre uso específico en esta etiqueta para obtener información adicional sobre los intervalos mínimos requeridos antes de repetir la aplicación de este producto.

Se pueden utilizar rociadores con campana y aplicadores con enjugador que eviten todo contacto del cultivo con la solución herbicida en el medio de hileras con mantillo o sin este, una vez que el cultivo esté establecido. Donde se detalla específicamente en las secciones de cultivo individuales, a continuación, se pueden utilizar aplicadores con enjugador sobre ciertos cultivos para controlar las malezas más altas. Con estos métodos de aplicación es posible causar daños a los cultivos. Consulte la sección "EQUIPO Y TÉCNICAS DE APLICACIÓN" de esta etiqueta para información relacionada con el potencial de daño a los cultivos usando el equipo de aplicación selectiva.

La aplicación de tratamiento localizado de este producto para el control de malezas en un sistema de cosecha solo puede realizarse si se indica específicamente en las secciones de cultivo individuales que siguen.

A menos que se prohíba de otra manera, todas las aplicaciones de este producto indicadas en estas secciones se pueden realizar con equipos de aplicación aérea, de ser posible, siempre que la persona que aplica el producto cumpla con las precauciones y restricciones especificadas en esta etiqueta y en las etiquetas complementarias separadas que se publican para este producto. Consulte la sección "EQUIPO Y TÉCNICAS DE APLICACIÓN" de esta etiqueta para información sobre aplicación aérea y los procedimientos para evitar el arrastre del rocío que pudiera causar daño a cualquier vegetación que no sea el objetivo de la aplicación. La utilización de las zonas de barrera apropiadas ayudará a evitar el daño a la vegetación adyacente.

MEZCLAS DE TANQUE: Este producto puede mezclarse en tanques con otros herbicidas para proporcionar control residual de malezas, un espectro más amplio de control de malezas o un mecanismo de acción alternativo. Lea y siga siempre las indicaciones de las etiquetas de todos los productos utilizados en la mezcla de tanque. Utilice todos los productos conforme a las proporciones y la época de aplicación indicadas en las etiquetas. Algunos productos de mezcla de tanque tienen el potencial de provocar daños en el cultivo. Lea todas las etiquetas de los productos utilizados en la mezcla de tanque antes de usarlos, para determinar el potencial de daño a los cultivos. Siempre determine con anticipación la compatibilidad de los productos de la mezcla de tanque juntos en la sustancia vehicular, mezclando antes pequeñas cantidades proporcionales. Mezclar otros productos con este herbicida en el tanque de rocío puede causar incompatibilidad, antagonismo o la reducción de la eficacia de este producto. Bayer CropScience LP no ha realizado pruebas de todas las formulaciones de productos para comprobar su compatibilidad o rendimiento en mezclas de tanque con este producto. Hasta el grado que sea compatible con la legislación pertinente, el comprador y todos los usuarios son responsables por todas las pérdidas o daños en relación con el uso o el manejo de mezclas de este producto con herbicidas u otros materiales que no se identifican específicamente en esta etiqueta, o en las etiquetas complementarias separadas o en las Fichas Técnicas publicadas para este producto. Consulte la sección "MEZCLA" de esta etiqueta para obtener mayor información sobre las mezclas de tanque.

PRECAUCIONES: Evite el contacto de este herbicida con follaje, brotes verdes o tallos, cortezas, raíces expuestas (incluidas las que emergen del mantillo plástico) o frutos de cultivos, ya que podría ocasionar daños severos o la destrucción de los cultivos. Las plántulas trasplantadas que tienen contacto con las malezas que están todavía mojadas con una solución de rocío de este producto podrían causar daños considerables al cultivo. Cuando realice aplicaciones de preemergencia, realícelas antes de la emergencia del cultivo para evitar graves daños al cultivo. Las aplicaciones al voleo de este producto efectuadas en la emergencia provocarán daños o serán fatales para las plántulas. Aplique antes de que germinen las semillas en tierra arenosa gruesa para minimizar aún más el riesgo de daños al cultivo. En los cultivos donde se permita el tratamiento localizado, el cultivo rociado con este producto se matará junto con las malezas. Tenga cuidado de no rociar ni permitir que el rocío se disperse fuera de la zona a tratar para evitar destruir otros cultivos. Vea la sección "EQUIPO Y TÉCNICAS DE APLICACIÓN" de esta etiqueta para obtener información adicional.

La aplicación antes de la cosecha en cultivos para semilla podría reducir su vigor o poder de germinación. Hasta el grado que sea compatible con la legislación pertinente, el comprador y todos los usuarios son responsables por todas las pérdidas o daños relacionados con el uso de este producto antes de la cosecha en cualquier cultivo para semilla.

RESTRICCIONES: Observe las proporciones de aplicación máximas indicadas en toda esta etiqueta. Las proporciones máximas permitidas se aplican al uso de este producto combinado con el uso de todos y cada uno de los otros herbicidas que contienen glifosato como el ingrediente activo, ya sea que se apliquen por separado o como mezclas. Calcule las proporciones de aplicación (equivalentes de ácido glifosato) y asegúrese de que el uso total de este y otros productos que contienen glifosato no exceda la proporción máxima especificada. Consulte la sección "INFORMACIÓN DEL PRODUCTO" de esta etiqueta para más información sobre las proporciones de aplicación máximas.

A menos que se especifique de otro modo en esta etiqueta, la aplicación con equipo selectivo, incluyendo los aplicadores con enjugador y rociadores con campana, se deben realizar al menos 14 días antes de la cosecha. En cultivos que aceptan tratamientos localizados, no aplique este producto a más del 10 por ciento del total del terreno a ser cosechado, a menos que se indique lo contrario. Las aplicaciones posteriores a la cosecha o en barbecho se deben realizar como mínimo 30 días antes de sembrar algún cultivo no indicado en esta etiqueta.

No coseche ni utilice como alimento la vegetación del área durante 8 semanas después de la aplicación de postemergencia, a menos que se indique lo contrario.

Cuando aplique este producto como mezcla de tanque con uno o más productos, consulte la etiqueta de cada producto de la mezcla de tanque para ver las restricciones y aplicar la mezcla según las precauciones más restrictivas de cada producto de la mezcla de tanque.

11.2.1 Caña de azúcar

TIPOS DE APLICACIONES: Barbecho químico; antes de sembrar; al momento de sembrar; preemergencia; rociador con campana entre hileras; rociador con pantalla entre hileras; aplicador con enjugador entre hileras; tratamiento localizado; regulador de crecimiento; posterior a la cosecha

Antes de sembrar, al momento de sembrar, preemergencia

INSTRUCCIONES DE USO: Este producto se puede aplicar en campos de caña de azúcar, alrededor de esos campos o bien, en el campo antes de la emergencia de la caña.

RESTRICCIONES: No aplique a la vegetación en o alrededor de zanjas, canales o estanques que contengan agua para riego, a menos que el surfactante agregado a la solución de rocío esté indicado para uso herbicida y aprobado para aplicación acuática.

Tratamiento localizado

INSTRUCCIONES DE USO: Este producto se puede aplicar como tratamiento localizado en caña de azúcar. Para el control de la caña de azúcar espontánea o enferma, prepare una solución de 1 por ciento de este producto en agua y rocíe hasta mojar usando un rociador de mano. Pueden obtenerse mejores resultados en caña de azúcar espontánea o enferma si se realiza la aplicación cuando haya por lo menos 7 hojas nuevas. Evite el contacto de este herbicida con la caña de azúcar sana, ya que podría ocasionar daños severos o destrucción.

RESTRICCIONES: No utilice el follaje de la caña de azúcar dentro del área de aplicación como alimento o pastura.

Rociadores con campana

INSTRUCCIONES DE USO: Este producto se puede aplicar con un rociador con campana para el control de malezas entre hileras de caña de azúcar. Vea en la sección "EQUIPO Y TÉCNICAS DE APLICACIÓN" de esta etiqueta las instrucciones adicionales para el empleo de rociadores con campana.

PRECAUCIONES: No permita el contacto de las malezas dentro del área tratada con el cultivo.

Regulación del crecimiento de plantas

INSTRUCCIONES DE USO: Este producto puede utilizarse como tratamiento foliar para regular el crecimiento de las plantas para acelerar la maduración y extender el período de nivel alto de sacarosa en caña de azúcar tanto de bajo tonelaje como de gran tonelaje. La mayor parte del aumento de sacarosa se concentra en los nódulos superiores del tallo de la caña tratada. Para maximizar la recuperación del azúcar cuando se realiza el desmoche en la cosecha, corte en la base de la cuarta hoja. Antes de aplicar este producto, consulte con la autoridad de caña de azúcar de su estado o con su representante local de Bayer CropScience LP acerca del grado de respuesta de sacarosa que puede anticipar.

Como resultado de la desecación de la hoja, se puede esperar mejor quema de los desechos.

Consulte las proporciones y los tiempos de aplicación siguientes de acuerdo con el estado donde se cultive la caña de azúcar. Al tratar caña de azúcar bajo condiciones de maduración adversas, o cuando aplique a variedades menos receptivas, utilice la proporción más elevada dentro del rango recomendado.

FLORIDA – Aplique de 6 a 14 onzas líquidas de este producto por acre, de 3 a 5 semanas antes de la cosecha del ÚLTIMO RETOÑO DE CAÑA SOLAMENTE.

HAWAII – Aplique de 10 a 24 onzas líquidas de este producto por acre, de 4 a 10 semanas antes de la cosecha.

LOUISIANA – Aplique de 4 a 14 onzas líquidas de este producto por acre, de 3 a 7 semanas antes de la cosecha del RETOÑO DE CAÑA SOLAMENTE.

PUERTO RICO –Aplique 6 onzas líquidas de este producto por acre de 3 a 5 semanas antes de la cosecha de RETOÑO DE CAÑA SOLAMENTE.

TEXAS – Aplique de 6 a 14 onzas líquidas de este producto por acre, de 3 a 5 semanas antes de la cosecha del RETOÑO DE CAÑA SOLAMENTE.

PRECAUCIONES: La aplicación de este producto puede provocar que los ojos se entrecierren. Este producto puede que no aumente el contenido de sacarosa de la caña de azúcar en condiciones de buena maduración natural. De 2 a 3 semanas después de la aplicación, este producto puede causar que las hojas pasen de un ligero color amarillento a un color café pronunciado y se sequen, y los entrenudos superiores se acorten. Puede morir el eje.

La lluvia antes de transcurrir 6 horas de la aplicación puede reducir la eficacia de este producto.

La aplicación en cultivos de caña de azúcar para semilla podría reducir su vigor o germinación. Hasta el grado en que sea compatible con la legislación pertinente, el comprador y todos los usuarios son responsables por todas las pérdidas o daños relacionados con el uso de este producto antes de la cosecha en cualquier cultivo de caña de azúcar para semilla.

RESTRICCIONES: No utilice el forraje de la caña de azúcar para alimentar animales después de la aplicación. Durante 30 días después de la aplicación de este producto, no siembre cultivos subsiguientes aparte de los siguientes: alfalfa y otras legumbres para forraje, frijoles (todo tipo), maíz (todo tipo), algodón, melones (todo tipo), pastos para pastura, maní, papas (irlandesas o dulces), sorgo (milo), soya, calabaza (todo tipo) o trigo.

No aplique para mejorar la maduración de ningún otro cultivo que no sea la caña de azúcar. El uso de este producto de cualquier manera contraria a las indicaciones contenidas en esta etiqueta, podría causar lesiones a personas, animales o cultivos u otras consecuencias no deseadas.

Tratamientos de barbecho

INSTRUCCIONES DE USO: Este producto se puede utilizar como sustituto de labranza en campos de barbecho entre cultivos de caña de azúcar. Este producto también puede usarse para quitar los últimos rastrojos de retoños de caña al aplicar de 3 a 3.75 cuartos de galón de este producto en 10 a 40 galones de agua por acre a los nuevos brotes de al menos 7 nuevas hojas. Deje transcurrir al menos 7 días entre la aplicación y la labranza. Se pueden realizar aplicaciones aéreas de hasta 72 onzas líquidas por acre en lugares con barbecho, donde la barrera es suficiente para evitar la dispersión a los cultivos adyacentes. Se pueden usar mezclas de tanque con 2,4-D o dicamba. Asegúrese de que el producto específico que se está usando esté indicado

para esta aplicación en la caña de azúcar. Lea y siga las instrucciones de la etiqueta para todos los productos en la mezcla de tanque.

11.3 Producción de semillas de paso o tepes

INSTRUCCIONES DE USO: Consulte la sección "MALEZAS CONTROLADAS" de esta etiqueta para conocer las proporciones de aplicación de este producto para malezas específicas. Cuando se aplica del modo indicado, este producto controlará estos pastos anuales y perennes, y las malezas de hoja ancha indicados. Las proporciones de aplicación especificadas en esta etiqueta para el control de malezas difíciles, o las especificadas en las etiquetas complementarias separadas de este producto, reemplaza las proporciones indicadas en la sección "MALEZAS CONTROLADAS" de esta etiqueta. Puede encontrar información adicional acerca del control de malezas difíciles, en las Fichas Técnicas publicadas para este producto.

CULTIVOS RECOMENDADOS: Cualquier pasto (familia de las gramíneas), excepto maíz; sorgo; caña de azúcar; cebada; trigo sarraceno; mijo (pearl, proso); avena; arroz; centeno; quinoa; teff; teosinte; triticale; trigo (todos los tipos); arroz salvaje

TIPOS DE APLICACIONES: Antes de sembrar; al momento de sembrar; preemergencia; renovación; eliminación de grupos de plantas establecidos; preparación del lugar; rociador con pantalla; aplicador con enjugador; tratamiento localizado; creación de hileras en ryegrass anual

Antes de sembrar, al momento de sembrar, preemergencia, renovación, eliminación de grupos de plantas establecidos, preparación del lugar

INSTRUCCIONES DE USO: Este producto controla la mayor parte de la vegetación existente a los fines de la renovación del césped o de zonas de semillas de pasto para forraje, o para establecer césped cultivado para tepes. Este producto se puede utilizar para destruir restos de vegetación no deseada cuando los campos de producción se convierten para especies o cultivos alternativos. No remueva la tierra ni las partes de la planta que estén bajo tierra antes del tratamiento y retrase las técnicas de labranza o renovación como segado vertical, ahuecamiento o rebanado al menos 7 días después de la aplicación para que se produzca el correcto traslado del herbicida a las partes subterráneas de la planta.

Aplique antes, durante o después de sembrar o para renovación. En aquellos lugares donde la vegetación existente crece con manejo de césped segado, aplique este producto después de omitir al menos una siega regular a fin de darle tiempo para crecer lo suficiente para que el rocío de herbicida sea interceptado por las plantas. Para lograr máximo control de la vegetación existente, demore la siembra hasta determinar si se produce algún crecimiento de partes de plantas subterráneas. Cuando se necesita repetir el tratamiento, debe permitirse el crecimiento suficiente de las plantas antes de la aplicación. Para pastos de estación cálida, como bermudagrass, las aplicaciones en verano u otoño brindan el mejor control. Se pueden utilizar equipos al voleo para controlar restos de tepes o de otra vegetación no deseada después de cosechar los tepes. Se pueden aplicar proporciones de hasta 3.75 cuartos de galón por acre para eliminar totalmente grupos de plantas establecidos de especies de pastos difíciles de eliminar.

RESTRICCIONES: Si el total de proporciones de aplicación es 2.25 cuartos de galón de este producto por acre o menos, no se requiere período de espera entre la aplicación y la utilización como forraje o pastura del ganado. Si la proporción es mayor de 2.25 cuartos de galón por acre, retire el ganado doméstico antes de aplicar y espere 8 semanas después de la aplicación para utilizar como pastura o para cosechar. Los cultivos indicados en esta etiqueta se pueden sembrar en el área en cualquier momento; todos los demás cultivos pueden sembrarse 30 días después de la aplicación.

Rociadores con pantalla

INSTRUCCIONES DE USO: Aplique de 24 a 72 onzas líquidas de este producto en 10 a 20 galones de agua por acre usando un rociador con pantalla para controlar las malezas entre las hileras de semilla para pasto. La siembra uniforme en hileras rectas facilita las aplicaciones con rociador con pantalla. Se obtienen los mejores resultados cuando el cultivo de semilla de pasto es suficientemente pequeño como para pasar con facilidad por las protecciones. Vea en la sección "EQUIPO Y TÉCNICAS DE APLICACIÓN" de esta etiqueta las instrucciones adicionales para el empleo de rociadores con pantalla.

PRECAUCIONES: Cualquier tipo de contacto de este producto con vegetación que no se desea incluir en el tratamiento podría causar daño.

Aplicador con enjugador

INSTRUCCIONES DE USO: Este producto se puede aplicar por la parte superior de pastos deseables utilizando aplicadores con enjugador para controlar las malezas altas. Vea en la sección "EQUIPO Y TÉCNICAS DE APLICACIÓN" de esta etiqueta las instrucciones adicionales para el empleo de aplicadores con enjugador.

PRECAUCIONES: Las gotas, la niebla, la espuma o las salpicaduras de la solución herbicida que se depositan en la vegetación deseable podrían causar decoloración, atrofia o destrucción.

Tratamiento localizado

INSTRUCCIONES DE USO: Aplique una solución de este producto al 1 por ciento con equipo de rocío manual para controlar las malezas en la vegetación establecida, antes del despunte de los pastos cultivados para semilla o para controlar restos de tepes o de otra vegetación no deseada después de cosechar los tepes.

PRECAUCIONES: Este producto matará el pasto deseable junto con las malezas. Tenga cuidado de no rociar ni permitir que el rocío se disperse fuera de la zona a tratar para evitar destruir otros cultivos.

Creación de hileras en ryegrass anual

INSTRUCCIONES DE USO: Se recomienda utilizar boquillas de baja presión o boquillas de goteo diseñadas para concentrar la aplicación en una franja estrecha. Ajuste la altura de la boquilla para establecer el espaciado deseado entre hileras y aplique de 12 a 24 onzas líquidas de este producto por acre. Se obtienen los mejores resultados cuando las aplicaciones se realizan antes de que las plantas de ryegrass alcancen 6 pulgadas de altura. Utilice la proporción más alta dentro del margen recomendado si las plantas de ryegrass tienen más de 6 pulgadas de altura.

PRECAUCIONES: Tenga cuidado de no rociar ni permitir que el rocío se disperse fuera de la zona a tratar para evitar destruir otros cultivos. Hasta el grado que sea compatible con la legislación pertinente, el cultivador asume toda la responsabilidad por las pérdidas de cultivos causadas por la aplicación incorrecta de este producto.

12.0 MALEZAS CONTROLADAS

Lea toda la etiqueta antes de usar este producto.

A menos que se indique lo contrario, este producto requiere que se agregue un surfactante no iónico cuyo uso con herbicidas esté recomendado en la etiqueta para la solución de rocío. Consulte la sección "MEZCLA" de esta etiqueta para obtener más información sobre el uso de surfactantes con este producto.

Aplique siempre la proporción de aplicación o concentración de solución de rocío mayor de este producto dentro del rango indicado cuando las malezas son muy densas o cuando crecen en áreas no tocadas (no cultivadas).

El control de malezas puede ser deficiente si se aplica a malezas cubiertas de polvo. En el caso de malezas segadas, utilizadas como pastura o cortadas, déjelas crecer nuevamente antes de aplicar este producto.
Consulte las secciones que siguen para conocer las proporciones de aplicación y el momento de aplicación para el control de malezas anuales y perennes, árboles, enredaderas y matorrales leñosos.

12.1 Control de malezas, renovación y segado químico en céspedes

El uso de este producto descrito en esta sección puede aplicarse al césped que crece en cualquier terreno indicado en esta etiqueta. Asegúrese de que cualquier producto de mezcla de tanque aplicado con este producto esté registrado para el uso deseado y en el sitio de la aplicación.

Control de malezas en Bermudagrass y Bahiagrass latentes

Este producto puede usarse para controlar o inhibir muchas malezas anuales y tall fescue (Festuca arundinacea) para el alivio eficaz de céspedes de bermudagrass y bahiagrass latentes antes de reverdecer en primavera las áreas donde estos céspedes son cobertura de terreno deseable y se puede tolerar algún daño o decoloración temporales.

Aplique de 6 a 48 onzas líquidas de este producto en 10 a 40 galones de agua por acre cuando bermudagrass y bahiagrass estén latentes y antes de reverdecer en primavera.

Aplicar más de 12 onzas líquidas de este producto por acre en céspedes bermudagrass y bahiagrass con mucho mantenimiento, como campos de golf y jardines, podría ocasionar daños o que se retrase el reverdecer en primavera.

Para el control residual de malezas en bermudagrass y bahiagrass latentes, este producto se puede mezclar en tanque con los herbicidas Outrider®, Oust Extra u Oust XP. Aplique de 6 a 48 onzas líquidas de este producto en una mezcla de tanque con la proporción apropiada de herbicida Outrider, Oust Extra u Oust XP en 10 a 40 galones de agua por acre. Para evitar que el reverdecer se retrase y minimizar el daño, no aplique más de 1 onza de herbicida Oust Extra u Oust XP por acre sobre bermudagrass y no más de 0.5 onzas sobre bahiagrass, y evite el tratamiento cuando estos pastos se encuentren en estado semilatente.

NO aplique este producto en mezcla de tanque con los herbicidas Outrider, Oust Extra u Oust XP en céspedes bermudagrass y bahiagrass con mucho mantenimiento, como campos de golf y jardines.

Control de malezas en Bermudagrass en crecimiento activo

Este producto se puede usar para controlar total o parcialmente muchas malezas anuales y perennes en bermudagrass en crecimiento activo. La aplicación de este producto podría ocasionar algún daño al bermudagrass, pero este se recuperará en condiciones de humedad una vez desaparezcan los efectos del producto. Utilícelo solo en bermudagrass bien establecido, donde puede tolerarse algún daño o decoloración temporales.

Aplique de 12 a 36 onzas líquidas de este producto en 10 a 40 galones de solución de rocío por acre. Use una proporción de aplicación más baja dentro de este rango para controlar malezas anuales de menos de 4 pulgadas de alto (o longitud de estolón) y aumente la proporción hacia el extremo superior del rango cuando las malezas aumenten de tamaño o se aproximen a la formación de flores o inflorescencias. En estas proporciones de aplicación, este producto proporcionará control parcial de las siguientes malezas perennes en bermudagrass en crecimiento activo:

- Bahiagrass
- Bluestem, silver
- Fescue, tall
- Johnsongrass
- Trumpetcreeper
- Vaseygrass

PRECAUCIONES: Aplicar más de 12 onzas líquidas de este producto por acre en bermudagrass con mucho mantenimiento, como campos de golf y jardines, podría causar daño y decoloración inaceptables del césped.

Para un espectro más amplio de control de malezas en bermudagrass en crecimiento activo, este producto se puede mezclar en tanque con los herbicidas Outrider, Oust Extra u Oust XP. Aplique estas mezclas de tanque solo en bermudagrass bien establecido, donde puede tolerarse algún daño o decoloración temporales. No haga más de una aplicación de este producto en estas mezclas de tanque en la misma temporada, de lo contrario podría causar un daño considerable al bermudagrass.

Aplique de 6 a 24 onzas líquidas de este producto por acre en una mezcla de tanque con el herbicida Outrider para control total o parcial de Johnsongrass y otras malezas indicadas en la etiqueta del herbicida Outrider. Use una proporción de aplicación mayor de ambos productos dentro de los rangos indicados para control de malezas anuales y perennes de más de 6 pulgadas de alto.

Aplique de 12 a 24 onzas líquidas de este producto por acre en una mezcla de tanque con herbicida Oust Extra u Oust XP por acre para un mejor control de las malezas indicadas en dichas etiquetas. Use una proporción de aplicación más baja de cada producto dentro de los rangos dados para controlar malezas anuales indicadas en las etiquetas de menos de 4 pulgadas de alto (o longitud de estolón) y aumente las proporciones hacia el extremo superior de los rangos cuando las malezas anuales aumenten de tamaño y se aproximen a la etapa de flores o inflorescencias. Esta mezcla de tanque proporcionará control parcial de las siguientes malezas perennes en bermudagrass en crecimiento activo:

- Bahiagrass
- Bluestem, silver
- Broomsedge
- Dallisgrass
- Dock, curly
- Dogfennel
- Fescue, tall
- Johnsongrass
- Poorjoe
- Trumpetcreeper
- Vaseygrass
- Vervain, blue

PRECAUCIONES: Aplique estas mezclas de tanque solo en bermudagrass bien establecido, donde puede tolerarse algún daño o decoloración temporales. NO aplique este producto en mezcla de tanque con los herbicidas Outrider u Oust en céspedes bermudagrass con mucho mantenimiento, como campos de golf y jardines.

Control de malezas en Bahiagrass en crecimiento activo

Para inhibir el crecimiento vegetativo y la inflorescencia de bahiagrass durante aproximadamente 45 días, aplique 4 onzas líquidas de este producto en 10 a 40 galones de agua por acre de 1 a 2 semanas después del reverdecer completo o después de cortar a una altura uniforme de 3 a 4 pulgadas antes de la emergencia de las inflorescencias.

Para inhibir el crecimiento de bahiagrass hasta por 120 días, aplique 3 onzas líquidas de este producto por acre, seguido por una aplicación de 2 a 3 onzas líquidas por acre unos 45 días más tarde. No haga más de 2 aplicaciones para inhibir el crecimiento al año.

Para un espectro más amplio de control de malezas en bahiagrass en crecimiento activo, este producto se puede mezclar en tanque con los herbicidas Outrider®, Oust Extra u Oust XP.

Aplique de 1.5 a 3.5 onzas líquidas de este producto por acre en una mezcla de tanque con una proporción adecuada de herbicida Outrider por acre para controlar malezas perennes o malezas anuales de más de 4 pulgadas de alto.

Aplique 4 onzas líquidas de este producto por acre en una mezcla de tanque con una proporción adecuada de herbicida Oust Extra u Oust XP de 1 a 2 semanas después de la primera siega de la primavera para un mejor control de las malezas indicadas en la etiqueta del herbicida Oust en bahiagrass en crecimiento activo. Haga esta aplicación una sola vez al año.

PRECAUCIONES: Aplique estas mezclas de tanque solo en bahiagrass bien establecido, donde puede tolerarse algún daño o decoloración temporales.

Renovación de céspedes

Este producto controla la mayoría de la vegetación existente antes de la renovación del césped o de establecer céspedes cultivados para semilla o tepes. Para lograr máximo control de la vegetación existente, demore la siembra o la colocación de césped hasta determinar si se produce algún crecimiento de partes de plantas subterráneas. Cuando se necesita repetir las aplicaciones, debe permitirse el crecimiento suficiente de las plantas antes de volver a aplicar este producto. La aplicación en verano o en otoño proporciona un mejor control de los pastos de estación cálida, como el bermudagrass. Para el césped controlado, aplique este producto después de dejar de cortar el césped regularmente por lo menos una vez de manera que crezca lo suficiente para que la solución de rocío sea interceptada por las plantas.

Este producto no tiene actividad residual en el suelo y no afectará las plantas, semillas o tepes sembrados en el área después de la aplicación.

Puede utilizarse un equipo de mano para el tratamiento localizado de vegetación no deseada que crezca en el césped existente. Se puede usar aplicación al voleo o tratamiento localizado con rociador de mano para controlar restos de tepes o de otra vegetación no deseada después de cosechar los tepes.

PRECAUCIONES: No remueva la tierra ni las partes de la planta que estén bajo tierra antes de aplicar este producto. La labranza y las técnicas de renovación como corte vertical, perforación o rebanado deben esperar por lo menos 7 días después de la aplicación a fin de permitir la absorción adecuada de este herbicida en las partes de la planta que estén bajo tierra.

RESTRICCIONES: Si el total de proporciones de aplicación es 2.25 cuartos de galón de este producto por acre o menos, no se requiere período de espera entre la aplicación y la utilización como forraje o pastura del ganado. Si la proporción es mayor de 2.25 cuartos de galón por acre, retire el ganado doméstico antes de aplicar y espere 8 semanas después de la aplicación para utilizar como pastura o para cosechar.

Segado químico

Este producto se puede usar para inhibir el crecimiento de pastos perennes y anuales para servir como sustituto de la siega.

Pastos perennes – aplique 5 onzas líquidas de este producto por acre para inhibir el crecimiento de Kentucky bluegrass o 6 onzas líquidas para inhibir tall fescue, fine fescue, orchardgrass, quackgrass o reed canarygrass en 10 a 40 galones de solución de rocío por acre después que los pastos hayan reverdecido hasta por lo menos 75 por ciento de verde en la primavera, o de 7 a 10 días después de segar, cuando haya suficiente recrecimiento para proporcionar una altura deseable para regular el crecimiento. Utilice el segado químico únicamente en las áreas donde se puede tolerar cierto daño o decoloración temporales en pastos perennes.

Pastos anuales – aplique de 3 a 4 onzas líquidas de este producto en 10 a 40 galones de solución de rocío por acre para inhibir el crecimiento de algunos pastos anuales, como annual ryegrass, wild barley y wild oats en crecimiento activo en pasto grueso en bordes de carreteras o en otras áreas industriales y antes de que las inflorescencias estén en la etapa de desarrollo de bota. Esta aplicación puede causar daños a los pastos anuales deseados.

PRECAUCIONES: Utilice este producto para el segado químico únicamente en las áreas donde se puede tolerar cierto daño o decoloración temporales en pastos perennes y anuales.

12.2 Malezas anuales

Resulta más fácil controlar las malezas anuales cuando son pequeñas y están en crecimiento activo. El desarrollo de nuevas hojas indica crecimiento activo.

Para control total o parcial de las malezas anuales indicadas en esta sección cuando tienen menos de 6 pulgadas de alto o longitud de estolón y están en crecimiento activo, aplique 24 onzas líquidas de este producto por acre. Si tienen más de 6 pulgadas de alto o longitud de estolón, o crecen lentamente bajo condiciones de estrés, aumente la proporción de aplicación de 1 a 4 cuartos de galón por acre, dependiendo de la altura de la maleza y la gravedad de las malas condiciones de crecimiento.

Para aplicación usando un rociador manual con una técnica de rocío para mojar, aplique una solución de este producto al 0.5 por ciento a malezas anuales de menos de 6 pulgadas de altura o de longitud de estolón antes de la formación de inflorescencias en pasto o de la formación de brotes en malezas de hoja ancha. Para controlar las malezas anuales que tienen más de 6 pulgadas de alto o incluso malezas más pequeñas que crecen en condiciones de estrés, use una solución del 0.75 al 1.5 por ciento.

Aplique la concentración máxima de este producto dentro de este rango para malezas difíciles de controlar o para controlar malezas con una altura mayor a las 24 pulgadas.

Para controlar malezas anuales usando un aplicador de mano por goteo controlado (CDA), aplique una solución de 15 por ciento de este producto (de 19 a 20 onzas líquidas de este producto por galón de solución de rocío) a una velocidad de flujo de 2 onzas líquidas de solución de rocío por minuto y caminando a una velocidad de 1.5 millas por hora (1 cuarto de galón de solución de rocío por acre). Si usa el aplicador por goteo controlado montado en un vehículo, aplique la cantidad requerida de este producto como se indica en esta sección en 2 a 15 galones de agua por acre.

Para obtener mejor control, no pode, corte, labre, queme ni altere la vegetación en el área de aplicación por un mínimo de 3 días después de la aplicación.

Este producto no tiene actividad residual en el suelo y no controla la emergencia de nuevas malezas anuales a partir de semillas. Aplicaciones subsiguientes de este producto serán necesarias para

ESPECIES DE MALEZAS

Anoda, spurred
Balsam apple[1]
Barley
Barley, little
Barnyardgrass
Bassia, fivehook
Bittercress
Bluegrass, annual
Bluegrass, bulbous
Brome, downy
Brome, Japanese
Broomsedge
Buttercup
Castor bean[2]
Cheatgrass
Cheeseweed (Malva parviflora)
Chervil
Chickweed
Cocklebur
Copperleaf, hophornbeam
Copperleaf, Virginia
Coreopsis, plains/tickseed
Corn
Crabgrass
Cupgrass, woolly
Dwarf dandelion
Eclipta
False dandelion
False flax, small-seed
Fiddleneck
Filaree
Fleabane, annual
Fleabane, hairy (Conyza bonariensis)
Fleabane, rough
Foxtail
Foxtail, Carolina
Geranium, Carolina
Goatgrass, jointed
Goosegrass
Groundsel, common
Henbit
Horseweed/Marestail (Conyza canadensis)
Itchgrass
Johnsongrass, seedling
Junglerice
Knotweed
Kochia
Lambsquarters
Lettuce, prickly
Mannagrass, eastern
Mayweed
Medusahead
Morning glory (Ipomoea spp)
Mustard, blue
Mustard, tansy
Mustard, tumble
Mustard, wild
Nightshade, black
Oats
Panicum, browntop
Panicum, fall
Panicum, Texas
Pennycress, field
Pepperweed, Virginia
Pigweed
Puncturevine
Purslane, common
Pusley, Florida
Ragweed, common
Ragweed, giant
Rice, red
Rocket, London
Rocket, yellow
Rye
Ryegrass
Sandbur, field
Sesbania, hemp
Shattercane
Shepherd's-purse
Sicklepod
Signalgrass, broadleaf
Smartweed, ladysthumb
Smartweed, Pennsylvania
Sorghum, grain (milo)
Sowthistle, annual
Spanish needles[3]
Speedwell, corn
Speedwell, purslane
Sprangletop
Spurge, annual
Spurge, prostrate
Spurge, spotted
Spurry, umbrella
Starthistle, yellow
Stinkgrass
Sunflower
Teaweed / Prickly sida
Thistle, Russian
Velvetleaf
Wheat
Wild oats
Witchgrass

[1] Para controlar balsam apple, aplique este producto usando equipo de mano solamente.

[2] Se puede lograr el control de castor bean también inyectando 4 mililitros de este producto concentrado (sin diluir) por planta en la parte inferior del tallo principal.

[3] Para controlar Spanish needles, aplique 48 onzas líquidas de este producto por acre.

12.3 Malezas perennes

Se puede obtener un mejor control de las malezas perennes cuando se aplica este producto a las malezas objetivo que están pequeñas y en crecimiento activo. El desarrollo de nuevas hojas indica crecimiento activo. Si debe aplicar este producto a malezas más grandes o a malezas que crecen lentamente bajo condiciones de estrés, aplique en una proporción o concentración de solución de rocío hacia el extremo superior del rango especificado.

Si las malezas fueron segadas o labradas, no aplique este producto hasta que las plantas hayan reanudado el crecimiento activo y llegado a la etapa de crecimiento recomendada o hayan crecido lo suficiente para que la solución de rocío sea interceptada por las plantas. Para obtener mejor control, no pode, corte, labre, queme ni altere la vegetación en el área de aplicación por un mínimo de 7 días después de la aplicación.

Para controlar las malezas perennes indicadas en esta etiqueta usando equipo de mochila o de mano y una técnica de aplicación de bajo volumen, aplique una solución de 4 a 8 por ciento de este producto sobre la corona de la planta objetivo para cubrir el 50 por ciento del follaje superior de la planta.

Para controlar malezas perennes usando un aplicador de mano por goteo controlado (CDA), aplique una solución de 15 a 30 por ciento de este producto (de 19 a 38 onzas líquidas de este producto por galón de solución de rocío)

a una velocidad de flujo de 2 onzas líquidas de solución de rocío por minuto y caminando a una velocidad de 0.75 millas por hora (de 2 a 4 cuartos de galón de solución de rocío por acre). Si usa el aplicador por goteo controlado montado en un vehículo, aplique la cantidad requerida de este producto como se indica en la siguiente tabla, en 2 a 15 galones de agua por acre.

Este producto debe aplicarse en otoño antes de una helada agresiva.

Este producto no tiene actividad en el suelo y no controla la emergencia de malezas perennes a partir de semillas, raíces, rizomas o tubérculos subterráneos latentes presentes en el suelo en el momento de la aplicación. Se necesitará más de una aplicación de este producto para el control continuo de malezas que emergen después de la aplicación.

TABLA DE PROPORCIONES PARA MALEZAS PERENNES

Especies de maleza	Proporción por difusión (cuartos de galón/acre)	Concentración del rocío para mojar en rociador de mano (% solución)
Alfalfa*	0.7	1.5
Alligatorweed*	3	1.3
Aplique este producto cuando la mayoría de las plantas objetivo estén en floración. Puede ser necesaria más de una aplicación para el control total.		
Anise (fennel)	1.5 – 3	1 – 1.5
Bahiagrass	2.3 – 3.75	1.5
Beachgrass, European	–	3.5
Aplique una solución al 3.5 por ciento de este producto usando una técnica de rocío para mojar o una solución al 8 por ciente usando una técnica de aplicación de bajo volumen. Pueden obtenerse mejores resultados cuando se realiza la aplicación a malezas objetivo que estén en crecimiento activo en etapa de desarrollo de bota a floración. Aplique antes de que las hojas pierdan más del 50 por ciento del color verde en otoño. Observe el sitio de la aplicación y vuelva a aplicar este producto a las malezas objetivo que quedaron, si es necesario, antes de volver a sembrar el área con la vegetación deseada. Para el control selectivo de European beachgrass, aplique una solución de 33.3 por ciento de este producto que contenga de 1 a 2.5 por ciento de un surfactante no iónico durante el período de crecimiento activo usando un aplicador con enjugador. Obtendrá un mejor control al maximizar la cantidad de hojas individuales que tienen contacto con el aplicador con enjugador o dando una segunda pasada en sentido contrario.		
Evite el contacto de la solución herbicida con la vegetación deseable.		
Bentgrass*	1	1.5
Bermudagrass	4	1.5
Aplique cuando tenga inflorescencias.		
Bermudagrass, agua (knotgrass)	1	1.5
Bindweed, campo	2.3 – 3.75	1.5
Para controlar, aplique de 3 a 3.75 cuartos de galón de este producto por acre como aplicación al voleo al oeste del río Mississippi y de 2.3 a 3 cuartos de galón por acre al este del río Mississippi cuando bindweed esté en plena floración o después. Para obtener mejores resultados, aplique a finales del verano o en otoño.		
Bittersweet, Oriental	2.25	2
Para control de oriental bittersweet, aplique este producto como aplicación al voleo en 30 a 40 galones de solución de rocío que contenga 0.25 por ciento de un surfactante no iónico y 0.1 por ciento de organosilicona no iónica por acre. Use una concentración de 0.5 a 2 por ciento por volumen de surfactante no iónico cuando use un rociador manual y la técnica de rocío para mojar. Para obtener mejores resultados, asegúrese de cubrir completamente la planta objetivo con la solución de rocío.		

TABLA DE PROPORCIONES PARA MALEZAS PERENNES

Especies de maleza	Proporción por difusión (cuartos de galón/acre)	Concentración del rocío para mojar en rociador de mano (% solución)
Bluegrass, Kentucky	1.5 – 2.3	0.75
Aplique cuando la mayoría de las plantas objetivo hayan alcanzado la etapa de desarrollo de bota a floración. Cuando la aplicación se hace antes de la etapa de bota, el control puede verse reducido. En el otoño, aplique el tratamiento antes de que las plantas se oscurezcan.		
Blueweed, Texas	2.3 – 3.75	1.5
Aplique de 3 a 3.75 cuartos de galón de este producto por acre al oeste del río Mississippi y de 2.3 a 3 cuartos de galón por acre al este del río Mississippi cuando la mayoría de las plantas objetivo estén en plena floración o después. Para obtener mejores resultados, aplique a finales del verano o en otoño.		
Brackenfern	2.3 – 3	0.75 – 1
Aplique a las frondas completamente extendidas que tengan por lo menos 18 pulgadas de longitud.		
Bromegrass, smooth	1.5 – 2.3	0.75
Aplique este producto cuando la mayoría de las plantas objetivo hayan alcanzado la etapa de desarrollo de bota a floración. Cuando la aplicación se hace antes de la etapa de bota, el control puede verse reducido. En el otoño, aplique el tratamiento antes de que las plantas se oscurezcan.		
Bursage, woolly-leaf	–	1.5
Canarygrass, reed	1.5 – 2.3	0.75
Aplique este producto cuando la mayoría de las plantas objetivo hayan alcanzado la etapa de desarrollo de bota a floración. Cuando la aplicación se hace antes de la etapa de bota, el control puede verse reducido. En el otoño, aplique el tratamiento antes de que las plantas se oscurezcan.		
Cattail	2.3 – 3.75	0.75
Aplique este producto cuando las plantas objetivo estén en crecimiento activo y estén en la etapa de floración temprana o completa o después de esta. Se obtienen mejores resultados cuando las aplicaciones se realizan durante los meses de verano u otoño.		
Clover; red, white	2.3 – 3.75	1.5
Cogongrass	2.3 – 3.75	1.5
Aplique este producto a finales del verano o en otoño cuando las plantas de cogongrass tengan por lo menos 18 pulgadas de alto y estén en crecimiento activo. Debido a las etapas de crecimientos irregulares y la naturaleza densa de la vegetación de cogongrass, pueden ser necesarias varias aplicaciones para lograr el control.		

TABLA DE PROPORCIONES PARA MALEZAS PERENNES

Especies de maleza	Proporción por difusión (cuartos de galón/acre)	Concentración del rocío para mojar en rociador de mano (% solución)
Cordgrass	2 – 8	5 – 8
Antes de aplicar este producto para controlar cordgrass, inspeccione la zona para determinar si existen lechos de crustáceos dentro de la zona de aplicación. Si se pretende recolectar crustáceos en la zona, demore la aplicación de este producto hasta después de la recolección o mantenga una zona de transición de 50 pies entre el área de aplicación y los lechos de crustáceos comerciales o no recolecte los crustáceos hasta por lo menos 14 días después de aplicar este producto. Vea las restricciones abajo.		
Las condiciones ideales para controlar cordgrass son cuando las plantas no tienen lodo ni desechos y están en crecimiento activo, y se puede conseguir una buena cobertura del rocío. La presencia de desechos o lodo en la superficie de cordgrass reducirá el rendimiento del producto. Para una mejor captación del herbicida, lave las plantas objetivo antes de aplicar y espere como mínimo 4 horas para que las plantas se sequen antes de aplicar este producto. Cuando cordgrass ha sido cortado antes de la aplicación, espere que vuelva a crecer lo suficiente antes de aplicar este producto para asegurar una intercepción y captación adecuadas de este producto. La lluvia o la inmersión de la planta en agua de marea antes de transcurrir 4 horas de la aplicación puede reducir la eficacia de este producto.		
Aplique de 2 a 8 cuartos de galón de este producto por acre usando equipo de aplicación terrestre al voleo o con sensor óptico en 5 a 100 galones de solución de rocío o en 5 a 10 galones de solución de rocío por acre si se usa equipo de aplicación aérea.		
Aplique una solución de 5 a 8 por ciento de este producto al usar rociadores manuales de mochila o rociador de alto volumen. Realice todas las aplicaciones de este producto para control de cordgrass en una solución de rocío que contenga 0.25% o más (1 o más cuartos de galón por 100 galones de solución de rocío) de un surfactante no iónico u otro coadjuvante que sea compatible con este producto y esté indicado en la etiqueta para usar con herbicidas y aprobado para usar en sitios acuáticos. Para obtener mejores resultados, asegúrese de conseguir una cobertura completa de los macizos de cordgrass.		
RESTRICCIONES: Si se mantiene una zona de transición de 50 pies entre el área de aplicación y los lechos de crustáceos comerciales, no hay restricciones a la recolección de crustáceos. Si se aplica dentro de una zona de 50 pies de los lechos de crustáceos comerciales, NO recolecte los crustáceos hasta por lo menos 14 días después de aplicar este producto.		
Cutgrass, giant*	3	1
Se necesitará más de una aplicación de este producto para lograr el control, especialmente donde la vegetación esté parcialmente sumergida en el agua. Permita que las malezas que son el objetivo crezcan hasta la etapa de 7 a 10 hojas antes de realizar la siguiente aplicación.		
Dallisgrass	2.3 – 3.75	1.5
Dandelion	2.3 – 3.75	1.5
Dock, curly	2.3 – 3.75	1.5
Dogbane, hemp	3	1.5
Aplique este producto cuando la mayoría de las plantas objetivo hayan alcanzado la etapa de desarrollo de brotación tardía a floración. Para obtener mejores resultados, aplique a finales del verano o en otoño.		
Fescue (excepto tall)	2.3 – 3.75	1.5
Fescue, tall	2.3	1
Aplique este producto cuando la mayoría de las plantas objetivo hayan alcanzado la etapa de crecimiento de bota a floración. Si se aplica antes de la etapa de bota, puede obtenerse un menor control del deseado.		

TABLA DE PROPORCIONES PARA MALEZAS PERENNES

Especies de maleza	Proporción por difusión (cuartos de galón/acre)	Concentración del rocío para mojar en rociador de mano (% solución)
Guinea grass	2.3	0.75
Aplique este producto cuando la mayoría de las plantas objetivo hayan alcanzado la etapa de crecimiento de 7 hojas.		
Hemlock, poison	1.5 – 3	0.75 – 1.5
También se puede lograr el control inyectando 5 mililitros de una solución al 5 por ciento de este producto usando un dispositivo de inyección manual en una caña de una hoja por planta, 12 pulgadas por encima de la corona de la raíz.[1] No se requiere surfactante.		
Hogweed, giant	–	–
Inyecte 5 mililitros de una solución al 5 por ciento de este producto en una caña de una hoja por planta, 12 pulgadas por encima de la corona de la raíz.[1] No se requiere surfactante.		
Horsenettle	2.3 – 3.75	1.5
Horseradish	3	1.5
Aplique este producto cuando la mayoría de las plantas objetivo hayan alcanzado la etapa de desarrollo de brotación tardía a floración. Para obtener mejores resultados, aplique a finales del verano o en otoño.		
Horsetail, field	–	–
Inyecte 0.5 mililitros de este producto por tallo directamente en el tallo de la planta, un segmento por encima de la corona de la raíz.[1] No se requiere surfactante.		
Iceplant	1.5	1.5
Iris, yellow flag	–	–
Corte los tallos de flores 8 o 9 pulgadas por encima de la corona de la raíz. Introduzca una aguja inyectora en el centro del tallo y luego retírela lentamente a medida que inyecta 0.5 mililitros de este producto con un inyector manual.[1] No se requiere surfactante.		
Ivy; cape, German	1.5 – 3	0.75 – 1.5
Jerusalem artichoke	2.3 – 3.75	1.5
Johnsongrass	1.5 – 2.3	0.75
Aplique este producto cuando la mayoría de las plantas objetivo hayan alcanzado la etapa de desarrollo de bota a floración o antes de que las plantas se hayan oscurecido en el otoño. Cuando se aplica antes de la etapa de bota, el control puede verse reducido.		
Kikuyu grass	1.5 – 2.3	0.75
Knapweed	3	1.5
Aplique este producto cuando la mayoría de las plantas objetivo hayan alcanzado la etapa de desarrollo de brotación tardía a floración. Para obtener mejores resultados, aplique a finales del verano o en otoño.		

TABLA DE PROPORCIONES PARA MALEZAS PERENNES

Especies de maleza	Proporción por difusión (cuartos de galón/acre)	Concentración del rocío para mojar en rociador de mano (% solución)
Knotweed; Bohemian, giant, Japanese	3	2
Aplique 3 cuartos de galón de este producto por acre como aplicación al voleo en 3 a 40 galones de solución de rocío con 0.5 a 1 por ciento por volumen de un surfactante no iónico. Para aplicar usando un rociador de mochila y la técnica de rocío para mojar, aplique una solución al 2 por ciento de este producto que contenga de 0.5 a 2 por ciento por volumen de un surfactante no iónico. Para obtener mejor control, no altere la vegetación en el área de aplicación por un mínimo de 7 días después de la aplicación.		
También se puede obtener control al hacer un corte limpio de los tallos justo por debajo del segundo o tercer nodo sobre la superficie y aplicar 0.36 onzas líquidas (10 mililitros) de una solución al 50 por ciento de este producto en agua en el "pozo" o internodo que quede. Asegúrese de que los restos de la parte superior de la planta que se eliminó se recojan y desechen correctamente para evitar que se propaguen nuevas plantas de los retoños. El uso de biobarreras, tales como paneles de cartón, madera contrachapada o plástico, ayudará a evitar la propagación de materia vegetal. La proporción de aplicación total combinada de este producto no puede exceder 8 cuartos de galón por acre.[1] También se puede lograr el control inyectando 5 mililitros de este producto por tallo en el segundo o tercer internodo usando un dispositivo de inyección manual.[1] No se requiere surfactante.		
Lantana	–	0.75 – 1
Aplique cuando la mayoría de las plantas se encuentren en la etapa de floración o después de ella. Utilice la concentración más alta de solución de rocío para plantas que han alcanzado la etapa de crecimiento leñoso.		
Lespedeza	2.3 – 3.75	1.5
Loosestrife, purple	2	1 – 1.5
Aplique cuando la mayoría de las plantas se encuentren en la etapa de floración o después de ella. Se pueden obtener mejores resultados cuando la aplicación se realiza durante los meses de verano o de otoño. La aplicación en otoño debe hacerse antes de una helada agresiva.		
Lotus, American	2	0.75
Aplique cuando la mayoría de las plantas se encuentren en la etapa de floración o después de ella. Se pueden obtener mejores resultados cuando la aplicación se realiza durante los meses de verano o de otoño. La aplicación en otoño debe hacerse antes de una helada agresiva. Puede ser necesaria más de una aplicación de este producto para controlar el recrecimiento de semillas y partes de plantas subterráneas.		
Maidencane	3	0.75
Se necesitará más de una aplicación de este producto para lograr el control, especialmente para la vegetación parcialmente sumergida en el agua. Permita que las plantas crezcan hasta la etapa de 7 a 10 hojas antes de realizar la siguiente aplicación.		
Milkweed, común	2.3	1.5
Aplique este producto cuando la mayoría de las plantas objetivo hayan alcanzado la etapa de desarrollo de brotación tardía a floración.		
Muhly, wirestem	1.5 – 2.3	0.75
Aplique cuando la mayoría de las plantas objetivo tengan por lo menos 8 pulgadas de alto (etapa de desarrollo de 3 a 4 hojas) y estén en crecimiento activo.		
Mullein, común	2.3 – 3.75	1.5
Napiergrass	2.3 – 3.75	1.5

TABLA DE PROPORCIONES PARA MALEZAS PERENNES

Especies de maleza	Proporción por difusión (cuartos de galón/acre)	Concentración del rocío para mojar en rociador de mano (% solución)
Nightshade, silverleaf	2.3 – 3.75	1.5
Aplique de 3 a 3.75 cuartos de galón de este producto por acre como aplicación al voleo al oeste del río Mississippi y de 2.3 a 3 cuartos de galón por acre al este del río Mississippi cuando la mayoría de las plantas objetivo estén en plena floración o después. Se pueden obtener mejores resultados cuando la aplicación se realiza a finales del verano o en otoño, después de la formación de frutos.		
Nutsedge; púrpura, amarillo	2.3	0.75
Aplique este producto para controlar las plantas existentes de nutsedge y las nueces inmaduras adjuntas cuando las plantas objetivo están en flor o cuando se pueden encontrar nueces nuevas en las puntas de los rizomas. No se podrán controlar las nueces que todavía no han germinado y será necesario repetir las aplicaciones de este producto para lograr el control a largo plazo.		
Orchardgrass	1.5 – 2.3	0.75
Aplique cuando la mayoría de las plantas objetivo hayan alcanzado la etapa de desarrollo de bota a floración. Cuando se aplica antes de la etapa de bota, puede obtenerse un menor control del deseado. En el otoño, aplique el tratamiento antes de que las plantas se oscurezcan.		
Pampas grass	2.3 – 3.75	1.5
Para grass	3	0.75
Se necesitará más de una aplicación de este producto para lograr el control total. Permita que las plantas crezcan hasta la etapa de 7 a 10 hojas antes de realizar la siguiente aplicación.		
Pepperweed, perenne	3	1.5
Phragmites*	2 – 3.75	0.75 – 1.5
Para el control parcial de phragmites en Florida y en los condados de otros estados que bordean el Golfo de México, aplique 3.75 cuartos de galón de este producto por acre como aplicación al voleo o una solución al 1.5 por ciento usando un rociador de mano. En otras áreas de los EE. UU., aplique de 2 a 3 cuartos de galón por acre como aplicación al voleo o, para control parcial, aplique una solución al 0.75 por ciento usando un rociador de mano. Para obtener mejores resultados, aplique a finales del verano o en otoño cuando las plantas están en crecimiento activo y en plena floración. Debido a la naturaleza densa de la vegetación (que puede impedir la correcta cobertura del rocío) y a las etapas de crecimiento irregulares, puede ser necesaria más de una aplicación de este producto para lograr el control. Los síntomas visuales de control se desarrollarán con lentitud.		
Quackgrass	1.5 – 2.3	0.75
Aplique este producto cuando la mayoría de las plantas objetivo tengan por lo menos 8 pulgadas de alto (etapa de desarrollo de 3 a 4 hojas) y estén en crecimiento activo.		
Redvine*	1.5	1.5
Reed; común, gigante	3 – 3.75	1.5
Para obtener mejores resultados, aplique a finales del verano o en otoño. También se puede lograr el control inyectando 5 mililitros de este producto concentrado (sin diluir) directamente en el segundo o tercer internodo usando un dispositivo de inyección manual.[1] No se requiere surfactante.		
Ryegrass, perenne	1.5 – 2.3	0.75
Aplique este producto cuando la mayoría de las plantas objetivo hayan alcanzado la etapa de crecimiento de bota a floración. Cuando se aplica antes de la etapa de bota, el control puede verse reducido. En el otoño, aplique el tratamiento antes de que el ryegrass se oscurezca.		

TABLA DE PROPORCIONES PARA MALEZAS PERENNES		
Especies de maleza	**Proporción por difusión** (cuartos de galón/acre)	**Concentración del rocío para mojar en rociador de mano** (% solución)
Salvinia, giant	3 – 3.75	2

Aplique una solución al 2 por ciento de este producto que contenga de 0.5 a 2 por ciento por volumen de un surfactante no iónico aprobado para uso acuático y que contenga por lo menos 70 por ciento de ingrediente activo usando la técnica de rocío para mojar. Para aplicación al voleo, aplique de 3 a 3.75 cuartos de galón de este producto por acre en 3 a 40 galones de solución de rocío que contenga 0.1 por ciento por volumen de organosilicona y 0.25 por ciento de surfactante no iónico o mezcla de rocío coadjuvante (spreader sticker) aprobado para uso acuático. Deje transcurrir al menos 3 días después de la aplicación antes de alterar la vegetación en el área de aplicación. Este producto no controlará plantas que estén completamente sumergidas o que tienen la mayoría de su follaje debajo del agua.

Smartweed, swamp	2.3 – 3.75	1.5
Spatterdock	3	0.75

Aplique cuando la mayoría de las plantas objetivo estén en plena floración. Para obtener mejores resultados, aplique en verano o en otoño.

Spurge, leafy*	–	1.5
Starthistle, amarillo	–	1.5
Sweet potato, wild*	–	1.5

Aplique cuando la mayoría de las plantas objetivo se encuentren en la etapa de floración o después de ella. Puede ser necesaria más de una aplicación para el control total.

Thistle, artichoke	1.5 – 2.3	2

Aplique cuando la mayoría de las plantas objetivo se encuentren en la etapa de brotación o después de ella.

Thistle, Canada	1.5 – 2.3	1.5

Aplique cuando la mayoría de las plantas objetivo se encuentren en la etapa de brotación o después de ella. También puede obtener control con inyecciones al tallo. Corte de 8 a 9 plantas de las más altas en un macizo en la etapa de brotación. Introduzca una aguja inyectora en el centro del tallo y luego retírela lentamente a medida que inyecta 0.5 mililitros de este producto concentrado en el tallo.[1] No requiere surfactante.

Timothy	1.5 – 2.3	1.5

Aplique cuando la mayoría de las plantas objetivo hayan alcanzado la etapa de desarrollo de bota a floración. Si la aplicación se hace antes de la etapa de bota, el control puede verse reducido. En el otoño, aplique el tratamiento antes de que las plantas se oscurezcan.

Torpedograss*	3 – 3.75	0.75 – 1.5

Aplique este producto en una proporción o concentración de solución de rocío menor dentro del rango especificado cuando torpedograss crece en el terreno y en una proporción o concentración mayor dentro del rango cuando está parcialmente sumergido en agua o creciendo como mata flotante. Se necesitarán aplicaciones adicionales de este producto para mantener el control.

Trumpetcreeper*	1.5 – 2.3	1.5
Tules, común	–	1.5

Aplique a las plantas objetivo cuando se encuentren en la etapa de brotación o después de ella. Los síntomas visuales aparecerán lentamente y puede que no aparezcan hasta 3 semanas o más después de la aplicación.

Vaseygrass	2.3 – 3.75	1.5
Velvetgrass	2.3 – 3.75	1.5

TABLA DE PROPORCIONES PARA MALEZAS PERENNES		
Especies de maleza	**Proporción por difusión** (cuartos de galón/acre)	**Concentración del rocío para mojar en rociador de mano** (% solución)
Waterhyacinth	2.5 – 3	0.75 – 1

Aplique cuando las plantas objetivo se encuentren en la etapa de floración temprana o después de ella. Los síntomas visuales pueden tardar en aparecer 3 o más semanas después de la aplicación, y la necrosis completa y descomposición de 60 a 90 días después de la aplicación. Si desea obtener los efectos visuales más rápido, use una proporción de aplicación más alta dentro del rango indicado.

Waterlettuce	–	0.75 – 1

Aplique una solución al 1 por ciento de este producto en áreas de infestación severa. Se pueden obtener mejores resultados si se aplica de mediados del verano hasta el invierno. Si se aplica en primavera, es posible que se necesite más de una aplicación para lograr el control.

Waterprimrose	–	0.75

Realice la aplicación a plantas objetivo que se encuentren en etapa de floración o después de ella, pero antes de que cambien de color en el otoño. Para obtener un mejor control es necesaria una cobertura completa.

Wheatgrass, western	1.5 – 2.3	0.75

Aplique cuando la mayoría de las plantas objetivo hayan alcanzado la etapa de desarrollo de bota a floración. Las aplicaciones realizadas antes de la etapa de bota podrían tener menor control. En el otoño, aplique el tratamiento antes de que las plantas se oscurezcan.

* Control parcial

[1] Al usar inyecciones de tallo, el uso total combinado de este producto no debe exceder 8 cuartos de galón por acre por año. A 5 mililitros de producto concentrado (sin diluir) por tallo, 8 cuartos de galón tratarán aproximadamente 1500 tallos por acre por año. La cantidad de tallos que pueden tratarse por acre variará dependiendo del volumen de inyección y de la concentración de este producto en la solución de aplicación.

Otras perennes indicadas en esta etiqueta – Aplique de 2.3 a 3.75 cuartos de galón de este producto por acre como aplicación al voleo o una solución de 0.75 a 1.5 por ciento usando un rociador manual.

12.4 Árboles, enredaderas y matorrales leñosos

Aplique este producto a árboles y matorrales que estén en crecimiento activo después de la expansión completa de las hojas. Use una proporción de aplicación mayor dentro del rango indicado para árboles y matorrales más grandes y/o en áreas de denso crecimiento vegetativo. Para el control de enredaderas, aplique este producto en una proporción de aplicación o concentración de solución de rocío mayor dentro del rango indicado cuando las plantas objetivo hayan alcanzado la etapa de crecimiento leñoso.

Se obtiene un mejor control de árboles y matorrales leñosos cuando se realiza la aplicación a finales del verano o en otoño después de la formación de frutas. Sin embargo, en las zonas áridas, se puede obtener un mejor control cuando la aplicación se realiza en la primavera o a comienzos del verano, cuando los árboles y matorrales tienen mayor contenido de humedad y están florecidos. Se puede anticipar un control deficiente cuando este producto se aplica a árboles y matorrales sometidos a estrés por sequía.

Se aceptan algunos colores otoñales en especies de hoja caduca no deseables al aplicar este producto a árboles y matorrales en el otoño, siempre y cuando no se haya producido una importante caída de las hojas. El rendimiento de este producto podría verse reducido si se aplica después de una helada. Después de aplicar en otoño, es posible que los síntomas no aparezcan antes de las heladas o del envejecimiento.

Para obtener mejores resultados, espere 7 días o más después de la aplicación para podar, cortar, labrar, quemar o eliminar los árboles, enredaderas y matorrales leñosos del sitio de la aplicación. Pueden ser necesarias aplicaciones adicionales de este producto para controlar árboles y matorrales que se regeneren a partir de semillas o partes subterráneas.

MEZCLAS DE TANQUE: Este producto puede aplicarse en cualquier proporción indicada en esta etiqueta en una mezcla de tanque con los siguientes productos para aumentar el espectro de control de malezas herbáceas, árboles, enredaderas y matorrales leñosos. Para el control de las malezas herbáceas, aplique el producto de la mezcla de tanque en la proporción de aplicación o concentración de solución de rocío más baja dentro del rango especificado. Para el control de poblaciones densas o de árboles, enredaderas y matorrales leñosos difíciles de controlar, aumente la proporción de aplicación o la concentración de solución de rocío del producto en la mezcla de tanque hacia el extremo más alto del rango. Consulte las etiquetas de cada producto para conocer los usos aprobados y las proporciones de aplicación. No todos los productos en mezcla de tanque están aprobados para uso acuático.

Arsenal; Herbicida concentrado para aplicadores Arsenal; Escort XP; Forestry Garlon 4 Specialty; Forestry Garlon XRT Specialty; Garlon 3A Specialty; Garlon 4 Specialty; Garlon 4 Ultra Specialty; Vastlan Specialty; imazapyr; metsulfuron methyl; triclopyr

Asegúrese de que la cantidad correcta del herbicida Garlon esté bien mezclada con agua en el tanque de rociado antes de agregar este producto.

Aplicación a tocones cortados

Este producto se puede usar para controlar rebrotes y retoños de matorrales leñosos y árboles en cualquier sitio indicado en esta etiqueta.

Corte el árbol o matorral leñoso cerca de la superficie de la tierra o del agua y aplique inmediatamente una solución de este producto al 50 o 100 por ciento (sin diluir) a la superficie recién cortada utilizando un aplicador capaz de aplicar este producto a todo el cámbium. La demora en la aplicación puede resultar en un rendimiento inferior. Para obtener mejores resultados, corte el árbol o matorral leñoso durante el período de crecimiento activo y expansión completa de las hojas y aplique este producto. No se necesita surfactante para la aplicación a tocones cortados.

Para controlar tree of heaven (Ailanthus altissima), corte el árbol cerca de la superficie de la tierra y aplique de inmediato una solución al 50 por ciento de este producto (16 onzas líquidas por cuarto de galón de solución) y un 10 por ciento de herbicida Arsenal (de 3 a 4 onzas líquidas por cuarto de galón de solución) en agua a la superficie recién cortada.

NO REALICE UNA APLICACIÓN EN TOCONES CORTADOS CUANDO LAS RAÍCES DE MATORRALES LEÑOSOS O ÁRBOLES DESEABLES PUEDEN ESTAR INJERTADAS EN LAS RAÍCES DEL TOCÓN CORTADO, PORQUE SE PUEDE CAUSAR DAÑO A LOS ÁRBOLES ADYACENTES. Algunos retoños, tallos o árboles pueden compartir el mismo sistema de raíces. Los árboles adyacentes de edad, altura y espaciado similares pueden tener raíces compartidas. Ya sea injertados o compartidos, es probable que se dañen tallos o árboles adyacentes cuando se aplica este producto a uno o más árboles que comparten un sistema común de raíces.

Aplicación de inyección y anillado de matorrales leñosos y árboles

Este producto se puede usar para controlar árboles y matorrales leñosos indicados en esta sección por aplicación de inyección o anillado (frill) en cualquier sitio acuático o terrestre indicado en esta etiqueta.

Inyecte o aplique el equivalente 1 mililitro (0.04 onzas líquidas) de este producto por cada 2 ó 3 pulgadas de diámetro del tronco a la altura del pecho (DBH en inglés). Si inyecta este producto en un matorral leñoso o árbol, use equipo capaz de penetrar el tejido vivo de la planta debajo de la corteza. No se requiere surfactante para la inyección directa de este producto en árboles y matorrales leñosos.

Para aplicación con anillado, aplique una solución de 50 a 95 por ciento de este producto en agua con 0.5% o más por volumen de un surfactante no iónico a una incisión anular continua alrededor del árbol o en cortes espaciados uniformemente alrededor del árbol por debajo del nivel de las ramas. A medida que el diámetro del árbol aumenta, pueden obtenerse mejores resultados al aplicar este producto a una incisión anular continua o en cortes menos espaciados. Evite las técnicas de aplicación que permiten

que este producto se escurra de las áreas cortadas o con incisiones. En las especies que segregan savia copiosamente, haga los cortes o incisiones en un ángulo oblicuo para producir un efecto de copa y aplicar una solución al 95 por ciento de este producto con un surfactante no iónico, como se describe antes. Para obtener mejores resultados, realice esta aplicación durante el período de crecimiento activo y después de la expansión completa de las hojas.

Aplicación modificada de alto volumen y bajo volumen con mochila

Para el control total y parcial de árboles, enredaderas y matorrales leñosos indicados en esta etiqueta al usar un rociador de mochila u otro equipo manual y una técnica de aplicación foliar dirigida de bajo volumen, aplique una solución de 4 a 8 por ciento de este producto que contenga de 0.5 a 1 por ciento por volumen de un surfactante no iónico de forma uniforme sobre la corona de la planta para cubrir el 50 por ciento del follaje superior de los árboles, enredaderas y matorrales leñosos no deseados.

TABLA DE PROPORCIONES PARA MATORRALES LEÑOSOS, ÁRBOLES Y ENREDADERAS

Especie	Proporción por difusión (cuartos de galón/acre)	Concentración del rocío para mojar en rociador de mano (% solución)
Alder	2.3 – 3	0.75 – 1.2
Ash*	1.5 – 3.75	0.75 – 1.5
Aspen, quaking	1.5 – 2.3	0.75 – 1.2
Bearclover (Bearmat)*	1.5 – 3.75	0.75 – 1.5
Beech*	1.5 – 3.75	0.75 – 1.5
Birch	1.5	0.75
Blackberry	2.3 – 3	0.75 – 1.2
Blackgum	1.5 – 3.75	0.75 – 1.5
Bracken	1.5 – 3.75	0.75 – 1.5
Broom; French, Scotch	1.5 – 3.75	1.2 – 1.5
Buckwheat, California*	1.5 – 3	0.75 – 1.5
Cascara*	1.5 – 3.75	0.75 – 1.5
Castor bean	1.5 – 3.75	1.5
Además, para controlar, inyecte 4 mililitros de este producto concentrado (sin diluir) por planta directamente en la parte inferior del tallo principal con un dispositivo de inyección manual.1 No requiere surfactante.		
Catsclaw*	–	1.2 – 1.5
Para control parcial, aplique este producto cuando por lo menos el 50 por ciento de las hojas nuevas estén completamente desarrolladas.		
Ceanothus*	1.5 – 3.75	0.75 – 1.5
Chamise*	1.5 – 3.75	0.75
Cerezo; amargo, negro, pin	1.5 – 3.75	1 – 1.5
Cottonwood, eastern	1.5 – 3.75	0.75 – 1.5
Coyote brush	2.3 – 3	1.2 – 1.5
Para controlar, aplique este producto cuando por lo menos el 50 por ciento de las hojas nuevas estén completamente desarrolladas.		
Cypress; swamp, bald	1.5 – 3.75	0.75 – 1.5
Deerweed	1.5 – 3.75	0.75 – 1.5
Dewberry	2.3 – 3	0.75 – 1.2
Dogwood*	3 – 3.75	1 – 2
Elderberry	1.5	0.75
Elm*	1.5 – 3.75	0.75 – 1.5
Eucalipto, blue gum	–	1.5
Para controlar nuevos brotes de eucaliptos, aplique este producto usando un rociador manual cuando los nuevos brotes tengan entre 6 a 12 pies de altura. Asegúrese de conseguir una cobertura completa.		

TABLA DE PROPORCIONES PARA MATORRALES LEÑOSOS, ÁRBOLES Y ENREDADERAS

Especie	Proporción por difusión (cuartos de galón/acre)	Concentración del rocío para mojar en rociador de mano (% solución)
Gallberry	1.5 – 3.75	0.75 – 1.5
Gorse*	1.5 – 3.75	0.75 – 1.5
Hackberry, western	1.5 – 3.75	0.75 – 1.5
Hasardia*	1.5 – 3	0.75 – 1.5
Hawthorn	1.5 – 2.3	0.75 – 1.2
Hazel	1.5	0.75
Hickory*	3 – 3.75	1 – 2
Honeysuckle	2.3 – 3	0.75 – 1.2
Hornbeam, American*	1.5 – 3.75	0.75 – 1.5
Huckleberry	1.5 – 3.75	0.75 – 1.5
Ivy, poison	3 – 3.75	1.5
Kudzu	3	1.5
Locust, black*	1.5 – 3	0.75 – 1.5
Madrone resprouts (rebrotes)	–	1.5
Magnolia, sweetbay	1.5 – 3.75	0.75 – 1.5
Manzanita*	1.5 – 3.75	0.75 – 1.5
Maple, red	1 – 3.75	0.75 – 1.2
Para controlar, aplique una solución de 0.75 a 1.2 por ciento de este producto usando un rociador manual cuando las hojas estén completamente desarrolladas. Para control parcial, aplique de 1 a 3.75 cuartos de galón por acre en aplicación al voleo.		
Maple, sugar	–	0.75 – 1.2
Para controlar, aplique este producto con un rociador manual cuando por lo menos el 50 por ciento de las hojas nuevas estén completamente desarrolladas.		
Maple, vine*	1.5 – 3.75	0.75 – 1.5
Monkey flower*	1.5 – 3	0.75 – 1.5
Oak; black, white*	1.5 – 3	0.75 – 1.5
Oak; northern, pin	1.5 – 3	0.75 – 1.2
Para controlar, aplique este producto cuando por lo menos el 50 por ciento de las hojas nuevas estén completamente desarrolladas.		
Oak, poison	3 - 3.75	1.5
Puede que tenga que repetir las aplicaciones para lograr el control. La aplicación en otoño debe hacerse antes de que las hojas pierdan su color verde.		
Oak, post	2.3 – 3	0.75 – 1.2
Oak, red	–	0.75 – 1.2
Para controlar, aplique este producto con un rociador manual cuando por lo menos el 50 por ciento de las hojas nuevas estén completamente desarrolladas.		
Oak, scrub*	1.5 – 3	0.75 – 1.5
Oak, southern red	1.5 – 3.75	1 – 1.5
Orange, Osage	1.5 – 3.75	0.75 – 1.5
Peppertree, Brazilian (Florida holly)*	1.5 – 3.75	1.5
Persimmon*	1.5 – 3.75	0.75 – 1.5
Pine	1.5 – 3.75	0.75 – 1.5
Poplar, amarillo*	1.5 – 3.75	0.75 – 1.5
Prunus	1.5 – 3.75	1 – 1.5

TABLA DE PROPORCIONES PARA MATORRALES LEÑOSOS, ÁRBOLES Y ENREDADERAS

Especie	Proporción por difusión (cuartos de galón/acre)	Concentración del rocío para mojar en rociador de mano (% solución)
Raspberry	2.3 – 3	0.75 – 1.2
Redbud, eastern	1.5 - 3.75	0.75 - 1.5
Redcedar, eastern	1.5 – 3.75	0.75 – 1.5
Rose, multiflora	1.5	0.75
Realice las aplicaciones antes de que los insectos que se alimentan de hojas deterioren las hojas.		
Russian olive*	1.5 – 3.75	0.75 – 1.5
Sage, black	1.5 – 3	0.75
Sage, white*	1.5 – 3	0.75 – 1.5
Sagebrush, California	1.5 – 3	0.75
Salmonberry	1.5	0.75
Saltbush	–	1
Saltcedar*	3 – 3.75	1 – 2
Para el control parcial, aplique una solución de 1 a 2 por ciento de este producto usando un rociador manual o de 3 a 3.75 cuartos de galón por acre en aplicación al voleo. Para controlar, aplique una solución de 1 a 1.5 por ciento de este producto en una mezcla de tanque con herbicida Arsenal o Herbicida concentrado para aplicadores Arsenal usando un rociador manual. Para controlar con aplicación al voleo, aplique 1.5 cuartos de galón de este producto por acre en una mezcla de tanque con una proporción apropiada de herbicida Arsenal o Herbicida concentrado para aplicadores Arsenal para plantas de hasta 6 pies de alto. Para controlar plantas de saltcedar mayores de 6 pies de alto con aplicación al voleo, aplique 3 cuartos de galón de este producto por acre en una mezcla de tanque con una proporción más alta de herbicida Arsenal o Herbicida concentrado para aplicadores Arsenal.		
Sassafras*	1.5 – 3.75	0.75 – 1.5
Sea Myrtle	–	1
Sourwood*	1.5 – 3.75	0.75 – 1.5
Sumac; laurel, poison, smooth, sugarbush, winged*	1.5 – 3	0.75 – 1.5
Sweetgum	1.5 – 2.3	0.75 – 1.5
Swordfern*	1.5 – 3.75	0.75 – 1.5
Tallowtree, Chinese	–	0.75
Tan oak (rebrotes)*	–	1.5
Thimbleberry	1.5	0.75
Tobacco, tree*	1.5 – 3	0.75 – 1.5
Toyon*	–	1.5
Trumpetcreeper	1.5 – 2.3	0.75 – 1.2
Vine maple*	1.5 – 3.75	0.75 – 1.5
Virginia creeper	1.5 – 3.75	0.75 – 1.5
Waxmyrtle, southern*	1.5 – 3.75	1.5
Willow	2.3	0.75
Yerba Santa, California*	–	1.5

* Control parcial

Otros árboles y matorrales leñosos indicados en esta etiqueta – Para control parcial, aplique de 1.5 a 3.75 cuartos de galón de este producto por acre como aplicación al voleo o una solución al 0.75 o 1.5 por ciento usando un rociador manual y la técnica de rocío para mojar.

13.0 LIMITES EN LA GARANTÍA Y LA RESPONSABILIDAD

Bayer CropScience LP (la "Compañía") garantiza que este producto concuerda con la descripción química de la etiqueta. HASTA EL GRADO QUE SEA COMPATIBLE CON LA LEGISLACIÓN PERTINENTE, NO SE HACE NINGUNA OTRA GARANTÍA EXPRESA O IMPLÍCITA ACERCA DE LA IDONEIDAD PARA UN USO PARTICULAR O COMERCIABILIDAD. Esta garantía está sujeta también a las condiciones y limitaciones que aquí se indican.

El comprador y todos los usuarios utilizarán este producto únicamente con los propósitos y de acuerdo con la etiqueta de las Instrucciones completas para el uso ("Instrucciones") y notificarán de inmediato a la Compañía si tienen alguna reclamación que se base en un contrato, negligencia, estricta responsabilidad u otros derechos extracontractuales.

Hasta el grado que sea compatible con la legislación pertinente, el comprador y todos los usuarios son responsables por todas las pérdidas, lesiones o daños que resultasen por el uso o manipulación en condiciones que estén más allá del control de esta Compañía, incluyendo sin limitarse a: incompatibilidad con productos que no sean los señalados en las Instrucciones, aplicación o contacto con vegetación que no se quiera destruir, daño a cultivos o la incapacidad del producto para controlar los biotipos de malezas que desarrollan resistencia al glifosato, condiciones climáticas inusuales, condiciones climáticas fuera de los límites que se consideran normales en el lugar de la aplicación y para el período de tiempo en el cual se aplica el producto, así como condiciones climáticas que estén fuera de los límites indicados en las Instrucciones, uso y/o aplicación que no estén explícitamente aconsejadas en las Instrucciones o no sean compatibles con estas, condiciones de humedad que estén fuera de los límites establecidos en las Instrucciones, o la presencia de productos en la tierra o sobre ella, en los cultivos o en la vegetación que se está tratando, diferentes a los indicados en las Instrucciones.

Esta Compañía no garantiza ninguno de los productos reformulados o reempacados de este producto, excepto de acuerdo a los requisitos de la administración de esta Compañía y con el permiso escrito expreso de esta Compañía.

HASTA EL GRADO QUE SEA COMPATIBLE CON LA LEGISLACIÓN PERTINENTE, LA ÚNICA Y EXCLUSIVA COMPENSACIÓN AL USUARIO O COMPRADOR Y EL LÍMITE DE RESPONSABILIDAD DE ESTA COMPAÑÍA O DE CUALQUIER OTRO VENDEDOR POR CUALQUIER PÉRDIDA O POR TODAS LAS PÉRDIDAS, PERJUICIOS O DAÑOS QUE RESULTASEN DEL USO O MANEJO DE ESTE PRODUCTO (INCLUYENDO RECLAMOS QUE SE BASEN EN UN CONTRATO, NEGLIGENCIA, ESTRICTA RESPONSABILIDAD U OTROS DERECHOS EXTRACONTRACTUALES), SERÁ EL PRECIO PAGADO POR EL USUARIO O EL COMPRADOR POR LA CANTIDAD INVOLUCRADA DE ESTE PRODUCTO O, A ELECCIÓN DE ESTA COMPAÑÍA O DE OTRO VENDEDOR, EL REEMPLAZO DE DICHA CANTIDAD, O SI NO SE OBTUVO MEDIANTE COMPRA SE REEMPLAZARÁ DICHA CANTIDAD DEL PRODUCTO. HASTA EL GRADO QUE SEA COMPATIBLE CON LA LEGISLACIÓN PERTINENTE, EN NINGÚN CASO ESTA COMPAÑÍA U OTRO VENDEDOR SERÁN RESPONSABLES POR DAÑOS INCIDENTALES, CONSECUENTES O ESPECIALES.

En el momento de abrir y usar el producto, se asume que el comprador y todos los usuarios han aceptado las condiciones de los LIMITES EN LA GARANTÍA Y LA RESPONSABILIDAD que no pueden variar por medio de ningún acuerdo verbal o escrito. Si las condiciones son inaceptables, devuelva el producto inmediatamente sin abrir el envase.

En caso de emergencia relacionada con este producto o si necesita ayuda médica, llame por cobrar, de día o de noche, al 1-800-334-7577.

Certainty, Outrider, Roundup, Roundup Custom y su diseño, y TRUEBLUE ADVANTAGE PROVEN RELIABLE SUPPORTED y su diseño, son marcas registradas de Grupo Bayer. Todas las demás marcas registradas son propiedad de sus respectivos dueños. © 2020 Grupo Bayer. Todos los derechos reservados.

Nº. Reg. EPA 524-343

Envasado para:
BAYER CROPSCIENCE LP
800 N. LINDBERGH BLVD.
ST. LOUIS, MISSOURI, 63167 U.S.A.

2D CODE

161018Bv2

Roundup® CUSTOM
FOR AQUATIC & TERRESTRIAL USE

A broad-spectrum postemergence herbicide for aquatic and industrial, turf, ornamental, forestry, roadside, utility rights-of-way, select crop, and other listed terrestrial weed control.

(For a complete list of aquatic and terrestrial use sites, see the Directions for Use section of the attached labeling.)

ACTIVE INGREDIENT:	
*Glyphosate, N-(phosphonomethyl)glycine, in the form of its isopropylamine salt	**53.8%**
OTHER INGREDIENTS:	**46.2%**
	100.0%

*Contains 648 grams of the active ingredient glyphosate, in the form of its isopropylamine salt per liter, or 5.4 pounds per U.S. gallon, which is equivalent to 480 grams of the acid, glyphosate, per liter or 4.0 pounds per U.S. gallon (39.9% by weight).

EPA Reg. No. 524-343 **EPA Est. 524-IA-1**

Keep Out of Reach of Children
CAUTION

DIRECTIONS FOR USE

It is a violation of Federal law to use this product in any manner inconsistent with its labeling.

Not all products listed on this label are registered for use in California.
Check the registration status of each product in California before using.

See Complete Directions for Use attached to this label for complete Agricultural and Non-Agricultural Use Requirements of the Worker Protection Standard, Directions for Use and Limit of Warranty and Liability in English and Spanish.

GROUP	9	HERBICIDE

STORAGE AND DISPOSAL

Proper pesticide storage and disposal are essential to protect against exposure to people and the environment due to leaks and spills, excess product or waste, and vandalism. Do not allow this product to contaminate water, foodstuffs, feed or seed by storage and disposal.

PESTICIDE STORAGE: STORE ABOVE 5°F (-15°C) TO KEEP PRODUCT FROM CRYSTALLIZING. Crystals will settle to the bottom. If allowed to crystallize, warm to 68°F (20°C) to redissolve and roll or shake container or recirculate contents of larger containers to mix well before using. Store pesticides away from food, pet food, feed, seed, fertilizers, and veterinary supplies. Keep container closed to prevent spills and contamination. See individual container label for additional storage conditions, if any.

PESTICIDE DISPOSAL: To avoid wastes, use all material in the container, including rinsate, by application according to label directions. If wastes cannot be avoided, offer remaining product to a waste disposal facility or pesticide disposal program. Such programs are often run by state or local governments or by industry. All disposal must be in accordance with applicable federal, state and local regulations and procedures.

CONTAINER HANDLING AND DISPOSAL: Nonrefillable container. Do not reuse this container to hold materials other than pesticides or dilute pesticides (rinsate). After emptying and cleaning, it may be allowable to temporarily hold rinsate or other pesticide-related materials in this container. Contact your state regulatory agency to determine allowable practices in your state. Triple rinse or pressure rinse (or equivalent) this container promptly after emptying. Triple rinse as follows: Empty the remaining contents into application equipment or mix-tank and continue to drain for 10 seconds after the flow begins to drip. Fill the container ¼ full with water and recap. Shake for 10 seconds. Pour rinsate into application equipment or mix-tank, or store rinsate for later use or disposal. Continue to drain for 10 seconds after the flow begins to drip. Repeat this procedure two more times. Pressure rinse as follows: Empty the remaining contents into application equipment or mix-tank and continue to drain for 10 seconds after the flow begins to drip. Place container so that it can drain directly into application equipment or mix-tank while rinsing, or collect rinsate for later use or disposal. Insert pressure rinsing nozzle into the side of the container and rinse at about 40 PSI for at least 30 seconds. Continue to drain for 10 seconds after the flow begins to drip. Once properly rinsed, some plastic pesticide containers can be taken to a container collection site or picked up for recycling. To find the nearest collection site, contact your chemical dealer or Bayer CropScience LP at 1-866-99BAYER (1-866-992-2937). If recycling is not available, dispose of in accordance with federal, state and local regulations and procedures, which may include puncturing the properly rinsed container and disposing in a sanitary landfill.

FOR PRODUCT INFORMATION OR ASSISTANCE USING THIS PRODUCT, CALL TOLL-FREE, 1-866-99BAYER (1-866-992-2937)

IN CASE OF AN EMERGENCY INVOLVING THIS PRODUCT OR FOR MEDICAL ASSISTANCE, CALL COLLECT, DAY OR NIGHT, 1-800-334-7577

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Packed for:
BAYER CROPSCIENCE LP
800 N. LINDBERGH BLVD.
ST. LOUIS, MISSOURI 63167 USA

PLACE BAR CODE HERE
883580926201

NET 2.5 GAL

BAYER

SECTION 1: IDENTIFICATION OF THE SUBSTANCE/MIXTURE AND OF THE COMPANY/UNDERTAKING

Product identifier

Trade name	ROUNDUP CUSTOM® FOR AQUATIC & TERRESTRIAL USE
Product code (UVP)	86738473
SDS Number	102000037603
EPA Registration No.	524-343

Relevant identified uses of the substance or mixture and uses advised against

Use	Herbicide
Restrictions on use	See product label for restrictions.

Information on supplier

Supplier	Bayer CropScience LP 800 North Lindbergh Blvd. St. Louis, MO 63167 USA
Responsible Department	Email: SDSINFO.BCS-NA@bayer.com

Emergency telephone no.

Emergency Telephone Number (24hr/ 7 days)	1-800-334-7577
Product Information Telephone Number	1-866-99BAYER (1-866-992-2937)

SECTION 2: HAZARDS IDENTIFICATION

Classification in accordance with regulation HCS 29CFR §1910.1200
This material is not hazardous under the criteria of the Federal OSHA Hazard Communication Standard 29CFR 1910.1200.

Labelling in accordance with regulation HCS 29CFR §1910.1200
No hazard label for supply/use required.

Hazards Not Otherwise Classified (HNOC)
No physical hazards not otherwise classified.
No health hazards not otherwise classified.

SECTION 3: COMPOSITION/INFORMATION ON INGREDIENTS

Hazardous Component Name	CAS-No.	Concentration % by weight
Isopropylamine salt of glyphosate	38641-94-0	53.8

SECTION 4: FIRST AID MEASURES

Description of first aid measures

General advice When possible, have the product container or label with you when calling a poison control center or doctor or going for treatment.

Inhalation Move to fresh air. If person is not breathing, call 911 or an ambulance, then give artificial respiration, preferably mouth-to-mouth if possible. Call a physician or poison control center immediately.

Skin contact Wash off immediately with plenty of water for at least 15 minutes. Take off contaminated clothing and shoes immediately. Call a physician or poison control center immediately.

Eye contact Hold eye open and rinse slowly and gently with water for 15-20 minutes. Remove contact lenses, if present, after the first 5 minutes, then continue rinsing eye. Call a physician or poison control center immediately.

Ingestion Call a physician or poison control center immediately. Rinse out mouth and give water in small sips to drink. DO NOT induce vomiting unless directed to do so by a physician or poison control center. Never give anything by mouth to an unconscious person. Do not leave victim unattended.

Most important symptoms and effects, both acute and delayed

Symptoms To date no symptoms are known.

Indication of any immediate medical attention and special treatment needed

Risks This product is not a cholinesterase inhibitor.

Treatment Treatment with atropine and oximes is not indicated. Appropriate supportive and symptomatic treatment as indicated by the patient's condition is recommended.

SECTION 5: FIREFIGHTING MEASURES

Extinguishing media

Suitable Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide.

Unsuitable High volume water jet

Special hazards arising from the substance or mixture	In the event of fire the following may be released:, Carbon monoxide (CO), Carbon dioxide (CO2), Nitrogen oxides (NOx), Oxides of phosphorus
Advice for firefighters	
Special protective equipment for firefighters	In the event of fire and/or explosion do not breathe fumes. Firefighters should wear NIOSH approved self-contained breathing apparatus and full protective clothing. Equipment should be thoroughly decontaminated after use.
Further information	Keep out of smoke. Fight fire from upwind position. Cool closed containers exposed to fire with water spray. Do not allow run-off from fire fighting to enter drains or water courses.

Specific hazards from the substance or mixture which can increase the fire

Flash point	does not flash
Auto-ignition temperature	No data available
Lower explosion limit	Not applicable
Upper explosion limit	Not applicable
Explosivity	Not explosive

SECTION 6: ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures

Precautions	Keep unauthorized people away. Isolate hazard area. Avoid contact with spilled product or contaminated surfaces.

Methods and materials for containment and cleaning up

Methods for cleaning up	Soak up with inert absorbent material (e.g. sand, silica gel, acid binder, universal binder, sawdust). Collect and transfer the product into a properly labelled and tightly closed container. Clean contaminated floors and objects thoroughly, observing environmental regulations. Keep in suitable, closed containers for disposal.
Additional advice	Use personal protective equipment. If the product is accidentally spilled, do not allow to enter soil, waterways or waste water canal. Do not allow product to contact non-target plants.
Reference to other sections	Information regarding safe handling, see section 7. Information regarding personal protective equipment, see section 8. Information regarding waste disposal, see section 13.

SECTION 7: HANDLING AND STORAGE

Precautions for safe handling

Advice on safe handling	Use only in area provided with appropriate exhaust ventilation. Handle and open container in a manner as to prevent spillage. Avoid contact with skin, eyes and clothing.
Hygiene measures	Wash hands thoroughly with soap and water after handling and before eating, drinking, chewing gum, using tobacco, using the toilet or applying cosmetics. Remove Personal Protective Equipment (PPE) immediately after handling this product. Remove soiled clothing immediately and clean thoroughly before using again. Wash thoroughly and put on clean clothing.

Conditions for safe storage, including any incompatibilities

Requirements for storage areas and containers	Store in a cool, dry place and in such a manner as to prevent cross contamination with other crop protection products, fertilizers, food, and feed. Store in original container and out of the reach of children, preferably in a locked storage area. Protect from freezing. Keep away from direct sunlight. Reacts with galvanised steel or unlined mild steel to produce hydrogen, a highly flammable gas that could explode. Partial crystallization may occur on prolonged storage below the minimum storage temperature. Freezing will affect the physical condition but will not damage the material. Thaw and mix before using.
Advice on common storage	Keep away from food, drink and animal feedingstuffs.

SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

Control parameters

No known occupational limit values.

Exposure controls

Personal protective equipment
In normal use and handling conditions please refer to the label and/or leaflet. In all other cases the following recommendations would apply.

Respiratory protection	When respirators are required, select NIOSH approved equipment based on actual or potential airborne concentrations and in accordance with the appropriate regulatory standards and/or industry recommendations.
Hand protection	Chemical-resistant gloves (barrier laminate, butyl rubber, nitrile rubber or Viton)
Eye protection	Safety glasses with side-shields
Skin and body protection	Wear long-sleeved shirt and long pants and shoes plus socks.

General protective measures	Follow manufacturer's instructions for cleaning/maintaining PPE. If no such instructions for washables, use detergent and warm/tepid water. Keep and wash PPE separately from other laundry.

SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

Information on basic physical and chemical properties

Form	Liquid, clear
Colour	colorless to light yellow or brown
Odour	odourless
Odour Threshold	No data available
pH	4.4 - 4.8 (6.3 %)
Melting point/range	No data available
Boiling Point	No data available
Flash point	does not flash
Flammability	Not applicable
Auto-ignition temperature	No data available
Thermal decomposition	No data available
Minimum ignition energy	Not applicable
Self-accelarating decomposition temperature (SADT)	No data available
Upper explosion limit	Not applicable
Lower explosion limit	Not applicable
Vapour pressure	Not applicable
Evaporation rate	No data available
Relative vapour density	No significant volatility.
Relative density	1.206 (20 °C)
Density	1.21 g/cm³ (20 °C)
Water solubility	completely soluble
Partition coefficient: n-octanol/water	Glyphosate: log Pow: -3.2
Viscosity, dynamic	No data available

Viscosity, kinematic	No data available
Oxidizing properties	No data available
Explosivity	Not explosive
Other information	Further safety related physical-chemical data are not known.

SECTION 10: STABILITY AND REACTIVITY

Reactivity	Stable under normal conditions.
Chemical stability	Stable under recommended storage conditions.
Possibility of hazardous reactions	Reacts with galvanised steel or unlined mild steel to produce hydrogen, a highly flammable gas that could explode.
Conditions to avoid	Extremes of temperature and direct sunlight.
Incompatible materials	Galvanised steel, Unlined mild steel
Hazardous decomposition products	No decomposition products expected under normal conditions of use.

SECTION 11: TOXICOLOGICAL INFORMATION

Exposure routes	Skin contact, Eye contact, Inhalation, Ingestion
Immediate Effects	
Eye	Not expected to produce significant adverse effects when recommended use instructions are followed.
Skin	Not expected to produce significant adverse effects when recommended use instructions are followed.
Ingestion	Not expected to produce significant adverse effects when recommended use instructions are followed.
Inhalation	Not expected to produce significant adverse effects when recommended use instructions are followed.

Information on toxicological effects

Acute oral toxicity	LD50 (Rat) > 5,000 mg/kg Test conducted with a similar formulation. No deaths
Acute inhalation toxicity	LC50 (Rat) > 4.24 mg/l Exposure time: 4 h

	Determined in the form of liquid aerosol. Highest attainable concentration. No deaths Test conducted with a similar formulation.
Acute dermal toxicity	LD50 (Rabbit) > 5,000 mg/kg Test conducted with a similar formulation. No deaths
Skin corrosion/irritation	No skin irritation (Rabbit) Test conducted with a similar formulation.
Serious eye damage/eye irritation	No eye irritation (Rabbit) Test conducted with a similar formulation.
Respiratory or skin sensitisation	Skin: Non-sensitizing. (Guinea pig) OECD Test Guideline 406, Buehler test Test conducted with a similar formulation.

Assessment STOT Specific target organ toxicity – single exposure

Glyphosate: Based on available data, the classification criteria are not met.

Assessment STOT Specific target organ toxicity – repeated exposure

Glyphosate did not cause specific target organ toxicity in experimental animal studies.

Assessment mutagenicity

Glyphosate was not mutagenic or genotoxic in a battery of in vitro and in vivo tests.

Assessment carcinogenicity

Glyphosate was not carcinogenic in lifetime feeding studies in rats and mice.
Important comment to IARC Listing:, Our expert opinion is that classification as a carcinogen is not warranted.

ACGIH

None.

NTP

None.

IARC

Isopropylamine salt of glyphosate	38641-94-0	Overall evaluation: 2A

Assessment toxicity to reproduction

Glyphosate did not cause reproductive toxicity in a two-generation study in rats.

Assessment developmental toxicity

Glyphosate did not cause developmental toxicity in rats and rabbits.

Aspiration hazard

Based on available data, the classification criteria are not met.

SECTION 12: ECOLOGICAL INFORMATION

Toxicity to fish	LC50 (Oncorhynchus mykiss (rainbow trout)) > 1,000 mg/l static test; Exposure time: 96 h Test conducted with a similar formulation. LC50 (Lepomis macrochirus (Bluegill sunfish)) > 1,000 mg/l static test; Exposure time: 96 h Test conducted with a similar formulation.
Chronic toxicity to fish	Oncorhynchus mykiss (rainbow trout) flow-through test NOEC: >= 9.63 mg/l The value mentioned relates to the active ingredient glyphosate.
Toxicity to aquatic invertebrates	EC50 (Daphnia magna (Water flea)) 930 mg/l static test; Exposure time: 48 h Test conducted with a similar formulation.
Chronic toxicity to aquatic invertebrates	EC50 (Daphnia magna (Water flea)): 12.5 mg/l Exposure time: 21 d The value mentioned relates to the active ingredient glyphosate.
Toxicity to aquatic plants	EbC50 (Raphidocelis subcapitata (freshwater green alga)) 72.9 mg/l static test; Exposure time: 72 h The value mentioned relates to the active ingredient glyphosate. NOEC (Raphidocelis subcapitata (freshwater green alga)) 26.4 mg/l static test; Exposure time: 72 h The value mentioned relates to the active ingredient glyphosate.
Biodegradability	Glyphosate: Not rapidly biodegradable
Koc	Glyphosate: Koc: 6920
Bioaccumulation	Glyphosate: Does not bioaccumulate.
Mobility in soil	Glyphosate: Immobile in soil

Results of PBT and vPvB assessment

PBT and vPvB assessment	Glyphosate: This substance is not considered to be persistent, bioaccumulative and toxic (PBT). This substance is not considered to be very persistent and very bioaccumulative (vPvB).
Additional ecological information	No further ecological information is available.
Environmental precautions	Apply this product as specified on the label. Do not apply directly to water, to areas where surface water is present or to intertidal areas below the mean high water mark.

Do not contaminate surface or ground water by cleaning equipment or disposal of wastes, including equipment wash water.
Retain and dispose of contaminated wash water.

SECTION 13: DISPOSAL CONSIDERATIONS

Waste treatment methods

Product	Dispose in accordance with all local, state/provincial and federal regulations.
Contaminated packaging	Consult state and local regulations regarding the proper disposal of container. Follow advice on product label and/or leaflet.
RCRA Information	Characterization and proper disposal of this material as a special or hazardous waste is dependent upon Federal, State and local laws and are the user's responsibility. RCRA classification may apply.

SECTION 14: TRANSPORT INFORMATION

According to national and international transport regulations this material is not classified as dangerous goods / hazardous material.

Freight Classification:	COMPOUNDS, TREE OR WEEDKILLING, N.O.I., other than poison; HAVING A DENSITY OF GREATER THAN 20 LBS. PER CUBIC FOOT

SECTION 15: REGULATORY INFORMATION

EPA Registration No. 524-343
US Federal Regulations
TSCA list
Water 7732-18-5
US. Toxic Substances Control Act (TSCA) Section 12(b) Export Notification (40 CFR 707, Subpt D)
No export notification needs to be made.
SARA Title III - Section 302 - Notification and Information
Not applicable.
SARA Title III - Section 313 - Toxic Chemical Release Reporting
None.

US States Regulatory Reporting
CA Prop65
This product does not contain any substances known to the State of California to cause cancer.

WARNING: This product contains a chemical known to the State of California to cause birth defects or other reproductive harm. For more information go to www.P65Warnings.ca.gov.

Formaldehyde	50-00-0	Carcinogenic.

US State Right-To-Know Ingredients
None.

Environmental
CERCLA
None.
Clean Water Section 307(a)(1)
None.
Safe Drinking Water Act Maximum Contaminant Levels
None.

EPA/FIFRA Information:
This chemical is a pesticide product regulated by the Environmental Protection Agency and is subject to certain labeling requirements under federal pesticide law. These requirements differ from the classification criteria and hazard information required for safety data sheets, and for workplace labels of non-pesticide chemicals. Following is the hazard information required on the pesticide label:

Signal word: Caution!

SECTION 16: OTHER INFORMATION

Abbreviations and acronyms

49CFR	Code of Federal Regulations, Title 49
ACGIH	US. ACGIH Threshold Limit Values
ATE	Acute toxicity estimate
CAS-Nr.	Chemical Abstracts Service number
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
EINECS	European inventory of existing commercial substances
ELINCS	European list of notified chemical substances
IARC	International Agency for Research on Cancer
IATA	International Air Transport Association
IMDG	International Maritime Dangerous Goods
N.O.S.	Not otherwise specified
NTP	US. National Toxicology Program (NTP) Report on Carcinogens
OECD	Organization for Economic Co-operation and Development
TDG	Transportation of Dangerous Goods
TWA	Time weighted average
UN	United Nations
WHO	World health organisation

NFPA 704 (National Fire Protection Association):

Health - 0	Flammability - 0	Instability - 0	Others - none

HMIS (Hazardous Materials Identification System, based on the Fourth Edition Ratings Guide)

Health - 0	Flammability - 0	Physical Hazard - 0	PPE -

0 = minimal hazard, 1 = slight hazard, 2 = moderate hazard, 3 = severe hazard, 4 = extreme hazard,
* = chronic health hazard

Reason for Revision: New Safety Data Sheet.

Revision Date: 01/26/2023

Changes since the last version are highlighted in the margin. This version replaces all previous versions.

This information is provided in good faith but without express or implied warranty. The customer assumes all responsibility for safety and use not in accordance with label instructions. The product names are registered trademarks of Bayer.

PULL HERE TO OPEN

Glyphogan® Plus

HERBICIDE

Non-selective, broad-spectrum weed control for many cropping systems, farmsteads and Conservation Reserve Program acres. Selective broad-spectrum weed control in Roundup Ready® crops.

ACTIVE INGREDIENT:	% BY WT.
*Glyphosate, N-(phosphonomethyl)glycine, in the form of its isopropylamine salt	41.0%
OTHER INGREDIENTS:	59.0%
TOTAL	100.0%

*Contains 480 grams per litre or 4 pounds per U.S. gallon of the active ingredient glyphosate, in the form of its isopropylamine salt. Equivalent to 356 grams per litre or 3 pounds per U.S. gallon of the acid, glyphosate.

KEEP OUT OF REACH OF CHILDREN

CAUTION

FIRST AID	
IF IN EYES:	• Hold eye open and rinse slowly and gently with water for 15-20 minutes. • Remove contact lenses, if present, after the first 5 minutes; then continue rinsing eye. • Call a poison control center or doctor for treatment advice.

(continued)

EPA Reg. No. 66222-176

FIRST AID *(continued)*	
IF SWALLOWED:	• Immediately call a poison control center or doctor. • Do not induce vomiting unless told to do so by a poison control center or doctor. • Do not give any liquid to the person. • Do not give anything by mouth to an unconscious person.
IF INHALED:	• Move person to fresh air. • If person is not breathing, call 911 or an ambulance; then give artificial respiration, preferably mouth-to-mouth if possible. • Call a poison control center or doctor for further treatment advice.
IF ON SKIN OR CLOTHING:	• Take off contaminated clothing. • Rinse skin immediately with plenty of water for 15-20 minutes. • Call a poison control center or doctor for further treatment advice.
Have the product container or label with you when calling a poison control center or doctor or going for treatment. You may also contact PROSAR at 1-877-250-9291 for emergency medical treatment information.	

Manufactured for:
Makhteshim Agan of North America, Inc.
4515 Falls of Neuse Road
Suite 300
Raleigh, NC 27609

M A N A

For additional precautionary, handling, and use statements, see inside of this booklet.

EPA 121508/EPA 032111/Rev B

277

12702

EPA Est. No. ☐ 70989-MO-01
☐ _____

Net Contents:

☐ **30 Gallons**
☐ **270 Gallons**
☐ _____

FG# 12636 (30 Gallons)
FG# 12637 (270 Gallons)

Glyphogan® Plus

HERBICIDE

Non-selective, broad-spectrum weed control for many cropping systems, farmsteads and Conservation Reserve Program acres. Selective broad-spectrum weed control in Roundup Ready® crops.

ACTIVE INGREDIENT:	**% BY WT.**
*Glyphosate, N-(phosphonomethyl)glycine, in the form of its isopropylamine salt.	41.0%
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TOTAL	100.0%

*Contains 480 grams per litre or 4 pounds per U.S. gallon of the active ingredient glyphosate, in the form of its isopropylamine salt. Equivalent to 356 grams per litre or 3 pounds per U.S. gallon of the acid, glyphosate.

KEEP OUT OF REACH OF CHILDREN

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IF IN EYES:	• Hold eye open and rinse slowly and gently with water for 15-20 minutes. • Remove contact lenses, if present, after the first 5 minutes; then continue rinsing eye. • Call a poison control center or doctor for treatment advice.

(continued)

FIRST AID *(continued)*	
IF SWALLOWED:	• Immediately call a poison control center or doctor. • Do not induce vomiting unless told to do so by a poison control center or doctor. • Do not give any liquid to the person. • Do not give anything by mouth to an unconscious person.
IF INHALED:	• Move person to fresh air. • If person is not breathing, call 911 or an ambulance; then give artificial respiration, preferably mouth-to-mouth if possible. • Call a poison control center or doctor for further treatment advice.
IF ON SKIN OR CLOTHING:	• Take off contaminated clothing. • Rinse skin immediately with plenty of water for 15-20 minutes. • Call a poison control center or doctor for further treatment advice.
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EPA Reg. No. 66222-176

12944; 12702

M A N A

Manufactured for:
Makhteshim Agan of North America, Inc.
4515 Falls of Neuse Road
Suite 300
Raleigh, NC 27609

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EPA 121508/EPA 032111/Rev B

PRECAUTIONARY STATEMENTS
HAZARDS TO HUMANS AND DOMESTIC ANIMALS
CAUTION

Causes moderate eye irritation. Avoid contact with eyes, skin, or clothing. Wash thoroughly with soap and water after handling.
DOMESTIC ANIMALS: This product is considered to be relatively non-toxic to dogs and other domestic animals; however, ingestion of this product or large amounts of freshly sprayed vegetation may result in temporary gastrointestinal irritation (vomiting, diarrhea, colic, etc.). If such symptoms are observed, provide the animal with plenty of fluids to prevent dehydration. Call a veterinarian if symptoms persist for more than 24 hours.

PERSONAL PROTECTIVE EQUIPMENT (PPE)

Applicators and other handlers must wear:
- Long-sleeved shirt and long pants
- Shoes plus socks

Follow manufacturer's instructions for cleaning/maintaining PPE. If no such instructions for washables, use detergent and hot water. Keep and wash PPE separately from other laundry.

ENGINEERING CONTROLS STATEMENT: When handlers use closed systems, enclosed cabs, or aircraft in a manner that meets the requirements listed in the Worker Protection Standard (WPS) for agricultural pesticides [40 CFR 170.240 (d)(4-6)], the handler PPE requirements may be reduced or modified as specified in the WPS.

USER SAFETY RECOMMENDATIONS

Users should:
- Wash hands before eating, drinking, chewing gum, using tobacco, or using the toilet.
- Remove clothing immediately if pesticide gets inside. Then wash thoroughly and put on clean clothing.

279

ENVIRONMENTAL HAZARDS

Do not apply directly to water, to areas where surface water is present, or to intertidal areas below the mean high water mark. Do not contaminate water when cleaning equipment or disposing of equipment washwaters.

PHYSICAL OR CHEMICAL HAZARDS

Spray solutions of this product should be mixed, stored, and applied using only stainless steel, aluminum, fiberglass, plastic, or plastic-lined steel containers.

DO NOT MIX, STORE, OR APPLY THIS PRODUCT OR SPRAY SOLUTIONS OF THIS PRODUCT IN GALVANIZED STEEL OR UNLINED STEEL (EXCEPT STAINLESS STEEL) CONTAINERS OR SPRAY TANKS. This product or spray solutions of this product react with such containers and tanks to produce hydrogen gas which may form a highly combustible gas mixture. This gas mixture could flash or explode causing serious personal injury if ignited by open flame, spark, welder's torch, lighted cigarette, or other ignition source.

DIRECTIONS FOR USE

It is a violation of Federal law to use this product in any manner inconsistent with its labeling.

This product can only be used in accordance with the Directions for Use on this label or in separately published supplemental labeling.

Do not apply this product in a way that will contact workers or other persons, either directly or through drift. Only protected handlers may be in the area during application. For any requirements specific to your State or Tribe, consult the agency responsible for pesticide regulation.

AGRICULTURAL USE REQUIREMENTS

Use this product only in accordance with its labeling and with the Worker Protection Standard, 40 CFR Part 170. This Standard contains requirements for the protection of agricultural workers on farms, forests, nurseries, and greenhouses, and handlers of agricultural pesticides. It contains requirements for training, decontamination, notification, and emergency assistance. It also contains specific instructions and exceptions pertaining to the statements on this label about personal protective equipment (PPE) and restricted-entry interval. The requirements in this box only apply to uses of this product that are covered by the Worker Protection Standard.

Do not enter or allow worker entry into treated areas during the restricted-entry interval (REI) of 4 hours.

PPE required for early entry to treated areas that is permitted under the Worker Protection Standard and that involves contact with anything that has been treated such as plants, soil, or water is:

- Coveralls
- Chemical-resistant gloves made of any waterproof material
- Shoes plus socks

NON-AGRICULTURAL USE REQUIREMENTS

The requirements in this box apply to uses of this product that are NOT within the scope of the Worker Protection Standard for agricultural pesticides, 40 CFR Part 170. The WPS applies when this product is used to produce agricultural plants on farms, forests, nurseries, or greenhouses.

Keep people and pets off treated areas until spray solution has dried.

AVOID CONTACT OF HERBICIDE WITH FOLIAGE, GREEN STEMS, EXPOSED NON-WOODY ROOTS OR FRUIT OF CROPS (EXCEPT AS SPECIFIED FOR INDIVIDUAL ROUNDUP READY® CROPS), AND DESIRABLE PLANTS AND TREES BECAUSE SEVERE INJURY OR DESTRUCTION MAY RESULT.

Read the entire label before using this product. Use only according to label instructions.

Read the "LIMITATION OF WARRANTY AND LIABILITY" statement at the end of the label before buying or using. If terms are not acceptable, return at once unopened.

280

GENERAL INFORMATION (How This Product Works)

Product Description: This product is a postemergent, systemic herbicide with no soil residual activity. It is generally non-selective and gives broad-spectrum control of many annual weeds, perennial weeds, woody brush, and trees. It is formulated as a water-soluble liquid. No additional surfactants, additives containing surfactant, buffering agents, or pH adjusting agents are needed or recommended. It may be applied through most standard industrial or field-type sprayers after dilution and thorough mixing with water or other carriers according to label instructions.

Do not add surfactants, additives containing surfactants, buffering agents, or pH adjusting agents to this product. Ammonium sulfate may be used. See the "MIXING" section of this label for instructions.

When an adjuvant is to be used with this product, Makhteshim Agan of North America, Inc. suggests the use of a Chemical Producers and Distributors Association certified adjuvant.

Time to Symptoms: This product moves through the plant from the point of foliage contact to and into the root system. Visible effects on most annual weeds occur within 2 to 4 days, but on most perennial weeds may not occur for 7 days or more. Extremely cool or cloudy weather following treatment may slow activity of this product and delay development of visual symptoms. Visible effects are a gradual wilting and yellowing of the plant which advances to complete browning of above-ground growth and deterioration of underground plant parts.

Stage of Weeds: Annual weeds are easiest to control when they are small. Best control of most perennial weeds is obtained when treatment is made at late growth stages approaching maturity. Refer to the "ANNUAL WEEDS RATE TABLE," "PERENNIAL WEEDS RATE TABLE," and the "WOODY BRUSH AND TREES RATE TABLE" for recommendations for specific weeds.

Always use the higher rate of this product per acre within the specified range when weed growth is heavy or dense or weeds are growing in an undisturbed (non-cultivated) area.

Do not treat weeds under poor growing conditions such as drought stress, disease, or insect damage, as reduced weed control may result. Reduced results may also occur when treating weeds heavily covered with dust.

Cultural Considerations: Reduced control may result when applications are made to annual or perennial weeds that have been mowed, grazed, or cut, and have not been allowed to regrow to the recommended stage for treatment.

Rainfastness: Heavy rainfall soon after application may wash this product off of the foliage, and a repeat application may be required for adequate control.

Spray Coverage: For best results, spray coverage should be uniform and complete. Do not spray weed foliage to the point of runoff.

Mode of Action: The active ingredient in this product inhibits an enzyme found only in plants that is essential to formation of specific amino acids.

No Soil Activity: Weeds must be emerged at the time of application to be controlled by this product. Weeds germinating from seed after application will not be controlled. Unemerged plants arising from unattached underground rhizomes or root stocks of perennials will not be affected by the herbicide and will continue to grow.

Biological Degradation: Degradation of this product is primarily a biological process carried out by soil microbes.

Tank Mixing: This product does not provide residual weed control. For subsequent residual weed control, follow a label-approved herbicide program. Read and carefully observe the cautionary statements and all other information appearing on the labels of all herbicides used. Use according to the most restrictive label directions for each product in the mixture.

Buyer and all users are responsible for all loss or damage in connection with the use or handling of mixtures of this product with herbicides or other materials that are not expressly recommended in this labeling. Mixing this product with herbicides or other materials not recommended on this label may result in reduced performance.

Annual Maximum Use Rate: Except as otherwise specified in a crop section of this label, the combined total of all treatments must not exceed 8 quarts of this product per acre per year. For applications in non-crop sites, the combined total of all treatments must not exceed 10.6 quarts of this product per acre per year.

NOTE: Use of this product in any manner not consistent with this label may result in injury to persons, animals or crops, or other unintended consequences. Keep container closed to prevent spills and contamination.

MIXING

Clean sprayer parts immediately after using this product by thoroughly flushing with water.

NOTE: REDUCED RESULTS MAY OCCUR IF WATER CONTAINING SOIL IS USED SUCH AS VISIBLY MUDDY WATER OR WATER FROM PONDS AND DITCHES THAT IS NOT CLEAR.

281

Mixing with Water

This product mixes readily with water. Mix spray solutions of this product as follows: Fill the mixing or spray tank with the required amount of water. Add the specified amount of this product near the end of the filling process and mix well. Use caution to avoid siphoning back into the carrier source. Use approved anti-back-siphoning devices where required by state or local regulations. During mixing and application, foaming of the spray solution may occur. To prevent or minimize foam, avoid the use of mechanical agitators; terminate by-pass and return lines at the bottom of the tank; and, if needed, use an approved anti-foam or defoaming agent.

Tank Mixing Procedure

Mix labeled tank mixtures of this product with water as follows:

1. Place a 20- to 35-mesh screen or wetting basket over filling port.
2. Through the screen, fill the spray tank one-half full with water and start agitation.
3. If a wettable powder is used, make a slurry with the water carrier and add it SLOWLY through the screen into the tank. Continue agitation.
4. If a flowable formulation is used, premix one part flowable with one part water. Add diluted mixture SLOWLY through the screen into the tank. Continue agitation.
5. If an emulsifiable concentrate formulation is used, premix one part emulsifiable concentrate with two parts water. Add diluted mixture slowly through the screen into the tank. Continue agitation.
6. Continue filling the spray tank with water and add the required amount of this product near the end of the filling process.
7. Add individual formulations to the spray tank as follows: wettable powder, flowable, emulsifiable concentrate, drift control additive, and water-soluble liquid.

Maintain good agitation at all times until the contents of the tank are sprayed. If the spray mixture is allowed to settle, thorough agitation is required to resuspend the mixture before spraying is resumed.

Keep by-pass line on or near the bottom of the tank to minimize foaming. Screen size in nozzle or line strainers should be no finer than 50 mesh.

Always predetermine the compatibility of labeled tank mixtures of this product with water carrier by mixing small proportional quantities in advance. Ensure that the specific tank mixture product is registered for application at the desired site.

Refer to the “TANK MIXING” section under the “GENERAL INFORMATION” section for additional precautions.

Mixing for Hand-Held Sprayers
Prepare the desired volume of spray solution by mixing the amount of this product in water as shown in the following table:

Spray Solution

Desired Volume	Amount of Glyphogan Plus Herbicide					
	0.5%	1%	1.5%	2%	5%	10%
1 gallon	0.7 oz	1.3 oz	2 oz	2.7 oz	6.5 oz	13 oz
25 gallons	1 pt	1 qt	1.5 qt	2 qt	5 qt	10 qt
100 gallons	2 qt	1 gal	1.5 gal	2 gal	5 gal	10 gal

2 tablespoons = 1 fluid ounce

For use in knapsack sprayers, it is suggested that the specified amount of this product be mixed with water in a larger container. Fill sprayer with the mixed solution.

Ammonium Sulfate
The addition of 1 to 2 percent dry ammonium sulfate by weight or 8.5 to 17 pounds per 100 gallons of water may increase the performance of this product, particularly when tank mixed with certain residual herbicides on annual and perennial weeds. The equivalent rate of ammonium sulfate in a liquid formulation may also be used. Ensure that dry ammonium sulfate is completely dissolved in the spray tank before adding herbicides. Thoroughly rinse the spray system with clean water after use to reduce corrosion.

NOTE: When using ammonium sulfate, apply this product at rates specified in this label. Lower rates will result in reduced performance.

Colorants or Dyes
Agriculturally-approved colorants or marking dyes may be added to this product. Colorants or dyes used in spray solutions of this product may reduce performance, especially at lower rates or dilutions. Use colorants or dyes according to the manufacturer's recommendations.

Drift Control Additives
Drift control additives may be used with all equipment types except wiper applicators, sponge bars, and Controlled Droplet Applicator (CDA) equipment. When a drift control additive is used, read and carefully observe the cautionary statements and all other information appearing on the additive label.

APPLICATION EQUIPMENT AND TECHNIQUES

Do not apply this product through any type of irrigation system.

This product may be applied with the following application equipment:

Aerial – Fixed-wing and helicopter.

Ground Broadcast Spray – Boom or boomless systems, pull-type sprayer, floaters, pick-up sprayers, spray coupes, and other ground broadcast equipment.

Hand-Held or High-Volume Spray Equipment – Knapsack and backpack sprayers, pump-up pressure sprayers, handguns, handwands, mistblowers*, lances, and other hand-held and motorized spray equipment used to direct the spray onto weed foliage.

* This product is not registered in California or Arizona for use in mistblowers.

Selective Equipment – Recirculating sprayers, shielded and hooded sprayers, wiper applicators, and sponge bars.

Injection Systems – Aerial or ground injection sprayers.

Controlled Droplet Applicator (CDA) – Hand-held or boom-mounted applicators which produce a spray consisting of a narrow range of droplet sizes.

APPLY THESE SPRAY SOLUTIONS IN PROPERLY MAINTAINED AND CALIBRATED EQUIPMENT CAPABLE OF DELIVERING DESIRED VOLUMES.

SPRAY DRIFT MANAGEMENT

AVOID DRIFT. EXTREME CARE MUST BE USED WHEN APPLYING THIS PRODUCT TO PREVENT INJURY TO DESIRABLE PLANTS AND CROPS.

Do not allow the herbicide solution to mist, drip, drift, or splash onto desirable vegetation since minute quantities of this product can cause severe damage or destruction to the crop, plants, or other areas on which treatment was not intended. The likelihood of injury occurring from the use of this product increases when winds are gusty, as wind velocity increases, when wind direction is constantly changing, or when there are other meteorological conditions that favor spray drift. When spraying, avoid combinations of pressure and nozzle type that will result in splatter or fine particles (mist) which are likely to drift. AVOID APPLYING AT EXCESSIVE SPEED OR PRESSURE.

AERIAL SPRAY DRIFT MANAGEMENT

Avoiding spray drift at the application site is the responsibility of the applicator. The interaction of many equipment- and weather-related factors determines the potential for spray drift. The applicator and the grower are responsible for considering all these factors when making decisions.

The following drift management requirements must be followed to avoid off-target drift movement from aerial applications to agricultural field crops. These requirements do not apply to forestry applications, public health uses, or to applications using dry formulations.

1. The distance of the outermost nozzles on the boom must not exceed 3/4 the length of the wingspan or rotor.
2. Nozzles must always point backward, parallel with the airstream, and never be pointed downward more than 45 degrees.

Where states have more stringent regulations, they should be observed.

The applicator should be familiar with and take into account the information covered in the "AERIAL DRIFT REDUCTION ADVISORY" section of this label.

AERIAL DRIFT REDUCTION ADVISORY

This section is advisory in nature and does not supersede the mandatory label requirements.

Importance of Droplet Size

The most effective way to reduce drift potential is to apply large droplets. The best drift management strategy is to apply the largest droplets that provide sufficient coverage and control. Applying larger droplets reduces drift potential, but will not prevent drift if applications are made improperly or under unfavorable environmental conditions (see the **"Wind," "Temperature and Humidity,"** and **"Temperature Inversions"** sections of this label).

Controlling Droplet Size

- **Volume:** Use high flow rate nozzles to apply the highest practical spray volume. Nozzles with the higher rated flows produce larger droplets.
- **Pressure:** Do not exceed the nozzle manufacturer's recommended pressures. For many nozzle types, lower pressure produces larger droplets. When higher flow rates are needed, use higher flow rate nozzles instead of increasing pressure.
- **Number of Nozzles:** Use the minimum number of nozzles that provide uniform coverage.
- **Nozzle Orientation:** Orienting nozzles so that the spray is released backward, parallel to the airstream, will produce larger droplets than other orientations and is the recommended practice. Significant deflection from the horizontal will reduce droplet size and increase drift potential.
- **Nozzle Type:** Use a nozzle type that is designed for the intended application. With most nozzle types, narrower spray angles produce larger droplets. Consider using low-drift nozzles. Solid-stream nozzles oriented straight back produce the largest droplets and the lowest drift.

Boom Length: For some use patterns, reducing the effective boom length to less than 3/4 of the wingspan or rotor length may further reduce drift without reducing swath width.

Application Height: Applications should not be made at a height greater than 10 feet above the top of the target plants unless a greater height is required for aircraft safety. Making applications at the lowest height that is safe reduces the exposure of the droplets to evaporation and wind.

Swath Adjustment

When applications are made with a crosswind, the swath will be displaced downwind. Therefore, on the up and downwind edges of the field, the applicator must compensate for this displacement by adjusting the path of the aircraft upwind. Swath adjustment distance should increase with increasing drift potential (higher wind, smaller droplets, etc.).

Wind

Drift potential is lowest between wind speeds of 2 to 10 miles per hour. However, many factors, including droplet size and equipment type determine drift potential at any given speed. Application should be avoided below 2 miles per hour due to variable wind direction and high inversion potential. **NOTE**: Local terrain can influence wind patterns. Every applicator should be familiar with local wind patterns and how they affect drift.

Temperature and Humidity

When making applications in low relative humidity, set up equipment to produce larger droplets to compensate for evaporation. Droplet evaporation is most severe when conditions are both hot and dry.

Temperature Inversions

Applications should not occur during a temperature inversion because drift potential is high. Temperature inversions restrict vertical air mixing which causes small suspended droplets to remain in a concentrated cloud. This cloud can move in unpredictable directions due to the light variable winds common during inversions. Temperature inversions are characterized by increasing temperatures with altitude and are common on nights with limited cloud cover and light to no wind. They begin to form as the sun sets and often continue into the morning. Their presence can be indicated by ground fog; however, if fog is not present, inversions can also be identified by the movement of smoke from a ground source or an aircraft smoke generator. Smoke that layers and moves laterally in a concentrated cloud (under low wind conditions) indicates an inversion, while smoke that moves upward and rapidly dissipates indicates good vertical air mixing.

Sensitive Areas
The product should only be applied when the potential for drift to adjacent sensitive areas (e.g., residential areas, bodies of water, known habitat for threatened or endangered species, non-target crops) is minimal (e.g., when wind is blowing away from the sensitive areas).

Aerial Equipment
DO NOT APPLY THIS PRODUCT USING AERIAL SPRAY EQUIPMENT EXCEPT UNDER CONDITIONS AS SPECIFIED WITHIN THIS LABEL.

Use the specified rates of this herbicide in 3 to 15 gallons of water per acre unless otherwise specified on this label. Unless otherwise specified, do not exceed 1 quart per acre. Aerial applications of this product may be made in annual cropping conventional tillage systems, fallow and reduced-tillage systems, and preharvest applications. Refer to the individual use area sections of this label for recommended volumes, application rates, and further instructions.

This product plus dicamba tank mixtures may not be applied by air in California.

Avoid direct application to any body of water.

AVOID DRIFT – DO NOT APPLY DURING LOW-LEVEL INVERSION CONDITIONS, WHEN WINDS ARE GUSTY, OR UNDER ANY OTHER CONDITION WHICH FAVORS DRIFT. DRIFT MAY CAUSE DAMAGE TO ANY VEGETATION CONTACTED TO WHICH TREATMENT IS NOT INTENDED. TO PREVENT INJURY TO ADJACENT DESIRABLE VEGETATION, APPROPRIATE BUFFER ZONES MUST BE MAINTAINED. Coarse sprays are less likely to drift; therefore, do not use nozzles or nozzle configurations which dispense spray as fine spray droplets. Do not angle nozzles forward into the airstream and do not increase spray volume by increasing nozzle pressure. Ensure uniform application – To avoid streaked, uneven, or overlapped application, use appropriate marking devices.

Aircraft Maintenance
Thoroughly wash aircraft, especially landing gear, after each day of spraying to remove residues of this product accumulated during spraying or from spills. PROLONGED EXPOSURE OF THIS PRODUCT TO UNCOATED STEEL SURFACES MAY RESULT IN CORROSION AND POSSIBLE FAILURE OF THE PART. LANDING GEAR IS MOST SUSCEPTIBLE. The maintenance of an organic coating (paint) which meets aerospace specification MIL-C-38413 may prevent corrosion.

AERIAL APPLICATION IN CALIFORNIA ONLY

Aerial applications of this product are allowed in the following situations:
1. In fallow and reduced-tillage systems prior to the emergence or transplanting of labeled crops.
2. In alfalfa and pasture renovation applications.
3. Over-the-top applications in Roundup Ready® corn and cotton.
4. Preharvest in alfalfa, corn, cotton, wheat, Roundup Ready® corn, and Roundup Ready® cotton.

Do not plant subsequent crops other than those listed in the label booklet for 30 days following application.

When tank mixing this product with 2,4-D for aerial applications, only 2,4-D amine formulations may be used. This tank mixture may be used for fallow and reduced-tillage systems and alfalfa and pasture renovation applications only.

DO NOT EXCEED THE FOLLOWING MAXIMUM RATES WHEN MAKING APPLICATIONS BY AIR:

1 Quart per Acre Prior to Harvest	2 Quarts per Acre
Alfalfa	Fallow
Corn	Reduced-Tillage Systems
Roundup Ready® Corn*	Alfalfa and Pasture Renovation
Cotton	
Roundup Ready® Cotton*	
Wheat	

* This restriction also applies to over-the-top applications in these crops.

Aerial Equipment
Use the specified rates of this product in 3 to 15 gallons of water per acre. Use the following guidelines when aerial applications are made near crops or desirable perennial vegetation after bud break and before total leaf drop and/or near other desirable vegetation or annual crops.

1. Do not apply within 100 feet of all desirable vegetation or crops.
2. If wind up to 5 miles per hour is blowing toward desirable vegetation or crops, do not apply within 500 feet of the desirable vegetation or crop(s).
3. Winds blowing from 5 to 10 miles per hour toward desirable vegetation or crops may require buffer zones in excess of 500 feet.
4. Do not apply when winds are in excess of 10 miles per hour or when inversion conditions exist.

AERIAL APPLICATION IN FRESNO COUNTY, CALIFORNIA ONLY (From February 15 through March 31 Only)

Geographic Areas

This only applies to the area contained inside the following boundaries within Fresno County, California.

North:	Fresno County line
South:	Fresno County line
East:	State Highway 99
West:	Fresno County line

General Information

Always read and follow the label directions and precautionary statements for all products used in the aerial application.

Observe the following directions to minimize off-site movement during aerial application of this product. Minimization of off-site movement is the responsibility of the grower, Pest Control Advisor, and aerial applicator.

Written Recommendations

A written recommendation MUST be submitted by or on behalf of the applicator to the Fresno County Agricultural Commissioner 24 hours prior to the application. This written recommendation MUST state the proximity of surrounding crops and that conditions of each manufacturer's product label and this label have been satisfied.

Aerial Applicator Training and Equipment

Aerial application of this product is limited to pilots who have successfully completed a Fresno County Agricultural Commissioner and California Department of Pesticide Regulation approved training program for aerial application of herbicides. All aircraft must be inspected, critiqued in flight, and certified at a Fresno County Agricultural Commissioner approved fly-in. Test and calibrate spray equipment at intervals sufficient to ensure that proper rates of herbicides and adjuvants are being applied during commercial use. Applicator must document such calibrations and testing. Demonstration of performance at Fresno County Agricultural Commissioner approved fly-ins constitutes such documentation or other written records showing calculations and measurements of flight and spray parameters acceptable to the Fresno County Agricultural Commissioner.

Applications at Night – Do not apply this product by air earlier than 30 minutes prior to sunrise and/or later than 30 minutes after sunset without prior permission from the Fresno County Agricultural Commissioner.

To report known or suspected misuse of this product, call 1-800-332-3111.

For additional information on the proper aerial application of this product, call 1-916-784-1718.

NOTE: For aerial application from April 1 through February 14, refer to the "AERIAL APPLICATION IN CALIFORNIA ONLY" section of this label.

AERIAL APPLICATION IN ARKANSAS ONLY

AVOID DRIFT. DO NOT APPLY INTO STILL AIR WHERE THERE IS A TEMPERATURE INVERSION LAYER LOW ENOUGH FOR FINE SPRAY PARTICLES TO BECOME SUSPENDED AND MOVE OUTSIDE THE TARGET AREA WHEN THE INVERSION LAYER MOVES. DO NOT APPLY WHEN WINDS ARE GUSTY OR UNDER ANY OTHER CONDITION THAT FAVORS DRIFT. DRIFT IS LIKELY TO CAUSE DAMAGE TO ANY VEGETATION CONTACTED. TO PREVENT INJURY TO ADJACENT DESIRABLE VEGETATION, APPROPRIATE BUFFER ZONES MUST BE MAINTAINED.

Use the specified rate of this product in 3 to 15 gallons of water per acre.

Use sufficient carrier volume and appropriate equipment setup to form droplets large enough to avoid drift potential. Coarse droplets in the 300 to 500 (VMD) micron range are recommended.

Applications should typically be made with the nozzle release point at 8 to 15 feet above the top of the target plants unless a greater height is required for aircraft safety.

The distance of the outermost nozzles on the boom must not exceed 75 percent of the length of the wingspan or rotor. In many cases, reducing this distance to 65 percent of the length of the wingspan or rotor will improve drift control without affecting the swath width.

Nozzles must always discharge backward parallel with the airstream and never discharge downward more than 45 degrees on fixed-wing aircraft or forward of the prevailing airflow on rotary-winged aircraft. Avoid the use of nozzles with wide angle discharge.

Do not apply this product when winds are in excess of 10 miles per hour.

Do not apply when there is a low-level inversion where fine spray particles could be suspended in still air and move outside the target area when the inversion layer moves. These conditions may occur when wind speeds are less than 2 miles per hour.

Use the following guidelines when applications are made near crops or other desirable vegetation:
1. Do not apply within 100 feet of any desirable vegetation or crops.
2. If wind up to 5 miles per hour is blowing toward desirable vegetation or crops, do not apply within 500 feet upwind of the desirable vegetation or crops.
3. Winds blowing from 5 to 10 miles per hour toward desirable vegetation or crops will likely require buffer zones in excess of 500 feet.

AERIAL APPLICATION IN ARKANSAS, LOUISIANA, MISSISSIPPI, MISSOURI, AND TENNESSEE ONLY

This product controls annual and perennial weeds listed on this label prior to planting, or emergence of corn, cotton, rice, sorghum, and soybeans; prior to the harvest of cotton and soybeans; and following the harvest of any crop in the fall via aerial applications in these locations.

Aerial applications of this product may be made in fallow systems and conventional, reduced, and zero tillage systems. For applications via aerial equipment, use the specified rates of this product in 3 to 10 gallons of water per acre. Do not exceed a rate of 3 quarts per acre. The likelihood of injury occurring from the use of this product is greatest when winds are gusty or in excess of 5 miles per hour or when other conditions including lesser velocities will allow spray drift to occur.

GROUND BROADCAST EQUIPMENT

Use the specified rates of this product in 3 to 40 gallons of water per acre as a broadcast spray unless otherwise specified. As density of weeds increases, spray volume should be increased within the recommended range to ensure complete coverage. Carefully select proper nozzles to avoid spraying a fine mist. For best results with ground application equipment, use flat fan spray nozzles. Check for even distribution of spray droplets.

HAND-HELD OR HIGH-VOLUME EQUIPMENT

Apply to foliage of vegetation to be controlled. For applications made on a spray-to-wet basis, spray coverage should be uniform and complete. Do not spray to the point of runoff. Use coarse sprays only. For control of weeds listed in the "ANNUAL WEEDS RATE TABLE," apply a 0.5 percent solution of this product to weeds less than 6 inches in height or runner length. Apply prior to seedhead formation in grass or bud formation in broadleaf weeds. For annual weeds over 6 inches tall or unless otherwise specified, use a 1 percent solution.

For best results, use a 2 percent solution on harder-to-control perennials such as bermudagrass, dock, field bindweed, hemp dogbane, milkweed, and Canada thistle.

When using application methods which result in less than complete coverage, use a 5 percent solution for annual and perennial weeds and a 5 to 10 percent solution for woody brush and trees.

SELECTIVE EQUIPMENT

This product may be applied through recirculating spray systems, shielded applicators, hooded sprayers, wiper applicators, or sponge bars after dilution and thorough mixing with water to listed weeds growing in any non-crop site specified on this label and only when specifically recommended in cropping systems.

AVOID CONTACT OF HERBICIDE WITH DESIRABLE VEGETATION.

Contact of the herbicide solution with desirable vegetation may result in damage or destruction. Applicators used above desirable vegetation should be adjusted so that the lowest spray stream or wiper contact point is at least 2 inches above the desirable vegetation. Droplets, mist, foam, or splatter of the herbicide solution settling on desirable vegetation may result in discoloration, stunting, or destruction.

Applications made above the crops should be made when the weeds are a minimum of 6 inches above the desirable vegetation. Better results may be obtained when more of the weed is exposed to the herbicide solution. Weeds not contacted by the herbicide solution will not be affected. This may occur in dense clumps, severe infestations, or when the height of the weeds varies so that not all weeds are contacted. In these instances, repeat treatment may be necessary.

Recirculating Spray System

A recirculating spray system directs the spray solution onto weeds growing above desirable vegetation, while spray solution not intercepted by weeds is collected and returned to the spray tank for reuse.

Shielded and Hooded Applicators

A hooded sprayer is a type of shielded applicator where the spray pattern is fully enclosed including top, sides, front, and back, thereby shielding the crop from the spray solution. Use nozzles that provide uniform coverage within the treated area. Keep shields on these sprayers adjusted to protect desirable vegetation. EXTREME CARE MUST BE EXERCISED TO AVOID CONTACT OF HERBICIDE WITH DESIRABLE VEGETATION.

When applying to crops grown on raised beds, ensure that the hood is designed to completely enclose the spray solution. If necessary, extend the front and rear flaps of the hoods to reach the ground in deep furrows. EXTREME CARE MUST BE EXERCISED TO AVOID CONTACT OF HERBICIDE WITH DESIRABLE VEGETATION.

This equipment must be set up and operated in a manner that avoids bouncing or raising the hoods off the ground in any way. If the hoods are raised, spray particles may escape and come into contact with the crop causing damage or destruction of the crop. The spray hoods must be operated on the ground or by skimming across the ground. Avoid operation on rough or sloping ground where the spray hoods might be raised off the ground.

These procedures will reduce the potential for crop injury:

- The spray hoods must be operated on the ground or by skimming across the ground.
- Leave at least an 8-inch untreated strip over the drill row. For example, if the crop row width is 38 inches, the maximum width of the spray hood should be 30 inches.
- Maximum tractor speed: 5 miles per hour to avoid bouncing of the spray hoods.
- Maximum wind speed: 10 miles per hour.
- Use low-drift nozzles that provide uniform coverage within the treated area.

Crop injury may occur when the foliage of treated weeds comes into direct contact with leaves of the crop. Do not apply this product when the leaves of the crop are growing in direct contact with weeds to be treated. Droplets, mist, foam, or splatter of the herbicide solution may contact the crop and cause discoloration, stunting, or destruction.

Wiper Applicators and Sponge Bars

A wiper or sponge applicator applies the herbicide solution onto weeds by rubbing the weed with an absorbent material containing the herbicide solution. Wipers over the top of crops may be used only when specifically recommended in this product's labeling.

When applied under the conditions described in the following paragraphs, this product CONTROLS many weeds including volunteer corn, Texas panicum, common rye, shattercane, sicklepod, spanishneedles, and bristly starbur and SUPPRESSES many weeds including Florida beggarweed, bermudagrass, hemp dogbane, dogfennel, guineagrass, johnsongrass, milkweed, silverleaf nightshade, redroot pigweed, common ragweed, giant ragweed, smutgrass, sunflower, Canada thistle, musk thistle, vaseygrass, and velvetleaf.

Wiper applicators are devices that physically wipe appropriate amounts of this product directly onto the weed.

Equipment must be designed, maintained, and operated to prevent the herbicide solution from contacting desirable vegetation. Operate this equipment at ground speeds no greater than 5 miles per hour. Performance may be improved by reducing speed in areas of heavy weed infestations to ensure adequate wiper saturation. Better results may be obtained if two applications are made in opposite directions.

Avoid leakage or dripping onto desirable vegetation. Adjust height of applicator to ensure adequate contact with weeds. Keep wiping surfaces clean. Be aware that on sloping ground, the herbicide solution may migrate causing dripping on the lower end and drying of the wicks on the upper end of a wiper applicator.

Do not use wiper equipment when weeds are wet.

Mix only the amount of solution to be used during a 1-day period, as reduced activity may result from use of leftover solutions. Clean wiper parts immediately after using this product by thoroughly flushing with water.

Do not add surfactant to the herbicide solution.

For Rope or Sponge Wick Applicators – Mix 1 gallon of this product in 2 gallons of water to prepare a 33 percent solution. Apply this solution to weeds listed in this section.

For Porous Plastic Applicators – Solutions ranging from 33 to 100 percent of this product in water may be used in porous plastic wiper applications.

INJECTION SYSTEMS

This product may be used in aerial or ground injection spray systems. It may be used as a liquid concentrate or diluted prior to injecting into the spray stream. Do not mix this product with the concentrate of other products when using injection systems.

CDA EQUIPMENT

The rate of this product applied per acre by vehicle-mounted CDA equipment must not be less than the amount specified in this label when applied by conventional broadcast equipment. For vehicle-mounted CDA equipment, apply 3 to 15 gallons of water per acre.

For the control of annual weeds with hand-held CDA units, apply a 20 percent solution of this product at a flow rate of 2 fluid ounces per minute and a walking speed of 1.5 miles per hour (1 quart per acre). For the control of perennial weeds, apply a 20 to 40 percent solution of this product at a flow rate of 2 fluid ounces per minute and a walking speed of 0.75 miles per hour (2 to 4 quarts per acre).

Controlled droplet application equipment produces a spray pattern that is not easily visible. Extreme care must be exercised to avoid spray or drift contacting the foliage or any other green tissue of desirable vegetation, as damage or destruction may result.

1.0 ANNUAL AND PERENNIAL CROPS

NOTE: THIS SECTION GIVES GENERAL DIRECTIONS THAT APPLY TO ALL LISTED CROPS WITHIN SECTION 1 BELOW. SEE THE INDIVIDUAL CROP CATEGORIES FOR SPECIFIC INSTRUCTIONS, PREHARVEST INTERVALS, AND ADDITIONAL PRECAUTIONS AND RESTRICTIONS.

See the "ROUNDUP READY® CROPS" section of this label or separately published supplemental labeling for instructions for treating Roundup Ready® crops.

GENERAL USE INSTRUCTIONS:
Unless otherwise specified, applications may be made to control any of the weeds listed in the "ANNUAL WEEDS RATE TABLE," "PERENNIAL WEEDS RATE TABLE," and the "WOODY BRUSH AND TREES RATE TABLE." For any crop not listed in this label, applications must be made at least 30 days prior to planting.

For broadcast postemergent treatments, do not harvest or feed treated vegetation for 8 weeks following application unless otherwise specified.

Post-directed hooded sprayers and wiper equipment capable of preventing all crop contact with herbicide solutions may be used in mulched or unmulched row middles after crop establishment. Where specifically noted below, wipers may also be used above certain crops to control tall weeds. Refer to the "SELECTIVE EQUIPMENT" section of this label for essential precautions when using hooded sprayers or wipers to avoid crop injury caused by leakage of spray mists or dripping onto crops. Crop injury is possible with these applications and shall be the sole responsibility of the applicator.

When applying this product prior to transplanting crops into plastic mulch, residues may be removed from the plastic by 0.5 inches of water via sprinkler irrigation or natural rainfall.

The maximum use rates stated throughout this product's labeling apply to this product combined with the use of all other herbicides containing glyphosate or sulfosate as the active ingredient, whether applied as mixtures or separately. Calculate the application rates and ensure that the total use of this and other glyphosate- or sulfosate-containing products does not exceed stated maximum use rate.

1.1 Cereal and Grain Crops

LABELED CROPS: Barley, Buckwheat, Millet (pearl, proso), Oats, Rice, Rye, Teosinte, Triticale, Wheat (all types), and Wild Rice.

PRECAUTIONS, RESTRICTIONS: Do not treat rice fields or levees when field is flooded.

TYPES OF APPLICATIONS: Preplant, preemergence, at-planting, red rice control prior to planting rice (Texas only), spot treatment (except rice), postharvest, preharvest (wheat only), wiper applicators (wheat only).

Preplant, Preemergence, At-Planting
USE INSTRUCTIONS: This product may be applied before, during, or after planting of cereal crops. Applications must be made prior to emergence of the crop.

Spot Treatment (Except Rice)
USE INSTRUCTIONS: This product may be applied as a spot treatment in cereal crops. Apply this product before heading in small grains.

PRECAUTIONS, RESTRICTIONS: Do not treat more than 10 percent of the total field area to be harvested. The crop receiving spray in the treated area will be killed. Take care to avoid drift or spray outside target area for the same reason.

Wiper Applicators (Wheat Only)
USE INSTRUCTIONS: Wiper applications may be used in wheat. To control common rye or cereal rye, apply after the weeds have headed and achieved maximum growth and when the rye is at least 6 inches above the wheat crop.

PRECAUTIONS, RESTRICTIONS: Allow at least 35 days between application and harvest. Do not use roller applicators.

Preharvest (Wheat Only)
USE INSTRUCTIONS: This product provides weed control when applied prior to harvest of wheat. Apply after the hard-dough stage of grain (30 percent or less grain moisture) and at least 7 days prior to harvest. Wheat stubble may be grazed immediately after harvest.

This product may be applied using either aerial or ground spray equipment. For ground applications, apply this product in 10 to 20 gallons of water per acre. For aerial applications, apply this product in 3 to 10 gallons of water per acre.

PRECAUTIONS, RESTRICTIONS: Do not apply more than 1 quart of this product per acre. Do not apply to wheat grown for seed, as a reduction in germination or vigor may occur.

Postharvest
USE INSTRUCTIONS: This product may be applied after harvest of cereal crops. Higher rates may be required for control of large weeds which were growing in the crop at the time of harvest. Tank mixtures with 2,4-D or dicamba may be used.

PRECAUTIONS, RESTRICTIONS: For any crop not listed on this label, applications must be made at least 30 days prior to planting the next crop. Do not harvest or feed treated vegetation for 8 weeks following application.

Red Rice Control Prior to Planting Rice (Texas Only)
USE INSTRUCTIONS: Apply 1.5 quarts of this product in 5 to 10 gallons of water per acre. Flush fields prior to application to obtain uniform germination and stand of red rice. Make application when the majority of the red rice plants are in the 2-leaf stage and no more than 4 inches tall. Red rice plants with less than 2 true leaves may be only partially controlled.

PRECAUTIONS, RESTRICTIONS: Avoid spraying during low humidity conditions, as reduced control may result. Do not treat rice fields or levees when the fields contain floodwater. Do not re-flood treated fields for 8 days following application.

Non-Selective Control of Listed Annual Weeds in Small Grain Cropping Systems (South Dakota Only)
USE INSTRUCTIONS: Apply by ground application in 5 to 10 gallons of water per acre. For aerial applications, apply in 2 to 3 gallons of water per acre.

PRECAUTIONS, RESTRICTIONS: The likelihood of injury occurring from the use of this product is greatest when winds are gusty or in excess of 5 miles per hour or when other conditions, including lesser wind velocities, will allow spray drift to occur. Adjust boom height on ground equipment to prevent streaked, overlapped, or uneven applications. Avoid spraying when weeds are subject to moisture stress, when dust is on foliage, or when straw canopy covers the weeds.

1.2 Corn

TYPES OF CORN: Field corn, Seed corn, Sweet corn, and Popcorn. For Roundup Ready® corn, see the "ROUNDUP READY® CROPS" section of this label.

TYPES OF APPLICATIONS: Preplant, preemergence, at-planting, spot treatment, hooded sprayers, preharvest, postharvest.

Preplant, Preemergence, At-Planting
USE INSTRUCTIONS: This product may be applied alone or in a tank mixture before, during, or after planting corn. Applications must be made prior to emergence of the crop.

TANK MIXTURES: This product may be tank mixed with the following products provided that the specific product is registered for application before, during, or after planting corn in conventional tillage systems into a cover crop, established sod, or in previous crop residue. Apply these tank mixtures in 10 to 20 gallons of water or 10 to 60 gallons of nitrogen solution per acre. For improved burndown, this product may be tank mixed with 2,4-D or dicamba.

2,4-D	Guardsman®	Lorox®
Atrazine	Harness®	Marksman®
Banvel®	Harness® XTRA	Micro-Tech®
Cyanazine	Harness® XTRA 5.6L	Prowl®
Broadstrike®	Lariat®	Simazine
Bullet®	Lasso®/Alachlor	Surpass®
Frontier®	Linex®	Topnotch®

NOTE: These tank mixes are not registered in California.

For difficult-to-control annual weeds such as fall panicum, barnyardgrass, crabgrass, shattercane, and broadleaf signalgrass up to 2 inches tall and Pennsylvania smartweed up to 6 inches tall, apply this product at 2 pints per acre in these tank mixtures. For other labeled annual weeds, apply 1 to 1.5 pints of this product per acre when weeds are less than 6 inches tall and 2 to 3 pints when weeds are over 6 inches tall.

PRECAUTIONS, RESTRICTIONS: Applications of 2,4-D or dicamba must be made at least 7 days prior to planting corn.

For Southern states, do not apply in nitrogen solutions to tough-to-control grasses such as barnyardgrass, fall panicum, broadleaf signalgrass, annual ryegrass, and any perennial weeds. The area covered by this recommendation includes from Route 50 South in Illinois and Indiana and the following states: Alabama, Arkansas, Delaware, Florida, Georgia, Kentucky, Louisiana, Maryland, Mississippi, New Jersey, North Carolina, Oklahoma, South Carolina, Tennessee, Texas, Virginia, and West Virginia. Refer to the map under "ANNUAL WEEDS RATE TABLE."

Hooded Sprayers
USE INSTRUCTIONS: This product may be used through hooded sprayers for weed control between the rows of all types of corn (including field corn, sweet corn, and popcorn). Only hooded sprayers that completely enclose the spray pattern may be used. See additional instructions for the use of hooded sprayers in the "APPLICATION EQUIPMENT AND TECHNIQUES" and "SELECTIVE EQUIPMENT" sections of this label.

PRECAUTIONS, RESTRICTIONS: Corn must be at least 12 inches tall measured without extending leaves. Contact of this product in any manner to any vegetation to which treatment is not intended may cause damage. Such damage shall be the sole responsibility of the applicator. Do not apply more than 1 quart of this product per acre for each application and no more than 3 quarts per acre per year for hooded sprayer applications. Do not graze or feed corn forage or fodder following applications of this product through hooded sprayers.

Leave at least an 8-inch untreated strip over the drill row. For example, if the crop row width is 38 inches, the maximum width of the spray hood should be 30 inches.

Spot Treatment
USE INSTRUCTIONS: For spot treatments, apply this product prior to silking of corn.

PRECAUTIONS, RESTRICTIONS: Do not treat more than 10 percent of the total field area to be harvested. The crop receiving spray in the treated area will be killed. Take care to avoid drift or spray outside target area for the same reason.

Preharvest
USE INSTRUCTIONS: Make applications at 35 percent grain moisture or less. Ensure that maximum kernel fill is complete and the corn is physiologically mature (black layer formed). For ground applications, apply up to 3 quarts of this product per acre. For aerial applications, apply up to 1 quart of this product per acre.

PRECAUTIONS, RESTRICTIONS: Allow a minimum of 7 days between application and harvest. Preharvest application is not recommended for corn grown for seed, as a reduction in germination or vigor may occur.

Postharvest
USE INSTRUCTIONS: This product may be applied after harvest of corn. Higher rates may be required for control of large weeds which were growing in the crop at the time of harvest. Tank mixtures with 2,4-D or dicamba may be used.

PRECAUTIONS, RESTRICTIONS: Do not harvest or feed treated vegetation for 8 weeks following application.

1.3 Cotton

TYPES OF APPLICATIONS: Preplant, preemergence, at-planting, hooded sprayer, selective equipment, spot treatment, preharvest. For Roundup Ready® cotton, see the "ROUNDUP READY® CROPS" section of this label.

Preplant, Preemergence, At-Planting
USE INSTRUCTIONS: This product may be applied alone or in tank mixtures before, during, or after planting cotton. Applications must be made prior to emergence of the crop.

Hooded Sprayer, Selective Equipment
USE INSTRUCTIONS: This product may be applied through hooded sprayers, recirculating sprayers, shielded applicators, or wiper applicators in cotton. Allow at least 7 days between application and harvest.

PRECAUTIONS, RESTRICTIONS: See the "APPLICATION EQUIPMENT AND TECHNIQUES" and "SELECTIVE EQUIPMENT" sections of this label for information on proper use and calibration of this equipment.

Spot Treatment
USE INSTRUCTIONS: For spot treatments, apply this product prior to boll opening of cotton.

PRECAUTIONS, RESTRICTIONS: Do not treat more than 10 percent of the total field area to be harvested. The crop receiving spray in treated area will be killed. Take care to avoid drift or spray outside target area for the same reason.

Preharvest
USE INSTRUCTIONS: This product provides weed control and cotton regrowth inhibition when applied prior to harvest of cotton. For weed control, apply at rates given in the "ANNUAL WEEDS RATE TABLE," "PERENNIAL WEEDS RATE TABLE," and the "WOODY BRUSH AND TREES RATE TABLE" of this label. For cotton regrowth inhibition, apply 1 pint to 2 quarts of this product per acre.

This product may be applied using either aerial or ground spray equipment. For ground applications, apply this product in 10 to 20 gallons of water per acre. For aerial applications, apply this product in 3 to 10 gallons of water per acre. Apply after sufficient bolls have developed to produce the desired yield of cotton. Applications made prior to this time could affect maximum yield potential.

TANK MIXTURES: This product may be tank mixed with Def® 6, Folex®, or Prep®/Setup™ to provide additional enhancement of cotton leaf drop.

PRECAUTIONS, RESTRICTIONS: Allow a minimum of 7 days between application and harvest of cotton. Do not feed or graze treated cotton forage or hay following preharvest applications. Do not apply more than 1 quart of this product per acre by air. Do not apply more than 2 quarts of this product per acre by ground. Do not apply to cotton grown for seed, as a reduction in germination or vigor may occur.

1.4 Fallow Systems

TYPES OF APPLICATIONS: Chemical fallow, preplant fallow beds, aid-to-tillage.

Chemical Fallow

USE INSTRUCTIONS: This product may be applied during the fallow period prior to planting or emergence of any crop listed on this label. This product may be used as a substitute for tillage to control annual weeds in fallow fields. Also, broadcast or spot treatments will control or suppress many perennial weeds in fallow fields. Ground or aerial application equipment may be used. Tank mixtures with 2,4-D and dicamba may be used. Refer to the specific product labels for crop rotation restrictions and cautionary statements of all products used in tank mixtures. Some crop injury may occur if dicamba is applied within 45 days of planting.

PRECAUTIONS, RESTRICTIONS: Do not apply dicamba tank mixtures by air in California. For any crop not listed on this label, applications must be made at least 30 days prior to planting.

Preplant Fallow Beds

USE INSTRUCTIONS: This product may be applied to fallow beds prior to planting or emergence of any crop listed on this label. For any crop not listed on this label, applications must be made at least 30 days prior to planting. This product will control weeds listed in the "ANNUAL WEEDS RATE TABLE," "PERENNIAL WEEDS RATE TABLE," and the "WOODY BRUSH AND TREES RATE TABLE" sections of this label.

TANK MIXTURES: In addition, 12 fluid ounces of this product plus 2 to 3 fluid ounces of Goal™ 2XL/Galigan 2E per acre will control the following weeds with the maximum height or length indicated: 3" – common cheeseweed, chickweed, groundsel; 6" – London rocket, shepherdspurse.

16 fluid ounces of this product plus 2 to 3 fluid ounces of Goal 2XL/Galigan 2E per acre will control the following weeds with the maximum height or length indicated: 6" – common cheeseweed, groundsel, marestail *(Conyza canadensis)*; 12" – chickweed, London rocket, shepherdspurse.

Aid-to-Tillage

USE INSTRUCTIONS: This product may be used in conjunction with tillage practices in fallow systems or preplant to labeled crops to control downy brome, cheat, volunteer wheat, tansy mustard, and foxtail. For any crop not listed on this label, applications must be made at least 30 days prior to planting. Apply 8 fluid ounces of this product in 3 to 10 gallons of water per acre. Make applications before weeds are 6 inches in height. Application must be followed by conventional tillage practices no later than 15 days after treatment and before regrowth occurs. Allow at least 1 day after application before tillage.

PRECAUTIONS, RESTRICTIONS: Tank mixtures with residual herbicides may result in reduced performance.

1.5 Grain Sorghum (Milo)

TYPES OF APPLICATIONS: Preplant, preemergence, at-planting, spot treatment, wiper applicators, preharvest, postharvest.

Preplant, Preemergence, At-Planting

USE INSTRUCTIONS: This product may be applied alone or in tank mixture before, during, or after planting grain sorghum. Applications must be made prior to emergence of the crop.

Spot Treatment and Wiper Applications

USE INSTRUCTIONS: This product may be applied as a spot treatment in grain sorghum. Make spot treatments before heading of milo. This product may be applied with wiper applicators to control or suppress the weeds listed under "WIPER AND SPONGE BARS " in the "SELECTIVE EQUIPMENT" section of this label.

PRECAUTIONS, RESTRICTIONS: For spot treatment, do not treat more than 10 percent of the total field area to be harvested. The crop receiving spray in treated area will be killed. Take care to avoid drift or spray outside target area for the same reason.

For wiper applicators, allow at least 40 days between application and harvest. Do not use roller applicators. Do not feed or graze treated milo fodder. Do not ensile treated vegetation.

Preharvest

USE INSTRUCTIONS: Make applications at 30 percent grain moisture or less.

PRECAUTIONS, RESTRICTIONS: Do not apply more than 2 quarts of this product per acre. Allow a minimum of 7 days between application and harvest. Preharvest application is not recommended for sorghum grown for seed, as a reduction in germination or vigor may occur. The use of this product for preharvest grain sorghum (milo) is not registered in California.

Postharvest

USE INSTRUCTIONS: This product may be applied after harvest of grain sorghum. Higher rates may be required for control of large weeds which were growing in the crop at the time of harvest. Tank mixtures with 2,4-D or dicamba may be used.

This product may be applied to grain sorghum (milo) stubble following harvest to suppress or control regrowth. Apply 1 quart of this product per acre for control or 1.5 pints of this product per acre for suppression.

PRECAUTIONS, RESTRICTIONS: Do not harvest or feed treated vegetation for 8 weeks following application.

1.6 Herbs

LABELED CROPS: Peppermint, Spearmint

Spot Treatments (Peppermint and Spearmint Only)

USE INSTRUCTIONS: This product may be used as a spot treatment in spearmint and peppermint. Apply spot treatments on a spray-to-wet basis with hand-held equipment such as backpack and knapsack sprayers, pump-up pressure sprayers, handguns, handwands, or any other hand-held or motorized spray equipment used to direct the spray solution to a limited area.

PRECAUTIONS, RESTRICTIONS: Allow at least 7 days between application and harvest. Further applications may be made in the same area at 30-day intervals. In spot treatment applications, no more than 10 percent of the total field area to be harvested should be treated at one time. The crop receiving spray in the treated area will be killed. Take care to avoid drift or spray outside the target area for this reason.

1.7 Soybeans

TYPES OF APPLICATIONS: Preplant, preemergence, at-planting, spot treatment, preharvest, selective equipment, hooded sprayers. For Roundup Ready® soybeans, see the "ROUNDUP READY® CROPS" section of this label.

Preplant, Preemergence, At-Planting

USE INSTRUCTIONS: This product may be applied alone or in a tank mixture before, during, or after planting soybeans. Applications must be made prior to emergence of the crop. Tank mixtures of this product with any of the following products may be applied in conventional tillage systems into a cover crop, established sod, or in previous crop residue.

Canopy®
Command®
Frontier®
Fusion®
Lasso®/Alachlor
Linex®
Lorox®/Linuron
Micro-Tech®
Prowl®
Pursuit®
Pursuit® Plus
Scepter®
Sencor®/Lexone®/Metribuzin
Squadron®

NOTE: The tank mix recommendations in this section are not registered in California.

For improved burndown, this product may be tank mixed with 2,4-D or 2,4-DB. See the 2,4-D label for intervals between application and planting.

For difficult-to-control annual weeds such as fall panicum, barnyardgrass, crabgrass, shattercane, and broadleaf signalgrass up to 2 inches tall and Pennsylvania smartweed up to 6 inches tall, apply this product at 2 pints per acre in these tank mixtures. For other labeled annual weeds, apply 1 to 1.5 pints of this product per acre when weeds are less than 6 inches tall and 2 to 3 pints when weeds are over 6 inches tall.

Spot Treatment

USE INSTRUCTIONS: For spot treatments, apply this product prior to initial pod set in soybeans.

PRECAUTIONS, RESTRICTIONS: Do not treat more than 10 percent of the total field area to be harvested. The crop receiving spray in treated area will be killed. Take care to avoid drift or spray outside target area for the same reason.

Preharvest

USE INSTRUCTIONS: This product provides weed control when applied prior to harvest of soybeans.

Apply at rates given in the "ANNUAL WEEDS RATE TABLE," "PERENNIAL WEEDS RATE TABLE," and the "WOODY BRUSH AND TREES RATE TABLE." This product may be applied using either aerial or ground spray equipment. For ground applications, apply this product in 10 to 20 gallons of water per acre. For aerial applications, apply this product in 3 to 10 gallons of water per acre. Apply after pods have set and lost all green color. Care should be taken to avoid excessive seed shatter loss due to ground application equipment.

PRECAUTIONS, RESTRICTIONS: Do not apply more than 6 quarts per acre of this product for preharvest applications. Do not apply more than 1 quart per acre of this product by air. Allow a minimum of 7 days between application and harvest of soybeans. Do not graze or harvest treated crop for livestock feed within 25 days of last preharvest application. Do not apply to soybeans grown for seed, as a reduction in germination or vigor may occur.

Selective Equipment
USE INSTRUCTIONS: This product may be applied through recirculating sprayers, shielded applicators, hooded sprayers, over-the-top wiper applicators, or sponge bars in soybeans. Allow at least 7 days between application and harvest.

PRECAUTIONS, RESTRICTIONS: See the "SELECTIVE EQUIPMENT" part of the "APPLICATION EQUIPMENT AND TECHNIQUES" section of this label for information on proper use and calibration of this equipment.

1.8 Sugarcane

TYPES OF APPLICATIONS: Preplant, preemergence, spot treatment, fallow, hooded sprayers.

Preplant and Preemergence
USE INSTRUCTIONS: This product may be applied in or around sugarcane fields or in fields prior to the emergence of plant cane.

PRECAUTIONS, RESTRICTIONS: Do not apply to vegetation in or around ditches, canals, or ponds containing water to be used for irrigation.

Spot Treatment
USE INSTRUCTIONS: This product may be applied as a spot treatment in sugarcane. For control of volunteer or diseased sugarcane, make a 1 percent solution of this product in water and spray to wet the foliage of vegetation to be controlled. Volunteer or diseased sugarcane should have at least 7 new leaves.

PRECAUTIONS, RESTRICTIONS: Avoid spray contact with healthy cane plants since severe damage or destruction may result. Do not feed or graze treated sugarcane foliage following application.

Fallow Treatments
USE INSTRUCTIONS: This product may be used as a replacement for tillage in fields that are lying fallow between sugarcane crops. This product may also be used to remove the last stubble of ratoon cane. For removal of last stubble of ratoon cane, apply 4 to 5 quarts of this product in 10 to 40 gallons of water per acre to new growth having at least 7 new leaves. Allow 7 or more days after application before tillage.

Hooded Sprayers
USE INSTRUCTIONS: This product may be used through hooded sprayers for weed control between the rows of sugarcane. See the "SELECTIVE EQUIPMENT" part of the "APPLICATION EQUIPMENT AND TECHNIQUES" section of this label for additional use instructions.

PRECAUTIONS, RESTRICTIONS: Do not allow treated weeds to come into contact with the crop. Droplets, mist, foam, or splatter of the herbicide solution settling on the crop may result in discoloration, stunting, or destruction. Such damage shall be the sole responsibility of the applicator.

2.0 VEGETABLE CROPS

NOTE: THIS "VEGETABLE CROPS" SECTION GIVES GENERAL DIRECTIONS THAT APPLY TO ALL LISTED VEGETABLE CROPS WITHIN THIS SECTION. SEE THE INDIVIDUAL CROP CATEGORIES FOR SPECIFIC INSTRUCTIONS, PREHARVEST INTERVALS, PRECAUTIONS, AND RESTRICTIONS.

USE DIRECTIONS: This product may be applied prior to the emergence of direct-seeded vegetables or prior to transplanting vegetables. For the following crops, apply only prior to planting and allow at least 3 days between application and planting: cantaloupe, casaba melon, crenshaw melon, cucumber, eggplant, garlic, gherkin, gourds, ground cherry, honeydew melon, honey ball melon, mango melon, melons (all), muskmelon, pepper (all), Persian melon, pumpkin, squash (summer, winter), tomatillo, tomato, watercress, and watermelon.

PRECAUTIONS, RESTRICTIONS: When applying this product prior to transplanting crops into plastic mulch, care must be taken to remove residues of this product from the plastic prior to transplanting. Residues can be removed by a single 0.5-inch application of water, either by natural rainfall or via a sprinkler system.

2.1 Brassica Vegetables

LABELED CROPS: Broccoli (all), Brussels sprouts, Cabbage (all), Chinese cabbage (bok choy), Cauliflower, Cavalo broccolo, Collards, Kale, Kohlrabi, Mizuna, Mustard greens, Mustard spinach, Rape greens.

2.2 Bulb Vegetables

LABELED CROPS: Garlic, Leek, Onion, Shallot.

2.3 Cucurbit Vegetables and Fruits

LABELED CROPS: Chayote (fruit), Cucumber, Gherkin, Gourds, Melons (all), Cantaloupe, Casaba melon, Crenshaw melon, Honeydew melon, Honey ball melon, Mango melon, Muskmelon, Okra, Persian melon, Pumpkin, Summer squash (includes crookneck squash, scallop squash, straightneck squash, vegetable marrow, zucchini), Winter squash (includes butternut squash, calabaza, hubbard squash, acorn squash, spaghetti squash), Watermelon.

2.4 Leafy Vegetables

LABELED CROPS: Amaranth, Arugula (roquette), Beet greens, Cardoon, Celery, Chinese celery, Celtuce, Chervil, Chrysanthemum, Corn salad, Cress, Dandelion, Dock (sorrel), Endive, Florence fennel, Lettuce (head and leaf), Parsley, Purslane (garden and winter), Radicchio (red chicory), Rhubarb, Spinach (all), Swiss chard, Watercress (upland).

2.5 Fruiting Vegetables

LABELED CROPS: Eggplant, Groundcherry *(Physalis* spp.), Pepino, Pepper (all), Tomatillo, Tomato.

2.6 Legume Vegetables (Succulent or Dried)

LABELED CROPS: Beans (all: *Lupinus*: includes grain lupin, sweet lupin, white lupin, and white sweet lupin), Beans *(Phaseolus*: includes field bean, kidney bean, lima bean, navy bean, pinto bean, runner bean, snap bean, tepary bean, wax bean), Beans *(Vigna*: includes adzuki bean, asparagus bean, blackeyed pea, catjang, Chinese longbean, cowpea, crowder pea, moth bean, mung bean, rice bean, southern pea, urd bean, yardlong bean), Broad bean (fava), Chickpea (garbanzo), Guar, Jackbean, Lablab bean, Lentil, Peas (all: *Pisum*: includes dwarf pea, edible-podded pea, English pea, field pea, garden pea, green pea, snow-pea, sugar snap pea), Pigeon pea, Soybean (immature seed), Sword bean.

2.7 Root and Tuber Vegetables

LABELED CROPS: Artichoke (Jerusalem), Beet (all, garden), Carrot, Celeriac, Chicory, Ginseng, Horseradish, Parsnip, Potato (Irish), Oriental radish, Radish, Rutabaga, Sugar beets, Salsify, Sweet potato, Turnip, Yams.

Directed Applications (Non-Bearing Ginseng Only)

USE INSTRUCTIONS: This product may be used for general weed control in established non-bearing ginseng. Direct applications so that there is no contact of this product with the ginseng plant. Applications may be made with boom equipment, CDA, shielded sprayers, hand-held and high-volume wands, lances, and orchard guns or with wiper application equipment.

PRECAUTIONS, RESTRICTIONS: Allow one year to elapse between application and harvest. Extreme care must be exercised to avoid contact of herbicide solution, spray, drift, or mist with foliage or green bark of trunk, branches, suckers, fruit, or other parts of desirable plants. Contact of this product with other than matured brown bark can result in serious crop damage.

Over-the-Top Wiper Applications (Rutabagas Only)

USE INSTRUCTIONS: Wiper applications may be used over the top of rutabagas.

PRECAUTIONS, RESTRICTIONS: Allow at least 14 days between application and harvest of rutabagas.

2.8 Asparagus

TYPES OF APPLICATIONS: Preplant, preemergence, spot treatment, postharvest

Preplant and Preemergence

USE INSTRUCTIONS: This product may be applied prior to emergence of asparagus.

PRECAUTIONS, RESTRICTIONS: Do not apply within a week before the first spears emerge.

Spot Treatment

USE INSTRUCTIONS: This product may be applied immediately after cutting, but prior to the emergence of new spears.

PRECAUTIONS, RESTRICTIONS: Do not treat more than 10 percent of the total field area to be harvested. Do not harvest within 5 days of treatment.

Postharvest

USE INSTRUCTIONS: This product may be applied after the last harvest and all spears have been removed. If spears are allowed to regrow, delay application until ferns have developed. Delayed treatments should be applied as a directed or shielded spray in order to avoid contact of the spray with ferns, stems, or spears.

PRECAUTIONS, RESTRICTIONS: Direct contact of the spray with the asparagus may result in serious crop injury. Select and use recommended types of spray equipment for postemergence postharvest applications. A directed spray is any application where the spray pattern is aligned in such a way as to avoid direct contact of the spray with the crop. A shielded spray is any application where a physical barrier is positioned and maintained between the spray and the crop to prevent contact of spray with the crop.

2.9 Peanuts

TYPES OF APPLICATIONS: Preplant, preemergence, at-planting

USE INSTRUCTIONS: This product may be applied before, during, or after planting peanuts. Applications must be made prior to the emergence of the crop.

2.10 Sunflowers

TYPES OF APPLICATIONS: Preplant, preemergence

USE INSTRUCTIONS: This product may be applied before, during, or after planting sunflowers. Applications must be made prior to emergence of the crop.

PRECAUTIONS, RESTRICTIONS: Do not apply more than 1 quart of this product per acre for sunflowers. Make only one preplant or preemergent application per year. Do not feed or graze sunflower forage following application of this product.

3.0 TREE, NUT, AND VINE CROPS

NOTE: THIS SECTION GIVES GENERAL DIRECTIONS THAT APPLY TO ALL LISTED TREE, NUT, AND VINE CROPS WITHIN THIS SECTION. SEE THE INDIVIDUAL CROP CATEGORIES FOR SPECIFIC INSTRUCTIONS, PREHARVEST INTERVALS, PRECAUTIONS, AND RESTRICTIONS.

GENERAL USE INSTRUCTIONS:
TYPES OF APPLICATIONS: General weed control, middles (between rows of trees), strips (within rows of trees), selective equipment (shielded sprayers, wiper applications, except kiwi), perennial grass suppression, cut stump. Applications may be made with boom equipment, CDA equipment, shielded sprayers, hand-held and high-volume wands, lances, orchard guns, or with wiper applicator equipment, except as directed.

This product may be applied in middles, strips, and for general weed control in established tree fruit and nut groves, orchards, berries, and vineyards. It may also be used for site preparation prior to transplanting these crops. Allow a minimum of 3 days between application and transplanting. Apply 1 pint to 5 quarts per acre according to the "ANNUAL WEEDS RATE TABLE" and "PERENNIAL WEEDS RATE TABLE" sections of this label. Repeat applications may be made up to a maximum of 10.6 quarts per acre per year.

Middles (Between Rows)
USE INSTRUCTIONS: This product will control or suppress annual and perennial weeds and ground covers growing between the rows of labeled tree fruits, tree nuts, and vine crops. If weeds are under drought stress, irrigate prior to application. Reduced control may result if weeds have been mowed prior to application.

TANK MIXTURES: A tank mixture of this product plus Goal 2XL/Galigan 2E may be used for annual weeds in middles between rows of citrus crops, tree fruits, tree nuts, and vine crops. This mixture is recommended when weeds are stressed or growing in dense populations. 16 to 32 fluid ounces per acre of this product plus 3 to 12 fluid ounces per acre of Goal 2XL/Galigan 2E will control annual weeds with a maximum height or diameter of 6 inches including crabgrass, hairy fleabane *(Conyza bonariensis)*, common groundsel, junglerice, common lambsquarters, redroot pigweed, London rocket, common ryegrass, shepherds-purse, annual sowthistle, common cheeseweed (malva), filaree (suppression), horseweed/marestail *(Conyza canadensis)*, stinging nettle, and common purslane (suppression). 12 to 32 oz./A of this product plus 3 to 12 fluid ounces per acre of Goal 2XL/Galigan 2E will control common cheeseweed (malva) with a maximum height or diameter of 3 inches.

Strips (In Rows)
TANK MIXTURES: This product may be applied in rows of tree, nut, or vine crops in tank mixtures with the following products:

Devrinol® 50 DF
Direx® 4L/Diuron 4L
Goal® 2XL/Galigan® 2E
Karmex® DF/Diuron 80 DF
Krovar® I
Prowl®
Princep Caliber® 90
Simazine 4L
Simazine 80W
Sim-Trol® 4L
Solicam® DF
Surflan® AS/Oryzalin 4AS
Surflan® 75W

Do not apply these tank mixtures in Puerto Rico.

Refer to the individual product labels for specific crops, rates, geographic restrictions, and precautionary statements. Apply 1 pint to 5 quarts of this product per acre in these tank mixtures. Use rates at the higher end of the specified rate range when weeds are stressed, growing in dense populations, or are greater than 12 inches tall.

Perennial Grass Suppression

This product will suppress perennial grasses such as bahiagrass, bermudagrass, tall fescue, orchardgrass, Kentucky bluegrass, and quackgrass that are grown as ground covers in tree and vine crops.

For suppression of tall fescue, fine fescue, orchardgrass, and quackgrass, apply 8 fluid ounces of this product in 10 to 20 gallons of water per acre.

For suppression of Kentucky bluegrass covers, apply 6 fluid ounces of this product per acre. Do not add ammonium sulfate.

For best results, mow cool season grass covers in the spring to even their height and apply this product 3 to 4 days after mowing.

For suppression of vegetative growth and seedhead inhibition of bahiagrass for approximately 45 days, apply 6 fluid ounces of this product in 10 to 25 gallons of water per acre. Apply 1 to 2 weeks after full green-up or after mowing to a uniform height of 3 to 4 inches. This application must be made prior to seedhead emergence.

For suppression up to 120 days, apply 4 fluid ounces of this product per acre followed by an application of 2 to 4 fluid ounces per acre about 45 days later. Make no more than 2 applications per year.

For burndown of bermudagrass, apply 1 to 2 quarts of this product in 3 to 20 gallons of water per acre. Use this treatment only if reduction of the bermudagrass stand can be tolerated. When burndown is required prior to harvest, allow at least 21 days to elapse to ensure sufficient time for burndown to occur.

For suppression of bermudagrass, apply 6 to 16 fluid ounces of this product per acre east of the Rocky Mountains and 16 fluid ounces of this product per acre west of the Rocky Mountains. Apply in a total spray volume of 3 to 20 gallons per acre no sooner than 1 to 2 weeks after full green-up. If the bermudagrass is mowed prior to application, maintain a minimum of 3 inches in height. Sequential applications may be made when regrowth occurs and bermudagrass injury and stand reduction can be tolerated. East of the Rocky Mountains, rates of 6 to 10 fluid ounces of this product per acre should be used in shaded conditions or where a lesser degree of suppression is desired.

Selective Equipment

Shielded and wiper applicators may be used in tree crops and grapes. Refer to the individual crop section for time interval between application and harvest.

GENERAL PRECAUTIONS, RESTRICTIONS: For all uses in this section, extreme care must be exercised to avoid contact of herbicide solution, spray, drift, or mist with foliage, or green bark of trunk, branches, suckers, fruit, or other parts of trees, canes, and vines. Contact of this product with other than matured brown bark can result in serious crop damage or destruction. Avoid painting cut stumps with this product, as injury resulting from root grafting may occur in adjacent trees.

3.1 Berry Crops

LABELED CROPS: Blackberry (boysenberry, dewberry, and youngberry), Blueberry, Cranberry, Currant, Elderberry, Gooseberry, Huckleberry, Loganberry, Olallieberry, Raspberry (black, red).

TYPES OF APPLICATIONS: Preplant, preemergence, directed spray (except Cranberry), wiper application.

USE INSTRUCTIONS: This product may be applied as a preplant or preemergence broadcast application or as a wiper application for crops listed in this section. Directed sprays may be applied to any crop except cranberries. For wick or wiper applications, mix 1 gallon of this product in 4 gallons of water to prepare a 20 percent solution. In severe infestations, reduce equipment ground speed to ensure that adequate amounts of this product are wiped on the weeds. A second treatment in the opposite direction may be beneficial.

PRECAUTIONS, RESTRICTIONS: To avoid damage, herbicide sprays must not be allowed to contact desirable vegetation including green shoots, canes, or foliage. Allow a minimum of 30 days between last application and harvest in cranberries. Allow a minimum of 14 days between last application and harvest in other berry crops.

3.2 Citrus Crops

LABELED CROPS: Calamondin, Chironja, Citron, Citrus Hybrids, Grapefruit, Kumquat, Lemon, Lime, Mandarin (tangerine), Orange (all), Pummelo, Tangelo (ugli), Tangor.

TYPES OF APPLICATIONS: General weed control, middles (between rows of trees), strips (within rows of trees), selective equipment (shielded sprayers, wiper applications).

USE INSTRUCTIONS: For general use directions, see the "TREE, NUT, AND VINE CROPS (GENERAL)" section. The recommendations below pertain to applications in Florida and Texas.

FLORIDA AND TEXAS: For burndown or control of the weeds listed below, apply the specified rates of this product in 3 to 30 gallons of water per acre. Where weed foliage is dense, use 10 to 30 gallons of water per acre. For citron, apply as a post-directed spray only.

For goatweed, apply 2 to 3 quarts of this product per acre. Apply in 20 to 30 gallons of water per acre when plants are actively growing. Use 2 quarts per acre when plants are less than 8 inches tall and 3 quarts per acre when plants are greater than 8 inches tall. If goatweed is greater than 8 inches tall, the addition of Krovar® I or Karmex®/Diuron may improve control. Refer to the individual product labels for specific crops, rates, geographic restrictions, and precautionary statements.

Perennial weeds:

WEED SPECIES	GLYPHOGAN PLUS HERBICIDE RATE PER ACRE			
	1 Qt.	2 Qts.	3 Qts.	5 Qts.
Bermudagrass	B	—	PC	C
Guineagrass				
Texas and Florida Ridge	B	C	C	C
Florida Flatwoods	—	B	C	C
Paragrass	B	C	C	C
Torpedograss	S	—	PC	C

S = Suppression B = Burndown
PC = Partial control C = Control

PRECAUTIONS, RESTRICTIONS: Allow a minimum of 1 day between last application and harvest in citrus crops.

3.3 Pome Fruit, Stone Fruit, and Olives

LABELED CROPS: Apple, Crabapple, Loquat, Mayhaw, Pear, Quince, Apricot, Cherry (sweet, tart), Nectarine, Olive, Peach, Plum/Prune (all types).

TYPES OF APPLICATIONS: General weed control, middles (between rows of trees), strips (in row of trees), selective equipment.

USE DIRECTIONS: For general use directions, see the "TREE, NUTS, AND VINE CROPS (GENERAL)" section. The following directions are specific to tree fruits.

EQUIPMENT RESTRICTIONS: For cherries, any application equipment listed in this section may be used in all states. For olives, apply as a post-directed spray only. Any application equipment listed in this section may be used in apricots, nectarines, peaches, and plums/prunes growing in Arizona, California, Colorado, Idaho, Kansas, Kentucky, New Jersey, North Dakota, Oklahoma, Oregon, Texas, Utah, and Washington, except for peaches grown in the states specified in the following paragraph. In all other states, use wiper equipment only.

For PEACHES grown in Alabama, Arkansas, Florida, Georgia, Louisiana, Mississippi, North Carolina, South Carolina, and Tennessee only, apply with a shielded boom sprayer or shielded wiper applicator which prevents any contact of this product with the foliage or bark of trees. Apply no later than 90 days after first bloom. Applications made after this time may result in severe damage. Remove suckers and low-hanging limbs at least 10 days prior to application. Avoid applications near trees with recent pruning wounds or other mechanical injury. Apply only near trees that have been planted in the orchard for 2 or more years. EXTREME CARE MUST BE TAKEN TO ENSURE NO PART OF THE PEACH TREE IS CONTACTED.

PRECAUTIONS, RESTRICTIONS: Allow a minimum of 1 day between last application and harvest for apple, crabapple, loquat, mayhaw, pear, and quince. Allow a minimum of 17 days between last application and harvest in apricot, cherry (sweet, tart), nectarine, olive, peach, and plum/prune.

3.4 Tree Nuts

LABELED CROPS: Almond, Beechnut, Brazil nut, Butternut, Cashew, Chestnut, Chinquapin, Filbert (hazelnut), Hickory nut, Macadamia, Pecan, Pistachio, Walnut (black, English).

TYPES OF APPLICATIONS: General weed control, middles (between rows of trees), strips (in row of trees), selective equipment.

USE DIRECTIONS: For general use directions, see the "TREE, NUTS, AND VINE CROPS (GENERAL)" section. The following directions are specific to tree nuts.

PRECAUTIONS, RESTRICTIONS: Allow a minimum of 3 days between last application and harvest of tree nuts.

3.5 Tropical and Subtropical Trees and Fruits

LABELED CROPS: Atemoya, Avocado, Banana, Barbados cherry (acerola), Breadfruit, Canistel, Carambola (starfruit), Cherimoya, Cocoa beans, Coconuts, Coffee, Dates, Figs, Guava, Jaboticaba, Jackfruit, Longan, Lychee, Mango, Marmaladebox (genip), Papaya, Passion fruit, Persimmon, Pineapple, Plantain, Pomegranate, Sapodilla, Sapote (black, mamey, white), Soursop, Sugar apple, Tamarind, Tea.

TYPES OF APPLICATIONS: General weed control, middles (between rows of trees), strips (in row of trees), selective equipment plus Bananacide (banana only).

USE DIRECTIONS: This product may be applied for general weed control or for site preparation prior to transplanting crops listed in this section. In coffee and banana, delay applications 3 months after transplanting to allow the new coffee or banana plant to become established.

PRECAUTIONS, RESTRICTIONS: Allow a minimum of 1 day between last application and harvest in banana, guava, and papaya. Allow a minimum of 28 days between last application and harvest in coffee and plantain. Allow a minimum of 14 days between last application and harvest for any other tropical or subtropical tree fruit crop including tea. Do not feed or graze treated pineapple forage following application.

Bananacide (Bananas Only)
USE INSTRUCTIONS: This product may be used to destroy banana plants. For direct application to bananas, remove fruit prior to treatment.

3.6 Vine Crops

LABELED CROPS: Grapes (raisin, table, wine), Kiwi.

TYPES OF APPLICATIONS: General weed control, middles (between rows), strips (in row), selective equipment.

USE DIRECTIONS: For general use directions, see the "TREE, NUTS, AND VINE CROPS (GENERAL)" section. The following directions are specific to vine crops. Applications should not be made when green shoots, canes, or foliage are in the spray zone. In the northeast and Great Lakes regions, applications must be made prior to the end of bloom stage of grapes to avoid injury, or make applications with shielded sprayers or wiper equipment.

PRECAUTIONS, RESTRICTIONS: Allow a minimum of 14 days between last application and harvest.

4.0 PASTURE GRASSES, FORAGE LEGUMES, AND RANGELANDS

4.1 Alfalfa, Clover, and Other Forage Legumes

LABELED CROPS: Alfalfa, Clover, Kudzu, Lespedeza, Lupin, Sainfoin, Trefoil, Velvet bean, Vetch (all types).

TYPES OF APPLICATIONS: Dormant (alfalfa only), preplant, preemergence, at-planting, spot treatment (alfalfa and clover only), wiper applicators (alfalfa and clover only), renovation, preharvest (alfalfa only).

Dormant (Alfalfa Only)
USE INSTRUCTIONS: This product will control or suppress many weeds including quackgrass, downy brome, and cheatgrass in dormant alfalfa. Apply 8 to 12 ounces per acre of this product. Apply in the spring to alfalfa that is dormant. Applications should be made after spring temperatures have warmed enough to encourage resumption of weed growth, but prior to initiation of trifoliate leaf expansion of the alfalfa. Applications made after expansion of the first trifoliate leaf of the alfalfa will cause growth reduction and reduced crop yield.

PRECAUTIONS, RESTRICTIONS: Do not use ammonium sulfate when spraying dormant alfalfa with this product. Do not use this product where a slight yield reduction in the first cutting of alfalfa cannot be tolerated. Do not make more than one application per year. Allow 36 hours after application before grazing livestock or harvesting. Slight discoloration of the alfalfa may occur, but the alfalfa will regreen and regrow under moist soil conditions as effects of this product wear off. Application of this product can cause crop injury. Any crop injury is the sole responsibility of the applicator.

Preplant, Preemergence, and At-Planting
USE INSTRUCTIONS: This product may be applied before, during, or after planting alfalfa and clover. Applications must be made prior to emergence of the crop.

PRECAUTIONS, RESTRICTIONS: Remove domestic livestock before application and wait 8 weeks after application before grazing or harvesting.

Preharvest (Alfalfa Only)
USE INSTRUCTIONS: This product may be used in declining alfalfa stands or any stand of alfalfa where crop destruction is acceptable. This application will severely injure or destroy the stand of alfalfa. This product will control annual and perennial weeds including quackgrass when applied prior to the harvest of alfalfa. The treated crop and weeds can be harvested and fed to livestock after 36 hours. Allow a minimum of 36 hours between application and harvest. Use up to 1 quart of this product per acre. Applications may be made at any time of the year. Make only one application to an existing stand of alfalfa per year. For control of quackgrass, apply in the spring, late summer, or fall when quackgrass is actively growing. Treatments for quackgrass must be followed by deep tillage for complete control.

PRECAUTIONS, RESTRICTIONS: Do not apply more than 1 quart of this product per acre as a preharvest treatment. Do not apply to alfalfa grown for seed, as a reduction in germination or vigor may occur.

Spot Treatment and Wiper Applications (Alfalfa and Clover Only)
USE INSTRUCTIONS: This product may be applied as a spot treatment in alfalfa or clover. This product may be applied with wiper applicators to control or suppress the weeds listed under "WIPER AND SPONGE BARS" in the "SELECTIVE EQUIPMENT" section of this label. Applications may be made in the same area at 30-day intervals.

PRECAUTIONS, RESTRICTIONS: For spot treatment and wiper applications, apply in areas where the movement of domestic livestock can be controlled. No more than 10 percent of the total field area should be treated at one time. Remove domestic livestock before application and wait 14 days after application before grazing livestock or harvesting.

Renovation
USE INSTRUCTIONS: This product may be applied as a broadcast spray to renovate existing stands of alfalfa, clover, and other labeled forage legumes. Labeled crops may be planted into the treated area.

PRECAUTIONS, RESTRICTIONS: Remove domestic livestock before application and wait 8 weeks between applications and grazing or harvesting.

4.2 Conservation Reserve Program (CRP)

TYPES OF APPLICATIONS: Renovation (rotating out of CRP), site preparation, postemergence weed control in dormant CRP grasses, wiper applications.

Renovation (Rotating out of CRP), Site Preparation
USE INSTRUCTIONS: This product may be used to prepare CRP land for crop production. Refer to Federal, state, or local use guides for CRP renovation recommendations.

Postemergence Weed Control in Dormant CRP Grasses, Wiper Applications
USE INSTRUCTIONS: This product may be used to suppress competitive growth and seed production of undesirable vegetation in CRP acres. Such applications may be made with wiper application equipment or as a broadcast or spot treatment to dormant CRP grasses. For selective applications with broadcast spray equipment, apply 12 to 16 fluid ounces of this product per acre in early spring before desirable CRP grasses such as crested and tall wheatgrass break dormancy and initiate green growth. Late fall applications can be made after desirable perennial grasses have reached dormancy.

PRECAUTIONS, RESTRICTIONS: Some stunting of CRP perennial grasses will occur if broadcast applications are made when plants are not dormant. Do not apply more than 3 quarts per acre per year onto CRP grasses.

4.3 Grass Seed Production

LABELED CROPS: Any grass *(Gramineae* family) except corn, sorghum, sugarcane, and those listed above under "CEREAL AND GRAIN CROPS."

TYPES OF APPLICATIONS: Preplant, renovation, site preparation, shielded sprayers.

Preplant, Renovation, and Site Preparation
USE INSTRUCTIONS: This product may be applied before planting or renovation of turf or forage grass areas grown for seed production. For maximum control of existing vegetation, delay planting to determine if any regrowth from escaped underground plant parts occurs. Where repeat treatments are necessary, sufficient regrowth must be attained prior to application. For warm-season grasses such as bermudagrass, summer or fall applications provide best control.

PRECAUTIONS, RESTRICTIONS: Do not disturb soil or underground plant parts before treatment. Tillage or renovation techniques such as vertical mowing, coring, or slicing should be delayed for 7 days after application to allow proper translocation into underground plant parts. Do not feed or graze treated areas for 8 weeks following application.

Shielded Sprayers (Idaho, Oregon, and Washington Only)
USE INSTRUCTIONS: Apply 1 to 3 quarts of this product as a broadcast spray in 10 to 20 gallons of water per acre to control weeds in the rows. Uniform planting in straight rows aids in shielded sprayer applications. Best results are obtained when the grass seed crop is small enough to easily pass by or through the protective shields.

PRECAUTIONS, RESTRICTIONS: Contact of this product in any manner to any vegetation to which treatment is not intended may cause damage. Such damage shall be the sole responsibility of the applicator.

4.4 Pastures

LABELED CROPS: Any grass *(Gramineae* family except corn, sorghum, sugarcane, and those listed above under "CEREAL AND GRAIN CROPS") including Bahiagrass, Bermudagrass, Bluegrass, Bromegrass, Fescue, Orchardgrass, Ryegrass, Timothy, Wheatgrass, Alfalfa, and Clover. In Hawaii, pastures include Kikuyugrass, Pangola grass, and Guineagrass.

TYPES OF APPLICATIONS: Spot treatment, over-the-top wiper application, preplant, preemergence, pasture renovation.

Spot Treatment and Wiper Application
USE INSTRUCTIONS: This product may be applied as a spot treatment or with wiper applicators in pastures. Applications may be made in the same area at 30-day intervals.

PRECAUTIONS, RESTRICTIONS: For spot treatment and wiper applications, apply in areas where the movement of domestic livestock can be controlled. No more than 10 percent of the total pasture area should be treated at one time. Remove domestic livestock before application and wait 14 days after application before grazing livestock or harvesting.

Preplant, Preemergence, and Pasture Renovation

USE INSTRUCTIONS: This product may be applied prior to planting or emergence of forage grasses and legumes. In addition, this product may be used to control perennial pasture species listed on this label prior to replanting.

PRECAUTIONS, RESTRICTIONS: Remove domestic livestock before application and wait 8 weeks after application before grazing or harvesting.

5.0 ROUNDUP READY® CROPS

The following instructions include all applications which can be made onto the specified Roundup Ready® crops during the complete cropping season. Do NOT combine these instructions with other recommendations made for crop varieties that do not contain the Roundup Ready® gene in the "ANNUAL AND PERENNIAL CROPS" section of this label.

MAKHTESHIM AGAN OF NORTH AMERICA, INC. (MANA) RECOMMENDS USE OF THIS PRODUCT FOR POSTEMERGENCE APPLICATION ONLY ON CROP VARIETIES DESIGNATED AS CONTAINING THE ROUNDUP READY® GENE.

Applying this product to crop varieties that are not designated as Roundup Ready® will result in severe crop injury and yield loss. Avoid contact with foliage, green stems, fruit of crops, or any desirable plants that do not contain the Roundup Ready® gene, since severe injury or destruction will result.

The Roundup Ready® designation indicates that the crop variety contains a patented gene that provides tolerance to this product. Information on Roundup Ready® crop varieties may be obtained from your seed supplier or MANA representative. Roundup Ready® crop varieties must be purchased from an authorized licensed seed supplier.

IT IS UNLAWFUL TO SELL OR PLANT SAVED SEED. SEEDS WITH THE ROUNDUP READY® GENE MAY ONLY BE USED FOR PLANTING A COMMERCIAL CROP IN A SINGLE SEASON. SEED MAY NOT BE SAVED FOR REPLANTING AND SAVED SEED MAY NOT BE SUPPLIED TO OTHERS FOR REPLANTING. MANA DOES NOT WARRANT THE SAFETY OR PERFORMANCE OF THIS PRODUCT WHEN USED ON "BROWN BAG" OR FARMER-SAVED SEED.

For ground applications with broadcast equipment, apply this product in 5 to 20 gallons of spray solution per acre. Carefully select proper nozzle and spray pressure to avoid spraying a fine mist. For best results with ground application equipment, use flat fan spray nozzles. Check for even distribution of spray droplets.

For aerial applications, apply this product in 3 to 15 gallons of water per acre. See the "APPLICATION EQUIPMENT AND TECHNIQUES" section of this label for procedures to avoid spray drift that may cause injury to any vegetation not intended for treatment. Use of appropriate buffer zones will help prevent injury to adjacent vegetation.

For proper stewardship of aerial applications over the top of Roundup Ready® crops, MANA recommends that growers and applicators read and follow all precautions and procedures contained in the use guide *A Guide to On-Target Aerial Application* available by calling 1-800-ROUNDUP (1-800-768-6387) or on the internet at www.FARMSOURCE™.com.

ATTENTION: AVOID DRIFT. EXTREME CARE MUST BE USED WHEN APPLYING THIS PRODUCT TO PREVENT INJURY TO DESIRABLE PLANTS AND CROPS WHICH DO NOT CONTAIN THE ROUNDUP READY® GENE.

See the "MIXING" and "APPLICATION EQUIPMENT AND TECHNIQUES" sections of this label for additional directions and restrictions on the application of this product.

Sprayer Preparation: It is important that sprayer and mixing equipment be clean and free of pesticide residue before making applications of this product. Follow the cleaning procedures specified on the label of the product(s) previously used. THOROUGHLY CLEAN THE SPRAY TANK AND ALL LINES AND FILTERS TO ELIMINATE POTENTIAL CONTAMINATION FROM OTHER HERBICIDES PRIOR TO MIXING AND APPLYING THIS PRODUCT.

5.1 Seed Production of Canola with the Roundup Ready® Gene

MANA RECOMMENDS USE OF THIS PRODUCT TO CONTROL NON-GLYPHOSATE-TOLERANT CANOLA IN PRODUCTION FIELDS OF CANOLA WHICH CONTAIN THE ROUNDUP READY® GENE.

SEVERE INJURY OR DEATH WILL RESULT IF CANOLA VARIETIES WHICH DO NOT CONTAIN THE ROUNDUP READY® GENE ARE SPRAYED WITH THIS PRODUCT.

USE INSTRUCTIONS: This product will control non-glyphosate-tolerant canola in seed production fields of canola containing the Roundup Ready® gene. This product may be applied by ground application equipment only. Apply 1 pint of this product in 5 to 20 gallons of spray solution per acre as a broadcast spray. A second application of 1 pint may be applied if needed to control non-glyphosate-resistant canola plants. Apply to Roundup Ready® canola from emergence to the pre-flower (early bolting) stage.

300

PRECAUTIONS, RESTRICTIONS: Do not exceed a maximum rate of 1 quart of this product per acre per season. Treated canola may not be used for food or feed. Do not feed or graze treated canola. Do not process treated canola for food or feed.

5.2 Preplant, Preemergent and/or Over-the-Top Applications to Canola with the Roundup Ready® Gene

MANA RECOMMENDS USE OF THIS PRODUCT ONLY ON CANOLA WHICH CONTAINS THE ROUNDUP READY® GENE.

DO NOT USE THIS PRODUCT ON CANOLA WITH THE ROUNDUP READY® GENE PLANTED IN THE FOLLOWING STATES: ALABAMA, DELAWARE, FLORIDA, GEORGIA, KENTUCKY, MARYLAND, NEW JERSEY, NORTH CAROLINA, SOUTH CAROLINA, TENNESSEE, VIRGINIA, AND WEST VIRGINIA.

SEVERE INJURY OR DEATH WILL RESULT IF CANOLA VARIETIES WHICH DO NOT CONTAIN THE ROUNDUP READY® GENE ARE SPRAYED WITH THIS PRODUCT. Avoid contact with foliage, green stems, fruit of crops, or any desirable plants which do not contain the Roundup Ready® gene since severe injury or destruction will result.

USE INSTRUCTIONS: This product will control many troublesome emerged weeds when applied preplant, preemergent, and/or over-the-top applications in Roundup Ready® canola.

PRECAUTIONS, RESTRICTIONS: See the "ROUNDUP READY® CROPS" general section of this label for other precautionary instructions for use in Roundup Ready® crops. There are no rotational crop restrictions following applications of this product. Allow a minimum of 60 days between last application and canola harvest. Refer to the table below for maximum seasonal rates.

Maximum Allowable Combined Application Quantities Per Season	
Preplant and preemergence applications	2 quarts per acre
Total in-crop application from emergence to 6-leaf stage	1 quart per acre

Ground Applications: Apply this product in 5 to 20 gallons of spray solution per acre using broadcast equipment. Carefully select proper nozzle and spray pressure to avoid spraying a fine mist. For best results with ground application equipment, use nozzles which provide a flat fan pattern. Check for even distribution of spray droplets.

Aerial Applications: Use the specified rates of this product in 3 to 15 gallons of spray solution per acre. Do not exceed a maximum rate of 16 ounces of this product per acre when applied by air. AVOID DRIFT. EXTREME CARE MUST BE USED WHEN APPLYING THIS PRODUCT TO PREVENT INJURY TO DESIRABLE PLANTS AND CROPS WHICH DO NOT CONTAIN THE ROUNDUP READY® GENE. DO NOT APPLY DURING LOW-LEVEL INVERSION CONDITIONS, WHEN WINDS ARE GUSTY, OR UNDER ANY OTHER CONDITIONS WHICH FAVOR DRIFT. DRIFT MAY CAUSE DAMAGE TO ANY VEGETATION CONTACTED TO WHICH TREATMENT IS NOT INTENDED. MAINTAIN APPROPRIATE BUFFER ZONES TO PREVENT INJURY TO ADJACENT DESIRABLE VEGETATION.

Do not allow the herbicide solution to mist, drip, drift, or splash onto desirable vegetation since minute quantities of this herbicide can cause severe damage or destruction to the crop, plants, or other areas on which treatment was not intended. The likelihood of injury occurring from the use of this product is greatest when winds are gusty or in excess of 5 miles per hour or when other conditions including lesser wind velocities will allow spray drift to occur. When spraying, avoid combinations of pressure and nozzle type that will result in splatter or fine particles (mist) that are likely to drift. AVOID APPLYING AT EXCESSIVE SPEED OR PRESSURE.

Coarse sprays are less likely to drift; therefore, do not use nozzles or nozzle configurations that dispense spray as fine spray droplets. Do not angle nozzles forward into the airstream and do not increase spray volume by increasing nozzle pressure.

WEEDS CONTROLLED: For specific rates of application and instructions, refer to the "ANNUAL WEEDS RATE TABLE" and the "PERENNIAL WEEDS RATE TABLE."

TANK MIXTURES: Tank mixes of this product with other herbicides, insecticides, or fungicides may result in reduced weed control or crop injury and are not recommended for over-the-top applications of this product. Some weeds with multiple germination times or suppressed (stunted) weeds may require sequential applications of this product for control. The second application should be made after some regrowth has occurred and at least 10 days after a previous application of this product. This product will control or suppress most perennial weeds. For some perennial weeds, repeat applications may be required to eliminate crop competition throughout the growing season. For over-the-top uses on Roundup Ready® crop varieties, crop safety and weed control performance are not warranted by MANA when this product is used in conjunction with "brown bag" or "bin run" seed saved from previous year's production and replanted.

Preplant or Preemergence

USE INSTRUCTIONS: This product may be applied by aerial or ground application equipment before planting or emergence of canola.

RESTRICTIONS, PRECAUTIONS: The maximum combined application rate from all preplant and preemergent applications must not exceed 2 quarts per acre per season. **NOTE:** In no-till and stale seedbed systems, always use a burndown treatment to control existing weeds before canola emerges. Apply a preplant burndown treatment of 16 to 32 fl. oz. per acre of this product.

Over-the-Top (Postemergence)

USE INSTRUCTIONS: This product may be applied by aerial or ground application equipment postemergence to Roundup Ready® canola from emergence through the 6-leaf stage of development. To maximize yield potential, make applications early to eliminate competing weeds.

RESTRICTIONS, PRECAUTIONS: Do not exceed 16 fl. oz. per acre of this product in any single over-the-top broadcast application. Do not apply more than two broadcast over-the-top applications from emergence to the 6-leaf stage of development. Sequential over-the-top applications must be at least 10 days apart.

5.3 Corn with the Roundup Ready® Gene

MANA RECOMMENDS USE OF THIS PRODUCT ONLY ON CORN SEED WHICH CONTAINS THE ROUNDUP READY® GENE.

SEVERE INJURY OR DEATH WILL RESULT IF CORN VARIETIES WHICH DO NOT CONTAIN THE ROUNDUP READY® GENE ARE SPRAYED WITH THIS PRODUCT. Avoid contact with foliage, green stems, fruit of crops, or any desirable plants which do not contain the Roundup Ready® gene, since severe injury or destruction will result.

Postemergence

USE INSTRUCTIONS: This product may be applied postemergence to Roundup Ready® corn during the period beginning at corn emergence and continuing through the 12-leaf stage or until corn height reaches 30 inches, whichever comes first.

PRECAUTIONS, RESTRICTIONS: See the "ROUNDUP READY® CROPS" section of this label for general precautionary instructions for use in Roundup Ready® crops. Single in-crop applications of this product are not to exceed 1 quart per acre. Sequential in-crop applications of this product may not exceed 2 quarts per acre per growing season. Total Glyphogan Plus use must not exceed 8 quarts per acre per year. Refer to the table below for maximum seasonal rates.

Allow a minimum of 50 days between application of this product and harvest of corn forage and 7 days between application and harvest of corn grain. Allow a minimum of 14 days between in-crop applications of this product. The use of additives for in-crop applications to Roundup Ready® corn is prohibited. There are no rotational crop restrictions following applications of this product.

Maximum Allowable Application Quantities Per Season	
Combined total per year for all applications	8 quarts per acre
Preplant, preemergence applications (maximum)	5 quarts per acre
Total in-crop applications from emergence to 12-leaf stage or 30 inches	2 quarts per acre
Maximum preharvest application rate	1 quart per acre

WEEDS CONTROLLED: When applied as directed, this product controls labeled annual grass and broadleaf weeds in Roundup Ready® corn. Many perennial grasses and broadleaf weeds will be controlled or suppressed with one or more application of this product. Applications should be made to actively growing weeds before they reach the maximum size listed in the "ANNUAL WEEDS RATE TABLE" and "PERENNIAL WEEDS RATE TABLE" on this label. Glyphogan Plus applied at up to 1 quart per acre will burn down or suppress the growth of the following perennial weeds and reduce crop competition: nutsedge, rhizome johnsongrass, quackgrass, Canada thistle, wirestem muhly.

AVOID DRIFT. EXTREME CARE MUST BE USED WHEN APPLYING THIS PRODUCT TO PREVENT INJURY TO DESIRABLE PLANTS AND CROPS.

Ground Applications: Apply this product in 5 to 20 gallons of spray solution per acre using broadcast equipment. Refer to the "ANNUAL WEEDS RATE TABLE" and "PERENNIAL WEEDS RATE TABLE" section for specific application rates. Carefully select proper nozzle and spray pressure to avoid spraying a fine mist. For best results with ground application equipment, use nozzles which provide a flat fan pattern. Check for even distribution of spray droplets.

Aerial Applications: Use the specified rates of this product in 3 to 15 gallons of spray solution per acre. Do not exceed a maximum rate of 1 quart of this product per acre when applied by air. Refer to the "ANNUAL WEEDS RATE TABLE" and "PERENNIAL WEEDS RATE TABLE" sections for specific application rates. AVOID DRIFT. DO NOT APPLY DURING INVERSION CONDITIONS, WHEN WINDS ARE GUSTY, OR UNDER ANY OTHER CONDITIONS WHICH FAVOR DRIFT. DRIFT MAY CAUSE DAMAGE TO ANY VEGETATION CONTACTED TO WHICH TREATMENT IS NOT INTENDED. MAINTAIN APPROPRIATE BUFFER ZONES TO PREVENT INJURY TO ADJACENT DESIRABLE VEGETATION.

Sequential Applications: Some weeds with multiple germination times or suppressed (stunted) weeds may require sequential applications of this product for control. The second application should be made after some regrowth has occurred.

TANK MIXTURES: Glyphogan Plus with Micro-Tech®: Use these tank mixtures for postemergence and residual control of additional annual weeds in corn. These tank mixtures may be made during the period beginning at corn emergence and continuing until corn height reaches 5 inches.

Glyphogan Plus with atrazine, Banvel®, Clarity®, Permit®, or 2,4-D: Use these tank mixtures for postemergence control of additional weeds in corn. A Glyphogan Plus tank mixture with atrazine may be made during the period beginning at corn emergence and continuing until corn height reaches 12 inches. A Glyphogan Plus tank mixture with Banvel or Clarity at 0.125 to 0.25 lb. per acre may be made during the period beginning at corn emergence and continuing until corn height reaches 30 inches. A Glyphogan Plus tank mixture with Permit may be made during the period beginning at corn emergence and continuing until corn height reaches 30 inches. A Glyphogan Plus tank mixture with 2,4-D at 0.125 to 0.25 lb. per acre may be made during the period beginning at corn emergence and continuing until corn is at the 5-leaf stage or corn height reaches 8 inches, whichever comes first.

5.4 Cotton with the Roundup Ready® Gene

See the "ROUNDUP READY® CROPS" section of this label for general precautionary instructions for use in Roundup Ready® Cotton. MANA RECOMMENDS USE OF THIS PRODUCT FOR POSTEMERGENCE APPLICATION ONLY ON COTTON VARIETIES DESIGNATED AS CONTAINING THE ROUNDUP READY® GENE.

SEVERE INJURY OR DEATH OF COTTON WILL RESULT IF ANY COTTON VARIETIES NOT PROPERLY DESIGNATED AS HAVING THE ROUNDUP READY® GENE ARE SPRAYED WITH THIS PRODUCT. AVOID CONTACT OF HERBICIDE WITH FOLIAGE, GREEN STEMS, FRUIT OF CROPS, OR ANY DESIRABLE PLANTS AND TREES, OTHER THAN CROPS WITH THE ROUNDUP READY® GENE, SINCE SEVERE INJURY OR DESTRUCTION WILL RESULT.

USE INSTRUCTIONS: This product will control many troublesome weeds with over-the-top, post-directed, hooded spray, and preharvest applications in Roundup Ready® cotton.

PRECAUTIONS, RESTRICTIONS: For preharvest applications (applied for preharvest annual and perennial weed control as a broadcast treatment to Roundup Ready® cotton after 20% boll crack), allow a minimum of 7 days between final application and harvest of cotton. There are no rotational crop restrictions following application of this product. Sprayer preparation: Cotton is very sensitive to many herbicides at extremely low concentrations, and care should be taken to thoroughly clean all equipment prior to use. Follow the cleaning procedures specified on the label of the product(s) previously used.

NOTE: Glyphogan Plus will not enhance the performance of harvest aids when applied to Roundup Ready® cotton. Do not apply Glyphogan Plus to crops grown for seed.

303

MAXIMUM ANNUAL RATES: See table below for maximum amount of this product which can be applied to Roundup Ready® Cotton.

Maximum Allowable Application Quantities Per Season	
Combined total per year for all applications	8 quarts per acre
Preplant, preemergence applications	5 quarts per acre
Total in-crop applications from ground cracking to lay-by	4 quarts per acre
Maximum preharvest application rate	2 quarts per acre

Ground Applications: Use the specified rates of this product in 5 to 20 gallons of spray solution per acre as a broadcast spray. Carefully select proper nozzle and spray pressure to avoid spraying a fine mist. For best results with ground application equipment, use nozzles which provide a flat fan pattern. Check for even distribution of spray droplets.

Aerial Applications: Use the specified rates of this product in 3 to 15 gallons of spray solution per acre. Do not exceed a rate of 1 quart of this product per acre. AVOID DRIFT. EXTREME CARE MUST BE USED WHEN APPLYING THIS PRODUCT TO PREVENT INJURY TO DESIRABLE PLANTS AND CROPS WHICH DO NOT CONTAIN THE ROUNDUP READY® GENE. DO NOT APPLY DURING LOW LEVEL INVERSION CONDITIONS, WHEN WINDS ARE GUSTY, OR UNDER ANY OTHER CONDITIONS WHICH FAVOR DRIFT. DRIFT MAY CAUSE DAMAGE TO ANY VEGETATION CONTACTED TO WHICH TREATMENT IS NOT INTENDED. MAINTAIN APPROPRIATE BUFFER ZONES TO PREVENT INJURY TO ADJACENT DESIRABLE VEGETATION.

Over-the-Top Applications

This product may be applied by aerial or ground application equipment postemergence to Roundup Ready® cotton from the ground cracking stage until the 4-leaf (node) stage of development (until the fifth true leaf reaches the size of a quarter). Over-the-top applications made after the 4-leaf (node) stage of development may result in boll loss, delayed maturity, and/or yield loss. Any single over-the-top broadcast application should not exceed 1 quart per acre. No more than two over-the-top broadcast applications may be made from crop emergence through the 4-leaf (node) stage of development. Sequential over-the-top applications of this product must be at least 10 days apart, and cotton must have at least two nodes of incremental growth between applications.

NOTE: Always plant into a weed-free seedbed. In no-till and stale seedbed systems, always burn down existing weeds before cotton emerges. Apply a pre-plant burndown treatment of 16 to 48 fl. oz. per acre of this product.

Post-Directed or Hooded Applications
This product may be applied using precision post-directed or hooded sprayers to Roundup Ready® cotton through lay-by. Be especially careful to minimize contact of the spray with cotton leaves. At this stage, post-directed equipment should be used which directs the spray to the base of the cotton plants. Place nozzles in a low position directing a horizontal spray pattern under the cotton leaves to contact weeds in the row. For best results, make applications while weeds are small (less than 3 inches). Minimize spray drift onto the leaves of the cotton plants by maintaining low spray pressure (less than 30 PSI). Applications that contact the cotton leaves may result in boll loss, delayed maturity, and/or yield loss. Any single post-directed application should not exceed 1 quart per acre of this product. No more than two applications should be made from the fifth leaf through lay-by. Sequential in-crop applications of this product must be at least 10 days apart, and cotton must have at least two nodes of incremental growth between applications.

Salvage Treatment
This treatment may be used after the 4-leaf stage of development and should only be used where weeds threaten to cause the loss of the crop. One quart per acre may be applied either as an over-the-top application or as a post-directed treatment sprayed higher on the cotton plants and over the weeds. **NOTE:** Salvage treatments will result in significant boll loss, delayed maturity, and/or yield loss. No more than one salvage treatment should be used per growing season.

WEEDS CONTROLLED: For specific rates of application and instructions for control of various annual and perennial weeds, refer to the "ANNUAL WEEDS RATE TABLE" and "PERENNIAL WEEDS RATE TABLE" of this label. Glyphogan Plus applied at 1 quart per acre will burn down or suppress the growth of the following perennial weeds and reduce crop competition: yellow and purple nutsedge, rhizome johnsongrass, common bermudagrass, silverleaf nightshade, trumpet creeper, and redvine. Fall preharvest applications may be required for control of these perennial weeds. Tank mixtures with other herbicides may result in reduced weed control or crop injury and are not recommended for over-the-top applications of this product. Some weeds with multiple germination times or suppressed (stunted) weeds may require sequential applications of this product for control.

5.5 Roundup Ready Flex Cotton

The instructions provided in this section are specific to, and may only be used with, varieties designated as Roundup Ready Flex cotton. Applications described in this section on other than Roundup Ready Flex cotton will cause crop injury and reduced yields. DO NOT combine the instructions in this section with those in the "Roundup Ready Cotton" section or with any other Roundup Ready cotton or Roundup Ready Flex cotton instructions in labeling for this or any other glyphosate-containing products. Drift of this product from an application made to Roundup Ready Flex cotton onto adjacent fields of post 4-leaf (node) Roundup Ready cotton may cause extensive injury including boll loss, delayed maturity, and/or yield loss.

TYPES OF APPLICATION: Preplant, At-Planting, Preemergence, Postemergence (In-crop), Preharvest

USE INSTRUCTIONS: Refer to the following table for maximum application rates of this product with Roundup Ready Flex cotton.

Maximum Application Rates	
Combined total per year for all applications	8 quarts per acre
Total of all Preplant, At-planting, Preemergence applications	5 quarts per acre
Total of all In-crop applications from cracking to 60 percent open bolls	6 quarts per acre
Total of all In-crop applications between layby and 60 percent open bolls	2 quarts per acre
Total of all In-crop applications from 60 percent bolls open to 7 days prior to harvest	2 quarts per acre
Total of all In-crop applications from emergence through harvest	6 quarts per acre

PRECAUTIONS, RESTRICTIONS: See the "ROUNDUP READY CROPS" section of the Glyphogan Plus Herbicide label for precautionary instructions regarding the use of this product in Roundup Ready Crops. Also refer to the Glyphogan Plus Herbicide label for more information on Maximum Application Rates.

Preplant, At-Planting, Preemergence
USE INSTRUCTIONS: This product may be applied before, during, or after planting Roundup Ready Flex cotton.

TANK MIXTURES: This product may be tank mixed with 2,4-D or Clarity and applied prior to planting only. This product may be tank mixed with the following products and applied prior to crop emergence. Ensure that the specific product being used is labeled for application prior to planting or the emergence of cotton. Read and follow label directions of all products in the tank mixture.

clomazone, diuron, flumioxazin, fluometuron, fomesafen, metolachlor, s-metolachlor, pendimethalin, prometryn, pyrithiobac-sodium

Caparol, Cotton Pro, Command, Cotoran, MANA Diuron, Direx, Karmex, Parallel, Parallel PCS Dual MAGNUM, Dual II MAGNUM, Prowl, Prowl H2O, Reflex, Pyrimax, Staple, Valor, Zorial

PRECAUTIONS, RESTRICTIONS: Maximum quantity of this product that may be applied for all preplant, at-planting, and preemergence applications combined is 5 quarts per acre per season. Refer to individual tank mix product label for restrictions and precautions; use according to the most restrictive precautionary statements for each product in the tank mixture.

Postemergence (In-crop)
USE INSTRUCTIONS: This product may be applied to control annual grasses and broadleaf weeds listed in the Glyphogan Plus Herbicide label. To maximize yield potential, eliminate competing weeds early. Many perennial weeds will be controlled or suppressed with one or more applications of this product. Use an initial application of 1 quart per acre to control or suppress 1- to 3-inch-tall annual grasses and broadleaf weeds. This product may be applied postemergence to Roundup Ready Flex cotton using ground application equipment at rates up to 1.5 quarts per acre per application. In addition to broadcast application, post-directed spray equipment may be used to achieve more thorough weed coverage.

TANK MIXTURES: This product may be tank mixed with the following products and applied postemergence (in-crop) over the top of Roundup Ready Flex cotton. Ensure that the specific product being used is labeled for application postemergence (in-crop) to cotton. Read and follow label directions of all products in the tank mixture.

clethodim, fluazifop-P-butyl, fomesafen, metolachlor, s-metolachlor, pyrithiobac-sodium, quizalofop-p-ethyl, sethoxydim, trifloxysulfuron-sodium

Assure II, Parallel, Parallel PCS, Dual MAGNUM, Envoke, Fusilade, Poast Plus, Arrow, Select, Pyrimax, Staple

Pyrimax or Staple may cause leaf yellowing and/or leaf crinkling when applied postemergence (in-crop) in Roundup Ready Flex cotton. Parallel and Dual Magnum applied over the top of Roundup Ready Flex cotton may cause leaf injury in the form of necrotic spotting.

This product can be tank mixed with the following products for in-crop application using precision post-directed or hooded sprayers. Ensure that the specific product being used is labeled for application postemergence (in-crop) to cotton. Read and follow label directions of all products in the tank mixture.

carfentrazone-ethyl, diuron, flumioxazin, fluometuron, linuron, pendimethalin, prometryn, pyrithiobac-sodium, trifloxysulfuron-sodium

Aim, Cotton PRO, Caparol, Cotoran, MANA Diuron, Direx, Envoke, Layby-Pro, Prowl H2O, Pyrimax, Staple, Valor

Pyrimax or Staple may cause leaf yellowing and/or leaf crinkling when applied postemergence (in-crop) in Roundup Ready Flex cotton.

PRECAUTIONS, RESTRICTIONS: The maximum single, in-crop application rate of this product to Roundup Ready Flex cotton using ground application equipment is 1.5 quarts per acre. **In-crop application rates above 1 quart per acre made alone or with the addition of other crop chemical products containing surfactant may cause a crop response including leaf speckling or leaf necrosis.** Do not exceed a maximum rate of 1 quart of this product per acre when making application by air. Between layby and 60 percent open bolls, the maximum combined total application rate of this product is 2 quarts per acre. The maximum combined total of all applications of this product made from crop emergence to 60 percent open bolls must not exceed 6 quarts per acre. **DO NOT ADD ADDITIONAL SURFACTANT OR ADDITIVES CONTAINING SURFACTANT TO THIS PRODUCT FOR OVER-THE-TOP APPLICATION TO ROUNDUP READY FLEX COTTON.** Refer to individual tank mix product label for restrictions and precautions; use according to the most restrictive precautionary statements for each product in the tank mixture.

Preharvest
USE INSTRUCTIONS: This product may be applied to Roundup Ready Flex cotton up to 2 quarts per acre for annual and perennial weed control prior to harvest after 60 percent boll crack.

NOTE: This product will not enhance the performance of harvest aids when applied to Roundup Ready Flex cotton.

PRECAUTIONS, RESTRICTIONS: Allow a minimum of 7 days between application and harvest of Roundup Ready Flex cotton. DO NOT ADD ADDITIONAL SURFACTANT OR ADDITIVES CONTAINING SURFACTANT TO THIS PRODUCT FOR PREHARVEST APPLICATION TO ROUNDUP READY FLEX COTTON.

ATTENTION: USE OF THIS PRODUCT IN ACCORDANCE WITH LABEL DIRECTIONS IS EXPECTED TO RESULT IN NORMAL GROWTH OF ROUNDUP READY FLEX COTTON; HOWEVER, DUE TO THE SENSITIVITY OF COTTON FRUITING TO VARIOUS ENVIRONMENTAL CONDITIONS, AGRONOMIC PRACTICES, AND OTHER FACTORS, IT IS IMPOSSIBLE TO ELIMINATE ALL RISKS ASSOCIATED WITH THIS PRODUCT, EVEN WHEN APPLICATIONS ARE MADE IN CONFORMANCE WITH THE LABEL SPECIFICIATIONS. IN SOME CASES, THESE FACTORS CAN RESULT IN BOLL LOSS, DELAYED MATURITY, AND/OR YIELD LOSS.

5.6 Soybeans with the Roundup Ready® Gene

MANA RECOMMENDS USE OF THIS PRODUCT FOR POSTEMERGENCE APPLICATION ONLY ON SOYBEAN VARIETIES DESIGNATED AS CONTAINING THE ROUNDUP READY® GENE.

SEVERE INJURY OR DEATH OF SOYBEANS WILL RESULT IF ANY SOYBEAN VARIETIES NOT PROPERLY DESIGNATED AS HAVING THE ROUNDUP READY® GENE ARE SPRAYED WITH THIS PRODUCT. AVOID CONTACT OF HERBICIDE WITH FOLIAGE, GREEN STEMS, FRUIT OF CROPS, OR ANY DESIRABLE PLANTS AND TREES, OTHER THAN CROPS WITH THE ROUNDUP READY® GENE, SINCE SEVERE INJURY OR DESTRUCTION WILL RESULT.

See the "ROUNDUP READY® CROPS" section of this label for general precautionary instructions for use in Roundup Ready® soybeans.

USE INSTRUCTIONS: This product may be applied postemergence to Roundup Ready® soybeans from the cracking stage throughout flowering. When applied as directed, this product will control the labeled annual grasses and broadleaf weeds in Roundup Ready® soybeans. Many perennial grasses and broadleaf weeds will be controlled or suppressed with one or more applications of this product.

PRECAUTIONS, RESTRICTIONS: Allow a minimum of 14 days between final application and harvest of soybeans. There are no rotational crop restrictions following application of this product. Refer to the table below for the maximum annual rates.

NOTE: The use of this product for in-crop applications over Roundup Ready® soybeans may not be used in California unless the applicator has at the time of application a California-approved supplemental label specifying the accepted directions for use.

MAXIMUM ANNUAL RATES: See table below for maximum amount of this product which can be applied to Roundup Ready® Soybeans.

Maximum Allowable Application Quantities Per Season	
Combined total per year for all applications	8 quarts per acre
Preplant, prior to crop emergence	5 quarts per acre
Total in-crop applications from cracking throughout flowering	3 quarts per acre
Maximum combined total applied in-crop and preharvest	3 quarts per acre
Maximum combined total applied during flowering	2 quarts per acre
Maximum single rate for in-crop applications	2 quarts per acre
Maximum preharvest application rate (applied after loss of green color in soybean pods until 14 days before harvest)	1 quart per acre

Ground Applications: Use the specified rates of this product in 5 to 20 gallons of spray solution per acre as a broadcast spray. Carefully select proper nozzle and spray pressure to avoid spraying a fine mist. For best results with ground application equipment, use nozzles which provide a flat fan pattern. Check for even distribution of spray droplets.

Aerial Applications: Use the specified rates of this product in 3 to 15 gallons of spray solution per acre. Do not exceed a rate of 1 quart of this product per acre. Aerial applications are permitted only in the states of Alabama, Arkansas, Florida, Georgia, Kansas, Louisiana, Mississippi, Missouri (boot heel only), North Carolina, Oklahoma, South Carolina, Tennessee, and Texas. DO NOT APPLY DURING LOW-LEVEL INVERSION CONDITIONS, WHEN WINDS ARE GUSTY, OR UNDER ANY OTHER CONDITIONS WHICH FAVOR DRIFT. DRIFT MAY CAUSE DAMAGE TO ANY VEGETATION CONTACTED TO WHICH TREATMENT IS NOT INTENDED. MAINTAIN APPROPRIATE BUFFER ZONES TO PREVENT INJURY TO ADJACENT DESIRABLE VEGETATION.

ANNUAL WEED APPLICATION RATES

The following application rates will provide control of labeled grasses and broadleaf weeds in conventional and no-till soybean production systems. Refer to the "ANNUAL WEEDS RATE TABLE" on this label for application rates for specific annual weeds.

MANA will not warrant crop safety or weed control when Roundup Ready® soybeans are treated with herbicides not specified on this label. Because of the potential for: 1) crop injury, 2) poor weed control from antagonism, and/or 3) rotational crop restrictions, herbicides not specified on this label should not be used, whether applied preemergence or applied postemergence as a tank mixture with Glyphogan Plus.

This product may be used up to 64 fl. oz. per acre in any single application for control of annual weeds where heavy weed densities exist. The maximum combined total of this product which can be applied during flowering is 64 fl. oz. per acre.

NOTE: The following instructions are based on a clean start at planting by using a burndown application or tillage to control existing weeds before crop emergence. In no-till and stale seedbed systems, a preplant burndown treatment of 16 to 64 fl. oz. per acre of this product can be used to control existing weeds prior to crop emergence.

MIDWEST/MID-ATLANTIC INSTRUCTIONS

Narrow Row or Drilled Soybeans: A single in-crop application of this product will provide effective control of labeled weeds. For best results, an initial application of 32 fl. oz. per acre on 4- to 8-inch weeds is recommended. Weeds will generally be 4 to 8 inches tall 3 to 5 weeks after planting. If the initial application is delayed and weeds are 8 to 18 inches tall, use 48 fl. oz. per acre for best results.

Under adverse growing conditions such as drought, hail, wind damage, or a poor soybean stand that slows or delays canopy closure, a sequential application of this product at 16 to 32 fl. oz. per acre may be necessary to control late flushes of weeds. The combined total application in-crop must not exceed 64 fl. oz. per acre.

Wide Row Soybeans: An in-crop application of this product will provide effective control of the initial stand of labeled weeds. For best results, apply an initial application of 32 fl. oz. per acre on 4- to 8- inch weeds. Weeds will generally be 4 to 8 inches tall 3 to 5 weeks after planting. If new flushes of weeds occur, they can be controlled by sequential applications of this product.

Initial Treatment

Weed Height (inches)	Rate (fl. oz./A)
8	32
18	48

Sequential Application (if needed, combined total application in-crop not to exceed 96 fl. oz./A)

Weed Height (inches)	Rate (fl. oz./A)
1-3	16
3-6	24
6-12	32

Giant ragweed: Apply 32 fl. oz./A when the weed is 8 to 12 inches tall to avoid the need for sequential application.

Groundcherry, ladysthumb, Pennsylvania smartweed, morning glory: Apply 32 fl. oz./A to weeds 3 to 6 inches tall.

Some weeds such as black nightshade, wooly cupgrass, shattercane, wild proso millet, burcucumber, and giant ragweed with multiple germination times may require a sequential application of this product. Suppressed or stunted weeds may also require sequential applications. Sequential applications should be made after some regrowth has occurred. Use a minimum of 16 fl. oz. of this product per acre for sequential applications. The combined total of all in-crop postemergence treatments must not exceed 96 fl. oz. per acre.

SOUTHEAST INSTRUCTIONS

Narrow Row, Drilled, or Wide Row Soybeans: An in-crop application of this product will provide effective control of the initial stand of labeled weeds. For best results, apply an initial application of 32 fl. oz. per acre on 3- to 6-inch weeds. Weeds will generally be 3 to 6 inches tall 2 to 3 weeks after planting.

Weed Height (inches)	Rate (fl. oz./A)
3-6	32
6-12	48

Under adverse growing conditions such as drought, hail, wind damage, or a poor soybean stand that slows or delays canopy closure, a sequential application of this product at 16 to 32 fl. oz. per acre may be necessary to control late flushes of weeds.

Sequential Application (if needed, combined total application in-crop not to exceed 96 fl. oz./A)

Weed Height (inches)	Rate (fl. oz./A)
2-3	16
3-6	24
6-12	32

Florida pusley, hemp sesbania, and spurred anoda: Apply 32 fl. oz. per acre to weeds 2 to 4 inches for the initial application. Apply 32 fl. oz. per acre when these weeds are 3 to 6 inches tall if a sequential application is necessary.

Morning glory, black nightshade, groundcherry, and Pennsylvania smartweed: Apply 24 fl. oz. per acre on 1- to 3-inch weeds, 32 fl. oz. per acre on 3- to 6-inch weeds, or 48 fl. oz. per acre on 6- to 12-inch weeds for the initial application. Some weeds such as black nightshade, broadleaf signalgrass, Texas panicum, burcucumber, and sicklepod with multiple germination times may require a sequential application of this product. Suppressed or stunted weeds may also require sequential applications. Sequential applications should be made after some regrowth has occurred. Use a minimum of 16 fl. oz. of this product per acre for sequential applications. The combined total of all in-crop postemergence treatments must not exceed 96 fl. oz. per acre.

DELTA/MID-SOUTH INSTRUCTIONS

Narrow Row, Drilled, or Wide Row Soybeans: An in-crop application of this product will provide effective control of the initial stand of labeled weeds. A sequential application will be required to control new flushes of weeds. For best results, an initial application of 32 fl. oz. per acre on 2- to 4-inch weeds is recommended. Weeds will generally be 2 to 4 inches tall 2 to 3 weeks after planting.

Initial Treatment

Weed Height (inches)	Rate (fl. oz./A)
2-4	32
5-12	48

Sequential Application (if needed, combined total application in-crop not to exceed 96 fl. oz./A)

Weed Height (inches)	Rate (fl. oz./A)
2-3	16
3-6	24
6-12	32

Hemp sesbania and spurred anoda: Apply a sequential treatment of 32 fl. oz. per acre to weeds 3 to 6 inches tall if necessary.

Some weeds such as black nightshade, broadleaf signalgrass, Texas panicum, burcucumber, and sicklepod with multiple germination times may require a sequential application of this product. Suppressed or stunted weeds may also require sequential applications. Sequential applications should be made after some regrowth has occurred. Use a minimum of 16 fl. oz. of this product per acre for sequential applications. The combined total of all in-crop postemergence treatments must not exceed 96 fl. oz. per acre.

PERENNIAL WEEDS APPLICATION RATES

A 32 to 64 fl. oz. per acre rate (single or multiple applications) of this product will control or suppress perennial weeds such as bermudagrass, Canada thistle, common milkweed, field bindweed, hemp dogbane, horsenettle, marestail (horseweed), nutsedge, quackgrass, rhizome johnsongrass, redvine, trumpetcreeper, swamp smartweed, and wirestem muhly. For best results, allow perennial weed species to achieve at least 6 inches of growth before spraying with Glyphogan Plus. For additional information on perennial weeds, see the "PERENNIAL WEEDS RATE TABLE" on this label. For some perennial species, repeat applications may be required to eliminate crop competition throughout the growing season.

5.7 Sugar Beets with the Roundup Ready® Gene

MANA RECOMMENDS USE OF THIS PRODUCT FOR APPLICATION ONLY ON SUGAR BEET VARIETIES DESIGNATED AS CONTAINING THE ROUNDUP READY® GENE.

SEVERE INJURY OR DEATH OF SOYBEANS WILL RESULT IF ANY SUGAR BEET VARIETIES NOT PROPERLY DESIGNATED AS HAVING THE ROUNDUP READY® GENE ARE SPRAYED WITH THIS PRODUCT. AVOID CONTACT OF HERBICIDE WITH FOLIAGE, GREEN STEMS, FRUIT OF CROPS, OR ANY DESIRABLE PLANTS AND TREES OTHER THAN CROPS WITH THE ROUNDUP READY® GENE, SINCE SEVERE INJURY OR DESTRUCTION WILL RESULT.

See the "ROUNDUP READY® CROPS" section of this label for general precautionary instructions for use in Roundup Ready® sugar beets.

TYPES OF APPLICATIONS: Preplant, at-planting, preemergence, postemergence (in-crop).

PRECAUTIONS, RESTRICTIONS: Refer to the table below for rate restrictions.

Allow a minimum of 30 days between last application and sugar beet harvest. For any crop NOT listed in the "CROPS" section of this label, applications must be at least 30 days prior to planting.

Maximum Allowable Application Rates Per Season	
Combined total per year for all applications	8 quarts per acre
Combined total per year for preplant, preemergence applications	5 quarts per acre
Combined total from crop emergence through harvest	4.5 quarts per acre
Combined total per year for emergence to 8-leaf stage	2.5 quarts per acre
Combined total per year for 8-leaf stage to canopy closure	2 quarts per acre
Maximum single application rate from emergence to 8-leaf stage	1.5 quarts per acre
Maximum single application rate from 8-leaf stage and canopy closure	1 quart per acre

Preplant, Preemergence, At-Planting
USE INSTRUCTIONS: This product may be applied before, during, or after planting of Roundup Ready® sugar beets.

PRECAUTIONS, RESTRICTIONS: The maximum quantity of this product that may be applied for all preplant, at-planting, and preemergence applications combined is 5.0 quarts per acre per season.

Postemergence (In-Crop)
USE INSTRUCTIONS: To control annual grasses and broadleaf weeds, this product may be applied postemergent over the top to Roundup Ready® sugar beets from emergence to 30 days prior to harvest. To maximize yield potential, spray sugar beets early to eliminate competing weeds. Up to 4 sequential applications of this product may be made with at least 10 days between applications. Refer to the "ANNUAL WEEDS RATE TABLES" in this label for application rates for specific annual weeds. This product will control or suppress most perennial weeds. For some perennial weeds, repeat applications may be required to eliminate crop competition throughout the growing season.

6.0 NON-CROP USES AROUND THE FARMSTEAD

TYPES OF APPLICATIONS: General non-selective weed control, trim-and-edge, chemical mowing, cut stumps, habitat management, wildlife food plots, and rangelands (dormant).

General Weed Control, Trim-And-Edge
USE INSTRUCTIONS: This product may be used to control annual weeds, perennial weeds, and woody brush which are found in any part of the farmstead including building foundations, along and in fences, in dry ditches and canals, along ditchbanks, farm roads, shelterbelts, prior to landscape plantings and equipment storage areas.

TANK MIXTURES: This product may be tank mixed with the following products provided that the specific product is registered for use on such non-crop sites. Refer to these product labels for approved farmstead sites and application rates. For annual weeds, use 1 quart per acre of this product when weeds are less than 6 inches tall and 1.5 quarts per acre when weeds are greater than 6 inches tall. For perennial weeds, apply 2 to 5 quarts per acre in these tank mixes. For tank mixtures with these products through backpack sprayers, handguns, or other high-volume spray-to-wet applications, see "HAND-HELD OR HIGH-VOLUME EQUIPMENT" under the "APPLICATION EQUIPMENT AND TECHNIQUES" section of this label for specified rates.

309

Banvel	2,4-D
Diuron	Simazine, Simazine 4L, Simazine 80W
Princep® Caliber 90	Surflan® 75 W
Surflan® AS/Oryzalin 4 AS	

This product plus dicamba tank mixtures may not be applied by air in California.

Chemical Mowing
USE INSTRUCTIONS: This product will suppress perennial grasses listed in this section to serve as a substitute for mowing. Use 6 to 8 fl. oz. of this product per acre. Use 6 fl. oz. of this product per acre when treating Kentucky bluegrass. Use 8 fl. oz. of this product per acre when treating tall fescue, fine fescue, orchardgrass, or quackgrass covers. Apply treatments in 10 to 20 gallons of spray solution per acre. Chemical mowing applications may be made along farm ditches and other parts of farmsteads.

PRECAUTIONS, RESTRICTIONS: Use only in areas where some temporary injury or discoloration of perennial grasses can be tolerated.

Cut Stumps
TYPES OF APPLICATIONS: Treating cut stumps in any non-crop site listed on this label.

USE INSTRUCTIONS: This product will control regrowth of cut stumps and resprouts of many types of woody brush and tree species, some of which are listed below. Apply this product using suitable equipment to ensure coverage of the entire cambium. Cut trees or resprouts close to the soil surface. Apply a 50 to 100 percent solution of this product to the freshly cut surface immediately after cutting. Delays in application may result in reduced performance. For best results, applications should be made during periods of active growth and full leaf expansion.

Alder	Saltcedar
Eucalyptus	Sweetgum
Madrone	Tan oak
Oak	Willow
Reed, giant	

PRECAUTIONS, RESTRICTIONS: Do not make cut stump applications when the roots of desirable woody brush or trees may be grafted to the roots of the cut stump. Injury resulting from root grafting may occur in adjacent woody brush or trees.

Habitat Restoration and Management
TYPES OF USES: Habitat restoration and maintenance, wildlife food plots.

USE INSTRUCTIONS: This product may be used to control exotic and other undesirable vegetation in habitat management areas. Applications can be made to allow recovery of native plant species, prior to planting desirable native species, and for similar broad spectrum vegetation control requirements in habitat management areas. Spot treatments can be made to selectively remove unwanted plants for habitat maintenance and enhancement. The tank mixtures listed in this section of the label may be used for habitat restoration and maintenance.

Wildlife Food Plots
USE INSTRUCTIONS: This product may be used as a site preparation treatment to control annual and perennial weeds prior to planting wildlife food plots. Any wildlife food species may be planted after applying this product, or native species may be allowed to repopulate the area. If tillage is needed to prepare a seedbed, wait 7 days after application before tillage.

Rangelands (Dormant)
USE DIRECTIONS: This product will control or suppress many weeds, including downy brome, cheatgrass, cereal rye, medusahead rye, and jointed goatgrass in dormant rangelands. Apply 8 to 16 fl. oz. of this product per acre in the early spring when the weeds have greened up, but desirable grasses such as crested and tall wheatgrass are still truly dormant. Slight discoloration of the desirable grasses may occur, but they will regreen and regrow under most soil conditions as effects of this product wear off.

PRECAUTIONS, RESTRICTIONS: Do not use ammonium sulfate when spraying dormant rangeland grasses with this product. Do not make more than one application per year.

7.0 CHRISTMAS TREES

TYPES OF APPLICATIONS: Post-directed, spot treatment, site preparation

Post-Directed, Spot Treatment
USE INSTRUCTIONS: This product may be used as a post-directed spray and spot treatment around established Christmas trees.

PRECAUTIONS, RESTRICTIONS: Desirable plants may be protected from the spray solution by using shields or coverings made of cardboard or other impermeable material. THIS PRODUCT IS NOT RECOMMENDED FOR USE AS AN OVER-THE-TOP BROADCAST SPRAY IN CHRISTMAS TREES. Care must be exercised to avoid contact of spray, drift, or mist with foliage or green bark of established Christmas trees.

Site Preparation
USE INSTRUCTIONS: This product may be used prior to planting Christmas trees.

PRECAUTIONS, RESTRICTIONS: Precautions should be taken to protect non-target plants during site preparation applications.

ANNUAL WEEDS RATE TABLE
(Alphabetically by Species)

WATER CARRIER VOLUMES OF 3 TO 10 GALLONS PER ACRE FOR GROUND APPLICATIONS AND 3 TO 5 GALLONS PER ACRE FOR AERIAL APPLICATIONS ARE RECOMMENDED.

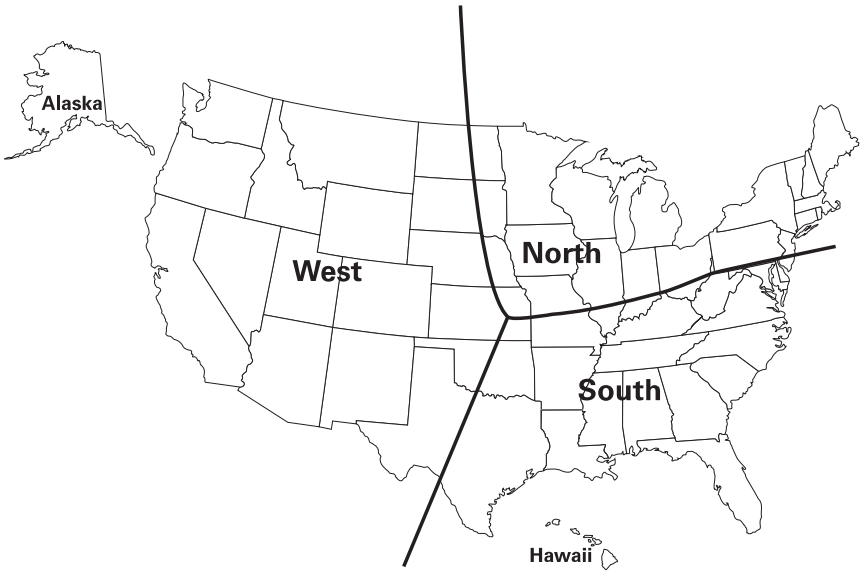
Apply to actively growing annual weeds.

Do not tank mix with soil residual herbicides when using these rates unless otherwise specified.

For weeds that have been mowed, grazed, or cut, allow regrowth to occur prior to treatment.

For those rates less than 48 fl. oz. per acre, this product may be used up to 48 fl. oz. per acre where heavy weed densities exist.

Refer to the map below for locations of the regions listed in the annual weed tables below.



ANNUAL WEEDS RATE TABLE – NORTH (N) AND SOUTH (S) REGIONS

The table below gives the maximum height or length in inches for various annual weeds which are controlled by Glyphogan Plus at different use rates (fl. oz. per acre).

		Maximum Weed Height/Length (in inches)					
		RATE OF GLYPHOGAN PLUS (fluid ounces per acre)					
WEED SPECIES	**REGION**	**12**	**16**	**24**	**32**	**40**	**48**
Anoda, spurred		–	1	2	3	5	8
Barley		–	18	18 +	–	–	–
Barnyardgrass	S	–	3	5	7	9	12
	N	–	–	6	12	–	–
Bassia, fivehook		–	–	–	6	–	–
Bittercress		–	12	20	–	–	–
Bluegrass, annual		–	10	–	–	–	–
Brome, downy		6	–	–	–	–	–
Brome, Japanese		–	6	–	24	–	–
Browntop panicum		–	6	8	12	–	24
Burcucumber		–	–	6	12	–	–
Buttercup		–	12	20	–	–	–
Carolina foxtail		–	20	–	–	–	–
Carolina geranium		–	–	–	4	–	9
Carpetweed		–	–	6	12	–	–

(continued on next page)

WEED SPECIES	REGION	Maximum Weed Height/Length (in inches) RATE OF GLYPHOGAN PLUS (fluid ounces per acre) 12	16	24	32	40	48
Cheat		–	6	20	–	–	–
Chervil		–	20	–	–	–	–
Chickweed		–	12	18	–	–	–
Cocklebur		–	12	18	24	–	–
Copperleaf, hophornbeam		–	1	2	3	4	6
Copperleaf, Virginia		–	1	2	3	4	6
Corn		–	12	20	–	–	–
Corn speedwell		–	12	–	–	–	–
Crabgrass		–	12	18	–	–	–
Cutleaf evening primrose		–	–	–	3	–	6
Dwarfdandelion		–	20	–	–	–	–
Eastern mannagrass		–	8	12	–	–	–
Eclipta		–	4	8	12	–	–
Fall panicum	S	–	4	6	8	12	24
	N	–	6	12	18	–	–
Falsedandelion		–	20	–	–	–	–
Falseflax, smallseed		–	12	–	–	–	–
Fiddleneck		–	–	–	6	–	12
Field pennycress		–	6	12	–	–	–
Filaree		–	–	–	–	–	12
Fleabane, annual		–	6	20	–	–	–
Fleabane, hairy *(Conyza bonariensis)*		–	6	–	–	–	–
Fleabane, rough		–	3	6	12	–	–
Florida pusley		–	–	–	12	–	–
Foxtail	N	18	18 +	–	–	–	–
	S	–	8	12	20	–	–
Goatgrass, jointed		–	6	–	–	–	–
Goosegrass		–	3	5	8	–	18
Grain sorghum (milo)		–	6	12	20	–	–
Groundsel, common		–	6	–	–	–	–
Hemp sesbania		–	–	2	4	6	8
Henbit		–	–	–	6	–	20
Horseweed/Marestail	N	–	6	12	18	–	–
(Conyza canadensis)	S	–	–	12	30	–	–
Itchgrass		–	6	12	18	–	–

(continued on next page)

WEED SPECIES	REGION	Maximum Weed Height/Length (in inches) RATE OF GLYPHOGAN PLUS (fluid ounces per acre) 12	16	24	32	40	48
Jimsonweed		–	–	6	–	12	–
Johnsongrass, seedling	N	–	12	18	–	–	–
	S	–	–	18	–	–	–
Junglerice		–	3	5	7	9	12
Knotweed		–	3	8	12	–	20
Kochia **		–	–	3 to 6	12	–	–
Lambsquarters		–	6	8	12	–	20
Little barley		–	20	–	–	–	–
London rocket		–	6	–	–	–	–
Mayweed		–	–	2	6	12	18
Morning glory (*Ipomoea* spp.)		–	–	2	4	–	6
Mustard, blue		6	–	–	–	–	–
Mustard, tansy		6	12	20	–	–	–
Mustard, tumble		6	–	–	–	–	–
Mustard, wild		6	12	18	–	–	–
Nightshade, black		–	6	12	–	–	–
Nightshade, hairy		–	6	12	–	–	–
Oats		–	–	6	20	–	–
Pigweed species		–	12	18	24	–	–
Plains/Tickseed coreopsis		–	5	12	18	–	–
Prickly lettuce		–	6	12	20	–	–
Purslane		–	–	–	6	–	12
Ragweed, common	N	–	6	12	18	–	–
	S	–	4	6	8	–	11
Ragweed, giant		–	–	4	6	–	11
Red rice		–	–	–	4	–	–
Russian thistle		–	–	–	6	–	–
Rye	N	–	18	18 +	–	–	–
	S	–	6	20	60	–	–
Ryegrass		–	–	–	6	–	7 +
Sandbur, field		12	–	–	–	–	–
Shattercane		–	12	18	–	–	–
Shepherdspurse		–	6	12	–	–	–
Sicklepod		–	–	2	4	–	8
Signalgrass, broadleaf		–	3	5	7	9	12
Smartweed, ladysthumb		–	4	6	8	–	12

(continued on next page)

WEED SPECIES	REGION	Maximum Weed Height/Length (in inches) RATE OF GLYPHOGAN PLUS (fluid ounces per acre) 12	16	24	32	40	48
Smartweed, Pennsylvania		–	4	6	8	–	12
Sowthistle, annual		–	–	–	6	–	12
Spanishneedles		–	–	–	8	–	18
Speedwell, purslane		–	12	–	–	–	–
Sprangletop		–	6	12	20	–	–
Spurge, prostrate		–	6	12	20	–	–
Spurge, spotted		–	6	12	20	–	–
Spurry, umbrella		6	–	–	–	–	–
Stinkgrass		12	–	–	–	–	–
Sunflower		–	12	18	–	–	–
Teaweed/Prickly sida		–	1	2	3	4	6
Texas panicum		–	6	8	12	–	24
Velvetleaf	N	–	3	6	12	–	–
	S	–	2	3	4	5	8
Virginia pepperweed		–	18	–	–	–	–
Waterhemp		–	–	6	12	–	–
Wheat	N	–	18	18 +	–	–	–
	S	–	6	30	–	–	–
Wheat (overwintered)		–	6	18	–	–	–
Wild oats		–	12	–	–	–	–
Witchgrass		–	12	–	–	–	–
Woolly cupgrass		–	6	12	–	–	–
Yellow rocket		–	–	12	20	–	–

** Do not treat kochia in the button stage.

ANNUAL WEEDS RATE TABLE – WEST REGION

The table below gives the maximum height or length in inches for various annual weeds which are controlled by Glyphogan Plus at different use rates (fl. oz. per acre).

WEED SPECIES	REGION	Maximum Weed Height/Length (in inches) RATE OF GLYPHOGAN PLUS (fluid ounces per acre) 12	16	24	32	48
Barley		12	–	–	–	–
Barnyardgrass		6	–	–	–	–
Bluegrass, annual		6	–	–	–	–
Bluegrass, bulbous		–	6	–	–	–
Brome, downy **		6	–	–	–	–

(continued on next page)

WEED SPECIES	REGION	Maximum Weed Height/Length (in inches) RATE OF GLYPHOGAN PLUS (fluid ounces per acre) 12	16	24	32	48
Buttercup		–	12	–	–	–
Cheat		–	6	–	–	–
Chickweed		–	6	–	–	–
Cocklebur		–	12	–	–	–
Corn		–	6	–	–	–
Crabgrass		–	12	–	–	–
Dwarfdandelion		–	12	–	–	–
Fall panicum		–	12	–	–	–
Falseflax, smallseed		–	12	–	–	–
Field pennycress		–	6	–	–	–
Filaree		–	–	–	–	12
Fleabane, hairy *(Conyza bonariensis)*		–	6	–	–	–
Florida pusley		–	–	–	12	–
Foxtail		8 fl. oz. for up to 12 inches				
Goatgrass, jointed		–	6	–	–	–
Groundsel, common		–	6	–	–	–
Henbit		–	6	–	–	–
Horseweed/Marestail *(Conyza canadensis)*		–	6	–	–	–
Johnsongrass, seedling		–	12	–	–	–
Lambsquarters		–	6	–	–	–
London rocket		–	6	–	–	–
Morning glory *(Ipomoea* spp.)		–	2	–	–	–
Mustard, blue		6	–	–	–	–
Mustard, tansy		6	–	–	–	–
Mustard, tumble		6	–	–	–	–
Mustard, wild		6	–	–	–	–
Pigweed species		–	12	–	–	–
Rye		12	–	–	–	–
Ryegrass, Italian		–	6	–	–	–
Sandbur, field		12	–	–	–	–
Shattercane		12	–	–	–	–
Shepherdspurse		–	6	–	–	–
Sowthistle, annual		–	6	–	–	–
Spurge, annual		–	6	–	–	–

(continued on next page)

WEED SPECIES	REGION	Maximum Weed Height/Length (in inches) RATE OF GLYPHOGAN PLUS (fluid ounces per acre) 12	16	24	32	48
Stinkgrass		12	–	–	–	–
Texas panicum		–	12	–	–	–
Wheat		18	–	–	–	–
Wild oats		–	12	–	–	–
Witchgrass		–	12	–	–	–

** For control of downy brome in no-till systems, use 16 fl. oz. per acre.

Annual Weeds – Rates for 10 to 40 Gallons per Acre

Apply 1 to 1.5 quarts of this product per acre. Use 1 quart per acre if weeds are less than 6 inches tall and 1.5 quarts per acre if weeds are over 6 inches tall. These rates will provide control of weeds listed in the annual weed control tables when water carrier volumes are 10 to 40 gallons per acre for ground applications.

Annual Weeds – Tank Mixtures with 2,4-D or Dicamba

12 to 16 fl. oz. of this product plus 0.25 pound a.i. of dicamba or 0.5 pound a.i. of 2,4-D per acre will control the following weeds with the maximum height or length indicated: 6 inches – prickly lettuce, marestail/horseweed, morning glory, kochia (dicamba only); 12 inches – cocklebur, lambsquarters, pigweed, Russian thistle.

16 fl. oz. of this product plus 0.5 pound a.i. of 2,4-D per acre will control the following weeds when they are a maximum height or length of 6 inches: common ragweed, giant ragweed, Pennsylvania smartweed, and velvetleaf.

12 fl. oz. of this product plus 0.25 pound a.i. of dicamba or 0.5 pound a.i. 2,4-D per acre will control foxtail up to 18 inches.

Refer to the specific product labels for crop rotation restrictions and cautionary statements of all products used in tank mixtures. Ensure that the specific product is registered for application at the desired site. Some crop injury may occur if dicamba is applied within 45 days of planting.

DO NOT APPLY DICAMBA TANK MIXTURES BY AIR IN CALIFORNIA.

316

PERENNIAL WEEDS RATE TABLE

(Alphabetically by Species)

Apply to actively growing perennial weeds.

NOTE: If weeds have been mowed or tilled, do not treat until plants have resumed active growth and have reached the recommended stages. Do not treat when weeds are under drought stress, as good soil moisture is necessary for active growth.

Repeat treatments may be necessary to control weeds regenerating from underground parts or seed. Repeat treatments must be made prior to crop emergence.

Unless otherwise stated, allow 7 or more days after application before tillage.

Best results are obtained when soil moisture is adequate for active weed growth.

For hand-held sprayers, prepare the desired volume of spray solution by mixing the amount of this product in water as shown in the following table.

Desired Volume	Amount of Glyphogan Plus to Prepare Different Percent Spray Concentrations 1/2%	1%	1 1/2%	2%	5%	10%
1 Gallon	2/3 oz	1 1/3 oz	2 oz	2 2/3 oz	6 1/2 oz	13 oz
25 Gallons	1 pt	1 qt	1 1/2 qt	2 qt	5 qt	10 qt
100 Gallons	2 qt	1 gal	1 1/2 gal	2 gal	5 gal	10 gal

2 tablespoons = 1 fluid ounce

Weed Species	Rate (Qt./A)	Water Volume (GPA)	Hand-Held % Solution
Alfalfa	**1**	**3 – 10**	**2%**
Make applications after the last hay cutting in the fall. Allow alfalfa to regrow to a height of 6 to 8 inches or more prior to treatment. Applications should be followed with deep tillage at least 7 days after treatment, but before soil freeze-up.			
Alligatorweed	**4**	**3 – 20**	**1.5%**
Partial control. Apply when most of the plants are in bloom. Repeat applications will be required to maintain control.			
Anise (fennel)	**—**	**—**	**1 – 2%**
For hand-held sprayers, apply as a spray-to-wet treatment. Optimum results are obtained when plants are treated at the bud to full-bloom stage of growth.			
Bahiagrass	**3 – 5**	**3 – 20**	**2%**
Apply when most plants have reached the early head stage.			
Bentgrass	**1.5**	**10 – 20**	**2%**
For suppression in grass seed production areas. For ground applications only. Ensure entire crown area has resumed growth prior to a fall application. Bentgrass should have at least 3 inches of growth. Tillage prior to treatment should be avoided. Tillage 7 to 10 days after application is recommended for best results.			
Bermudagrass	**3 – 5**	**3 – 20**	**2%**
For control, apply 5 quarts of this product per acre. For partial control, apply 3 quarts per acre. Treat when bermudagrass is actively growing and seedheads are present. Retreatment may be necessary to maintain control.			
Bermudagrass, water (knotgrass)	**1 – 1.5**	**5 – 10**	**2%**
Apply 1.5 quarts of this product in 5 to 10 gallons of water per acre. Apply when water bermudagrass is 12 to 18 inches in length. Allow 7 or more days before tilling, flushing, or flooding the field. Fall applications only: Apply 1 quart of this product in 5 to 10 gallons of water per acre. Fallow fields should be tilled prior to application. Apply prior to frost on water bermudagrass that is 12 to 18 inches in length. This product is not registered in California for use on water bermudagrass.			
Bindweed, field	**0.5 – 5**	**3 – 20**	**2%**
Do not treat when weeds are under drought stress, as good soil moisture is necessary for active growth. For control, apply 4 to 5 quarts of this product per acre west of the Mississippi River and 3 to 4 quarts east of the Mississippi River. Apply when the weeds are at or beyond full bloom. For best results, apply in late summer or fall. Fall treatments must be applied before a killing frost. Also for control, apply 2 quarts of this product plus 0.5 pound a.i. of dicamba in 10 to 20 gallons of water per acre. Do not apply by air. For suppression on irrigated agricultural land, apply 1 to 2 quarts of this product plus 1 pound a.i. of 2,4-D in 10 to 20 gallons of water per acre with ground equipment only. Applications should be made following harvest or in fall fallow ground when the bindweed is actively growing and the majority of runners are 12 inches or more in length. The use of at least one irrigation will promote active bindweed growth. For suppression, apply 16 fl. oz. of this product plus 0.5 pound a.i. of 2,4-D in 3 to 10 gallons of water per acre for ground applications and 3 to 5 gallons of water per acre for aerial applications. Apply by air in fallow and reduced-tillage systems only. Applications should be delayed until maximum emergence has occurred and when vines are between 6 to 18 inches in length. **In California only**, apply 1 to 5 quarts of this product per acre. Actual rate needed for suppression or control will vary within this range depending on local conditions. For suppression on irrigated land where annual tillage is performed, apply 1 quart of this product in 3 to 10 gallons of water per acre. Apply to bindweed that has reached a length of 12 inches or greater. Allow maximum weed emergence and runner growth. Allow 3 or more days after application before tillage.			
Bluegrass, Kentucky	**1 – 2**	**3 – 40**	**2%**
Apply 2 quarts of this product in 10 to 40 gallons of water per acre when most plants have reached boot-to-early seedhead stage of development. For partial control in pasture or hay crop renovation, apply 1 to 1.5 quarts of this product in 3 to 10 gallons of water per acre. Apply to actively growing plants when most have reached 4 to 12 inches in height.			
Blueweed, Texas	**3 – 5**	**3 – 40**	**2%**
Apply 4 to 5 quarts of this product per acre west of the Mississippi River and 3 to 4 quarts per acre east of the Mississippi River. Apply when plants are at or beyond full bloom. New leaf development indicates active growth. For best results, apply in late summer or fall. Fall treatments must be applied before a killing frost.			

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Weed Species	Rate (Qt./A)	Water Volume (GPA)	Hand-Held % Solution
Brackenfern	**3 – 4**	**3 – 40**	**1 – 1.5%**
Apply to fully expanded fronds that are at least 18 inches long.			
Bromegrass, smooth	**1 – 2**	**3 – 40**	**2%**
Apply 2 quarts of this product in 10 to 40 gallons of water per acre when most plants have reached boot-to-early seedhead stage of development. For partial control in pasture or hay crop renovation, apply 1 to 1.5 quarts of this product in 3 to 10 gallons of water per acre. Apply to actively growing plants when most have reached 4 to 12 inches in height.			
Bursage, woolly-leaf	**—**	**3 – 20**	**2%**
For control, apply 2 quarts of this product plus 0.5 pound a.i. of dicamba per acre. For partial control, apply 1 quart of this product plus 0.5 pound a.i. of dicamba per acre. Apply when plants are producing new active growth which has been initiated by moisture for at least 2 weeks and when plants are at or beyond flowering.			
Canarygrass, reed	**2 – 3**	**3 – 40**	**2%**
For best results, apply when most plants have reached the boot-to-head stage of growth.			
Cattail	**3 – 5**	**3 – 40**	**2%**
Apply when most plants have reached the early head stage.			
Clover, red or white	**3 – 5**	**3 – 20**	**2%**
Apply when most plants have reached the early bud stage.			
Cogongrass	**3 – 5**	**10 – 40**	**2%**
Apply when cogongrass is at least 18 inches tall in late summer or fall. Due to uneven stages of growth and the dense nature of vegetation preventing good spray coverage, repeat treatments may be necessary to maintain control.			
Dallisgrass	**3 – 5**	**3 – 20**	**2%**
Apply when most plants have reached the early head stage.			
Dandelion	**3 – 5**	**3 – 40**	**2%**
Apply when most plants have reached the early bud stage of growth. Also for control, apply 16 fl. oz. of this product plus 0.5 pound a.i. of 2,4-D in 3 to 10 gallons of water per acre.			
Dock, curly	**3 – 5**	**3 – 40**	**2%**
Apply when most plants have reached the early bud stage of growth. Also for control, apply 16 fl. oz. of this product plus 0.5 pound a.i. of 2,4-D in 3 to 10 gallons of water per acre.			
Dogbane, hemp	**4**	**3 – 40**	**2%**
Apply when most plants have reached the late bud to flower stage of growth. Following crop harvest or mowing, allow weeds to regrow to a mature stage prior to treatment. For best results, apply in late summer or fall. For suppression, apply 16 fl. oz. of this product plus 0.5 pound a.i. of 2,4-D in 3 to 10 gallons of water per acre for ground applications and 3 to 5 gallons of water per acre for aerial applications. Delay applications until maximum emergence of dogbane has occurred.			
Fescue (except tall)	**3 – 5**	**3 – 20**	**2%**
Apply when most plants have reached the early head stage.			
Fescue, tall	**1 – 3**	**3 – 40**	**2%**
Apply 3 quarts of this product per acre when most plants have reached boot-to-early seedhead stage of development. Fall applications only: Apply 1 quart of this product in 3 to 10 gallons of water per acre. Apply to fescue in the fall when plants have 6 to 12 inches of new growth. A sequential application of 1 pint per acre of this product will improve long-term control and control seedlings germinating after fall treatments or the following spring.			
Guineagrass	**3**	**3 – 40**	**1%**
Apply when most plants have reached at least the 7-leaf stage of growth. Ensure thorough coverage when using hand-held equipment.			

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Weed Species	Rate (Qt./A)	Water Volume (GPA)	Hand-Held % Solution
Horsenettle	**3 – 5**	**3 – 20**	**2%**
Apply when most plants have reached the early bud stage.			
Horseradish	**4**	**3 – 40**	**2%**
Apply when most plants have reached the late bud to flower stage of growth. For best results, apply in late summer or fall.			
Iceplant	**—**	**—**	**1.5 – 2%**
Iceplant should be at or beyond the early bud stage of growth. Thorough coverage is necessary for best control.			
Jerusalem artichoke	**3 – 5**	**3 – 20**	**2%**
Apply when most plants are in the early bud stage.			
Johnsongrass	**0.5 – 3**	**3 – 40**	**1%**
In annual cropping systems, apply 1 to 2 quarts of this product per acre. Apply 1 quart in 3 to 10 gallons of water per acre. Use 2 quarts of this product when applying 10 to 40 gallons of water per acre. In non-crop or areas where annual tillage is not practiced (no-till), apply 2 to 3 quarts of this product in 10 to 40 gallons of water per acre.			
For best results, apply when most plants have reached the boot-to-head stage of growth or in the fall prior to frost. Allow 7 or more days after application before tillage. Do not tank mix with residual herbicides when using 1 quart of this product per acre.			
For burndown of Johnsongrass, apply 1 pint of this product in 3 to 10 gallons of water per acre before the plants reach a height of 12 inches. For this use, allow at least 3 days after treatment before tillage.			
Spot treatment (partial control or suppression) – Apply a 1 percent solution of this product when Johnsongrass is 12 to 18 inches in height. Coverage should be uniform and complete.			
Kikuyugrass	**2 – 3**	**3 – 40**	**2%**
Spray when most kikuyugrass is at least 8 inches in height (3- or 4-leaf stage of growth). Allow 3 or more days after application before tillage.			
Knapweed	**4**	**3 – 40**	**2%**
Apply when most plants have reached the late bud to flower stage of growth. For best results, apply in late summer or fall.			
Lantana	**—**	**—**	**1 – 1.25%**
Apply at or beyond the bloom stage of growth. Use the higher application rate for plants that have reached the woody stage of growth.			
Lespedeza	**3 – 5**	**3 – 20**	**2%**
Apply when most plants have reached the early bud stage.			
Milkweed, common	**3**	**3 – 40**	**2%**
Apply when most plants have reached the late bud to flower stage of growth.			
Muhly, wirestem	**1 – 2**	**3 – 40**	**2%**
Use 1 quart of this product in 3 to 10 gallons of water per acre. Use 2 quarts of this product when applying 10 to 40 gallons of water per acre or in pasture, sod, or non-crop areas. Spray when the wirestem muhly is 8 inches or more in height. Do not till between harvest and fall applications or in the fall or spring prior to spring applications. Allow 3 or more days after application before tillage.			
Mullein, common	**3 – 5**	**3 – 20**	**2%**
Apply when most plants are in the early bud stage.			
Napiergrass	**3 – 5**	**3 – 20**	**2%**
Apply when most plants are in the early head stage.			
Nightshade, silverleaf	**2**	**3 – 10**	**2%**
Applications should be made when at least 60 percent of the plants have berries. Fall treatments must be applied before a killing frost.			

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Weed Species	Rate (Qt./A)	Water Volume (GPA)	Hand-Held % Solution
Nutsedge, purple or yellow	**0.5 – 3**	**3 – 40**	**1 – 2%**
Apply 3 quarts of this product per acre or apply a 1 to 2 percent solution for control of nutsedge plants and immature nutlets attached to treated plants. Treat when plants are in flower or when new nutlets can be found at rhizome tips. Nutlets that have not germinated will not be controlled and may germinate following treatment. Repeat treatments will be required for long-term control of ungerminated tubers. Sequential applications: 1 to 2 quarts of this product in 3 to 10 gallons of water per acre will also provide control. Make applications when a majority of the plants are in the 3- to 5-leaf stage (less than 6 inches tall). Repeat this application as necessary when newly emerging plants reach the 3- to 5-leaf stage. Subsequent applications will be necessary for long-term control. For partial control of existing plants, apply 1 pint to 2 quarts of this product in 3 to 40 gallons of water per acre. Treat when plants have 3 to 5 leaves and most are less than 6 inches tall. Repeat treatments will be required to control subsequent emerging plants or regrowth of existing plants.			
Orchardgrass	**1 – 2**	**3 – 40**	**2%**
Apply 2 quarts of this product in 10 to 40 gallons of water per acre when most plants have reached boot-to-early seedhead stage of development. For partial control in pasture or hay crop renovation, apply 1 to 1.5 quarts of this product in 3 to 10 gallons of water per acre. Apply to actively growing plants when most have reached 4 to 12 inches in height. Orchardgrass sods going to no-till corn: Apply 1 to 1.5 quarts of this product in 3 to 10 gallons of water per acre. Apply to orchardgrass that is a minimum of 12 inches tall for spring applications and 6 inches tall for fall applications. Allow at least 3 days following application before planting. A sequential application of atrazine will be necessary for optimum results.			
Pampasgrass	**—**	**—**	**1.5 – 2%**
Pampasgrass should be at or beyond the boot stage of growth. Thorough coverage is necessary for best control.			
Paragrass	**3 – 5**	**3 – 20**	**2%**
Apply when most plants are in the early head stage.			
Phragmites	**3 – 5**	**10 – 40**	**1 – 2%**
For partial control and for best results, treat during late summer or fall when plants are actively growing and in full bloom. Treatment before or after this stage may lead to reduced control. Due to the dense nature of the vegetation which may prevent good spray coverage or uneven stages of growth, repeat treatments may be necessary to maintain control. Visual control symptoms will be slow to develop.			
Poison hemlock	**—**	**—**	**1 – 2%**
For hand-held, apply as a spray-to-wet treatment. Optimum results are obtained when plants are treated at the bud to full-bloom stage of growth. Thorough coverage is necessary for best control.			
Quackgrass	**1 – 3**	**3 – 40**	**2%**
In annual cropping systems or in pastures and sods followed by deep tillage: Apply 1 quart of this product in 3 to 10 gallons of water per acre. For 10 to 40 gallons of water per acre, apply 2 quarts of this product. Do not tank mix with residual herbicides when using the 1-quart rate. Spray when quackgrass is 6 to 8 inches in height. Do not till between harvest and fall applications or in fall or spring prior to spring application. Allow 3 or more days after application before tillage. In pastures or sods, use a moldboard plow for best results. In pastures, sods, or non-crop areas where deep tillage does not follow application: Apply 2 to 3 quarts of this product in 10 to 40 gallons of water per acre when the quackgrass is greater than 8 inches tall.			
Redvine	**0.75 – 2**	**5 – 10**	**2%**
For suppression, apply 24 fl. oz. of this product per acre at each of two applications 7 to 14 days apart or a single application of 2 quarts per acre. Apply specified rates in 5 to 10 gallons of water per acre. Apply in late September or early October to plants that are at least 18 inches tall and have been growing 45 to 60 days since the last tillage operation. Make applications at least 1 week before a killing frost.			
Reed, giant	**—**	**—**	**2%**
Best results are obtained when applications are made in late summer to fall.			

(continued on next page)

Weed Species	Rate (Qt./A)	Water Volume (GPA)	Hand-Held % Solution
Ryegrass, perennial	**1 – 3**	**3 – 40**	**1%**
In annual cropping systems, apply 1 to 2 quarts of this product per acre. Apply 1 quart of this product in 3 to 10 gallons of water per acre. Use 2 quarts of this product when applying 10 to 40 gallons of water per acre. In non-crop or areas where annual tillage is not practiced (no-till), apply 2 to 3 quarts of this product in 10 to 40 gallons of water per acre. For best results, apply when most plants have reached the boot-to-head stage of growth or in the fall prior to frost. Do not tank mix with residual herbicides when using 1 quart of this product per acre.			
Smartweed, swamp	**3 – 5**	**3 – 40**	**2%**
Apply when most plants have reached the early bud stage of growth. Also for control, apply 16 fl. oz. of this product plus 0.5 pound a.i. of 2,4-D in 3 to 10 gallons of water per acre in the late summer or fall.			
Spurge, leafy	**—**	**3 – 10**	**2%**
For suppression, apply 16 fl. oz. of this product plus 0.5 pound a.i. of 2,4-D in 3 to 10 gallons of water per acre in the late summer or fall. If mowing has occurred prior to treatment, apply when most of the plants are 12 inches tall.			
Starthistle, yellow	**2**	**10 – 40**	**2%**
Best results are obtained when applications are made during the rosette, bolting, and early flower stages.			
Sweet potato, wild	**—**	**—**	**2%**
For partial control, apply to plants that are at or beyond the bloom stage of growth. Repeat applications may be required.			
Thistle, artichoke	**—**	**—**	**2%**
For partial control, apply to plants that are at or beyond the bloom stage of growth. Repeat applications may be required.			
Thistle, Canada	**2 – 3**	**3 – 40**	**2%**
Apply when most plants are at or beyond the bud stage of growth. After harvest, mowing, or tillage in the late summer or fall, allow at least 4 weeks for initiation of active growth and rosette development prior to the application of this product. Fall treatments must be applied before a killing frost. Allow 3 or more days after application before tillage. For suppression, apply 1 quart of this product or 1 pint of this product plus 0.5 pound a.i. of 2,4-D in 3 to 10 gallons of water per acre. Allow rosette regrowth to a minimum of 6 inches in diameter before treating. Applications can be made as long as leaves are still green and plants are actively growing at the time of application. Allow 3 or more days after application before tillage.			
Timothy	**2 – 3**	**3 – 40**	**2%**
For best results, apply when most plants have reached the boot-to-head stage of growth.			
Torpedograss	**4 – 5**	**3 – 40**	**2%**
For partial control, apply when most plants are at or beyond the seedhead stage of growth. Repeat applications will be required to maintain control. Fall treatments must be applied before frost.			
Trumpetcreeper	**2**	**5 – 10**	**2%**
For partial control, apply in late September or October to plants that are at least 18 inches tall and have been growing 45 to 60 days since the last tillage operation. Make applications at least 1 week before a killing frost.			
Vaseygrass	**3 – 5**	**3 – 20**	**2%**
Apply when most plants are in the early head stage.			
Velvetgrass	**3 – 5**	**3 – 20**	**2%**
Apply when most plants are in the early head stage.			
Wheatgrass, western	**2 – 3**	**3 – 40**	**2%**
For best results, apply when most plants have reached the boot-to-head stage of growth.			

WOODY BRUSH AND TREES RATE TABLE

Apply this product after full leaf expansion, unless otherwise directed. Use the higher rate for larger plants and/or dense areas of growth. On vines, use the higher rate for plants that have reached the woody stage of growth. Best results are obtained when application is made in late summer or fall after fruit formation.

In arid areas, best results are obtained when applications are made in the spring to early summer when brush species are at high moisture content and are flowering.

Allow 7 or more days after application before tillage, mowing, or removal. Repeat treatments may be necessary to control plants regenerating from underground parts or seed. Some autumn colors on undesirable deciduous species are acceptable provided no major leaf drop has occurred. Reduced performance may result if fall treatments are made following a frost.

Unless otherwise directed, apply broadcast treatments in 3 to 40 gallons of water per acre. Ensure thorough coverage when using hand-held equipment. Symptoms may not appear prior to frost or senescence with fall treatments.

Weed Species	Rate (Qt./A)	Hand-Held % Solution	
Alder	3 – 4	1 – 1.5%	
Ash *	2 – 5	1 – 2%	
Aspen, quaking	2 – 3	1 – 1.5%	
Bearmat (Bearclover) *	2 – 5	1 – 2%	
Beech *	2 – 5	1 – 2%	
Birch	2	1%	
Blackberry	3 – 4	1 – 1.5%	Make applications after plants have reached full leaf maturity. Best results are obtained when applications are made in late summer or fall. Applications may also be made after leaf drop and until a killing frost or as long as stems are green. After berries have set or dropped in late fall, blackberry can be controlled by applying a 0.75 percent solution of this product. For control of blackberries after leaf drop and until killing frost or as long as stems are green, apply 3 to 4 quarts of this product in 10 to 40 gallons of water per acre.
Blackgum	2 – 5	1 – 2%	
Bracken	2 – 5	1 – 2%	
Broom: French, Scotch	—	1.5 – 2%	
Buckwheat, California *	—	1 – 2%	Thorough coverage of foliage is necessary for best results.
Cascara *	2 – 5	1 – 2%	
Catsclaw *	—	1 – 1.5%	
Ceanothus *	2 – 5	1 – 2%	
Chamise	—	1%	Thorough coverage of foliage is necessary for best results.
Cherry: bitter, black, pin	2 – 3	1 – 1.5%	
Coyote brush	—	1.5 – 2%	Apply when at least 50 percent of the new leaves are fully developed.
Dogwood *	2 – 5	1 – 2%	
Elderberry	2	1%	
Elm *	2 – 5	1 – 2%	

(continued on next page)

Weed Species	Rate (Qt./A)	Hand-Held % Solution	
Eucalyptus	—	2%	For control of eucalyptus resprouts, apply when resprouts are 6 to 12 feet tall. Ensure complete coverage. Avoid application to drought-stressed plants.
Florida holly (Brazilian Peppertree)*	2 – 5	1 – 2%	
Gorse *	2 – 5	1 – 2%	
Hasardia *	—	1 – 2%	Thorough coverage of foliage is necessary for best results.
Hawthorn	2 – 3	1 – 1.5%	
Hazel	2	1%	
Hickory *	2 – 5	1 – 2%	
Honeysuckle	3 – 4	1 – 1.5%	
Hornbeam, American *	2 – 5	1 – 2%	
Kudzu	4	2%	Repeat applications may be required to maintain control.
Locust, black *	2 – 4	1 – 2%	
Madrone resprouts *	—	2%	Apply to resprouts that are 3 to 6 feet tall. Best results are obtained with spring/early summer treatments.
Manzanita *	2 – 5	1 – 2%	
Maple, red	2 – 4	1 – 1.5%	Apply a 1 to 1.5 percent solution when at least 50 percent of the new leaves are fully developed. For partial control, apply 2 to 4 quarts of this product per acre.
Maple, sugar	—	1 – 1.5%	Apply when at least 50 percent of the new leaves are fully developed.
Monkey flower *	—	1 – 2%	Thorough coverage of foliage is necessary for best results.
Oak: black, white *	2 – 4	1 – 2%	
Oak, post	3 – 4	1 – 1.5%	
Oak: northern, pin	—	1 – 1.5%	Apply when at least 50 percent of the new pin leaves are fully developed.
Oak: southern, red	2 – 3	1 – 1.5%	
Persimmon *	2 – 5	1 – 2%	
Pine	2 – 5	1 – 2%	
Poison ivy/Poison oak	4 – 5	2%	Repeat applications may be required to maintain control. Fall treatments must be applied before leaves lose green color.
Poplar, yellow *	2 – 5	1 – 2%	
Redbud, eastern	2 – 5	1 – 2%	
Rose, multiflora	2	1%	Treatments should be made prior to leaf deterioration by leaf-eating insects.
Russian olive *	2 – 5	1 – 2%	
Sage, black	—	1%	Thorough coverage of foliage is necessary for best results.
Sage, white *	2 – 5	1 – 2%	
Sagebrush, California	—	1%	Thorough coverage of foliage is necessary for best results.
Salmonberry	2	1%	

(continued on next page)

Weed Species	Rate (Qt./A)	Hand-Held % Solution	
Saltcedar	2 – 5	1 – 2%	
Sassafras *	2 – 5	1 – 2%	
Sourwood *	2 – 5	1 – 2%	
Sumac: poison, smooth, winged *	2 – 4	1 – 2%	
Sweetgum	2 – 3	1 – 1.5%	
Swordfern *	2 – 5	1 – 2%	
Tallowtree, Chinese	—	1%	Thorough coverage of foliage is necessary for best results.
Tan oak resprouts *	—	2%	Apply to resprouts that are less than 3 to 6 feet tall. Best results are obtained with fall applications.
Thimbleberry	2	1%	
Tobacco, tree *	—	1 – 2%	
Trumpetcreeper	2 – 3	1 – 1.5%	
Vine maple *	2 – 5	1 – 2%	
Virginia creeper	2 – 5	1 – 2%	
Waxmyrtle, southern *	2 – 5	1 – 2%	
Willow	3	1%	

* Partial Control

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STORAGE AND DISPOSAL

Do not contaminate water, foodstuffs, feed, or seed by storage or disposal.

PESTICIDE STORAGE: Store above 10°F (-12°C) to keep product from crystallizing. Crystals will settle to the bottom. If allowed to crystallize, place in a warm room at 68°F (20°C) for several days to redissolve and roll or shake container or recirculate in mini-bulk or bulk container to mix well before using.

Keep container closed to prevent spills and contamination.

PESTICIDE DISPOSAL: Wastes resulting from the use of this product that cannot be used or chemically reprocessed should be disposed of in a landfill approved for pesticide disposal or in accordance with applicable Federal, state, or local procedures.

Emptied container retains vapor and product residue. Observe all labeled safeguards until container is cleaned, reconditioned, or destroyed.

CONTAINER DISPOSAL:

Nonrefillable Container (five gallons or less): Nonrefillable container. Do not reuse or refill this container. Offer for recycling, if available. Clean container promptly after emptying. Triple rinse as follows: Empty the remaining contents into application equipment or a mix tank and drain for 10 seconds after the flow begins to drip. Fill the container 1/4 full with water and recap. Shake for 10 seconds. Pour rinsate into application equipment or a mix tank or store rinsate for later use or disposal. Drain for 10 seconds after the flow begins to drip. Repeat this procedure two more times.

Nonrefillable Container (greater than five gallons): Nonrefillable container. Do not reuse or refill this container. Offer for recycling, if available. Clean container promptly after emptying. Triple rinse as follows: Empty the remaining contents into application equipment or a mix tank. Fill the container 1/4 full with water. Replace and tighten closures. Tip container on its side and roll it back and forth, ensuring at least one complete revolution, for 30 seconds. Stand the container on its end and tip it back and forth several times. Turn the container over onto its other end and tip it back and forth several times. Empty the rinsate into application equipment or a mix tank or store rinsate for later use or disposal. Repeat this procedure two more times.

Refillable Container: Refillable container. Refill this container with glyphosate only. Do not reuse this container for any other purpose. Cleaning the container before final disposal is the responsibility of the person disposing of the container. Cleaning before refilling is the responsibility of the refiller. To clean the container before final disposal, empty the remaining contents from this container into application equipment or mix tank. Fill the container about 10 percent full with water. Agitate vigorously or recirculate water with the pump for 2 minutes. Pour or pump rinsate into application equipment or rinsate collection system. Repeat this rinsing procedure two more times.

325

LIMITATION OF WARRANTY AND LIABILITY

Read the entire directions for use, conditions of warranties and limitations of liability before using this product. If terms are not acceptable, return the unopened product container at once.

By using this product, user or buyer accepts the following **CONDITIONS**, **DISCLAIMER OF WARRANTIES** and **LIMITATIONS OF LIABILITY**.

CONDITIONS: The directions for use of this product are believed to be adequate and must be followed carefully. However, it is impossible to eliminate all risks associated with the use of this product. Crop injury, ineffectiveness or other unintended consequences may result because of such factors as weather conditions, presence of other materials, or the manner of use or application, all of which are beyond the control of Makhteshim Agan of North America, Inc. All such risks shall be assumed by the user or buyer.

DISCLAIMER OF WARRANTIES: To the extent consistent with applicable law, Makhteshim Agan of North America, Inc. makes no other warranties, express or implied, of merchantability or of fitness for a particular purpose or otherwise, that extend beyond the statements made on this label. No agent of Makhteshim Agan of North America, Inc. is authorized to make any warranties beyond those contained herein or to modify the warranties contained herein. To the extent consistent with applicable law, Makhteshim Agan of North America, Inc. disclaims any liability whatsoever for special, incidental or consequential damages resulting from the use or handling of this product.

LIMITATIONS OF LIABILITY: To the extent consistent with applicable law, the exclusive remedy of the user or buyer for any and all losses, injuries or damages resulting from the use or handling of this product, whether in contract, warranty, tort, negligence, strict liability or otherwise, shall not exceed the purchase price paid or at Makhteshim Agan of North America, Inc.'s election, the replacement of product.

Safety Data Sheet

Issue Date: 03-Feb-2009 **Revision Date:** 30-Oct-2015 **Version** 2

1. IDENTIFICATION

Product Identifier

Product Name **Glyphogan Plus herbicide**

Other means of identification

SDS # ADAMA-073

Registration Number(s) EPA Reg. No. 66222-176

Recommended use of the chemical and restrictions on use

Recommended Use EPA registered pesticide.

Details of the supplier of the safety data sheet

Manufacturer Address

Makhteshim Agan of North America, Inc. (d/b/a ADAMA)
3120 Highwoods Blvd., Suite 100
Raleigh, NC 27604
1-919-256-9300

Emergency Telephone Number

Emergency Telephone (24 hr) For fire, spill and/or leak contact INFOTRAC:
1-800-535-5053 (North America) 1-352-323-3500 (International)
For medical emergencies and health/safety inquiries, contact PROSAR:
1-877-250-9291

2. HAZARDS IDENTIFICATION

This chemical is a product registered by the Environmental Protection Agency and is subject to certain labeling requirements under federal law. These requirements differ from the classification criteria and hazard information required for safety data sheets, and for workplace labels of non-EPA registered chemicals. Please see Section 15 for additional EPA information. The product contains no substances which, at their given concentration, are considered to be hazardous to health.

Appearance Light yellow to amber clear liquid **Physical State** Liquid **Odor** Amine-like

Classification

Acute toxicity – Inhalation (Dusts/Mists)	Category 4

Signal Word

Warning

Hazard Statements
Harmful if inhaled

Precautionary Statements - Prevention
Avoid breathing dust/mist
Use only outdoors or in a well-ventilated area

Precautionary Statements – Response
IF INHALED: Remove person to fresh air and keep comfortable for breathing
Call a poison center/doctor if you feel unwell

3. COMPOSITION/INFORMATION ON INGREDIENTS

Chemical Name	CAS No	Weight-%
Isopropylamine salt of glyphosate	38641-94-0	41

4. FIRST-AID MEASURES

First Aid Measures

General Advice When possible, have the product container or label with you when calling a poison control center or doctor or going for treatment.

Eye Contact IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Call a poison control center or doctor for treatment advice.

Skin Contact IF ON SKIN: Wash with plenty of soap and water. Wash contaminated clothing before reuse. If skin irritation or rash occurs: Get medical advice/attention.

Inhalation Give oxygen if breathing is difficult. If breathing has stopped, call 911, give artificial respiration. Call a poison control center or doctor for further treatment advice.

Ingestion Immediately call a poison center or doctor/physician. Do not induce vomiting, unless directed by medical personnel. Never give anything by mouth to an unconscious person.

Most important symptoms and effects

Symptoms Direct contact with eyes may cause temporary irritation. Ingestion may cause symptoms of gastrointestinal irritation including abdominal discomfort, nausea, vomiting, and diarrhea.

Indication of any immediate medical attention and special treatment needed

Notes to Physician Treat symptomatically.

5. FIRE-FIGHTING MEASURES

Suitable Extinguishing Media
Water spray (fog). Foam. Carbon dioxide (CO_2). Dry chemical.

Unsuitable Extinguishing Media Not determined.

Specific Hazards Arising from the Chemical
Not determined.

Hazardous Combustion Products Nitrogen oxides (NOx). Carbon monoxide. Phosphorus oxides.

Protective equipment and precautions for firefighters
As in any fire, wear self-contained breathing apparatus pressure-demand, MSHA/NIOSH (approved or equivalent) and full protective gear. Prevent runoff from fire control or dilution from entering streams, sewers, or drinking water supply.

6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures

Personal Precautions	Wear protective clothing as described in Section 8 of this safety data sheet. Isolate hazard area. Keep unnecessary and unprotected personnel from entering.
Environmental Precautions	Prevent from entering into soil, ditches, sewers, waterways and/or groundwater. See Section 12, Ecological Information. See Section 13: DISPOSAL CONSIDERATIONS.

Methods and material for containment and cleaning up

Methods for Containment	Prevent further leakage or spillage if safe to do so.
Methods for Clean-Up	Absorb with inert material, and then place in suitable container for chemical waste. Clean the floor with detergent and water. Do not flush to sewer.

7. HANDLING AND STORAGE

Precautions for safe handling

Advice on Safe Handling	Handle in accordance with good industrial hygiene and safety practice. Use personal protection recommended in Section 8. Avoid contact with skin, eyes or clothing. Wash face, hands, and any exposed skin thoroughly after handling. Wash contaminated clothing before reuse. Use in accordance with product label instructions. Do not eat, drink, smoke, or apply cosmetics while handling this product. Do not breathe dust/fume/gas/mist/vapors/spray. Follow all product label instructions. Use only as directed.

Conditions for safe storage, including any incompatibilities

Storage Conditions	Keep container tightly closed and store in a cool, dry and well-ventilated place. Keep out of the reach of children. Keep/store only in original container. Store at ambient conditions. Do not contaminate water, food, or feed by storage or disposal. Store above 10°F. If allowed to crystallize, place in a warm room at 68°F (20°C) for several days to redissolve and roll or shake container or recirculate in mini-bulk or bulk container to mix well before using.
Incompatible Materials	Strong oxidizing agents. Strong bases. Mild steel. Galvanized metal.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Exposure Guidelines The following information is given as general guidance

Appropriate engineering controls

Engineering Controls	Please refer to the product label. Use only with adequate ventilation. Use process enclosures, local exhaust ventilation, or other engineering controls to keep worker exposure to airborne contaminants below any recommended or statutory limits.

Individual protection measures, such as personal protective equipment

Eye/Face Protection	Wear safety glasses with side shields (or goggles). Goggles are recommended.
Skin and Body Protection	Wear appropriate clothing to prevent repeated or prolonged skin contact. Wear long-sleeved shirt, long pants, and shoes plus socks. Use chemical resistant gloves, such as P.V.C., butyl-rubber, nitrile-rubber, or neoprene.
Respiratory Protection	NIOSH-approved respirator or mask in the absence of adequate ventilation.
General Hygiene Considerations	Handle in accordance with good industrial hygiene and safety practice. Wash face, hands and any exposed skin thoroughly after handling. Take off all contaminated clothing and wash it before reuse. Discard clothing and other absorbent materials that have been drenched or heavily contaminated with this product's concentrate. Do not reuse them. Follow manufacturer's instructions for cleaning and maintaining PPE. If no such instructions for washables, use detergent and hot water. Keep and wash PPE separately from other laundry.

9. PHYSICAL AND CHEMICAL PROPERTIES

Information on basic physical and chemical properties

Physical State	Liquid		
Appearance	Light yellow to amber clear liquid	**Odor**	Amine-like
Color	Clear light yellow to amber	**Odor Threshold**	Not determined

Property	**Values**	**Remarks • Method**
pH	4.5-5.5	
Melting Point/Freezing Point	Not determined	
Boiling Point/Boiling Range	Not determined	
Flash Point	> 100 °C / > 212 °F	
Evaporation Rate	Not determined	
Flammability (Solid, Gas)	Liquid-not applicable	
Upper Flammability Limits	Not determined	
Lower Flammability Limit	Not determined	
Vapor Pressure	Not determined	
Vapor Density	Not determined	
Specific Gravity	Not determined	
Water Solubility	Not determined	
Solubility in other solvents	Not determined	
Partition Coefficient	Not determined	
Auto-ignition Temperature	Not determined	
Decomposition Temperature	Not determined	
Kinematic Viscosity	55.955 (20°C); 22.755 (40°C) cSt	
Dynamic Viscosity	Not determined	
Explosive Properties	Not determined	
Oxidizing Properties	Not determined	
Density	1.171 g/mL @ 20°C	

10. STABILITY AND REACTIVITY

Reactivity
Not reactive under normal conditions.

Chemical Stability
Stable under recommended storage conditions.

Possibility of Hazardous Reactions
None under normal processing.

Hazardous Polymerization Hazardous polymerization does not occur.

Conditions to Avoid
Keep out of reach of children.

Incompatible Materials
Strong oxidizing agents. Strong bases. Mild steel. Galvanized metal.

Hazardous Decomposition Products
Nitrogen oxides (NOx). Phosphorous oxides. Carbon monoxide.

11. TOXICOLOGICAL INFORMATION

Information on likely routes of exposure

Product Information

Eye Contact Avoid contact with eyes.

Skin Contact Avoid contact with skin.

Inhalation Harmful if inhaled.

Ingestion Do not ingest.

Component Information Not available

Information on physical, chemical and toxicological effects

Symptoms Please see section 4 of this SDS for symptoms.

Delayed and immediate effects as well as chronic effects from short and long-term exposure

Carcinogenicity This product does not contain any carcinogens or potential carcinogens as listed by OSHA, IARC or NTP.

Product Information (Numerical measures of toxicity)
Acute Oral LD50 (Rat): >5,000 mg/kg
Acute Dermal LD50 (Rabbit): >5,000 mg/kg
Acute Inhalation LC50 (Rat): >2.5 mg/L (4-hr)
Eye Irritation: Moderately irritating.
Dermal Irritation: Mildly irritating.
Dermal Sensitization: Not a skin sensitizer.

12. ECOLOGICAL INFORMATION

Ecotoxicity
Toxic to aquatic life with long lasting effects. Do not apply directly to water, to areas where surface water is present or to intertidal areas below the mean high water mark. Do not contaminate water when cleaning equipment or disposing of equipment washwaters.

Component Information Not available

Persistence/Degradability
Not determined.

Bioaccumulation
Not determined.

Mobility
Not determined

Other Adverse Effects
Not determined

13. DISPOSAL CONSIDERATIONS

Waste Treatment Methods

Disposal of Wastes	Pesticide wastes are toxic. Improper disposal of excess pesticide, spray mixture, or rinsate is a violation of Federal law. If these wastes cannot be disposed of by use according to label instructions, contact your State Pesticide or Environmental Control Agency, or the Hazardous Waste representative of the nearest EPA Regional Office for guidance.
Contaminated Packaging	Disposal should be in accordance with applicable regional, national and local laws and regulations.

14. TRANSPORT INFORMATION

DOT Not regulated

IATA Not regulated

IMDG
Marine Pollutant This material may meet the definition of a marine pollutant

15. REGULATORY INFORMATION

International Inventories
Listed or exempt.

US Federal Regulations

SARA 311/312 Hazard Categories

Acute Health Hazard	Yes
Chronic Health Hazard	No
Fire Hazard	No
Sudden Release of Pressure Hazard	No
Reactive Hazard	No

SARA 313
Not determined

US State Regulations

California Proposition 65
This product does not contain any Proposition 65 chemicals.

U.S. State Right-to-Know Regulations
Not determined

EPA Pesticide Registration Number 66222-176

EPA Statement
This chemical is a pesticide product registered by the Environmental Protection Agency and is subject to certain labeling requirements under federal pesticide law. These requirements differ from the classification criteria and hazard information required for safety data sheets, and for workplace labels of non-pesticide chemicals. Following is the hazard information as required on the pesticide label:

EPA Pesticide Label
Signal Word: Caution

Causes moderate eye irritation. Harmful if swallowed or inhaled. Avoid contact with eyes, skin or clothing. Avoid breathing vapor or spray mist. Wash thoroughly with soap and water after handling.

Difference between SDS and EPA pesticide label

	EPA	OSHA
Signal Word	Caution	Warning
Acute toxicity - Oral	Harmful if swallowed	N/A
Acute toxicity - Inhalation	Harmful if inhaled	Harmful if inhaled
Serious eye damage/eye irritation	Causes moderate eye irritation	N/A

16. OTHER INFORMATION

NFPA	**Health Hazards**	**Flammability**	**Instability**	**Special Hazards**
	1	1	1	None
HMIS	**Health Hazards**	**Flammability**	**Physical Hazards**	**Personal Protection**
	1	1	1	See section 8

Issue Date: 03-Feb-2009
Revision Date: 30-Oct-2015
Revision Note: Updated format from 11-Nov-2014

Disclaimer
The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text.

End of Safety Data Sheet

ARSENAL® POWERLine™ herbicide

SPECIMEN

For the control of undesirable vegetation in grass pasture, rangeland and industrial noncropland areas including railroad, utility plant sites, petroleum tank farms, pumping installations, storage areas; utility, pipeline, and highway rights-of-way; fence rows; nonirrigation ditchbanks; and for the establishment and maintenance of wildlife openings

Active Ingredient:	
isopropylamine salt of imazapyr (2-[4,5-dihydro-4-methyl-4-(1-methylethyl)-5-oxo-1*H*-imidazol-2-yl]-3-pyridinecarboxylic acid)*	26.7%
Other Ingredients:	73.3%
Total:	100.0%

* Equivalent to 21.8% 2-[4,5-dihydro-4-methyl-4-(1-methylethyl)-5-oxo-1*H*-imidazol-2-yl]-3-pyridinecarboxylic acid or 2 pounds acid per gallon

EPA Reg. No. 241-431 **EPA Est. No.**

KEEP OUT OF REACH OF CHILDREN

CAUTION/PRECAUCIÓN

Si usted no entiende la etiqueta, busque a alguien para que se la explique a usted en detalle. (If you do not understand this label, find someone to explain it to you in detail.)

See inside for complete **First Aid**, **Precautionary Statements**, **Directions For Use**, **Conditions of Sale and Warranty**, and state-specific crop and/or use site restrictions.

In case of an emergency endangering life or property involving this product, call day or night 1-800-832-HELP (4357).

Net Contents:

BASF Corporation
26 Davis Drive
Research Triangle Park, NC 27709

BASF
The Chemical Company

FIRST AID	
If swallowed	• Call a poison control center or doctor immediately for treatment advice. • Have person sip a glass of water if able to swallow. • **DO NOT** induce vomiting unless told to by a poison control center or doctor. • **DO NOT** give anything to an unconscious person.
If in eyes	• Hold eyes open and rinse slowly and gently with water for 15 to 20 minutes. • Remove contact lenses, if present, after first 5 minutes; then continue rinsing eyes. • Call a poison control center or doctor for treatment advice.
If on skin	• Take off contaminated clothing. • Rinse skin immediately with plenty of water for 15 to 20 minutes. • Call a poison control center or doctor for treatment advice.
If inhaled	• Move person to fresh air. • If person is not breathing, call 911 or an ambulance; then give artificial respiration, preferably by mouth to mouth, if possible. • Call a poison control center or doctor for further treatment advice.
HOTLINE NUMBER	
Have the product container or label with you when calling a poison control center or doctor or going for treatment. You may also contact BASF Corporation for emergency medical treatment information: 1-800-832-HELP (4357).	

Precautionary Statements

Hazards to Humans and Domestic Animals

CAUTION. Harmful if swallowed, causes moderate eye irritation. Avoid contact with eyes or clothing. Prolonged or frequently repeated skin contact may cause allergic reactions in some individuals.

Personal Protective Equipment (PPE)

Some materials that are chemical resistant to this product are barrier laminate, butyl rubber, or polyethylene. If you want more options, follow the instructions for **Category A** on an EPA chemical-resistance category selection chart.

Mixers, loaders, applicators, and other handlers must wear:

- Long-sleeved shirt and long pants
- Shoes plus socks
- Chemical-resistant gloves for all mixers and loaders, plus applicators using handheld equipment

Follow manufacturer's instructions for cleaning and maintaining PPE. If no such instructions for washables exist, use detergent and hot water. Keep and wash PPE separately from other laundry. Discard clothing and other absorbent materials that have been drenched or heavily contaminated with this product's concentrate. **DO NOT** reuse them.

Engineering Controls

Pilots must use an enclosed cockpit that meets the requirements listed in the Worker Protection Standard (WPS) for agricultural pesticides [40 CFR 170.240(d)(6)].

USER SAFETY RECOMMENDATIONS

Users should:

- Wash hands with plenty of soap and water before eating, drinking, chewing gum, using tobacco, or using the toilet.
- Remove clothing/PPE immediately if pesticide gets inside. Then wash thoroughly and put on clean clothing.
- Remove PPE immediately after handling this product. Wash the outside of gloves before removing. As soon as possible, wash thoroughly and change into clean clothing.

Physical and Chemical Hazards

Spray solutions of **Arsenal® PowerLine™ herbicide** should be mixed, stored and applied only in stainless steel, fiberglass, plastic and plastic-lined steel containers.

DO NOT mix, store or apply **Arsenal PowerLine** or spray solutions of **Arsenal PowerLine** in unlined steel (except stainless steel) containers or spray tanks.

Environmental Hazards

This product is toxic to plants. Drift and runoff may be hazardous to plants in water adjacent to treated areas. **DO NOT** apply directly to water, or to areas where surface water is present, or to intertidal areas below the mean high water mark. **DO NOT** contaminate water when disposing of equipment washwater or rinsate. See **Directions For Use** for additional precautions and requirements.

Directions For Use

It is a violation of federal law to use this product in a manner inconsistent with its labeling.

DO NOT apply this product in a way that will contact workers or other persons, either directly or through drift. Only protected handlers may be in the area during application.

Arsenal® PowerLine™ herbicide must be used only in accordance with instructions on the leaflet label attached to the container. Keep containers closed to avoid spills and contamination.

AGRICULTURAL USE REQUIREMENTS

Use this product only in accordance with its labeling and with the Worker Protection Standard, 40 CFR part 170. This standard contains requirements for the protection of agricultural workers on farms, forests, nurseries, and greenhouses, and handlers of agricultural pesticides. It contains requirements for training, decontamination, notification, and emergency assistance. It also contains specific instructions and exceptions pertaining to the statements on this label about personal protective equipment (PPE) and restricted-entry interval. The requirements in this box only apply to uses of this product that are covered by the Worker Protection Standard.

DO NOT enter or allow worker entry into treated areas during the restricted-entry interval (REI) of **48 hours**.

PPE required for early entry to treated areas that is permitted under the Worker Protection Standard and that involves contact with anything that has been treated, such as plants, soil, or water, is:

- Protective eyewear
- Coveralls
- Shoes plus socks
- Chemical-resistant gloves made of any waterproof material.

NONAGRICULTURAL USE REQUIREMENTS

The requirements in this box apply to uses of this product that are NOT within the scope of the Worker Protection Standard (WPS) for agricultural pesticides (40 CFR Part 170). The WPS applies when this product is used to produce agricultural plants on farms, forests, nurseries, or greenhouses.

DO NOT enter or allow others to enter treated areas until sprays have dried.

STORAGE AND DISPOSAL

DO NOT contaminate water, food or feed by storage or disposal.

Pesticide Storage

DO NOT store below 10° F.

Pesticide Disposal

Wastes resulting from the use of this product must be disposed of of on-site or at an approved waste disposal facility.

(continued)

STORAGE AND DISPOSAL *(continued)*

Container Handling

Nonrefillable Container. DO NOT reuse or refill this container. Triple rinse or pressure rinse container (or equivalent) promptly after emptying; then offer for recycling, if available, or reconditioning, if appropriate, or puncture and dispose of in a sanitary landfill, or by incineration, or by other procedures approved by state and local authorities.

Triple rinse containers small enough to shake (capacity ≤ 5 gallons) as follows: Empty the remaining contents into application equipment or a mix tank and drain for 10 seconds after the flow begins to drip. Fill the container 1/4 full with water and recap. Shake for 10 seconds. Pour rinsate into application equipment or a mix tank, or store rinsate for later use or disposal. Drain for 10 seconds after the flow begins to drip. Repeat this procedure two more times.

Triple rinse containers too large to shake (capacity > 5 gallons) as follows: Empty the remaining contents into application equipment or a mix tank. Fill the container 1/4 full with water. Replace and tighten closures. Tip container on its side and roll it back and forth, ensuring at least one complete revolution, for 30 seconds. Stand the container on its end and tip it back and forth several times. Turn the container over onto its other end and tip it back and forth several times. Empty the rinsate into application equipment or a mix tank, or store rinsate for later use or disposal. Repeat this procedure two more times.

Pressure rinse as follows: Empty the remaining contents into application equipment or mix tank and continue to drain for 10 seconds after the flow begins to drip. Hold container upside down over application equipment or mix tank, or collect rinsate for later use or disposal. Insert pressure rinsing nozzle in the side of the container and rinse at about 40 PSI for at least 30 seconds. Drain for 10 seconds after the flow begins to drip.

Refillable Container. Refill this container with pesticide only. **DO NOT** reuse this container for any other purpose. Triple rinsing the container before final disposal is the responsibility of the person disposing of the container. Cleaning before refilling is the responsibility of the refiller.

Triple rinse as follows: To clean the container before final disposal, empty the remaining contents from this container into application equipment or mix tank. Fill the container about 10% full with water. Agitate vigorously or recirculate water with the pump for 2 minutes. Pour or pump rinsate into application equipment or rinsate collection system. Repeat this rinsing procedure two more times.

(continued)

STORAGE AND DISPOSAL *(continued)*

Container Handling *(continued)*

When this container is empty, replace the cap and seal all openings that have been opened during use; return the container to the point of purchase or to a designated location. This container must only be refilled with a pesticide product. Prior to refilling, inspect carefully for damage such as cracks, punctures, abrasions, worn-out threads and closure devices. Check for leaks after refilling and before transport. **DO NOT** transport if this container is damaged or leaking. If the container is damaged, or leaking, or obsolete and not returned to the point of purchase or to a designated location, triple rinse emptied container and offer for recycling, if available, or dispose of container in compliance with state and local regulations.

In Case of Spill

In case of large-scale spillage regarding this product, call:

- CHEMTREC 1-800-424-9300
- BASF Corporation 1-800-832-HELP (4357)

Steps to be taken in case material is released or spilled:

- Dike and contain the spill with inert material (sand, earth, etc.) and transfer liquid and solid diking material to separate containers for disposal.
- Remove contaminated clothing, and wash affected skin areas with soap and water.
- Wash clothing before reuse.
- Keep the spill out of all sewers and open bodies of water.

RESTRICTIONS

DO NOT use on food crops. Keep from contact with fertilizers, insecticides, fungicides and seeds. **DO NOT** drain or flush equipment on or near desirable trees or other plants, or on areas where their roots may extend, or in locations where the chemical may be washed or moved into contact with their roots. **DO NOT** use on lawns, walks, driveways, tennis courts, or similar areas where roots of desirable vegetation may extend and be exposed to potential injury and/or mortality from root uptake of **Arsenal® PowerLine™ herbicide** unless this risk is acceptable. **DO NOT** side trim desirable vegetation with this product unless severe injury or plant death can be tolerated. **DO NOT** allow sprays to drift onto desirable plants.

Clean application equipment after using this product by thoroughly flushing with water.

PRODUCT INFORMATION

Use Sites. Arsenal PowerLine is an aqueous solution to be mixed with water and a surfactant and applied as a spray solution to grass pasture and rangeland and industrial noncropland including utility plant sites, petroleum tank farms, pumping installations, storage areas; railroad, utility, and highway rights-of-way; fence rows; and nonirrigation ditchbanks including grazed or hayed areas within these sites. **Arsenal PowerLine** is recommended for the establishment and maintenance of wildlife openings. **Arsenal PowerLine** may also be used for the release of unimproved Bermudagrass (see specific directions) and for use under certain paved surfaces (see specific directions).

Application Methods. Arsenal PowerLine will control most annual and perennial grasses and broadleaf weeds in addition to many brush and vine species. **Arsenal PowerLine** will provide residual control of labeled weeds that germinate in the treated areas. This product may be applied either preemergence or postemergence to the weeds; however, postemergence application is the method of choice in most situations, particularly for perennial species. For maximum activity, weeds should be growing vigorously at the time of postemergence application, and the spray solution should include a surfactant (see **ADJUVANTS** section for specific recommendations). These solutions may be applied selectively using low-volume techniques or may be applied broadcast by using ground equipment or aerial equipment. In addition, **Arsenal PowerLine** may also be used for stump and cut stem treatments (see specific directions).

Herbicidal Activity. Arsenal PowerLine is readily absorbed through leaves, stems, and roots and is translocated rapidly throughout the plant, with accumulation in the meristematic regions. Treated plants stop growing soon after spray application. Chlorosis appears first in the newest leaves, and necrosis spreads from this point. In perennials, the herbicide is translocated into, and kills, underground storage organs which prevents regrowth. Chlorosis and tissue necrosis may not be apparent in some plant species until 2 weeks after application. Complete kill of plants may not occur for several weeks. Applications of **Arsenal PowerLine** are rainfast 1 hour after treatment.

PRECAUTIONS FOR AVOIDING INJURY TO NONTARGET PLANTS

Untreated trees can occasionally be affected by root uptake of **Arsenal PowerLine** through movement into the top soil. Injury or loss of desirable trees or other plants may result if **Arsenal PowerLine** is applied on or near desirable trees or other plants, on areas where their roots extend, or in locations where the treated soil may be washed or moved into contact with their roots.

SPRAY DRIFT REQUIREMENTS

Aerial Applications

- Applicators are required to use a coarse or coarser droplet size (ASABE S572) or, if specifically using a spinning atomizer nozzle, applicators are required to use a volume mean diameter (VMD) of 385 microns or greater for release heights below 10 feet. Applicators are required to use a very coarse or coarser droplet size or, if specifically using a spinning atomizer nozzle, applicators are required to use a VMD of 475 microns or greater for release heights above 10 feet. Applicators must consider the effects of nozzle orientation and flight speed when determining droplet size.

- Applicators are required to use upwind swath displacement.
- The boom length must not exceed 60% of the wingspan or 90% of the rotor blade diameter to reduce spray drift.
- Applications with wind speeds less than 3 mph and with wind speeds greater than 10 mph are prohibited.
- Applications into temperature inversions are prohibited.

Ground Boom Applications

- Applicators are required to use a nozzle height below 4 feet above the ground or plant canopy and coarse or coarser droplet size (ASABE S572) or, if specifically using a spinning atomizer nozzle, applicators are required to use a volume mean diameter (VMD) of 385 microns or greater.
- Applications with wind speeds greater than 10 mph are prohibited.
- Applications into temperature inversions are prohibited.

Wind Erosion

Avoid treating powdery, dry or light sandy soils when conditions are favorable for wind erosion. Under these conditions, the soil surface should first be settled by rainfall or irrigation.

ADJUVANTS

Postemergence applications of Arsenal® PowerLine™ herbicide require the addition of a spray adjuvant for optimum herbicide performance.

Nonionic Surfactants. Use a nonionic surfactant (NIS) at the rate 0.25% volume/volume (v/v) or higher (see manufacturer's label) of the spray solution (0.25% v/v is equivalent to 1 quart in 100 gallons). For best results, select a nonionic surfactant with an HLB (hydrophilic to lipophilic balance) ratio between 12 and 17 with at least 70% surfactant in the formulated product (alcohols, fatty acids, oils, ethylene glycol or diethylene glycol should not be considered as surfactants to meet the above requirements).

Methylated Seed Oils (MSO) or Vegetable Oil Concentrates. Instead of a surfactant, a methylated seed oil or vegetable-based seed oil concentrate may be used at the rate of 1.5 to 2 pints per acre. When using spray volumes greater than 30 gallons per acre, methylated seed oil or vegetable-based seed oil concentrates should be mixed at a rate of 1% of the total spray volume, or alternatively use a nonionic surfactant as described above. Research indicates that these oils may aid in **Arsenal PowerLine** deposition and uptake by plants under moisture or temperature stress.

Silicone-based Surfactants. See manufacturer's label for specific rate recommendations. Silicone-based surfactants may reduce the surface tension of the spray droplet allowing greater spreading on the leaf surface as compared to conventional nonionic surfactants. However, some silicone-based surfactants may dry too quickly, limiting herbicide uptake.

Fertilizer/Surfactant Blends. Nitrogen-based liquid fertilizers, such as 28%N, 32%N, 10-34-0 or ammonium sulfate, may be added at the rate of 2 to 3 pints per acre in combination with the recommended rate of nonionic surfactant, methylated seed oil or vegetable/seed oil concentrate. The use of fertilizers in a tank mix without a nonionic surfactant, methylated seed oil or vegetable/seed oil concentrate is not recommended.

APPLICATION METHODS

AERIAL APPLICATIONS

All precautions must be taken to minimize or eliminate spray drift. Fixed-wing aircraft and helicopters can be used to apply **Arsenal PowerLine**. However, **DO NOT** make applications by fixed-wing aircraft unless appropriate buffer zones can be maintained to prevent spray drift out of the target area or, when treating open tracts of land, spray drift as a result of fixed-wing aircraft application can be tolerated. Aerial equipment designed to minimize spray drift, such as a helicopter equipped with a **Microfoil™ boom**, **Thru-Valve™ boom** or raindrop nozzles, must be used and calibrated. Except when applying with a **Microfoil boom**, a drift control agent may be added at the recommended label rate. Side trimming is not recommended with **Arsenal PowerLine** unless death of treated tree can be tolerated.

Uniformly apply the specified amount of **Arsenal PowerLine** in 2 or more gallons of water per acre. The actual minimum spray volume per acre is determined by the spray equipment used. Use adequate spray volume to provide accurate and uniform distribution of spray particles over the treated area and to avoid spray drift. Include in the spray solution a nonionic surfactant or methylated seed oil or manufacturer's label rate of a silicone-based surfactant (see the **ADJUVANTS** section of this label for specific recommendations). A foam-reducing agent may be added at the recommended label rate, if needed.

IMPORTANT. Thoroughly clean application equipment, including landing gear, immediately after use of this product. Prolonged exposure of this product to uncoated steel (except stainless steel) surfaces may result in corrosion and failure of the exposed part. The maintenance of an organic coating (paint) may prevent corrosion.

GROUND APPLICATIONS

Broadcast. Use 5 or more gallons of water per acre. The actual minimum spray volume per acre is determined by the spray equipment used. Use adequate spray volume to provide accurate and uniform distribution of spray particles over the treated area and to avoid spray drift. To minimize spray drift, select proper nozzles to avoid spraying a fine mist. Use pressures less than 50 psi, and **DO NOT** spray under gusty or windy conditions. Add a foam-reducing agent, if needed, and a spray pattern indicator, if desired, at the recommended label rates. Clean application equipment after using this product by thoroughly flushing with water.

When making applications to rights-of-way corridors where desirable tree roots may extend, use 1 to 3 pints of **Arsenal® PowerLine™ herbicide** per acre in combination with recommended tank mixes. Use rates higher than 3 pints per acre in these situations may cause injury or death of desirable trees when their roots extend into treated zones.

FOLIAR

Side Trimming
DO NOT side trim with **Arsenal PowerLine** unless severe injury or death of the treated tree can be tolerated. **Arsenal PowerLine** is readily translocated and can result in death of the entire tree.

Low-volume Foliar
Use equipment calibrated to deliver 5 to 20 gallons of spray solution per acre. To prepare the spray solution, thoroughly mix in water 0.5% to 5% **Arsenal PowerLine** plus surfactant (see the **ADJUVANTS** section of this label for specific recommendations). A foam-reducing agent may be applied at the recommended label rate, if needed. For control of difficult brush species (see **WEEDS CONTROLLED** section for relative susceptibility of weed species), use the higher concentrations of herbicide and/or spray volumes, but **DO NOT** apply more than 6 pints of **Arsenal PowerLine** per acre. Excessive wetting of foliage is not recommended. See the following mixing guide for some suggested volumes of **Arsenal PowerLine** and water.

BRUSH CONTROL

Use the specified rate of **Arsenal PowerLine** with the preferred application technique for the control of undesirable brush.

TANK MIXES AND APPLICATION RATES*

Target Vegetation	Rate of Arsenal® PowerLine™ herbicide	Tank Mix
Mixed hardwoods without elm, locust, or pine	1.0 to 1.5% by volume	Surfactant
Mixed hardwoods containing elm, locust, and pine	0.5 to 1.0% by volume	**Accord®** at 2 to 3% by volume plus surfactant
Mixed hardwoods with locust and pine, but no elm	0.5 to 1.0% by volume	**Krenite®** at 2 to 5% by volume plus surfactant
Mixed hardwoods with locust and elm, but no pine	0.5 to 1.0% by volume	**Escort®** at 2 ozs/acre or 2.3 grams/gallon plus surfactant

* Tank mixes with 2,4-D or products containing 2,4-D have resulted in reduced efficacy of **Arsenal PowerLine**.

MIXING CHART

% Solution	Arsenal PowerLine per Gallon of Mix (fl ozs)	Arsenal PowerLine per 4-gallon Backpack (fl ozs)
0.5%	0.6	2.6
1.0%	1.3	5.1
2.0%	2.6	10.2
3.0%	3.8	15.4
5.0%	6.4	25.6

MEASURING CHART		
128 fluid ounces	=	1 gallon
16 fluid ounces	=	1 pint
8 pints	=	1 gallon
4 quarts	=	1 gallon
2 pints	=	1 quart

Application Instructions. For low volume, select proper nozzles so that herbicide is not overapplied. Best results are achieved when the spray covers the crown and approximately 70% of the plant. The use of an even flat-fan tip with a spray angle of 40 degrees or less will aid in proper deposition.

Recommended tip sizes include 4004E or 1504E. For a straight stream and cone pattern, adjustable cone nozzles, such as 5500 X3 or 5500 X4, may be used. Attaching a roll-over valve onto a Spraying Systems Model 30 gunjet or other similar spray guns allows for the use of both a flat-fan and cone tips on the same gun.

Proper Spray Pattern. Moisten but **DO NOT** drench target vegetation causing spray solution to run off.

Low Volume with Backpacks. For brush up to 4-feet tall, spray down on the crown covering crown and penetrating approximately 70% of the plant.

For brush 4-feet to 8-feet tall, swipe the sides of target vegetation by directing spray to at least 2 sides of the plant in smooth vertical motions from the crown to the bottom. Make sure to cover the crown whenever possible.

For brush over 8-feet tall, lace sides of the brush by directing spray to at least 2 sides of the target in smooth zigzag motions from crown to bottom.

Low Volume with Hydraulic Handgun Application Equipment. Use same technique as described for **Low Volume with Backpacks**.

For broadcast applications, simulate a gentle rain near the top of target vegetation allowing spray to contact the crown and penetrate the target foliage without falling to the understory. Herbicide spray solution that contacts the understory may result in severe injury or death of plants in the understory.

SPRAY SOLUTION MIXING GUIDE FOR LOW-VOLUME APPLICATIONS

Amount of Spray Solution Prepared (gallons)	**Desired Concentration** (fluid volume)				
	0.5%	**0.75%**	**1%**	**1.5%**	**5%**
	(amount of Arsenal® PowerLine™ herbicide to use)				
1	0.6 fl oz	0.9 fl oz	1.3 fl ozs	1.9 fl ozs	6.5 fl ozs
3	1.9 fl ozs	2.8 fl ozs	3.8 fl ozs	5.8 fl ozs	1.2 pints
4	2.5 fl ozs	3.8 fl ozs	5.1 fl ozs	7.7 fl ozs	1.6 pints
5	3.2 fl ozs	4.8 fl ozs	6.5 fl ozs	9.6 fl ozs	2 pints
50	2 pints	3 pints	4 pints	6 pints	10 quarts
100	4 pints	6 pints	8 pints	6 quarts	5 gallons
2 tablespoons = 1 fluid ounce					

High-volume Foliar

For optimum performance when spraying medium-density to high-density brush, use equipment calibrated to deliver up to 100 gallons of spray solution per acre (GPA). Spray solutions exceeding 100 GPA may result in excessive spray runoff causing increased ground cover injury and injury to desirable species.

To prepare the spray solution, thoroughly mix **Arsenal PowerLine** at a rate of 2 to 6 pints per acre (see **GROUND APPLICATIONS** section) in water and add a surfactant (see **ADJUVANTS** section for specific recommendations and rates of surfactants). A foam-reducing agent may be added at the recommended label rate, if needed. For control of difficult species (see **WEEDS CONTROLLED** section for relative susceptibility of weed species), use the higher concentrations of herbicide and/or spray volumes, but **DO NOT** apply more than 6 pints of **Arsenal PowerLine** per acre. Uniformly cover the foliage of the vegetation to be controlled, but **DO NOT** apply to runoff. Excessive wetting of foliage is not recommended.

Tank Mixes for Brush Control

Arsenal PowerLine may be tank mixed with **Accord®**, **Banvel®**, **Escort®**, **Garlon® 3A**, **Krenite®**, **Roundup®**, **Telar®**, **Tordon® K**, and **Vanquish®** to provide control of **Arsenal PowerLine**-tolerant species.

Consult manufacturer's labels for specific rates and weeds controlled. Always follow the more restrictive label when making an application involving tank mixes. Tank mixing with 2,4-D, or products which contain 2,4-D, has resulted in reduced performance of **Arsenal PowerLine**.

Invert Emulsions. Arsenal PowerLine can be applied as an invert emulsion. The spray solution results in an invert (water-in-oil) spray emulsion designed to minimize spray drift and spray runoff resulting in more herbicide on the target foliage. The spray emulsion may be formed in a single tank (batch mixing) or injected (in-line mixing). Consult the invert chemical label for proper mixing directions.

CUT SURFACE

Cut Stubble

Arsenal® PowerLine™ herbicide can be applied within 2 weeks after mechanical mowing or cutting of brush. To suppress or control resprouting, uniformly apply a spray solution of **Arsenal PowerLine** at the rate of 1 to 2 pints per acre to the cut area. **Arsenal PowerLine** may be tank mixed with **Tordon® K** or picloram to aid in control or suppression of brush. The addition of 5% (v/v) or more of a penetrating agent can aid in uptake through the bark or exposed roots.

Cut stubble applications are made to the soil and cut brush stumps. This type of application may increase ground cover injury. However, vegetation will recover. Making applications of **Arsenal PowerLine** directly to the soil can increase potential root uptake causing injury or death of desirable trees.

Efficacy can be increased, and root uptake by desirable vegetation can be decreased, if the brush is allowed to regrow and the foliage is treated. See the **APPLICATION METHODS** section of this label.

Stump and Cut-stem Treatments

Arsenal PowerLine may be used to control undesirable woody vegetation on noncropland by applying the **Arsenal PowerLine** solution to the cambium area of freshly cut stump surfaces or to fresh cuts on the stem of the target woody vegetation. Applications can be made at any time of the year except during periods of heavy sap flow in the spring. **DO NOT** overapply solution causing runoff or puddling.

Mixing. Arsenal PowerLine may be mixed as either a concentrated or dilute solution for stump and cut stem treatments. The dilute solution may be used for applications to the surface of the stump or to cuts on the stem of the target woody vegetation. Concentrated solutions may be used for applications to cuts on the stem. Use of the concentrated solution permits application to fewer cuts on the stem, especially for large-diameter trees. Follow the application instructions to determine proper application techniques for each type of solution.

To prepare a dilute solution, mix 8 to 12 fluid ounces of **Arsenal PowerLine** with 1 gallon of water. If temperatures are such that freezing of the spray mixture may occur, antifreeze (ethylene glycol) may be used according to manufacturer's label to prevent freezing. The use of a surfactant or penetrating agent may improve uptake through partially callused cambiums. To prepare a concentrated solution, mix 2 quarts of **Arsenal PowerLine** with no more than 1 quart of water.

Application with Dilute Solutions

For cut stump treatments. Spray or brush the solution onto the cambium area of the freshly cut stump surface. Ensure that the solution thoroughly wets the entire cambium area (the wood next to the bark of the stump).

For tree-injection treatments. Using standard injection equipment, apply 1 milliliter of solution at each injection site around the tree with no more than 1-inch intervals between cut edges. Ensure that the injector completely penetrates the bark at each injection site.

For frill or girdle treatments. Using a hatchet, machete, or similar device, make cuts through the bark at intervals around the tree with no more than 2-inch intervals between cut edges. Spray or brush the solution into each cut until thoroughly wet.

Application with Concentrated Solutions

For tree injection treatments. Using standard injection equipment, apply 1 milliliter of solution at each injection site. Make at least 1 injection cut for every 3 inches of Diameter at Breast Height (DBH) on the target tree. For example, a 3-inch DBH tree will receive 1 injection cut, and a 6-inch DBH tree will receive 2 injection cuts. On trees requiring more than 1 injection site, place the injection cuts at approximately equal intervals around the tree.

For frill or girdle treatments. Using a hatchet, machete, or similar device, make cuts through the bark at approximately equal intervals around the tree. Make at least 1 cut for every 3 inches of DBH on the target tree. For example, a 3-inch DBH tree will receive 1 cut, and a 6-inch DBH tree will receive 2 cuts. Spray or brush the solution into each cut until thoroughly wet.

NOTE: Injury may occur to desirable woody plants if the shoots extend from the same root system or their root systems are grafted to those of the treated tree.

FOR CONTROL OF UNDESIRABLE WEEDS UNDER PAVED SURFACES

Arsenal PowerLine can be used under asphalt, pond liners and other paved areas ONLY in industrial sites or where the pavement has a suitable barrier along the perimeter that prevents encroachment of roots of desirable plants.

Arsenal PowerLine should be used only where the area to be treated has been prepared according to good construction practices. If rhizomes, stolons, tubers or other vegetative plant parts are present in the site, they should be removed by scalping with a grader blade to a depth sufficient to insure their complete removal.

IMPORTANT. Paving should follow **Arsenal PowerLine** applications as soon as possible. **DO NOT** apply where the chemical may contact the roots of desirable trees or other plants.

The product may not be used under pavement on residential properties such as driveways or parking lots, nor in recreational areas such as under bike or jogging paths, golf-cart paths, or tennis courts, or where landscape plantings could be anticipated. Injury or death of desirable plants may result if this product is applied where roots are present or where they may extend into the treated area. Roots of trees and shrubs may extend a considerable distance beyond the branch extremities or drip line.

APPLICATION DIRECTIONS FOR USE UNDER PAVED SURFACES

Applications should be made to the soil surface only when final grade is established. **DO NOT** move soil following **Arsenal® PowerLine™ herbicide** application.

Apply **Arsenal PowerLine** in sufficient water (at least 100 gallons per acre) to ensure thorough and uniform wetting of the soil surface, including the shoulder areas. Add **Arsenal PowerLine** at a rate of 6 pints per acre (2.2 fl ozs per 1000 square feet) to clean water in the spray tank during the filling operation. Agitate before spraying.

If the soil is not moist prior to treatment, incorporation of **Arsenal PowerLine** is needed for herbicide activation. **Arsenal PowerLine** can be incorporated into the soil to a depth of 4 to 6 inches using a rototiller or disc. Rainfall or irrigation of 1 inch will also provide uniform incorporation. **DO NOT** allow treated soil to wash or move into untreated areas.

FOR CONTROL OF UNDESIRABLE WEEDS IN UNIMPROVED BERMUDAGRASS AND BAHIAGRASS

Arsenal PowerLine may be used on unimproved Bermudagrass and Bahiagrass turf on roadsides, utility rights-of-way and other noncropland industrial sites. The application of **Arsenal PowerLine** on established common and coastal Bermudagrass and Bahiagrass provides control of labeled broadleaf and grass weeds. Competition from these weeds is eliminated, releasing the Bermudagrass and Bahiagrass. Treatment of Bermudagrass with **Arsenal PowerLine** results in a compacted growth habit and seedhead inhibition.

Uniformly apply with properly calibrated ground equipment using at least 10 gallons of water per acre with a spray pressure 20 to 50 psi.

IMPORTANT. Temporary yellowing of grass may occur when treatment is made after growth commences.
DO NOT add surfactant in excess of the recommended rate (1 fl oz per 25 gallons of spray solution).
DO NOT APPLY to grass during its first growing season.
DO NOT APPLY to grass that is under stress from drought, disease, insects, or other causes.

DOSAGE RATES AND TIMING

BERMUDAGRASS
Apply **Arsenal PowerLine** at 6 fl ozs to 12 fl ozs per acre when the Bermudagrass is dormant. Apply **Arsenal PowerLine** at 6 fl ozs to 8 fl ozs per acre after the Bermudagrass has reached full greenup. Applications made during greenup will delay greenup. Include a surfactant in the spray solution (see preceding **IMPORTANT** statements).

For additional preemergence control of annual grasses and small-seeded broadleaf weeds, add **Pendulum® AquaCap™ herbicide** at the rate of 2.1 to 4.2 quarts per acre. Consult the **Pendulum** label for weeds controlled and for other use directions and precautions.

For control of Johnsongrass in Bermudagrass turf, apply **Arsenal PowerLine** at 8 fl ozs per acre plus **Roundup® herbicide** at 12 fl ozs per acre plus surfactant. For additional control of broadleaves and vines, **Garlon® 3A** may be added to the above mix at the rate of 1 to 2 pints per acre. Observe all precautions and restrictions on the **Garlon 3A** and **Roundup** labels.

BAHIAGRASS
Apply **Arsenal PowerLine** at 4 fl ozs to 8 fl ozs per acre when the Bahiagrass is dormant or after the grass has initiated greenup but has not exceeded 25% greenup. Include in the spray solution a surfactant (see **ADJUVANTS** section for specific recommendations on surfactants).

Weeds Controlled in Unimproved Bermudagrass and Bahiagrass

Bedstraw*	*Gallium* spp.
Bishopweed*	*Ptilimnium capillaceum*
Buttercup*	*Ranunculus parviflorus*
Carolina geranium	*Geranium carolinianum*
Fescue	*Festuca* spp.
Foxtail	*Setaria* spp.
Little barley	*Hordeum pusillum*
Seedling Johnsongrass	*Sorghum halepense*
White clover	*Trifolium repens*
Wild carrot	*Daucus carota*
Yellow woodsorrel	*Oxalis stricta*

* Use not permitted in California unless otherwise directed by supplemental labeling.

GRASS GROWTH AND SEEDHEAD SUPPRESSION

Arsenal PowerLine may be used to suppress growth and seedhead development of certain turfgrass in unimproved areas. When applied to desirable turf, **Arsenal PowerLine** may result in temporary turf damage and/or discoloration. Effects to the desirable turf may vary with environmental conditions. For optimum performance, application should be made prior to culm elongation. Applications may be made before or after mowing. If applied prior to mowing, allow at least 3 days of active growth before mowing. If following a mowing, allow sufficient time for the grasses to recover before applying this product or injury may be amplified.

DO NOT APPLY to turf under stress (drought, cold, insect damaged, etc.) or severe injury or death may occur.

BERMUDAGRASS
Apply **Arsenal PowerLine** at 6 fl ozs to 8 fl ozs per acre from early greenup to prior to seedhead initiation. **DO NOT** add a surfactant for this application.

COOL SEASON UNIMPROVED TURF
Apply **Arsenal PowerLine** at 2 fl ozs per acre plus 0.25% nonionic surfactant. For increased suppression, **Arsenal PowerLine** may be tank mixed with such products as **Campaign®** (24 ozs per acre) or **Embark®** (8 ozs per acre).

Tank mixes may increase injury to desired turf. Consult each product label for recommended turf species and other use directions and precautions. Tank mixes with 2,4-D or products containing 2,4-D may decrease the effectiveness of **Arsenal® PowerLine™ herbicide**.

TOTAL VEGETATION CONTROL WHERE BARE GROUND IS DESIRED

Arsenal PowerLine is an effective herbicide for preemergence or postemergence control of many annual and perennial broadleaf and grass weeds where bare ground is desired. **Arsenal PowerLine** is particularly effective on hard-to-control perennial grasses. **Arsenal PowerLine** at 1.5 pints to 6 pints per acre can be used alone or in tank mix with herbicides such as **Banvel®**, **Finale®**, **Karmex®**, **Oust®**, **Pendulum®**, **Roundup®**, simazine, or **Vanquish®**. The degree and duration of control are dependent on the rate of **Arsenal PowerLine** used, tank mix partner, the volume of carrier, soil texture, rainfall and other conditions.

Consult manufacturers labels for specific rates and weeds controlled. Always follow the more restrictive label when making an application involving tank mixes.

TANK MIX INSTRUCTIONS FOR BARE GROUND

Herbicide Rates per Acre*

Arsenal PowerLine	Pendulum® AquaCap™ herbicide	Pendulum® 3.3 EC herbicide	Diuron
(pints)	(quarts)	(quarts)	(lbs ai)
1.5 to 3	4.2	4.8	4 to 6
2 to 4	4.2	4.8	6 to 10
3 to 6	4.2	4.8	8 to 12

* Use higher rates for fall applications and in areas that have not been previously treated or that feature heavy infestations.

Applications of **Arsenal PowerLine** may be made at any time of the year. Use equipment calibrated to deliver desired gallons per acre spray volume and uniformly distribute the spray pattern over the treated area.

Postemergence Applications. Always use a spray adjuvant (see **ADJUVANTS** section of this label) when making a postemergence application. For optimum performance on tough-to-control annual grasses, applications should be made at a total volume of 100 gallons per acre or less. For quicker burndown or brown-out of target weeds, **Arsenal PowerLine** may be tank mixed with products such as **Finale** or **Roundup**. Tank mixes with 2,4-D or products containing 2,4-D have reduced performance of **Arsenal PowerLine**. Always follow the more restrictive label when tank mixing.

SPOT TREATMENTS

Arsenal PowerLine may be used as a follow-up treatment to control escapes or weed encroachment in a bareground situation. To prepare the spray solution, thoroughly mix in each gallon of water 0.5% to 5% **Arsenal PowerLine** plus an adjuvant. For increased burndown, include **Finale** or **Roundup**, or similar products. For added residual weed control or to increase the weed spectrum, add **Pendulum** or diuron. Always follow the more restrictive label when tank mixing.

FOR SPOT TREATMENT WEED CONTROL IN GRASS PASTURE AND RANGELAND

For the control of undesirable vegetation in grass pasture and rangeland, **Arsenal PowerLine** may be applied as a spot treatment at a rate of 2 fl ozs to 48 fl ozs of product per treated acre using any of the described ground application methods. Spot applications to grass pasture and rangeland may not exceed more than 1/10 of the area to be grazed or cut for hay. See appropriate sections of this label for specific use directions for the application method and vegetation control desired. **DO NOT** apply more than 48 fl ozs per acre per year.

GRAZING AND HAYING RESTRICTIONS

There are no grazing restrictions following **Arsenal PowerLine** application. **DO NOT** cut forage grass for hay for 7 days after **Arsenal PowerLine** application.

INSTRUCTIONS FOR RANGELAND USE

Arsenal PowerLine may be applied to rangeland for the control of undesirable vegetation to achieve 1 or more of the following vegetation management objectives:

1. To control undesirable (nonnative, invasive and noxious) plant species
2. To control undesirable vegetation to aid in the establishment of desirable rangeland plant species
3. To control undesirable vegetation to aid in the establishment of desirable rangeland vegetation following a fire
4. To control undesirable vegetation to reduce wildfire fuel
5. To release existing desirable rangeland plant communities from the competitive pressure of undesirable plant species
6. To control undesirable vegetation to improve wildlife habitat

To ensure the protection of threatened and endangered plants when applying **Arsenal PowerLine** to rangeland:

1. Federal agencies must follow NEPA regulations to ensure protection of threatened and endangered plants.
2. State agencies must work with the Fish and Wildlife Service or the Service's designated state conservation agency to ensure protection of threatened and endangered plants.
3. Other organizations or individuals must operate under a Habitat Conservation Plan if threatened or endangered plants are known to be present on the land to be treated.

See the appropriate section(s) of this label for specific use directions for the desired rangeland vegetation management objective.

Arsenal PowerLine should only be applied to a given rangeland acre as specific weed problems arise. Long-term control of undesirable weed species ultimately depends on

the successful use of land management practices that promote the growth and sustainability of desirable rangeland plant species.

ROTATIONAL CROP INSTRUCTIONS

Rotational crops may be planted 12 months after applying **Arsenal® PowerLine™ herbicide** at the specified pasture and rangeland rate. Following 12 months after an **Arsenal PowerLine** application and before planting any crop, a successful field bioassay must be completed. The field bioassay consists of a test strip of the intended rotational crop planted in the previously treated area in the grass pasture/rangeland and grown to maturity. The test strip should include low areas and knolls, and include variations in soil type and pH within the treated area. If no crop injury is evident in the test strip, the intended rotational crop may be planted the following year.

Use of **Arsenal PowerLine** in accordance with label directions is expected to result in normal growth of rotational crops in most situations; however, various environmental and agronomic factors make it impossible to eliminate all risks associated with the use of this product and, therefore, rotational crop injury is always possible.

WEEDS CONTROLLED

Arsenal PowerLine will provide preemergence or postemergence control with residual control of the following target vegetation species at the rates listed. Residual control refers to control of newly germinating seedlings in both annuals and perennials. In general, annual weeds may be controlled by preemergence or postemergence applications of **Arsenal PowerLine**.

For established biennials and perennials, postemergence applications of Arsenal PowerLine are recommended. The rates shown below pertain to broadcast applications and indicate the relative sensitivity of these weeds. The relative sensitivity should be referenced when preparing low-volume spray solutions (see **Low-volume Foliar** section of **GROUND APPLICATIONS**); low-volume applications may provide control of the target species with less **Arsenal PowerLine** per acre than is shown for the broadcast treatments. **Arsenal PowerLine** may be used only in accordance with the instructions on this label.

RESISTANT BIOTYPES

Naturally occurring biotypes (a plant within a given species that has a slightly different but distinct genetic makeup from other plants of the same species) of some weeds listed on this label may not be effectively controlled by this and/or other herbicides (**Oust®**) with the ALS/AHAS enzyme-inhibiting mode of action. If naturally occurring ALS/AHAS-resistant biotypes are present in an area, **Arsenal PowerLine** should be tank mixed or applied sequentially with an appropriate registered herbicide having a different mode of action to ensure control.

Weeds Controlled

GRASSES

Common Name	Species	Growth Habit[2]
	Apply 2 to 3 pints per acre[1]	
Annual bluegrass	(*Poa annua*)	A
Broadleaf signalgrass	(*Brachiaria platyphylla*)	A
Canada bluegrass	(*Poa compressa*)	P
Downy brome	(*Bromus tectorum*)	A
Fescue	(*Festuca* spp.)	A/P
Foxtail	(*Setaria* spp.)	A
Italian ryegrass	(*Lolium multiflorum*)	A
Johnsongrass	(*Sorghum halepense*)	P
Kentucky bluegrass	(*Poa pratensis*)	P
Lovegrass	(*Eragrostis* spp.)	A/P
Orchardgrass	(*Dactylis glomerata*)	P
Paragrass	(*Brachiaria mutica*)	P
Quackgrass	(*Agropyron repens*)	P
Sandbur	(*Cenchrus* spp.)	A
Sand dropseed	(*Sporobolus cryptandrus*)	A
Smooth brome	(*Bromus inermis*)	P
Vaseygrass	(*Paspalum urvillei*)	P
Wild oats	(*Avena fatua*)	A
Witchgrass	(*Panicum capillare*)	A
	Apply 3 to 4 pints per acre[1]	
Barnyardgrass[3]	(*Echinochloa crus-galli*)	A
Beardgrass	(*Andropogon* spp.)	P
Bluegrass, annual[3]	(*Poa annua*)	A
Cheat	(*Bromus secalinus*)	A
Crabgrass	(*Digitaria* spp.)	A
Crowfootgrass[3]	(*Dactyloctenium aegyptium*)	A
Fall panicum	(*Panicum dichotomiflorum*)	A
Giant reed	(*Arundo donax*)	P
Goosegrass	(*Eleusine indica*)	A
Itchgrass[3]	(*Rottboellia exaltata*)	A
Junglerice[3]	(*Echinochloa colonum*)	A
Lovegrass[3]	(*Eragrostis* spp.)	A
Maidencane	(*Panicum hemitomon*)	A
Panicum, browntop[3]	(*Panicum fasciculatum*)	A
Panicum, Texas[3]	(*Panicum texanum*)	A
Prairie threeawn	(*Aristida oligantha*)	P
Reed canarygrass	(*Phalaris arundinacea*)	P
Sandbur, field[3]	(*Cenchrus incertus*)	A
Signalgrass[3]	(*Brachiaria* spp.)	A
Torpedograss	(*Panicum repens*)	P
Wild barley	(*Hordeum* spp.)	A
Wooly cupgrass[3]	(*Eriochloa villosa*)	A

Weeds Controlled *(continued)*

GRASSES *(continued)*

Common Name	Species	Growth Habit[2]
	Apply 4 to 6 pints per acre[1]	
Bahiagrass	(*Paspalum notatum*)	P
Bermudagrass[4]	(*Cynodon dactylon)*	P
Big bluestem	(*Andropogon gerardii)*	P
Cattail	(*Typha* spp.)	P
Cogongrass	(*Imperata cylindrica*)	P
Dallisgrass	(*Paspalum dilatatum*)	P
Feathertop	(*Pennisetum villosum*)	P
Guineagrass	(*Panicum maximum*)	P
Phragmites	(*Phragmites australis*)	P
Prairie cordgrass	(*Spartina pectinata*)	P
Saltgrass[4]	(*Distichlis stricta*)	P
Sand dropseed	(*Sporobolus cryptandrus*)	P
Sprangletop[3]	(*Leptochloa* spp.)	A
Timothy	(*Phleum pratense*)	P
Wirestem muhly	(*Muhlenbergia frondosa*)	P

BROADLEAF WEEDS

	Apply 2 to 3 pints per acre[1]	
African rue[10]	(*Peganum harmala*)	P
Alligatorweed	(*Alternanthera philoxeroides*)	A/P
Burdock	(*Arctium* spp.)	B
Carolina geranium	(*Geranium carolinianum*)	A
Carpetweed	(*Mollugo verticillata*)	A
Clover	(*Trifolium* spp.)	A/P
Common chickweed	(*Stellaria media*)	A
Common ragweed	(*Ambrosia artemisiifolia*)	A
Dandelion	(*Taraxacum officinale*)	P
Dogfennel	(*Eupatorium capillifolium*)	A
Filaree	(*Erodium* spp.)	A
Fleabane	(*Erigeron* spp.)	A
Hoary vervain	(*Verbena stricta*)	P
Indian mustard	(*Brassica juncea*)	A
Kochia[5]	(*Kochia scoparia*)	A
Lambsquarters	(*Chenopodium album*)	A
Lespedeza	(*Lespedeza* spp.)	P
Miners lettuce	(*Montia perfoliata*)	A
Mullein	(*Verbascum* spp.)	B
Nettleleaf goosefoot	(*Chenopodium murale*)	A
Oxeye daisy	(*Chrysanthemum leucanthemum*)	P
Pepperweed	(*Lepidium* spp.)	A
Pigweed	(*Amaranthus* spp.)	A
Puncturevine	(*Tribulus terrestris*)	A
Russian thistle	(*Salsola kali*)	A

Weeds Controlled *(continued)*

BROADLEAF WEEDS *(continued)*

Common Name	Species	Growth Habit[2]
	Apply 2 to 3 pints per acre[1] *(continued)*	
Smartweed	(*Polygonum* spp.)	A
Sorrell	(*Rumex* spp.)	P
Sunflower	(*Helianthus* spp.)	A
Sweet clover	(*Melilotus* spp.)	A
Tansymustard	(*Ambrosia psilostachya*)	P
Wild carrot	(*Daucus carota*)	B
Wild lettuce	(*Lactuca* spp.)	A/B
Wild parsnip	(*Pastinaca sativa*)	B
Wild turnip	(*Brassica campestris*)	B
Woollyleaf bursage	(*Franseria tomentosa*)	P
Yellow woodsorrel	(*Oxalis stricta*)	P
	Apply 3 to 4 pints per acre[1]	
Broom snakeweed[6]	(*Gutierrezia sarothrae*)	P
Bull thistle	(*Cirsium vulgare*)	B
Burclover[3]	(*Medicago* spp.)	A
Chickweed, mouseear[5]	(*Cerastium vulgatum*)	A
Clover, hop[3]	(*Trifolium procumbens*)	A
Cocklebur	(*Xanthium strumarium*)	A
Cudweed[3]	(*Gnaphalium* spp.)	A
Desert camelthorn	(*Alhagi pseudalhagi*)	P
Diffuse knapweed	(*Centaurea diffusa*)	A
Dock	(*Rumex* spp.)	P
Fiddleneck[3]	(*Amsinckia intermedia*)	A
Goldenrod	(*Solidago* spp.)	P
Henbit[3]	(*Lamium amplexicaule*)	A
Knotweed, prostrate[3]	(*Polygonum aviculare*)	A/P
Pokeweed	(*Phytolacca americana*)	P
Purple loosestrife[6]	(*Lythrum salicaria*)	P
Purslane	(*Portulaca* spp.)	A
Pusley, Florida[3]	(*Richardia scabra*)	A
Rocket, London[3]	(*Sisymbrium irio*)	A
Rush skeletonweed[6]	(*Chondrilla juncea*)	B
Saltbush	(*Atriplex* spp.)	A
Shepherdspurse[3]	(*Capsella bursa-pastoris*)	A
Spurge, annual[3]	(*Euphorbia* spp.)	A
Stinging nettle[6]	(*Urtica dioica*)	P
Velvetleaf[3]	(*Abutilon theophrasti*)	A
Yellow starthistle	(*Centaurea solstitialis*)	A

Weeds Controlled *(continued)*

BROADLEAF WEEDS *(continued)*

Common Name	Species	Growth Habit[2]
Apply 4 to 6 pints per acre[1]		
Arrowwood	(*Pluchea sericea*)	A
Canada thistle	(*Cirsium arvense*)	P
Giant ragweed	(*Ambrosia trifida*)	A
Grey rabbitbrush	(*Chrysothamnus nauseosus*)	P
Japanese bamboo/knotweed	(*Polygonum cuspidatum*)	P
Little mallow	(*Malva parviflora*)	B
Milkweed	(*Asclepias* spp.)	P
Primrose	(*Oenothera kunthiana*)	P
Russian knapweed	(*Centaurea repens*)	P
Sago pondweed[10]	(*Potamogeton pectinatus*)	P
Silverleaf nightshade	(*Solanum elaeagnifolium*)	P
Sowthistle	(*Sonchus* spp.)	A
Texas thistle	(*Cirsium texanum*)	P

VINES AND BRAMBLES

Apply 1 pint per acre		
Field bindweed	(*Convolvulus arvensis*)	P
Hedge bindweed	(*Calystegia sepium*)	A
Apply 2 to 3 pints per acre[1]		
Wild buckwheat	(*Polygonum convolvulus*)	P
Apply 3 to 4 pints per acre[1]		
Greenbriar	(*Smilax* spp.)	P
Honeysuckle	(*Lonicera* spp.)	P
Morningglory	(*Ipomoea* spp.)	A/P
Poison ivy	(*Rhus radicans*)	P
Redvine	(*Brunnichia cirrhosa*)	P
Wild rose	(*Rosa* spp.)	P
including: Multiflora rose	(*Rosa multiflora*)	P
Macartney rose	(*Rosa bracteata*)	P
Apply 4 to 6 pints per acre[1]		
Kudzu[4]	(*Pueraria lobata*)	P
Trumpetcreeper	(*Campsis radicans*)	P
Virginia creeper	(*Parthenocissus quinquefolia*)	P
Wild grape	(*Vitis* spp.)	P

BRUSH SPECIES

Apply 4 to 6 pints per acre[1]

Common Name	Species	Growth Habit[2]
American beech	(*Fagus grandifolia*)	P
Ash	(*Fraxinus* spp.)	P
Bald cypress	(*Taxodium distichum*)	P
Bigleaf maple	(*Acer macrophyllum*)	P
Blackgum	(*Nyssa sylvatica*)	P
Black locust[7]	(*Robinia pseudoacacia*)	P
Boxelder	(*Acer negundo*)	P
Brazilian peppertree	(*Schinus terebinthifolius*)	P
Cherry	(*Prunus* spp.)	P
Chinaberry	(*Melia azedarach*)	P
Chinese tallow-tree	(*Sapium sebiferum*)	P
Dogwood	(*Cornus* spp.)	P
Elm[8]	(*Ulmus* spp.)	P
Hawthorn	(*Crataegus* spp.)	P
Hickory	(*Carya* spp.)	P
Honeylocust[9]	(*Gleditsia triacanthos*)	P
Maple	(*Acer* spp.)	P
Melaleuca	(*Melaleuca quinquenervia*)	P
Mulberry	(*Morus* spp.)	P
Oak	(*Quercus* spp.)	P
Persimmon	(*Diospyros virginiana*)	P
Poplar	(*Populus* spp.)	P
Privet	(*Ligustrum vulgare*)	P
Red alder	(*Alnus rubra*)	P
Red maple	(*Acer rubrum*)	P
Russian olive	(*Elaeagnus angustifolia*)	P
Saltcedar	(*Tamarix ramosissima*)	P
Sassafras	(*Sassafras albidum*)	P
Sourwood	(*Oxydendrum arboreum*)	P
Sumac	(*Rhus* spp.)	P
Sweetgum	(*Liquidambar styraciflua*)	P
Willow	(*Salix* spp.)	P
Yellow poplar	(*Liriodendron tulipifera*)	P

[1] The higher rates should be used where heavy or well-established infestations occur.
[2] Growth Habit: A = Annual, B = Biennial, P = Perennial
[3] For preemergence control, tank mix with **Pendulum® herbicide**.
[4] Use a minimum of 75 GPA; control of established stands may require repeat applications.
[5] For preemergence control, tank mix with **Karmex®**, **Pendulum**, or diuron.
[6] For best results, early postemergence applications are required.
[7] Tank mix with **Accord®**, **Escort®**, **Garlon® 3A**, **Krenite®**, **Roundup®**, or **Tordon® K**.
[8] Tank mix with **Accord**, **Escort**, or **Roundup**.
[9] Tank mix with **Accord**, **Garlon 3A**, **Roundup**, or **Tordon K**.
[10] Use not permitted in California unless otherwise directed by supplemental labeling.

Conditions of Sale and Warranty

The **Directions For Use** of this product reflect the opinion of experts based on field use and tests. The directions are believed to be reliable and must be followed carefully. However, it is impossible to eliminate all risks inherently associated with the use of this product. Crop injury, ineffectiveness or other unintended consequences may result because of such factors as weather conditions, presence of other materials, or use of the product in a manner inconsistent with its labeling, all of which are beyond the control of BASF CORPORATION ("BASF") or the Seller. To the extent consistent with applicable law, all such risks shall be assumed by the Buyer.

BASF warrants that this product conforms to the chemical description on the label and is reasonably fit for the purposes referred to in the **Directions For Use**, subject to the inherent risks, referred to above.

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TO THE EXTENT CONSISTENT WITH APPLICABLE LAW, BASF AND THE SELLER DISCLAIM ANY LIABILITY FOR CONSEQUENTIAL, EXEMPLARY, SPECIAL OR INDIRECT DAMAGES RESULTING FROM THE USE OR HANDLING OF THIS PRODUCT.

BASF and the Seller offer this product, and the Buyer and User accept it, subject to the foregoing **Conditions of Sale and Warranty** which may be varied only by agreement in writing signed by a duly authorized representative of BASF. 1108

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BASF Corporation
26 Davis Drive
Research Triangle Park, NC 27709

BASF
The Chemical Company

We create chemistry

Safety Data Sheet
ARSENAL POWERLINE HERBICIDE

1. Identification

Product identifier used on the label

ARSENAL POWERLINE HERBICIDE

Recommended use of the chemical and restriction on use
Recommended use*: herbicide

* The "Recommended use" identified for this product is provided solely to comply with a Federal requirement and is not part of the seller's published specification. The terms of this Safety Data Sheet (SDS) do not create or infer any warranty, express or implied, including by incorporation into or reference in the seller's sales agreement.

Details of the supplier of the safety data sheet

Company:
BASF CORPORATION
100 Park Avenue
Florham Park, NJ 07932, USA

Telephone: +1 973 245-6000

Emergency telephone number

CHEMTREC: 1-800-424-9300
BASF HOTLINE: 1-800-832-HELP (4357)

Other means of identification

Substance number:	234359
EPA Registration number:	241-431
Molecular formula:	C(13) H(15) N(3) O(3). C(3) H(9) N
Chemical family:	imidazole derivative
Synonyms:	Isopropylamine salt of imazapyr

2. Hazards Identification

According to Regulation 2012 OSHA Hazard Communication Standard; 29 CFR Part 1910.1200

Classification of the product

Skin Sens.	1	Skin sensitization

Label elements

Pictogram:

Signal Word:
Warning

Hazard Statement:

H317	May cause an allergic skin reaction.

Precautionary Statements (Prevention):

P280	Wear protective gloves.
P261	Avoid breathing dust/fume/gas/mist/vapours/spray.
P272	Contaminated work clothing should not be allowed out of the workplace.

Precautionary Statements (Response):

P303 + P352	IF ON SKIN (or hair): Wash with plenty of soap and water.
P333 + P311	If skin irritation or rash occurs: Call a POISON CENTER or doctor/physician.
P362 + P364	Take off contaminated clothing and wash it before reuse.

Precautionary Statements (Disposal):

P501	Dispose of contents/container to hazardous or special waste collection point.

According to Regulation 1994 OSHA Hazard Communication Standard; 29 CFR Part 1910.1200

Emergency overview

CAUTION:
May cause moderate but temporary irritation to the eyes.
Prolonged or repeated skin contact may cause sensitization or allergic reactions.
HARMFUL IF SWALLOWED.
KEEP OUT OF REACH OF CHILDREN.
KEEP OUT OF REACH OF DOMESTIC ANIMALS.
Avoid contact with the skin, eyes and clothing.
Avoid inhalation of mists/vapours.

3. Composition / Information on Ingredients

According to Regulation 2012 OSHA Hazard Communication Standard; 29 CFR Part 1910.1200

CAS Number	Weight %	Chemical name
81510-83-0	26.7 %	imazapyr isopropylamine salt

According to Regulation 1994 OSHA Hazard Communication Standard; 29 CFR Part 1910.1200

CAS Number	Weight %	Chemical name
81510-83-0	26.7 %	imazapyr isopropylamine salt
	73.3 %	Proprietary ingredients

4. First-Aid Measures

Description of first aid measures

General advice:
Remove contaminated clothing.

If inhaled:
Keep patient calm, remove to fresh air, seek medical attention.

If on skin:
Wash thoroughly with soap and water.

If in eyes:
Wash affected eyes for at least 15 minutes under running water with eyelids held open.

If swallowed:
Immediately rinse mouth and then drink 200-300 ml of water, seek medical attention.

Most important symptoms and effects, both acute and delayed

Symptoms: The most important known symptoms and effects are described in the labelling (see section 2) and/or in section 11., Further important symptoms and effects are so far not known.

Indication of any immediate medical attention and special treatment needed

Note to physician

Treatment:	Treat according to symptoms (decontamination, vital functions), no known specific antidote.

5. Fire-Fighting Measures

Extinguishing media

Suitable extinguishing media:
foam, dry powder, carbon dioxide, water spray

Special hazards arising from the substance or mixture

Hazards during fire-fighting:
carbon monoxide, carbon dioxide, nitrogen oxide, nitrogen dioxide, Hydrocarbons,
If product is heated above decomposition temperature, toxic vapours will be released. The substances/groups of substances mentioned can be released if the product is involved in a fire.

Advice for fire-fighters

Protective equipment for fire-fighting:
Firefighters should be equipped with self-contained breathing apparatus and turn-out gear.

Further information:
In case of fire and/or explosion do not breathe fumes. Keep containers cool by spraying with water if exposed to fire. Collect contaminated extinguishing water separately, do not allow to reach sewage or effluent systems. Dispose of fire debris and contaminated extinguishing water in accordance with official regulations.

6. Accidental release measures

Personal precautions, protective equipment and emergency procedures

Take appropriate protective measures. Clear area. Shut off source of leak only under safe conditions. Extinguish sources of ignition nearby and downwind. Ensure adequate ventilation. Wear suitable personal protective clothing and equipment.

Environmental precautions
Do not discharge into the subsoil/soil. Do not discharge into drains/surface waters/groundwater. Contain contaminated water/firefighting water.

Methods and material for containment and cleaning up
Dike spillage. Pick up with suitable absorbent material. Place into suitable containers for reuse or disposal in a licensed facility. Spilled substance/product should be recovered and applied according to label rates whenever possible. If application of spilled substance/product is not possible, then spills should be contained, solidified, and placed in suitable containers for disposal. After decontamination, spill area can be washed with water. Collect wash water for approved disposal.

7. Handling and Storage

Precautions for safe handling
RECOMMENDATIONS ARE FOR MANUFACTURING, COMMERCIAL BLENDING, AND PACKAGING WORKERS. PESTICIDE APPLICATORS & WORKERS must refer to the Product Label and Directions for Use attached to the product for Agricultural Use Requirements in accordance with the EPA Worker Protection Standard 40 CFR part 170. Ensure adequate ventilation. Provide good ventilation of working area (local exhaust ventilation if necessary). Keep away from sources of ignition - No smoking. Keep container tightly sealed. Protect contents from the effects of light. Protect against heat. Protect from air. Handle and open container with care. Do not open until ready to use. Once container is opened, content should be used as soon as possible. Avoid aerosol formation. Avoid dust formation. Provide means for controlling leaks and spills. Do not return residues to the storage containers. Follow label warnings even after container is emptied. The substance/ product may be handled only by appropriately trained personnel. Avoid all direct contact with the substance/product. Avoid contact with the skin, eyes and clothing. Avoid inhalation of dusts/mists/vapours. Wear suitable personal protective clothing and equipment.

Protection against fire and explosion:
The relevant fire protection measures should be noted. Fire extinguishers should be kept handy. Avoid all sources of ignition: heat, sparks, open flame. Sources of ignition should be kept well clear. Avoid extreme heat. Keep away from oxidizable substances. Electrical equipment should conform to national electric code. Ground all transfer equipment properly to prevent electrostatic discharge. Electrostatic discharge may cause ignition.

Conditions for safe storage, including any incompatibilities
Segregate from incompatible substances. Segregate from foods and animal feeds. Segregate from textiles and similar materials.

Further information on storage conditions: Keep only in the original container in a cool, dry, well-ventilated place away from ignition sources, heat or flame. Protect containers from physical damage. Protect against contamination. The authority permits and storage regulations must be observed.

8. Exposure Controls/Personal Protection

Users of a pesticidal product should refer to the product label for personal protective equipment requirements.

Advice on system design:
Whenever possible, engineering controls should be used to minimize the need for personal protective equipment.

Personal protective equipment

RECOMMENDATIONS FOR MANUFACTURING, COMMERCIAL BLENDING, AND PACKAGING WORKERS:

Respiratory protection:
Wear respiratory protection if ventilation is inadequate. Wear a NIOSH-certified (or equivalent) TC23C Chemical/Mechanical type filter system to remove a combination of particles, gas and vapours. For situations where the airborne concentrations may exceed the level for which an air purifying respirator is effective, or where the levels are unknown or Immediately Dangerous to Life or Health (IDLH), use NIOSH-certified full facepiece pressure demand self-contained breathing apparatus (SCBA) or a full facepiece pressure demand supplied-air respirator (SAR) with escape provisions.

Hand protection:
Chemical resistant protective gloves, Protective glove selection must be based on the user's assessment of the workplace hazards.

Eye protection:
Safety glasses with side-shields. Tightly fitting safety goggles (chemical goggles). Wear face shield if splashing hazard exists.

Body protection:
Body protection must be chosen depending on activity and possible exposure, e.g. head protection, apron, protective boots, chemical-protection suit.

General safety and hygiene measures:
Wear long sleeved work shirt and long work pants in addition to other stated personal protective equipment. Work place should be equipped with a shower and an eye wash. Handle in accordance with good industrial hygiene and safety practice. Personal protective equipment should be decontaminated prior to reuse. Gloves must be inspected regularly and prior to each use. Replace if necessary (e.g. pinhole leaks). Take off immediately all contaminated clothing. Store work clothing separately. Hands and/or face should be washed before breaks and at the end of the shift. No eating, drinking, smoking or tobacco use at the place of work. Keep away from food, drink and animal feeding stuffs.

9. Physical and Chemical Properties

Form:	liquid
Odour:	odourless
Odour threshold:	not applicable, odour not perceivable
Colour:	transparent light yellow
pH value:	approx. 6 - 8 (25 °C)
Freezing point:	approx. 0 °C (1,013.3 hPa) Information applies to the solvent.
Boiling point:	approx. 100 °C (1,013.3 hPa) Information applies to the solvent.

Flash point:	> 100 °C The product has not been tested. The statement has been derived from the properties of the individual components.
Flammability:	not applicable
Lower explosion limit:	As a result of our experience with this product and our knowledge of its composition we do not expect any hazard as long as the product is used appropriately and in accordance with the intended use.
Upper explosion limit:	As a result of our experience with this product and our knowledge of its composition we do not expect any hazard as long as the product is used appropriately and in accordance with the intended use.
Autoignition:	Based on the water content the product does not ignite.
Vapour pressure:	approx. 23.3 hPa (20 °C) Information applies to the solvent.
Density:	approx. 1.10 g/cm3 (20 °C)
Relative density:	1.10 (20 °C)
Vapour density:	not applicable
Partitioning coefficient n-octanol/water (log Pow):	not applicable
Thermal decomposition:	carbon monoxide, carbon dioxide, nitrogen oxide, nitrogen dioxide, Hydrocarbons Stable at ambient temperature. If product is heated above decomposition temperature toxic vapours may be released.
Viscosity, dynamic:	163.2 mPa.s (20 °C)
Solubility in water:	miscible
Molar mass:	320.4 g/mol
Evaporation rate:	not applicable
Other Information:	If necessary, information on other physical and chemical parameters is indicated in this section.

10. Stability and Reactivity

Reactivity
No hazardous reactions if stored and handled as prescribed/indicated.

Corrosion to metals:
Corrosive effect on: mild steel brass

Oxidizing properties:
Not an oxidizer.

Chemical stability
The product is stable if stored and handled as prescribed/indicated.

Possibility of hazardous reactions

The product is chemically stable.

Conditions to avoid
Avoid all sources of ignition: heat, sparks, open flame. Avoid prolonged storage. Avoid electro-static discharge. Avoid contamination. Avoid prolonged exposure to extreme heat. Avoid extreme temperatures.

Incompatible materials
oxidizing agents, reducing agents

Hazardous decomposition products

Decomposition products:
No hazardous decomposition products if stored and handled as prescribed/indicated., Prolonged thermal loading can result in products of degradation being given off.

Thermal decomposition:
Possible thermal decomposition products:
carbon monoxide, carbon dioxide, nitrogen oxide, nitrogen dioxide, Hydrocarbons
Stable at ambient temperature. If product is heated above decomposition temperature toxic vapours may be released.

11. Toxicological information

Primary routes of exposure

Routes of entry for solids and liquids are ingestion and inhalation, but may include eye or skin contact. Routes of entry for gases include inhalation and eye contact. Skin contact may be a route of entry for liquefied gases.

Acute Toxicity/Effects

Acute toxicity
Assessment of acute toxicity: Slightly toxic after single ingestion. Relatively nontoxic after short-term skin contact. Relatively nontoxic after short-term inhalation.

Oral
Type of value: LD50
Species: rat
Value: > 2,000 mg/kg (OECD Guideline 423)
No mortality was observed.

Inhalation
Type of value: LC50
Species: rat
Value: > 5.5 mg/l
Exposure time: 4 h
The product has not been tested. The statement has been derived from substances/products of a similar structure or composition.

Dermal
Type of value: LD50
Species: rabbit
Value: > 5,000 mg/kg (OECD Guideline 402)
No mortality was observed.

Assessment other acute effects

Assessment of STOT single:
The available information is not sufficient for evaluation.

The product has not been tested. The statement has been derived from the properties of the individual components.

Irritation / corrosion
Assessment of irritating effects: May cause slight but temporary irritation to the eyes. May cause slight irritation to the skin.

Skin
Species: rabbit
Result: non-irritant
Method: Primary skin irritation test

Eye
Species: rabbit
Result: non-irritant

Sensitization
Assessment of sensitization: Caused skin sensitization in animal studies.

Skin sensitization test
Species: guinea pig
Result: Caused skin sensitization in animal studies.

Chronic Toxicity/Effects

Genetic toxicity
Assessment of mutagenicity: The product has not been tested. The statement has been derived from the properties of the individual components. Mutagenicity tests revealed no genotoxic potential.

Carcinogenicity
Assessment of carcinogenicity: The product has not been tested. The statement has been derived from the properties of the individual components. The results of various animal studies gave no indication of a carcinogenic effect.

Reproductive toxicity
Assessment of reproduction toxicity: The product has not been tested. The statement has been derived from the properties of the individual components. The results of animal studies gave no indication of a fertility impairing effect.

Teratogenicity
Assessment of teratogenicity: The product has not been tested. The statement has been derived from the properties of the individual components. Animal studies gave no indication of a developmental toxic effect at doses that were not toxic to the parental animals.

Symptoms of Exposure

The most important known symptoms and effects are described in the labelling (see section 2) and/or in section 11., Further important symptoms and effects are so far not known.

Medical conditions aggravated by overexposure
Individuals with pre-existing diseases of the respiratory system, skin or eyes may have increased susceptibility to excessive exposures.

12. Ecological Information

Toxicity

Aquatic toxicity
Assessment of aquatic toxicity:
There is a high probability that the product is not acutely harmful to fish. There is a high probability that the product is not acutely harmful to aquatic invertebrates. Acutely harmful for aquatic plants.

There is a high probability that the product is not acutely harmful to aquatic organisms.

Toxicity to fish
LC50 (96 h) > 120 mg/l, Cyprinus carpio

Aquatic invertebrates
EC50 (48 h) > 100 mg/l, Daphnia magna

Aquatic plants
EC50 (72 h) > 98.0 mg/l, Pseudokirchneriella subcapitata

No observed effect concentration (72 h) 25.8 mg/l, Pseudokirchneriella subcapitata

Assessment of terrestrial toxicity
With high probability not acutely harmful to terrestrial organisms.

Other terrestrial non-mammals

Information on: imazapyr
LC50, Anas platyrhynchos
With high probability not acutely harmful to terrestrial organisms.
LD50 > 100 ug/bee, Apis mellifera
With high probability not acutely harmful to terrestrial organisms.

Mobility in soil

Assessment transport between environmental compartments
The product has not been tested. The statement has been derived from the properties of the individual components.

Information on: Imazapyr

The substance will not evaporate into the atmosphere from the water surface.
Following exposure to soil, the product trickles away and can - dependant on degradation - be transported to deeper soil areas with larger water loads.

Additional information

Other ecotoxicological advice:
The ecological data given are those of the active ingredient. Do not release untreated into natural waters.

13. Disposal considerations

Waste disposal of substance:
Pesticide wastes are regulated. Improper disposal of excess pesticide, spray mix or rinsate is a violation of federal law. If pesticide wastes cannot be disposed of according to label instructions, contact the State Pesticide or Environmental Control Agency or the Hazardous Waste representative at the nearest EPA Regional Office for guidance.

Container disposal:
Rinse thoroughly at least three times (triple rinse) in accordance with EPA recommendations. Consult state or local disposal authorities for approved alternative procedures such as container recycling. Recommend crushing, puncturing or other means to prevent unauthorized use of used containers.

RCRA:
This product is not regulated by RCRA.

14. Transport Information

Land transport
USDOT

Not classified as a dangerous good under transport regulations

Sea transport
IMDG

Not classified as a dangerous good under transport regulations

Air transport
IATA/ICAO

Not classified as a dangerous good under transport regulations

15. Regulatory Information

Federal Regulations

Registration status:

Crop Protection	TSCA, US	released / exempt
Chemical	TSCA, US	blocked / not listed

EPCRA 311/312 (Hazard categories): Not hazardous;

CA Prop. 65:
Risk assessment indicates No Significant Risk Levels for Carcinogens and No Maximum Allowable Dose Levels for Chemicals Causing Reproductive Toxicity are expected when using this product as labeled for agricultural or residential use.

NFPA Hazard codes:
Health : 2 Fire: 1 Reactivity: 0 Special:

Labeling requirements under FIFRA

This chemical is a pesticide product registered by the Environmental Protection Agency and is subject to certain labeling requirements under federal pesticide law. These requirements differ from the classification criteria and hazard information required for safety data sheets, and workplace labels of non-pesticide chemicals. Following is the hazard information as required on the pesticide label.

CAUTION:
May cause moderate but temporary irritation to the eyes.
Prolonged or repeated skin contact may cause sensitization or allergic reactions.
HARMFUL IF SWALLOWED.
KEEP OUT OF REACH OF CHILDREN.
KEEP OUT OF REACH OF DOMESTIC ANIMALS.
Avoid contact with the skin, eyes and clothing.
Avoid inhalation of mists/vapours.

16. Other Information

SDS Prepared by:
BASF NA Product Regulations
SDS Prepared on: 2016/06/16

We support worldwide Responsible Care® initiatives. We value the health and safety of our employees, customers, suppliers and neighbors, and the protection of the environment. Our commitment to Responsible Care is integral to conducting our business and operating our facilities in a safe and environmentally responsible fashion, supporting our customers and suppliers in ensuring the safe and environmentally sound handling of our products, and minimizing the impact of our operations on society and the environment during production, storage, transport, use and disposal of our products.

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END OF DATA SHEET

Nufarm

Polaris®

Herbicide

GROUP 2 HERBICIDE

For control of undesirable vegetation growing within certain aquatic sites, forestry sites, pasture/rangeland, nonagricultural lands, establishment and maintenance of wildlife openings, release of unimproved Bermudagrass and Bahiagrass, bareground weed control, for use under certain paved areas, industrial noncropland areas including railroad, utility, pipeline and highway rights-of-way, utility plant sites, petroleum tank farms, pumping installations, fence rows, storage areas, non-irrigation ditchbanks including grazed or hayed areas within these sites, roads and transmission lines.

ACTIVE INGREDIENT:	
Isopropylamine salt of Imazapyr: (2-[4,5-dihydro-4-methyl-4-(1-methylethyl)-5-oxo-1H-imidazol-2-yl]-3-pyridinecarboxylic acid)*	27.7%
OTHER INGREDIENTS:	72.3%
TOTAL:	100.0%

* Equivalent to 22.62% 2-[4,5-dihydro-4-methyl-4-(1-methylethyl)-5-oxo-1H-imidazol-2-yl]-3-pyridinecarboxylic acid or 2 pounds acid per gallon.

Have the product container label with you when calling a poison control center or doctor or going for treatment.

In the State of New York, Aquatic Uses are Not Allowed.

KEEP OUT OF REACH OF CHILDREN

CAUTION / PRECAUCIÓN

Si usted no entiende la etiqueta, busque a alguien para que se la explique a usted en detalle.
(If you **DO NOT** understand the label, find someone to explain it to you in detail.)

SEE NEXT PAGE BOOKLET FOR ADDITIONAL FIRST AID AND PRECAUTIONARY STATEMENTS

For Chemical Spill, Leak, Fire, or Exposure, Call CHEMTREC (800) 424-9300
For Medical Emergencies Only, Call (877) 325-1840

EPA Reg. No. 228-534

Manufactured for
Nufarm Americas Inc.
11901 S. Austin Avenue
Alsip, IL 60803

Nufarm
Grow a better tomorrow

1 91662 01337 5

Net Contents

2.5 Gal.

(9.46 L)

Nonrefillable Container

14785000

PRECAUTIONARY STATEMENTS
HAZARDS TO HUMANS AND DOMESTIC ANIMALS
CAUTION / PRECAUCIÓN

No human or domestic animal hazard statements are required. Follow the instructions for Personal Protective Equipment and User Safety Recommendations.

PERSONAL PROTECTIVE EQUIPMENT (PPE):

Mixers, loaders, applicators and other handlers must wear:

- Long-sleeved shirt and long pants
- Shoes plus socks
- Chemical-resistant gloves made of any waterproof material

Follow manufacturer's instructions for cleaning/maintaining PPE. If no such instructions for washables exist, use detergent and hot water. Keep and wash PPE separately from other laundry. Discard clothing and other absorbent materials that have been drenched or heavily contaminated with this product's concentrate. DO NOT reuse them.

Engineering Controls

Pilots must use an enclosed cockpit that meet the requirements listed in the Worker Protection Standard (WPS) for agricultural pesticides [40 CFR 170.240(d) (6)].

USER SAFETY RECOMMENDATIONS

Users should

- Wash hands before eating, drinking, chewing gum, using tobacco or using the toilet.
- Remove clothing/PPE immediately if pesticide gets inside. Then wash thoroughly and put on clean clothing. If pesticide gets on skin, wash immediately with soap and water.
- Remove PPE immediately after handling this product. Wash the outside of gloves before removing. As soon as possible, wash thoroughly and change into clean clothing.

PHYSICAL AND CHEMICAL HAZARDS

Spray solutions of this product should be mixed, stored and applied only in stainless steel, fiberglass, plastic and plastic-lined steel containers.

DO NOT mix, store or apply this product or spray solutions of this product in unlined steel (except stainless steel) containers or spray tanks.

ENVIRONMENTAL HAZARDS

This pesticide is toxic to plants. Drift and run off may be hazardous to plants in water adjacent to treated areas. DO NOT apply directly to water except as specified on the label. Treatment of aquatic weeds may result in oxygen depletion or loss due to decomposition of dead plants. DO NOT treat more than one half the surface area of the water in a single operation and wait at least 10 to 14 days between treatments. Begin treatment along the shore and proceed outward in bands to allow aquatic organisms to move into untreated areas. DO NOT contaminate water when disposing of equipment washwater or rinsate. This pesticide is toxic to vascular plants and must be used strictly in accordance with the drift precautions of the label.

DIRECTIONS FOR USE

It is a violation of Federal law to use this product in a manner inconsistent with its labeling. DO NOT apply this product in a way that will contact workers or other persons, either directly or through drift. Only protected handlers may be in the area during application.

AGRICULTURAL USE REQUIREMENTS

Use this product only in accordance with its labeling and with the Worker Protection Standard, 40 CFR Part 170. This Standard contains requirements for the protection of agricultural workers on farms, forests, nurseries, and greenhouses, and handlers of agricultural pesticides. It contains requirements for training, decontamination, notification, and emergency assistance. It also contains specific instructions and exceptions pertaining to the statements on this label about personal protective equipment (PPE) and restricted entry interval. The requirements in this box only apply to uses of this product that are covered by the Worker Protection Standard.

DO NOT enter or allow worker entry into treated areas during the restricted entry interval (REI) of 48 hours.

PPE required for early entry to treated areas that is permitted under the Worker Protection Standard and that involves contact with anything that has been treated, such as plants, soil, or water, is:

- Coveralls
- Shoes plus socks
- Chemical-resistant gloves made of any waterproof material
- Protective eyewear

NON-AGRICULTURAL USE REQUIREMENTS

The requirements in this box apply to uses of this product that are NOT within the scope of the Worker Protection Standard (WPS) for agricultural pesticides (40 CFR Part 170). The WPS applies when this product is used to produce agricultural plants on farms, forests, nurseries, or greenhouses.

DO NOT enter or allow others to enter treated areas until sprays have dried.

PRODUCT INFORMATION

This product is an aqueous solution to be mixed with water and a surfactant and applied as a spray solution to control undesirable vegetation growing within certain aquatic sites, forestry sites, pasture/rangeland, and nonagricultural lands. Aquatic sites consist of standing and flowing water, estuarine/marine, wetland, and riparian areas. Nonagricultural lands include private, public and military land as follows: uncultivated nonagricultural areas (including airports, highway, railroad and utility rights of way and sewage disposal areas), uncultivated agricultural areas – noncrop producing (including farmyards, fuel storage areas, fence rows, nonirrigation ditch banks and barrier strips), industrial sites – outdoor (including lumber yards, pipeline and tank farms) and natural areas (including wildlife management areas, wildlife openings, wildlife habitats, recreation areas, campgrounds, trailheads, and trails). This product may also be used for the release of unimproved Bermudagrass and Bahiagrass, for bareground weed control, and for use under certain paved surfaces.

Herbicidal Activity: This product will control most annual and perennial grasses and broadleaf weeds in addition to many brush and vine species with some residual control of undesirable species that germinate above the waterline. This product is readily absorbed through emergent leaves and stems and is translocated rapidly throughout the plant, with accumulation in the meristematic regions. For maximum activity, weeds should be growing robustly at the time of application, and the spray solution should include a surfactant (see **ADJUVANTS** section for specific use directions). Treated plants stop growing soon after spray application. Chlorosis appears first in the newest leaves, and necrosis spreads from this point. In perennials, the herbicide is translocated into, and kills, underground or submerged storage organs, which prevents regrowth. Chlorosis and tissue necrosis may not be apparent in some plant species until two or more weeks after application. Complete kill of plants may not occur for several weeks. Applications of this product are rainfast one hour after treatment.

RESTRICTIONS and LIMITATIONS

DO NOT use on food or feed crops.
DO NOT apply this product to water within 0.5 miles upstream of an active potable water intake in flowing water (i.e. river, stream, etc.) or within 0.5 miles of an active potable water intake in a standing body of water, such as a lake, pond or reservoir.
DO NOT apply to water used for irrigation except as described in USE PRECAUTIONS AND RESTRICTIONS section of this label.
Keep from contact with fertilizers, insecticides, fungicides and seeds.
DO NOT drain or flush equipment on or near desirable trees or other plants, or on areas where their roots may extend, or in locations where the treated soil may be washed or moved into contact with their roots.
DO NOT use on lawns, walks, driveways, tennis courts or similar areas.
DO NOT side trim desirable vegetation with this product unless severe injury and plant death can be tolerated. Prevent drift of spray to desirable plants.
Clean application equipment after using this product by thoroughly flushing with water.

Nonagricultural Lands and Forestry Sites

- DO NOT apply more than 1.5 pounds acid equivalent Imazapyr (equivalent to 6 pints) per acre per year.

Pasture/Rangeland Sites

- DO NOT apply more than 0.75 pound acid equivalent Imazapyr (equivalent to 3 pints) per acre per year.
- DO NOT treat more than 1 /10 of the available area to be grazed or cut for hay.
- For spot treatment only.

Aquatic Sites

- DO NOT apply more than 1.5 pounds acid equivalent Imazapyr (equivalent to 6 pints) per acre per year.
- **No Application to Aquatic Sites in New York State.**

Aerial application - Aerial application to aquatic sites is restricted to helicopter only.

Irrigation water - Application to water used for irrigation that results in residues greater than 1.0 part per billion (ppb) MUST NOT be used for irrigation purposes for 120 days after application or until residue levels of this product are determined by laboratory analysis or other appropriate means of analysis to be 1.0 ppb or less. When applications are made within 500 feet of an active irrigation intake, DO NOT irrigate for at least 24 hours following application to allow for dissipation.

Quiescent or Slow-moving Waters - In lakes and reservoirs, DO NOT apply this product within 1 mile of an active irrigation water intake during the irrigation season. Applications less than 1 mile from an active irrigation water intake may be made during the off-season, provided that the irrigation intake will remain inactive for a minimum of 120 days after application or until residue levels of this product are determined by laboratory analysis or other appropriate means of analysis to be 1.0 ppb or less.

Restrictions for potable water intakes - DO NOT apply this product directly to water within 0.5 miles upstream of an active potable water intake in flowing water (i.e. river, stream, etc.) or within 0.5 miles of an active potable water intake in a standing body of water such as a lake, pond or reservoir. To make aquatic applications around and within 0.5 miles of active potable water intakes, the water intake must be turned off during application and for a minimum of 48 hours after the application. These aquatic applications may be made only in the cases where there are alternative water sources or holding ponds that would permit the turning off of an active potable water intake for a minimum period of 48 hours after the applications.

NOTE: Existing potable water intakes that are no longer in use, such as those replaced by connections to wells or a municipal water system, are not considered to be active potable water intakes. This restriction does not apply to intermittent, inadvertent overspray of water in terrestrial use sites.

Permitting - Consult local state fish and game agency and water control authorities before applying this product to public water. Permits may be required to treat such water.

Public waters - Application of this product to water can only be made by federal or state agencies, such as Water Management District personnel, municipal officials, and the U.S. Army Corps of Engineers, or those applicators who are licensed or certified as aquatic pest control applicators and are authorized by the state or local government. Treatment to other than non-native invasive species is limited to only those plants that have been determined to be a nuisance by a federal or state government entity.

Private waters - Applications may be made to private waters that are still, such as ponds, lakes and drainage ditches where there is minimal or no outflow to public waters.

Recreational use of water in treatment area - There are no restrictions on the use of water in the treatment area for recreational purposes, including swimming and fishing.

Livestock use of water in/from treatment area - There are no restrictions on livestock consumption of water from the treatment area.

Precautions for Avoiding Injury to Nontarget Plants

Untreated desirable plants can be affected by root uptake of this product from treated soil. Injury or loss of desirable plants may result if this product is applied on or near desirable plants, on areas where their roots extend, or in locations where the treated soil may be washed or moved into contact with their roots. When making applications along shorelines where desirable plants may be present, caution should be exercised to avoid spray contact with their foliage or spray application to the soil in which they are rooted. Shoreline plants that have roots that extend into the water in an area where this product has been applied generally will not be adversely affected by uptake of the herbicide from the water.

If treated vegetation is to be removed from the application site, DO NOT use the vegetative matter as mulch or compost on or around desirable species.

MANAGING OFF-TARGET MOVEMENT

Aerial Application

- Applicators are required to use coarse or coarser droplet size (ASABE S572) or if specifically using a spinning atomizer, nozzle applicators are required to use a volume mean diameter (VMD) of 385 microns or greater for release heights below 10 feet. Applicators are required to use a very coarse or coarser droplet size or if specifically using a spinning atomizer nozzle, applicators are required to use a VMD of 475 microns or greater for relase heights above 10 feet. Applicators must consider the effects of nozzle orientation and flight speed when determining droplet size.
- Applicators are required to use upwind swath displacement.
- The boom length must not exceed 60% of the wingspan or 90% of the rotor blade diameter to reduce spray drift.
- Applications with wind speeds less than 3 mph and with wind speeds greater than 10 mph are prohibited. These requirements do not apply to forestry applications, public health uses or to applications using dry formulations.
- Applications into temperature inversions are prohibited.

Ground Boom Application

- Applicators are required to use a nozzle height below 4 feet above the plant canopy or the ground and coarse or Coarser droplet size (ASABE S572) or, if specifically using a spinning atomizer nozzle, applicators are required to use a volume mean diameter (VMD) of 385 microns or greater.
- Applications with wind speeds greater than 10 mph are prohibited.
- Applications into temperature inversions are prohibited.

WIND EROSION

Avoid treating powdery dry or light sandy soils when conditions are favorable for wind erosion. Under these conditions, the soil surface should first be settled by rainfall or irrigation.

ADJUVANTS

Post-emergence applications of this product require the addition of a spray adjuvant for optimum herbicide performance. Only spray adjuvants that are approved or appropriate for aquatic use can be utilized. The addition of a Chemical Producers and Distributors Associations (CPDA) certified adjuvant can increase control. A CPDA certified drift control agent may also be used.

Nonionic Surfactants: Use a nonionic surfactant at the rate 0.25% v/v or higher (see manufacturer's label) of the spray solution (0.25% v/v is equivalent to 1 quart in 100 gallons). For best results, select a nonionic surfactant with a HLB (hydrophilic to lipophilic balance) ratio between 12 and 17 with at least 70% surfactant in the formulated product. Alcohols, fatty acids, oils, ethylene glycol or diethylene glycol should not be considered as surfactants to meet the above requirements.

Methylated Seed Oils or Vegetable Oil Concentrates: Instead of a surfactant, a methylated seed oil or vegetable-based seed oil concentrate may be used at the rate of 1.5 to 2 pints per acre. When using spray volumes greater than 30 gallons per acre, methylated seed oil or vegetable based seed oil concentrates should be mixed at a rate of 1 % of the total spray volume, or alternatively use a nonionic surfactant as described above. Research indicates that these oils may aid in product deposition and uptake by plants under moisture or temperature stress.

Silicone Based Surfactants: See manufacturer's label for specific rate recommendations. Silicone-based surfactants may reduce the surface tension of the spray droplet, allowing greater spreading on the leaf surface as compared to conventional nonionic surfactants. However, some silicone-based surfactants may dry too quickly, limiting herbicide uptake.

Invert emulsions: This product can be applied as an invert emulsion. The spray solution results in an invert (water-in-oil) spray emulsion designed to minimize spray drift and spray run-off, resulting in more herbicide on the target foliage. The spray emulsion may be formed in a single tank (batch mixing) or injected (in-line mixing). Consult the invert chemical label for proper mixing directions. Do not apply more than 3 pints of this product per acre in an invert emulsion.

Fertilizer/Surfactant Blends: Nitrogen based liquid fertilizers such as 28%N, 32%N, 10-34-0 or ammonium sulfate, may be added at the rate of 2 to 3 pints per acre in combination with the recommended rate of nonionic surfactant, methylated seed oil or vegetable/seed oil concentrate. The use of fertilizers in a tank mix without a nonionic surfactant, methylated seed oil or vegetable/seed oil concentrate is not recommended.

Other: An antifoaming agent, spray pattern indicator or drift reducing agent may be applied at the product labeled rate if necessary or desired.

TANK MIXES

It is the pesticide user's responsibility to ensure that all products are registered for the intended use. Read and follow the applicable restrictions and limitations and directions for use on all product label involved in tank mixing. Users must follow the most restrictive directions for use and precautionary statements of each product in the tank mixture.

APPLICATION METHODS

This product may be selectively applied by using low volume directed application techniques or may be broadcast applied using ground equipment, watercraft, or aircraft. Aerial applications to aquatic sites must be made by helicopter. In addition, this product may also be applied using cut stump, cut stem, and frill or girdle treatment techniques within nonagricultural lands, pasture/rangeland and aquatic sites. See AERIAL APPLICATION and GROUND APPLICATION sections for additional details.

COMPATIBILITY

Before full-scale mixing of this product with other pesticides, emulsifiers, fertilizers, surfactants or oils, determine the compatibility of the proposed mixture. Use proportionate quantities of each ingredient and mix in a small container. Always mix one product thoroughly with the diluent before adding another product. If no incompatibility is evident after 30 minutes, the mixture is generally compatible for spraying. To evaluate potential short term effects of applying the mixture, test the tank mix combination on a few plants or a small area before larger-scale treatments. Wait at least 2 to 3 days for problems to become apparent.

IMPORTANT: MIXING WITH OTHER SUBSTANCES MAY INCREASE THE RISK OF MIXING INCOMPATIBILITIES, REDUCED EFFECTIVENESS AND/OR CAUSE CROP INJURY OR LOSS. ANY LIABILITY FOR LOSS, INJURY OR DAMAGE RESULTING FROM A MIXTURE NOT SPECIFIED ON THIS LABEL OR IN MANUFACTURER'S SUPPLEMENTAL LABELING DISTRIBUTED FOR THIS PRODUCT IS SPECIFICALLY DISCLAIMED BY MANUFACTURER.

AERIAL APPLICATION

All precautions must be taken to minimize or eliminate spray drift. Both helicopter and fixed wing aircraft can be used to apply this product, but applications to aquatic sites are restricted to helicopter only. DO NOT make applications by helicopter or fixed wing aircraft unless appropriate buffer zones can be maintained to prevent spray drift out of the target area, or when spray drift as a result of helicopter application can be tolerated. Aerial equipment designed to minimize spray drift such as a helicopter equipped with a Microfoil™ boom Thru-Valve™ boom or raindrop nozzles must be used and calibrated. Except when applying with a Microfoil boom, a drift control agent may be added at the specified label rate. DO NOT side trim with this product unless death of treated tree can be tolerated.

Uniformly apply the specified amount of this product in 2 to 30 gallons of water per acre. A foam reducing agent may be added at the specified label rate.

Immediately after each use of this product thoroughly clean application equipment, including landing gear. Uncoated steel surfaces (except stainless steel surfaces) may result in corrosion and failure after prolonged exposure to the product. The maintenance of an paint (organic coating) may prevent corrosion.

GROUND APPLICATION

Low Volume Foliar:

Use equipment calibrated to deliver 5 to 20 gallons of spray solution per acre. To prepare the spray solution, thoroughly mix in water 0.5 to 5% of this product plus surfactant (see the ADJUVANTS section of this label for specific recommendations). A foam reducing agent may be applied at the label rate, if needed. For control of difficult species (see AQUATIC WEEDS CONTROLLED section and the TERRESTRIAL WEEDS CONTROLLED section for relative susceptibility of weed species), use the higher concentrations of herbicide and/or spray volumes but DO NOT apply more than 3 quarts of this product per acre in aquatic sites and nonagricultural lands and 1-5 quarts per acre in pasture/rangeland. Excessive wetting of foliage is not necessary.

For low volume foliar application, select proper nozzles to avoid over-application. Proper application is critical to ensure desirable results. Best results are achieved when the spray covers the crown and approximately 70% of the plant. The use of an even flat fan tip with a spray angle of 40 degrees or less will aid in proper deposition.

Appropriate tip sizes include 4004E, or 1504E. For a straight stream and cone pattern, adjustable cone nozzles such as 5500 X3 or 5500 X4 may be used. Attaching a rollover valve onto a Spraying Systems Model 30 gunjet or other similar spray guns allows for the use of both a flat fan and cone tips on the same gun.

Moisten, but DO NOT drench target vegetation causing spray solution to run off.

Low Volume Foliar with Backpacks:

For low-growing species, spray down on the crown, covering crown and penetrating approximately 70% of the plant.

For target species 4 to 8 feet tall, swipe the sides of target vegetation by directing spray to at least two sides of the plant in smooth vertical motions from the crown to the bottom. Make sure to cover the crown whenever possible.

For target species over 8 feet tall, lace sides of the target vegetation by directing spray to at least two sides of the target in smooth zigzag motions from crown to bottom.

Low Volume Foliar with Hydraulic Handgun Application Equipment:

Use same technique as described above for Low Volume Foliar with Backpacks.

For broadcast applications, simulate a gentle rain near the top of target vegetation, allowing spray to contact the crown and penetrate the target foliage without falling to the understory. Herbicide spray solution which contacts the understory may result in severe injury or death of plants in the understory.

High Volume Foliar:

For optimum performance when spraying medium to high-density vegetation, use equipment calibrated to deliver up to 100 gallons of spray solution per acre (GPA). Spray solutions exceeding 100 GPA may result in excessive spray run-off, causing increased ground cover injury, and injury to desirable species.

To prepare the spray solution, thoroughly mix this product in water and add a surfactant (see ADJUVANT section for specific recommendations and rates of surfactants). A foam-reducing agent may be added at the label rate, if needed. For control of difficult species (see AQUATIC WEEDS CONTROLLED section and the ADDITIONAL WEEDS CONTROLLED section for relative susceptibility of weed species), use the higher concentrations of herbicide and/or spray volumes, but DO NOT apply more than 3 quarts of this product per acre in aquatic sites and nonagricultural lands, and 1-5 quarts per acre in pasture/rangeland. Uniformly cover the foliage of the vegetation to be controlled but DO NOT apply to run-off. Excessive wetting of foliage is not necessary.

SIDE TRIMMING

DO NOT side trim with this product unless severe injury or death of the treated tree can be tolerated. This product is readily translocated and can result in death of the entire tree.

CUT SURFACE TREATMENTS

This product may be used to control undesirable woody vegetation by applying the product solution to the cambium area of freshly cut stump surfaces or to fresh cuts on the stem of the target woody vegetation. Applications can be made at any time of the year except during periods of heavy sap flow in the spring. DO NOT over apply solution causing run-off from the cut surface.

Injury may occur to desirable woody plants if the shoots extend from the same root system or their root systems are grafted to those of the treated tree.

This product may be mixed as either a concentrate or dilute solution. The dilute solution may be used for application to the cut surface of the stump or to cuts on the stem of target woody vegetation. Concentrated solutions may be used for applications to cuts on the stem. Use of the concentrated solution permits application to fewer cuts on the stem, especially for large diameter trees. Follow the application instructions to determine proper application techniques for each type of solution.

- To prepare a dilute solution, mix 8 to 12 fluid ounces of this product with one gallon of water. If temperatures are such that freezing of the spray mixture may occur, antifreeze (ethylene glycol) may be used according to manufacturer's label to prevent freezing. The use of a surfactant or penetrating agent may improve uptake through partially callused cambiums.
- To prepare a concentrated solution, mix 2 quarts of this product with no more than 1 quart of water.

CUT STUMP TREATMENT

Dilute Solution - Spray or brush the solution onto the cambium area of the freshly cut stump surface. Ensure that the solution thoroughly wets the entire cambium area (the wood next to the bark of the stump).

CUT STEM TREATMENT

(injection, hack-and-squirt)

Dilute Solution - Using standard injection equipment, apply 1 milliliter of solution at each injection site around the tree with no more than one-inch intervals between cut edges. Ensure that the injector completely penetrates the bark at each injection site.

Concentrate Solution - Using standard injection equipment, apply 1 milliliter of solution at each injection site. Make at least one injection cut for every 3 inches of Diameter at Breast Height (DBH) on the target tree. For example, a 3-inch DBH tree will receive 1 injection cut and a 6-inch DBH tree will receive 2 injection cuts. On trees requiring more than one injection site place the injection cuts at approximately equal intervals around the tree.

CUT STUBBLE

This product can be applied within 2 weeks after mechanical mowing or cutting of brush. To suppress or control resprouting, uniformly apply a spray solution of this product at the rate of 1.0 to 2.0 pints per acre to the cut area. This product may be tank-mixed with picloram (such as Trooper 22K), or equivalent labeled product for this use, to aid in control or suppression of brush. The addition of 5% (v/v) or more of a penetrating agent can aid in uptake through the bark or exposed roots.

Cut stubble applications are made to the soil and cut brush stumps. This type of application may increase ground cover injury. However, vegetation will recover. Making applications of this product directly to the soil can increase potential root uptake causing injury or death of desirable trees.

Efficacy can be increased and root uptake by desirable vegetation can be decreased if the brush is allowed to regrow and the foliage is treated. See the Brush Control section of this label.

FRILL OR GIRDLE TREATMENT

Using a hatchet, machete, or chain saw, make cuts through the bark and completely around the tree to expose the cambium. The cut should angle downward extending into the cambium enough to expose at least two growth rings. Using a spray applicator or brush, apply a 25% to 100% solution of this product into each cut until thoroughly wet. Avoid applying so much herbicide that runoff to the ground or water occurs.

BASAL APPLICATION

This product is an aqueous formulation that requires mixing with **basal oil containing at least 15% emulsifier or will require the addition of an emulsifier, for application to the basal area** of brush and trees to control undesirable vegetation in the following noncropland areas: access roads, airfields, airports, along forest roads, around commercial or industrial structures or outbuildings, around farm and ranch structures and outbuildings, bare ground, construction sites, ditch banks, dry ditches & canals, fences & fencerows, firebreaks, gravel yards, habitat restoration & management areas, highways & roadsides (including aprons, medians, guardrails & right of ways), industrial plant sites, industrial areas, lumber yards, natural areas, paved areas, petroleum & other tank farms, pumping installations, pipeline, power, telephone & utility rights-of-way, power stations, railroad rights-of-way, refineries, resorts, storage areas, substations, uncropped farmstead areas, uncultivated non-agricultural areas, vacant lots, walkways, wastelands & wildlife habitat areas.

Thinline Basal and Stem Application

- This product may be applied as a thinline basal or arcing application to the stems of susceptible species such as big leaf maple (*Acer macrophyllum*), willow (*Salix* spp.) and Eucalyptus (*Eucalyptus* spp.) with a stem ground line diameter of 3 inches or less. Mix 24 to

48 fluid ounces of this product in one gallon of **basal oil containing at least 15% emulsifier**. Maintain uniform mixtures with frequent agitation. Direct a thin line of the spray solution to the stems beginning a few feet from the ground and descending toward the base of the tree making a zig-zag motion. Do not over apply causing puddling.

Low Volume Basal Bark Treatments

- This product, at the rate of 8 to 12 fluid ounces per gallon may be applied for low volume basal bark treatments. This product at 3.0 to 5.0% is recommended to be tank mixed with Relegate™ or Garlon® 4 or other basal products to broaden the spectrum of control. Consult the herbicide labels for rates and susceptible brush species. Mixing with basal requires compatibility tests prior to mixing large quantities. Mixing aids (such as emulsifiers, etc.) and ongoing agitation are required to attain a homogenous tank mix.
- Basal application should be made to the lower 12" to 18" of the target brush and go to the soil. Care should be taken not to puddle or over treat the stem. Basal application is best suited for low density brush sites, where stems do not exceed 700 stems per acre.

For Basal Application – It is advisory to mix only the intended amount of mixture that is to be sprayed that day. Adequate agitation must be maintained with all emulsion mixtures to prevent phase separation. Prior to tank mixing with other products, herbicides and oils, you must determine the compatibility of the proposed mixture. (See **COMPATIBILITY** section).

SPRAY SOLUTION MIXING GUIDE						
			TANK MIXING			
AMOUNT OF SPRAY SOLUTION BEING PREPARED	**NUFARM POLARIS ALONE**		**NUFARM POLARIS WHEN TANK MIXING**		**RELEGATE or GARLON 4**	
	6%	9%	3.0%	5.0%	15%	20%
1 Gallon	8.0 fl. oz.	12.0 fl. oz.	3.8 fl. oz.	6.4 fl. oz.	1.2 pts.	1.6 pts.
3 Gallons	1.5 pts.	2.25 pts.	11.5 fl. oz.	1.2 pts.	1.8 qts.	2.4 qts.
4 Gallons	1.0 qt.	1.5 qts.	15.4 fl. oz.	1.6 pts.	2.4 qts.	3.2 qts.
5 Gallons	1.25 qts.	1.0 qt. + 28.0 fl. oz.	1.2 pts.	1.0 qt.	3.0 qts.	1.0 gal.
50 Gallons	3.0 gals. + 1.0 pt.	4.0 gals. + 2.75 qts.	1.5 gals.	2.5 gals.	7.5 gals.	10.0 gals.
100 Gallons	6.0 gals. + 1.0 qt.	9.0 gals. + 1.5 qts.	3.0 gals.	5.0 gals.	15.0 gals.	20.0 gals.
16 fluid ounces = 1 pint : 2 pints = 1 quart : 4 quarts = 1 gallon						

FORESTRY USE

Site Preparation Treatment

This product may be used to control labeled grasses, broadleaf weeds, vines and brambles, and woody brush and trees on forest sites in advance of regeneration for the following conifer crop species:

Common Name	**Scientific Name**	**Rate** (fl oz/A)
Loblolly pine	*Pinus taeda*	48 to 80
Loblolly X pitch hybrid		
Longleaf pine	*Pinus palustris*	
Shortleaf pine	*Pinus echinata*	
Virginia pine	*Pinus virginiana*	
Slash pine	*Pinus elliottii*	40 to 64
Coastal redwood	*Sequoia sempervirens*	24 to 48
Douglas fir	*Pseudotsuga menziesii*	
Incense cedar	*Libocedrus decurrens*	
Western hemlock	*Tsuga heterophylla*	
California red fir	*Abies magnifica*	24 to 40
California white fir	*Abies concolor*	
Jack pine	*Pinus banksiana*	24 to 32
Lodgepole pine	*Pinus contorta*	
Pitch pine	*Pinus rigida*	
Ponderosa pine	*Pinus ponderosa*	
Sugar pine	*Pinus lambertiana*	
White pine	*Pinus strobes*	
Black spruce	*Picea mariana*	
Red spruce	*Picea rubens*	
White spruce	*Picea glauca*	

Use the specified rate of this product per acre applied as a broadcast foliar spray for long-term control of labeled woody plants and residual control of herbaceous weeds. Within 4 to 6 weeks of treatment, grass and other herbaceous weeds will be controlled and may provide fuel to facilitate a site preparation burn if desired to control conifers or other species tolerant to the herbicide.

Apply the specified rate of this product per acre in 5 to 30 gallons total spray solution for helicopter applications or 5 to 100 gallons total spray solution for mechanical ground spray and backpack applications. Use a minimum of 0.5% by volume nonionic surfactant (NIS). Use the higher label rate of this product and higher spray volumes when controlling particularly dense or multilayered canopies of hardwood stands or difficult to control species.

In certain cases, tank mixes may be necessary for chemical control of conifers and other species tolerant to this product. Observe all precautions and restrictions on the product labels. Always follow the most restrictive label. Combinations with other products labeled for forest site preparation may kill certain plants such as legumes and blackberry which are desirable for wildlife habitat.

Where quick initial brownout (deadening of foliage) is desired for burning, apply a tank mixture of 32 to 64 fl. oz. of this product with 16 to 64 fl. oz. glyphosate or 16 to 48 fl. oz. triclopyr ester per acre. For control of seedling pines, apply 32 to 64 fl. oz. of this product with 3 to 4 quarts glyphosate. For site preparation, rates less than 48 fl. oz, of this product will provide suppression of hard wood brush and trees, some resprouting may occur.

DO NOT plant seedlings of black spruce (*Picea mariana*) or white spruce (*Picea glauca*) on sites broadcast treated with this product or into the treated zone of spot or banded applications for 3 months following application or injury may occur.

HERBACEOUS WEED CONTROL

Use this product for selective weeding in the following conifer crop species:

Common Name	Scientific Name	Rate (fl oz/A)
Loblolly pine	*Pinus taeda*	12 to 20
Loblolly X pitch hybrid		
Virginia pine	*Pinus virginiana*	
Longleaf pine[1]	*Pinus palustris*	8 to 12
Slash pine[1]	*Pinus elliottii*	
Douglas fir[1]	*Pseudotsuga menziesii*	

[1]Use of surfactant is not recommended

This product may be applied as a broadcast treatment, banded over tree rows, or as a directed spray for release of young conifers from herbaceous weeds. To prevent possibility of conifer injury, DO NOT apply this product when conifers are under stress from drought disease, animal or winter injury, planting shock, or other stresses reducing conifer vigor. Broadcast applications may be made by helicopter, ground, or backpack sprayer. For difficult to control weeds, use the higher labeled rates. Where herbaceous weeds have overtopped conifer seedlings, a nonionic surfactant may be added to improve weed control (except for slash pine, long leaf pine, and Douglas fir) at a rate not to exceed 0.5% of spray solution volume. Some minor conifer growth inhibition may be observed when herbaceous weed control treatments are made during periods of active conifer growth.

This product may also be applied using backpack or handheld sprayers to control herbaceous weeds around individual conifer seedlings. Mix 0.8 to 1.2 fl. oz. of this product + 0.2 oz. nonionic surfactant per gallon of water. Direct the spray to the weeds and minimize the amount applied to conifer foliage for best conifer tolerance. Ensure that maximum labeled rates per acre for previously listed crop species are not exceeded.

This product may be tank mixed with Spyder® and/or Spyder Extra to broaden the spectrum of weeds controlled. For loblolly pine, apply 8 to 12 fl. oz. of this product + 1 to 2 fl. oz. Spyder and/or Spyder Extra per acre. The application of this product plus Spyder and/or Spyder Extra on other conifer species may cause growth suppression.

CONIFER RELEASE TREATMENT

This product may be applied as a broadcast or directed spray application for suppression of labeled brush, tree, and herbaceous weed species. Directed spray applications may be made with low volume applications in conifer stands of all ages by targeting unwanted vegetation and avoiding direct application to the conifer. Ensure that maximum labeled rates per acre listed for the following crop species are not exceeded.

Broadcast Applications for Release of the Following Conifers from Hardwood Competition

Common Name	Scientific Name	Rate (fl oz/A)
Loblolly pine[3]	*Pinus taeda*	24 to 40
Loblolly X pitch hybrid[3]		
Virginia pine[3]	*Pinus virginiana*	
Longleaf pine	*Pinus palustris*	24 to 32
Pitch pine	*Pinus rigida*	
Shortleaf pine	*Pinus echinata*	
Slash pine	*Pinus elliottii*	
White pine[1]	*Pinus strobes*	16 to 32
California red fir	*Abies magnifica*	16 to 24
California white fir	*Abies concolor*	
Lodgepole pine[2]	*Pinus contorta*	
Douglas fir[2]	*Pseudotsuga menziesii*	
Jack pine[2]	*Pinus banksiana*	12 to 24
Black spruce[2]	*Picea mariana*	
Red spruce[2]	*Picea rubens*	
White spruce[2]	*Picea glauca*	

[1]DO NOT make applications to white pine stands younger than three years old. To minimize potential white pine injury, release treatments should not be made prior to July 15.

[2]Applications should be made after formation of final conifer resting buds in the fall or height growth inhibitor may occur

[3]**Mid rotation release:** For broadcast applications below the pine canopy in established stands of loblolly pine, loblolly X pitch hybrid, and Virginia pine, use 32 to 64 fl. oz. of this product per acre. For mid rotation release of other species, use rates listed in the chart above.

For slash pine and longleaf pine, broadcast release treatments over the top of pines for the purpose of woody plant control must be made after August 15 and only in stands 2 through 5 years old. For applications over the top of slash pine and longleaf pine, DO NOT add surfactant and use lower labeled rates on sandy soils.

FOR THE AERIAL RELEASE TO SLASH PINE (*PINUS ELLIORTII*) STANDS OVER THE AGE OF 5 YEARS

This product may be applied as an aerial application for release of slash pine stands over the age of 5 years. In addition to reading and following all directions in this product, the following precautions and restrictions are required:

- Make applications in the fall after slash pine height growth has stopped and buds have set.
- Do not apply before September 15 even if height growth has stopped and buds have set.
- A maximum of 12 to 14 fl. oz./A of this product may be applied. Use the 12 fl. oz./A rate on sandier sites.

Apply the label rate of this product per acre when making broadcast applications with helicopter or ground spray equipment. Refer to mixing and application instructions for proper spray volumes. A nonionic surfactant may be added at no more than 0.25% by volume.

Use the higher label rates of this product when controlling particularly dense stands or difficult to control species.

Some minor conifer growth inhibition may be observed when release treatments are made during periods of active conifer growth. To minimize potential conifer height growth inhibition, DO NOT make broadcast applications to conifer stands except loblolly pine before the end of the second growing season. To minimize potential confer height growth inhibition, broadcast release treatments may be made late in the growing season. To prevent possibility of conifer injury, DO NOT apply this product when conifers are under stress from drought, disease, animal or winter injury, or other stresses reducing conifer vigor.

This product may be used to release loblolly pine seedlings during the first growing season following planting or for one year old natural loblolly pine regeneration. For one year old loblolly pine release, apply 24 to 40 fl. oz. per acre of this product after July 15. Rates below 32 fl. oz. per acre are intended for hardwood growth suppression expect hardwood resprouting.

SPOT TREATMENT OF UNDESIRABLE HARDWOOD VEGETATION

This product may be used as a directed foliar or cut stem application to control undesirable brush and hardwoods in the management of stands of all ages for the conifer species listed in the broadcast application section above. Refer to the mixing and application instructions in the foliar or cut stem sections for proper use rates, equipment, and application techniques. DO NOT exceed maximum labeled rates per acre listed for crop species. Cut stem applications may be used for spot treatment of undesirable hardwoods in Ponderosa pine stands using 24 fl. oz. or less of this product per acre.

Avoid direct application to desired plant species or injury may occur. Injury may occur to nontarget or desirable hardwoods or conifers if they extend from the same root system or their root systems are grafted to those of the treated tree or their roots extend into the treated zone.

LATE ROTATION VEGETATION CONTROL IN WESTERN CONIFER

In California, the Pacific Northwest, and Inland Northwest, broadcast aerial applications of this product up to 48 fl. oz. per acre are permissible in conifer stands that are targeted for harvesting the year following treatment. Use minimum spray volume of 15 gallons per acre. Significant conifer injury or mortality must be expected. DO NOT use this treatment if conifer injury or mortality cannot be tolerated.

BAG AND SPRAY APPLICATION FOR CONIFER RELEASE

In Douglas fir and Ponderosa pine stands, broadcast applications of this product up to 32 fl. oz. per acre are permissible when the trees are covered by bags prior to the application. The bags must prevent the spray mix from contacting the conifer foliage. On sites with coarse textured soils (e.g., decomposed granite, pumice, sandy or rocky sites) or low levels of soil organic matter (generally 5% or less) significant conifer growth inhibition and mortality is possible. DO NOT use this treatment on these types of sites if conifer growth inhibition and mortality cannot be tolerated.

NONAGRICULTURAL LAND USE

This product may be used for woody and herbaceous weed control in nonagricultural lands including private, public, and military lands. Applications are not applicable to treatment of commercial timber or other plants grown for sale or other commercial use or for commercial seed production or for research purposes.

BRUSH CONTROL

Use the specified rate of this product with the preferred application technique for control of undesirable brush.

Tank Mixes and Application Rates for Low-Volume Foliar Brush Control*

Target Vegetation	Arsenal Rate (% by volume)	Tank Mix
Mixed hardwoods without elm, locust, or pine	1.0 to 1.5	Surfactant
Mixed hardwoods containing elm, locust, and pine	0.5 to 1.0	AquaNeat® at 2% to 3% or Razor® at 2 2/3 to 4% by volume plus surfactant
Mixed hardwoods with locust and pine but no elm		Krenite® at 2% to 5% by volume plus surfactant
Mixed hardwoods with locust and elm but no pine		Patriot® at 2 oz/A or 2-3 grams/gal plus surfactant
*Tank mixes with 2,4-D or products containing 2,4-D could result in reduced product efficacy.		

Backpack and Handheld Spray Mixing Guide

% Solution	Product Per Gallon of Mix (oz)	Product Per 4 Gallon Backpack (oz)
0.25	0.3	1.3
0.5	0.6	2.6
1.0	1.3	5.1
2.0	2.6	10.2
3.0	3.8	15.4
5.0	6.4	25.6

Measuring Chart

128 fluid ounces	=	1 gallon
16 fluid ounces	=	1 pint
8 pints	=	1 gallon
4 quarts	=	1 gallon
2 pints	=	1 quart

FOR SELECTIVE CONTROL OF UNDESIRABLE WEEDS IN UNIMPROVED BERMUDAGRASS AND BAHIAGRASS

This product may be used on unimproved industrial noncropland Bermudagrass and bahiagrass turf, such as roadsides, utility rights-of-way and other nonagricultural lands. The application of this product on established common and coastal Bermudagrass and bahiagrass provides control of labeled broadleaf and grass weeds. Competition from these weeds is eliminated, releasing the Bermudagrass and bahiagrass. Treatment of Bermudagrass with this product results in a compacted growth habit and seedhead inhibition.

Uniformly apply with properly calibrated ground equipment using at least 10 gallons of water per acre. Temporary yellowing of grass may occur when treatment is made after growth begins. DO NOT add surfactant in excess of the specified rate (1 fl. oz. per 25 gallons of spray solution). DO NOT apply to grass during its first growing season. DO NOT apply to grass that is under stress from drought, disease, insects, or other causes.

DOSAGE RATES AND TIMING:

Bermudagrass - Apply this product at 6 to 12 fl. oz. per acre when the Bermudagrass is dormant. Apply this product at 6 to 8 fl. oz. per acre after the bermudagrass has reached full green-up. Applications made during green-up will delay green-up. Include a surfactant in the spray solution.

For additional pre-emergence control of annual grasses and small seeded broadleaf weeds, add Pendulum® Aquacap™ herbicide at the rate of 3.1 to 6.3 pints per acre. Consult the Pendulum® label for weeds controlled and for other use directions and precautions.

For control of Johnsongrass in bermudagrass turf, apply this product at 8 fl. oz. per acre plus Roundup® or Razor® at 12 fl. oz. per acre plus surfactant. For additional control of broadleaves and vines, Tahoe®3A or Garlon®3A may be added to the above mix at the rate of 1-2 pints per acre. Observe all precautions and restrictions on the Tahoe®3A, Garlon®3A and Roundup® labels.

Bahiagrass - Apply this product at 4 to 8 fl. oz. per acre when the bahiagrass is dormant or after the grass has initiated green-up but has not exceeded 25% green-up. Include in the spray solution a surfactant (See Adjuvant section for specific use directions for surfactants).

WEEDS CONTROLLED IN UNIMPROVED BERMUDAGRASS AND BAHIAGRASS

Bedstraw (*Galium* spp.)
Bishopweed (*Ptilimnium capillaceum*)
Buttercup (*Ranunculus parviflorus*)
Carolina geranium (*Geranium carolinianum*)
Fescue (*Festuca* spp.)
Foxtail (*Setaria* spp.)
Little barley (*Hordeum pusillum*)
Seedling Johnsongrass (*Sorghum halepense*)
Wild carrot (*Daucus carota*)
White clover (*Trifolium repens*)
Yellow woodsorrel (*Oxalis stricta*)

GRASS GROWTH AND SEEDHEAD SUPPRESSION

This product may be used to suppress growth and seedhead development of certain turfgrass in unimproved areas. When applied to desirable turf, this product may result in temporary turf damage and/or discoloration. Effects to the desirable turf may vary with environmental conditions. For optimum performance, application should be made prior to culm elongation. Applications may be made before or after mowing. If applied prior to mowing, allow at least three days of active growth before mowing. If following a mowing, allow sufficient time for the grasses to recover before applying this product or injury may be amplified.
DO NOT apply to turf under stress (drought, cold, insect damaged, etc.) or severe injury or death may occur.

Bermudagrass - Apply this product at 6 to 8 fl. oz. per acre from early green-up to prior to seed head initiation. DO NOT add a surfactant for this application.

Cool Season Unimproved Turf - Apply this product at 2 fl. oz. per acre plus 0.25% nonionic surfactant. For increased suppression, this product may be tank-mixed with such products as Campaign® (24 fl. oz. per acre) or Embark® (8 fl. oz. per acre).
Tank-mixes may increase injury to desired turf. Consult each product label for recommended turf species and other use directions and precautions. Tank mixes with 2,4-D or products containing 2,4-D may decrease the effectiveness of this product.

TOTAL VEGETATION CONTROL WHERE BAREGROUND IS DESIRED

This product is an effective herbicide for preemergence or post-emergence control of many annual and perennial broadleaf and grass weeds where bareground is desired. This product is particularly effective on hard-to-control perennial grasses. This product at 1.5 to 6 pints per acre can be used alone or in tank-mix with herbicides approved for use in bare ground. The degree and duration of control are dependent on the rate of this product used, tank-mix partner, the volume of carrier, soil texture, rainfall and other conditions.

Consult manufacturer's labels for specific rates and weeds controlled. Always follow the most restrictive directions for use and precautionary statements of each product when making an application involving tank-mixes.

Applications of this product may be made anytime of the year. Use equipment calibrated to deliver desired gallons per acre spray volume and uniformly distribute the spray pattern over the treated area.

Post-emergence Applications: Always use a spray adjuvant (See Adjuvant section of this label) when making a post-emergence application. For optimum performance on tough to control annual grasses, applications should be made at a total volume of 100 gallons per acre or less. For quicker burndown or brown-out of target weeds, this product may be tank-mixed with products such as Razor®, or Roundup®. Tank mixes with 2,4-D or products containing 2,4-D may reduce the performance of this product. Always follow the most restrictive directions for use and precautionary statements of each product when tank-mixing.

Spot Treatments: This product may be used as a follow-up treatment to control escapes or weed encroachment in a bareground situation. To prepare the spray solution, thoroughly mix in each gallon of water 0.5 to 5% of this product plus an adjuvant. For increased burndown, include Razor®, Roundup®. or similar products. For added residual weed control or to increase the weed spectrum, add ProClipse® herbicide, Vanquish® herbicide, or Diablo® herbicide. Always follow the most restrictive directions for use and precautionary statements of each product when tank-mixing.

FOR CONTROL OF UNDESIRABLE WEEDS UNDER PAVED SURFACES

This product can be used under asphalt, pond liners and other paved areas, ONLY in industrial sites or where the pavement has a suitable barrier along the perimeter that prevents encroachment of roots of desirable plants.

This product should be used only where the area to be treated has been prepared according to good construction practices. If rhizomes, stolons, tubers or other vegetative plant parts are present in the site, they should be removed by scalping with a grader blade to a depth sufficient to insure their complete removal.

Paving should follow applications of this product as soon as possible. DO NOT apply where the product may contact the roots of desirable trees or other plants.

This product is not to be used under pavement on residential properties such as driveways or parking lots or for use in recreational areas such as under bike or jogging paths, golf cart paths, or tennis courts, or where landscape plantings could be anticipated.

Injury or death of desirable plants may result if this product is applied where roots are present or where they may extend into the treated area. Roots of trees and shrubs may extend a considerable distance beyond the branch extremities (drip line).

Applications should be made to the soil surface only when final grade is established. DO NOT move soil following application of this product. Apply this product in sufficient water (at least 100 gal. per acre) to ensure thorough and uniform wetting of the soil surface, including the shoulder areas. Add this product at a rate of 3 quarts per acre (2.2 fl. oz. per 1000 square feet) to clean water in the spray tank during the filling operation. Agitate before spraying.

If the soil is not moist prior to treatment, incorporation of this product is needed for herbicide activation. This product can be incorporated into the soil to a depth of 4 to 6 inches using a rototiller or disc. Rainfall or irrigation of 1 inch will also provide uniform incorporation. DO NOT allow treated soil to wash or move into untreated areas.

SPOT TREATMENTS AND CRACK–AND-CREVICE TREATMENTS

Use this product as an initial or follow up treatment to control weed escapes or weed encroachment in bareground situations, including cracks and crevices in paved surfaces such as parking lots, runways and roadways.

FOR SPOT TREATMENT WEED CONTROL IN GRASS PASTURE AND RANGELAND

For the control of undesirable vegetation in grass pasture and rangeland, this product may be applied as a spot treatment at a rate of 2 to 48 fl. oz. of product per acre using any of the ground application methods as described in this label. Spot applications may not exceed more than one tenth of the area to be grazed or cut for hay in grass pasture and rangeland. See appropriate sections of this label for specific use directions for the application method and vegetation control desired.

DO NOT apply more than 48 fl. oz. per acre per year.

Grazing and Haying Restrictions:
DO NOT cut forage grass for hay for 7 days after application of this product.
There are no grazing restrictions following application of this product.

Rangeland Use Instructions:
This product may be applied to rangeland for the control of undesirable vegetation to achieve one or more of the following vegetation management objectives:

- Control of undesirable (noxious, invasive and non-native) plant species.
- Control of undesirable vegetation for wildlife habitat improvement.
- Control of undesirable vegetation to aid in the establishment of desirable rangeland plant species.
- Release of existing desirable rangeland plant communities from the competitive pressure of undesirable plant species.
- Control of undesirable vegetation to aid in the establishment of desirable vegetation following a fire.
- Control of vegetation to reduce wildfire fuel.

To ensure the protection of threatened and endangered plants, when applying this product to rangeland:

- Federal agencies must follow NEPA regulations to ensure protection of threatened and endangered plants.
- Other organizations or individuals must operate under a habitat conservation plan if threatened or endangered plants are known to be present on the land to be treated.
- State agencies must work with the Fish and Wildlife Service or the Service's designated state conservation agency to ensure protection of threatened and endangered plants.

See appropriate sections of this label for specific use directions for the desired rangeland vegetation management control desired.

This product must only be applied to a given rangeland acre as specific weed problems arise. Long-term control of undesirable weeds ultimately depends on the successful use of the land management practices that promote the sustainability and growth of desirable rangeland plant species.

ROTATIONAL CROP GUIDELINE

Rotational crops may be planted 12 months after applying this product at the specified pasture and rangeland rate. Twelve months after an application of this product, and before planting any crop, a successful field bioassay must be completed. The field bioassay consists of a test strip of the intended rotational crop planted in the previously treated area in the grass pasture and rangeland and grown to maturity. The test strip should include low areas and knolls, and include variations in soil type and pH within the treated area. If no crop injury is evident in the test strip, the intended rotational crop may be planted the following year.

Use of this product in accordance with label directions is expected to result in normal growth of rotational crops in most situations; however, various agronomic factors and environmental factors make it impossible to eliminate all risks associated with the use of this product and, therefore, rotational crop injury is always possible.

TERRESTRIAL WEEDS CONTROLLED

In terrestrial sites, this product will provide preemergence or post-emergence control with residual control of the following target vegetation species at the rates listed. Residual control refers to control of newly germinating seedlings in both annuals and perennials. In general, annual weeds may be controlled by preemergence or postemergence applications of this product. For established biennials and perennials postemergence applications of this product are recommended.

The rates shown below pertain to broadcast applications and indicate the relative sensitivity of these weeds. The relative sensitivity should be referenced when preparing low volume spray solutions (see "Low Volume" section of "Ground Applications"); low volume applications may provide control of the target species with less product per acre than is shown for the broadcast treatments. This product must be used only in accordance with the Directions for Use on this label.

The relative sensitivity of the species listed below can also be used to determine the relative risk of causing non-target plant injury if any of the below listed species are considered to be desirable within the area to be treated.

Resistant Biotypes: Naturally occurring biotypes (a plant within a given species that has a slightly different, but distinct genetic makeup from other plants of the same species) of some weeds listed on this label may not be effectively controlled. If naturally occurring resistant biotypes are present in an area, this product should be tank-mixed or applied sequentially with an appropriate registered herbicide having a different mode of action to ensure control.

TERRESTRIAL WEEDS CONTROLLED		
COMMON NAME	**SCIENTIFIC NAME**	**GROWTH HABIT[2]**
GRASS WEEDS		
Apply 2 to 3 pints per acre[1]		
Annual bluegrass	*Poa annua*	A
Broadleaf signalgrass	*Brachiaria platyphylla*	A
Canada bluegrass	*Poa compressa*	P
Downy brome	*Bromus tectorum*	A
Fescue	*Festuca* spp.	A/P
Foxtail	*Setaria* spp.	A
Italian ryegrass	*Lotium multiflorum*	A
Johnsongrass[4]	*Sorghum halepense*	P
Kentucky bluegrass	*Poa pratensis*	P
Napier grass[5]	*Pennisetum purpureum*	P
Orchardgrass	*Dactytis glomerata*	P
Paragrass	*Brachiaria mutica*	P
Quackgrass	*Agropyron repens*	P
Sandbur	*Cenchrus* spp.	A
Smooth brome	*Bromus inermis*	P
Vaseygrass	*Paspalum urvillei*	P
Wild oats	*Avena fatua*	A
Witchgrass	*Panicum capillare*	A

(continued)

TERRESTRIAL WEEDS CONTROLLED (continued)		
COMMON NAME	**SCIENTIFIC NAME**	**GROWTH HABIT[2]**
GRASS WEEDS (continued)		
Apply 3 to 4 pints per acre[1]		
Barnyardgrass	*Echinochloa crus-galli*	A
Beardgrass	*Andropogon* spp.	P
Bluegrass, annual	*Poa annua*	A
Bulrush[5]	*Scirpus validus*	P
Cheat	*Bromus secalinus*	A
Cogongrass	*Imperata cylindrica*	P
Crabgrass	*Digitaria* spp.	A
Crowfootgrass	*Dactyloctenium aegyptium*	A
Fall panicum	*Panicum dichotomiflorum*	A
Goosegrass	*Eleusine indica*	A
Itchgrass	*Rottboellia exaltata*	A
Lovegrass[4]	*Eragrostis* spp.	P
Maidencane[5]	*Panicum hemitomon*	A
Panicum, browntop	*Panicum fasciculatum*	A
Panicum, Texas	*Panicum texanum*	A
Prairie threeawn	*Aristida oligantha*	P
Sandbur, field	*Cenchrus incertus*	A
Signalgrass	*Brachiaria platyphylla*	A
Wild barley	*Hordeum* spp.	A
Woolly cupgrass	*Eriochloa villosa*	A

(continued)

TERRESTRIAL WEEDS CONTROLLED (continued)

COMMON NAME	SCIENTIFIC NAME	GROWTH HABIT[2]
GRASS WEEDS (continued)		
Apply 4 to 6 pints per acre[1]		
Bahiagrass	*Paspalum notatum*	P
Bermudagrass[3,4]	*Cynodon dactylon*	P
Big bluestem	*Andropogon gerardii*	P
Dallisgrass	*Paspalum dilatatum*	P
Feathertop	*Pennisetum villosum*	P
Guineagrass	*Panicum maximum*	P
Saltgrass[3]	*Distichlis stricta*	P
Sand dropseed	*Sporobolus cryptandrus*	P
Sprangletop	*Leptochloa* spp.	A
Timothy	*Phleum pratense*	P
Wirestem muhly	*Muhlenbergia frondosa*	P

[1] Use higher rate where heavy or well-established infestations occur.
[2] Growth Habit: A = Annual, B = Biennial, P = Perennial
[3] Use a minimum of 75 GPA.
[4] Use higher labeled rates.
[5] Use not permitted in California unless otherwise directed by supplemental labeling.

TERRESTRIAL WEEDS CONTROLLED (continued)

COMMON NAME	SCIENTIFIC NAME	GROWTH HABIT[2]
BROADLEAF WEEDS		
Apply 2 to 3 pints per acre[1]		
Burdock	*Arctium* spp.	B
Carolina geranium	*Geranium carolinianum*	A
Carpetweed	*Mollugo verticillata*	A
Clover	*Trifolium* spp.	A/P
Common chickweed	*Stellaria media*	A
Common ragweed	*Ambrosia artemisiifolia*	A
Dandelion	*Taraxacum officinale*	P
Dogfennel	*Eupatorium capillifolium*	A
Filaree	*Erodium* spp.	A
Fleabane	*Erigeron* spp.	A
Hoary vervain	*Verbena stricta*	P
Indian mustard	*Brassica juncea*	A
Kochia	*Kochia scoparia*	A
Lambsquarters	*Chenopodium album*	A
Lespedeza[3]	*Lespedeza* spp.	P
Miners lettuce	*Montia perfoliata*	A

(continued)

TERRESTRIAL WEEDS CONTROLLED (continued)

COMMON NAME	SCIENTIFIC NAME	GROWTH HABIT[2]
BROADLEAF WEEDS (continued)		
Apply 2 to 3 pints per acre[1] (continued)		
Mullein	*Verbascum* spp.	B
Nettleleaf goosefoot	*Chenopodium murale*	A
Oxeye daisy	*Chrysanthemum leucanthemum*	P
Pepperweed	*Lepidium* spp.	A
Pigweed	*Amaranthus* spp.	A
Puncturevine	*Tribulus terrestris*	A
Russian thistle	*Salsola kali*	A
Smartweed	*Polygonum* spp.	A/P
Sorrell	*Rumex* spp.	P
Sunflower	*Helianthus* spp.	A
Sweet clover	*Melilotus* spp.	A/B
Tansymustard	*Descurainia pinnata*	A
Western ragweed	*Ambrosia psilostachya*	P
Wild carrot	*Daucus carota*	B
Wild lettuce	*Lactuca* spp.	A/B
Wild parsnip	*Pastinaca saliva*	B
Wild turnip	*Brassica campestris*	B
Woollyleaf bursage	*Franseria tomentosa*	P
Yellow woodsorrel	*Oxalis stricta*	P
Apply 3 to 4 pints per acre[1]		
Broom snakeweed	*Gutierrezia sarothrae*	P
Bull thistle	*Cirsium vulgare*	B
Burclover	*Medicago* spp.	A
Chickweed mouseear	*Cerastium vulgatum*	A
Clover hop	*Trifolium procumbens*	A
Cocklebur	*Xanthium strumarium*	A
Cudweed	*Gnaphalium* spp.	A
Desert camelthorn	*Alhagi pseudalhagi*	P
Dock	*Rumex* spp.	P
Fiddleneck	*Amsinckia intermedia*	A
Goldenrod	*Solidago* spp.	P
Henbit	*Lamium amplexicaule*	A
Knotweed, prostrate	*Polygonum aviculare*	A/P
Pokeweed	*Phytolacca americana*	P
Purslane	*Portulaca* spp.	A
Pusley, Florida	*Richardia scabra*	A
Rocket London	*Sisymbrium irio*	A

(continued)

TERRESTRIAL WEEDS CONTROLLED (continued)

COMMON NAME	SCIENTIFIC NAME	GROWTH HABIT[2]
BROADLEAF WEEDS (continued)		
Apply 3 to 4 pints per acre[1] (continued)		
Rush skeletonweed[4]	*Chondrilla juncea*	B
Saltbush	*Atriplex* spp.	A
Shepherdspurse	*Capsella bursa-pastoris*	A
Spurge, annual	*Euphorbia* spp.	A
Stinging nettle[4]	*Urtica dioica*	P
Velvetleaf	*Abutilon theophrasti*	A
Yellow starthistle	*Centaurea solstitialis*	A
Apply 4 to 6 pints per acre[1]		
Arrowwood	Pluchea sericea	A
Canada thistle	Cirsium arvense	P
Giant ragweed	Ambrosia trifida	A
Gray rabbitbrush	*Chrysothamnus nauseosus*	P
Little mallow	*Malva parviflora*	B
Milkweed	*Asclepias* spp.	P
Primrose	*Oenothera kunthiana*	P
Silverleaf nightshade	*Solarium elaeagnifolium*	P
Sowthistle	*Sonchus* spp.	A
Texas thistle	*Cirsium* texanum	P

[1] Use higher rate where heavy or well-established infestations occur.
[2] Growth Habit: A = Annual, B = Biennial, P = Perennial
[3] Use not permitted in California unless otherwise directed by supplemental labeling.
[4] For best results, early postemergence applications are required.

TERRESTRIAL WEEDS CONTROLLED (continued)

COMMON NAME	SCIENTIFIC NAME	GROWTH HABIT[2]
VINES AND BRAMBLES		
Apply 1 pint per acre		
Field bindweed	*Convolvulus arvensis*	P
Hedge bindweed	*Calystegia sepium*	A
Apply 2 to 3 pints per acre[1]		
Wild buckwheat	*Polygonum convolvulus*	P
Apply 3 to 4 pints per acre[1]		
Greenbriar	*Smilax* spp.	P
Honeysuckle[3]	*Lonicera* spp.	P
Morningglory	*Ipomoea* spp.	A/P
Poison ivy	*Rhus radicans*	P
Redvine	*Brunnichia cirrhosa*	P

(continued)

TERRESTRIAL WEEDS CONTROLLED (continued)

COMMON NAME	SCIENTIFIC NAME	GROWTH HABIT[2]
VINES AND BRAMBLES (continued)		
Apply 3 to 4 pints per acre[1] (continued)		
Wild rose[3] Including: Multiflora rose Macartney rose	*Rosa* spp. *Rosa multiflora* *Rosa bracteata*	P P P
Apply 4 to 6 pints per acre[1]		
Trumpetcreeper	*Campsis radicans*	P
Virginia creeper	*Parthenocissus quinquefolia*	P
Wild grape	*Vitis* spp.	P

[1] Use higher labeled rate where heavy or well-established infestations occur.
[2] Growth Habit: A = Annual, B = Biennial, P = Perennial
[3] Use higher labeled rate.

TERRESTRIAL WEEDS CONTROLLED (continued)

COMMON NAME	SCIENTIFIC NAME	GROWTH HABIT[2]
BRUSH SPECIES		
Apply 2 to 4 pints per acre[1]		
Brazilian peppertree	*Schinus terebinthifolius*	P
Chinese tallow tree Popcorn tree	*Sapium sebiferum*	P
Russian olive	*Elaeagnus angustifolia*	P
Sumac	*Rhus* spp.	P
Willow	*Salix* spp.	P
Apply 4 to 6 pints per acre[1]		
Alder	*Alnus* spp.	P
American beech	*Fagus grandifolia*	P
Ash[3]	*Fraxinus* spp.	P
Aspen	*Populus* spp.	P
Autumn olive	*Elaeagnus umbellata*	P
Bald cypress	*Taxodium distichum*	P
Bigleaf maple	*Acer macrophyllum*	P
Birch[3]	*Betula* spp.	P
Black gum[4]	*Nyssa sylvatica*	P
Black oak	*Quercus kelloggii*	P
Boxelder	*Acer negundo*	P
Ceanothis	*Ceanothis* spp.	P
Cherry[3, 4]	*Prunus* spp.	P
Chinaberry	*Melia azedarach*	P
Chinquapin	*Castanopsis chrysophylla*	P

(continued)

TERRESTRIAL WEEDS CONTROLLED (continued)		
COMMON NAME	**SCIENTIFIC NAME**	**GROWTH HABIT[2]**
BRUSH SPECIES (continued)		
Apply 4 to 6 pints per acre[1]		
Cottonwood	*Populus trichocarpa* *P deltoides*	P
Cypress	*Taxodium* spp.	P
Dogwood[3]	*Cornus* spp.	P
Elm	*Ulmus* spp.	P
Eucalyptus	*Eucalyptus* spp.	P
Hawthorn	*Crataegus* spp.	P
Hickory[3]	*Carya* spp.	P
Huckleberry	*Gaylussacia* spp.	P
Lyonia spp. Including: Fetterbush Staggerbush	 *Lyonia lucida* *Lyonia mariana*	 P P
Madrone	*Arbutus menziesii*	P
Maple	*Acer* spp.	P
Melaleuca	*Melaleuca quinquenervia*	P
Mulberry[3, 6]	*Morus* spp.	P
Oak[7]	*Quercus* spp.	P
Persimmon[4]	*Diospyros virginiana*	P
Poison oak	*Rhus diversiloba*	P
Poplar	*Populus* spp.	P
Privet	*Ligustrum vulgare*	P
Red alder	*Alnus rubra*	P
Red maple	*Acer rubrum*	P

(continued)

TERRESTRIAL WEEDS CONTROLLED (continued)		
COMMON NAME	**SCIENTIFIC NAME**	**GROWTH HABIT[2]**
BRUSH SPECIES (continued)		
Apply 4 to 6 pints per acre[1] (continued)		
Saltcedar	*Tamarix pentandra*	P
Sassafras	*Sassafras albidum*	P
Sourwood[4]	*Oxydendrum arboreum*	P
Sweetgum	*Liquidambar styraciflua*	P
Sycamore	*Platanus occidentals*	P
Tanoak[3]	*Lithocarpus densiflorus*	P
Titi[8]	*Cyrilla racemiflora*	P
Tree of heaven	*Ailanthus altissima*	P
Vaccinium spp. Including: Blueberry Sparkleberry	 *Vaccinium* spp. *Vaccinium arboreum*	 P P
Water willow[9]	*Justicia americana*	P
Yellow poplar[3]	*Liriodendron tulipifera*	P

[1] Use higher labeled rate where heavy or well-established infestations occur.
[2] Growth Habit: A = Annual, B = Biennial, P = Perennial
[3] Use higher labeled rate.
[4] Best control with applications before formation of fall leaf color.
[5] Tank mix with glyphosate.
[6] Degree of control may be species dependent.
[7] For water oak (*Quercus nigia*) laurel oak (*Quercus laurifloria*) willow oak (*Quercus phellos*) and live oak (*Quercus virginiana*) use higher labeled rates.
[8] Suppression only.
[9] Use not permitted in California unless otherwise directed by supplemental labeling.

AQUATIC WEEDS CONTROLLED

This product may be applied for control of floating and emergent weeds (see Aquatic Weeds Controlled and Terrestrial Weeds Controlled) in or near bodies of water that may be nonflowing, flowing, or transient. This product may be applied to aquatic sites that include rivers, lakes, streams, seeps, drainage ditches, ponds, reservoirs, canals, bogs, marshes, swamps, estuaries, bays, brackish water, transitional areas between terrestrial and aquatic sites, riparian sites and seasonal wet areas. See Use Precautions and Restrictions section of this label for instructions, directions, precautions and restrictions on aquatic uses.

Read and observe the following directions if aquatic sites are present in nonagricultural lands and are part of the intended treatment area.

This product must be applied to the emergent foliage of the target vegetation and little to no activity on submerged aquatic weeds. Concentrations of this product, resulting from direct application to water, are not expected to be of sufficient concentration nor duration to control target vegetation. Application should be made in such a way as to maximize spray interception by the target vegetation while minimizing the amount of overspray that enters the water.

This product does not control plants that have a majority of their foliage underwater or plants that are completely submerged.

Product Application: This product should be applied with helicopter or surface application equipment in a minimum of 2 gallons of water per acre. When applying by helicopter, follow directions under Aerial Application section of this label; when using surface equipment refer to the Ground Application section.

When applying this product to moving bodies of water applications should be made while traveling upstream to prevent concentration of this herbicide in water. DO NOT apply to bodies of water or portions of bodies of water where emergent and/or floating weeds do not exist.

Large Application Areas / Oxygen Depletion: When application is to be made to target vegetation that covers a large percentage of surface area of impounded water, treating area in strips may avoid oxygen depletion from vegetation decay. Oxygen depletion may result in the suffocation of some sensitive aquatic organisms. If oxygen depletion is a concern, treat no more than 1/2 of the surface area of the water at a time. Wait at least 10 to 14 days between treatments. Begin treatment along the shore and proceed outward in bands to allow aquatic organisms ability to move into untreated areas.

Avoid washoff of sprayed foliage by recreational boat backwash or spray boat for 1 hour after application.

Apply this product at 1 to 3 quarts per acre depending on weed density and species present. DO NOT exceed the maximum label rate of 1.5 pounds acid equivalent Imazapyr (equivalent to 3 quarts) per acre per year. Use the higher labeled rate for heavy weed pressure. See Aquatic Weeds Controlled and Terrestrial Weeds Controlled sections for specific rates.

This product may be applied as a draw-down treatment in areas described in this label. Apply this product to weeds after water has been drained and allow 14 days before reintroduction of water.

This product will control the following target species as specified in the Use Rates and Application Directions section of the table. Rate instructions are expressed in terms of product volume for broadcast applications and as a percent solution for directed applications including spot treatments. For percent solution applications, DO NOT apply more than 1.5 pounds acid equivalent Imazapyr (equivalent to 3 quarts) per acre per year.

Mixing Guide

% Solution	**Product Per Gallon of Mix** (oz)
0.25	0.3
0.5	0.6
1.0	1.3
2.0	2.6
3.0	3.8
5.0	6.4

Measuring Chart

128 fluid ounces	=	1 gallon
16 fluid ounces	=	1 pint
8 pints	=	1 gallon
4 quarts	=	1 gallon
2 pints	=	1 quart

Common Name	**Scientific Name**	**Use Rates and Application Directions**
Floating Weeds		
*Floating heart	*Nymphodes spp*	2 to 4 pints/A applied in 100 GPA water mix. Ensure 100% coverage of actively growing emergent foliage.
*Frogbit	*Limnobium spongia*	1 to 2 pints/A applied in 100 GPA water mix. Ensure 100% coverage of actively growing emergent foliage.
*Spatterdock	*Nuphar luteum*	Apply a tank mix of 2 to 4 pints/A of this product +4 to 6 pints/A glyphosate in 100 GPA water for best control. Ensure 100% coverage of actively growing emergent foliage.
*Water hyacinth	*Eichhornia crassipes*	1 to 2 pints/A applied in 100 GPA water to actively growing foliage.
*Water lettuce	*Pistia stratiotes*	1 to 2 pints/A applied in 100 GPA water mix. Ensure 100% coverage of actively growing emergent foliage.
Emerged Weeds		
*Alligatorweed	*Alternanthera philoxeroides*	1 to 4 pints/A applied in 100 GPA water mix. Ensure 100% coverage of actively growing emergent foliage.
*Arrowhead duck potato	*Sagittaria spp*	1 to 2 pints/A applied to 100 GPA water mix. Ensure 100% coverage of actively growing emergent foliage.
*Bacopa lemon	*Bacopa spp*	1 to 2 pints/A applied in 100 GPA water mix. Ensure 100% coverage of actively growing emergent foliage.

*Use not permitted in California unless otherwise directed by supplemental labeling. *(continued)*

Common Name	Scientific Name	Use Rates and Application Directions
Emerged Weeds *(continued)*		
*Parrot feather	*Myriophyllum aquaticum*	Foliage must be above water for sufficient product uptake. Apply 2 to 4 pints/A (0.5% to 1.0% solution) of this product to actively growing emergent foliage.
*Pennywort	*Hydrocotyle spp*	1 to 2 pints/A applied in 100 GPA water mix. Ensure 100% coverage of actively growing emergent foliage.
*Pickerelweed	*Pontedena cordata*	2 to 3 pints/A applied in 100 GPA water mix. Ensure 100% coverage of actively growing emergent foliage.
*Taro wild Coco yam Dasheen Elephant's ear	*Colocasia esculentum*	4 to 6 pints/A applied in 100 GPA with a high quality sticker adjuvant. Ensure good coverage of actively growing emergent foliage.
*Water chestnut	*Trappa natans*	4 to 6 pints/A applied in 100 GPA with a high quality sticker adjuvant. Ensure good coverage of actively growing emergent foliage.
*Water lily	*Nymphaea odorata*	2 to 3 pints/A applied in 100 GPA water mix. Ensure 100% coverage of actively growing emergent foliage.
*Water primrose	*Ludwigia uruguayensis*	4 to 6 pints/A (1.0% to 1.5% solution). Ensure 100% coverage of actively growing emergent foliage.
Terrestrial/Marginal Weeds		
*Aquatic nightshade Soda apple	*Solanum tampicense*	2 pints/A (0.5% solution) applied to foliage
*Bamboo Japanese	*Phyllostachys spp*	3 to 4 pints/A (0.75% to 1.0% solution) applied to foliage
*Beach vitex	*Vitex rotundifolia*	5% solution + 1% MSO foliar spray. 17% solution stem injection (hack and squirt)
Brazilian pepper Christmasberry	*Schinus terebinthifolius*	2 to 4 pints/A (0.5% to 1.0% solution) applied to foliage
Cattail	*Typha spp*	2 to 4 pints/A (0.5% to 1.0% solution) applied to actively growing green foliage after full leaf elongation. Lower rates will control cattail in the North. Higher rates are needed in the South.
Chinese tallow tree	*Sapium sebiferum*	16 to 24 fl. oz./A applied to foliage
Cogongrass	*Imperata cylindrical*	Burn foliage, till area, then fall spray 2 quarts/A (1.0% solution) of this product+MSO applied to new growth.
Cordgrass prairie	*Spartina spp*	4 to 6 pints/A (1.0% to 1.5% solution) applied to actively growing foliage
*Cutgrass	*Zizaniopsis miliacea*	4 to 6 pints/A (1.0% to 1.5% solution) applied to actively growing foliage
*Elephant grass Napier grass	*Pennisetum purpureum*	3 pints/A (0.75% solution) applied to actively growing foliage
*Flowering rush	*Butomus umbellatus L*	2 to 3 pints/ (0.5% to 0.75% solution) A applied to actively growing foliage
Giant reed Wild cane	*Arundo donax*	4 to 6 pints/A (1.0% to 1.5% solution) applied in spring to actively growing foliage
*Golden bamboo	*Phyllostachys aurea*	3 to 4 pints/A (0.75% to 1.0% solution) applied to foliage when plant is actively growing, before setting seedhead. More foliage will result in greater herbicide uptake, resulting in greater root kill.
Junglerice	*Echinochloa colonum*	3 to 4 pints/A (0.75% to 1.0% solution) applied to actively growing foliage.
Knapweed	*Centaurea spp*	**Russian knapweed:** 2 to 3 pints/A (0.5% to 0.75% solution) +1 quart/A (0.5% solution) MSO fall applied after senescence begins.
Knotweed, Japanese	*Polygonum cuspidatum* *Fallopia japonica*	3 to 4 pints/A (0.75% to 1.0% solution) applied postemergence to actively growing foliage.

*Use not permitted in California unless otherwise directed by supplemental labeling. *(continued)*

Common Name	Scientific Name	Use Rates and Application Directions
Terrestrial/Marginal Weeds *(continued)*		
Melaleuca Paperbark tree	*Melaleuca quinquenervia*	• Established stands: apply 6 pints/A (1.5% solution) of this product + 6 pints/A (1.5% solution) glyphosate+spray adjuvant. For best results use 4 quarts/A (2.0% solution) MSO as an adjuvant. • Broadcast foliar control: apply aerially in a minimum of 2 passes at 10 gallons/A applied cross treatment. • Spot treatment: use 25% of this product+25% solution of glyphosate +1.25% MSO in water applied as a frill or stump treatment.
*Nutgrass Kili'p'opu	*Cyperus rotundus*	2 pints/A (0.5% solution) this product+1 quart/A (0.5% solution) MSO applied early postemergence.
*Nutsedge	*Cyperus spp*	2 to 3 pints/A (0.5% to 0.75% solution) postemergence to foliage or preemergence incorporated, nonincorporated preemergence applications will not control.
Phragmites Common reed	*Phragmites australis*	4 to 6 pints/A (1.0% to 1.5% solution) applied to actively growing green foliage after full leaf elongation. Ensure 100% coverage. If stand has a substantial amount of old stem tissue, mow or burn, allow to regrow to approximately 5 feet tall before retreatment. Lower rates will control phragmites in the North, higher rates are needed in the South.
*Poison hemlock	*Conium maculatum*	2 pints/A (0.5% solution) this product+1 quart/A (0.5% solution) MSO applied preemergence to early postemergence to rosette before flowering
Purple loosestrife	*Lynthrum salicana*	1 pint/A (0.25% solution) applied to actively growing foliage.
Reed canarygrass	*Phalaris arundinacea*	3 to 4 pints/A (0.75% to 1.0% solution) applied to actively growing foliage.
Rose swamp	*Rosa palustris*	2 to 3 pints/A (0.5% to 0.75% solution) applied to actively growing foliage.
Russian olive	*Elaeagnus angustifolia*	2 to 4 pints/A (1% solution) applied to foliage.
Saltcedar Tamarisk	*Tamarix spp*	Aerial application: 2 quarts this product+0.25% v/v NIS applied to actively growing foliage during flowering. Spot treatment: Use 1% solution of this product+0.25% v/v NIS and spray to wet foliage. After application, wait at least 2 years before disturbing treated saltcedar. Earlier disturbance can reduce overall control.
Smartweed	*Polygonum spp*	2 pints/A (0.5% solution) applied early postemergence
Sumac	*Rhus spp*	2 to 3 pints/A (0.5% to 0.75% solution) applied to foliage
Swamp morningglory Kangkong Water spinach	*Ipomoea aquatic*	1 to 2 pints/A (0.25% to 0.5% solution) of this product + 1 quart/A (0.5% solution) MSO applied early postemergence
Torpedo grass	*Panicum repens*	4 pints/A (1.0 to 1.5% solution). Ensure good coverage to actively growing foliage.
*White top Hoary cress	*Cardaria draba*	1 to 2 pints/A (0.25% to 0.5% solution) applied in spring to foliage during flowering.
Willow	*Salix spp*	2 to 3 pints/A (0.5% to 0.75% solution) of this product applied to actively growing foliage. Ensure good coverage.

*Use not permitted in California unless otherwise directed by supplemental labeling.

STORAGE AND DISPOSAL

DO NOT contaminate water, food or feed by storage or disposal.

PESTICIDE STORAGE: DO NOT store below 10° F.

PESTICIDE DISPOSAL: Wastes resulting from the use of this product must be disposed of on site or at an approved waste disposal facility.

CONTAINER HANDLING:

NOTE: This product is available in multiple containers. Refer to the Net Contents section of this products labeling for the applicable "Nonrefillable" or "Refillable" designation. Follow the container disposal [handling] instructions below that apply to your container type / size.

Nonrefillable Containers 5 Gallons or Less: Nonrefillable container. DO NOT reuse or refill this container. Offer for recycling if available. Triple rinse container (or equivalent) promptly after emptying. **Triple rinse as follows:** Empty the remaining contents into application equipment or a mix tank and drain for 10 seconds after the flow begins to drip. Fill the container 1/4 full with water and recap. Shake for 10 seconds. Pour rinsate into application equipment or a mix tank or store rinsate for later use or disposal. Drain for 10 seconds after the flow begins to drip. Repeat this procedure two more times. Then offer for recycling or reconditioning, or puncture and dispose of in a sanitary landfill, or by other procedures approved by State and local authorities. Plastic containers are also disposable by incineration, or, if allowed by State and local authorities, by burning. If burned stay out of smoke.

Nonrefillable containers larger than 5 gallons: Nonrefillable container. DO NOT reuse or refill this container. Offer for recycling if available. If recycling or reconditioning not available, puncture and dispose of in a sanitary landfill, or by other procedures approved by State and local authorities. Plastic containers are also disposable by incineration, or, if allowed by State and local authorities, by burning. If burned stay out of smoke. Triple rinse or pressure rinse container (or equivalent) promptly after emptying. **Triple rinse as follows:** Empty the remaining contents into application equipment or a mix tank. Fill the container ¼ full with water. Replace and tighten closures. Tip container on its side and roll it back and forth, ensuring at least one complete revolution, for 30 seconds. Stand the container on its end and tip it back and forth several times. Turn the container over onto its other end and tip it back and forth several times. Empty the rinsate into application equipment or a mix tank or store rinsate for later use or disposal. Repeat this procedure two more times. **Pressure rinse as follows:** Empty the remaining contents into application equipment or a mix tank and continue to drain for 10 seconds after the flow begins to drip. Hold container upside down over application equipment or mix tank or collect rinsate for later use or disposal. Insert pressure rinsing nozzle in the side of the container, and rinse at about 40 psi for at least 30 seconds. Drain for 10 seconds after the flow begins to drip.

Refillable containers larger than 5 gallons: Refillable container. Refill this container with pesticide only. DO NOT reuse this container for any other purpose. Cleaning the container before final disposal is the responsibility of the person disposing of the container. Cleaning before refilling is the responsibility of the refiller. To clean the container before final disposal, empty the remaining contents from this container into application equipment or a mix tank. Fill the container about 10% full with water. Agitate vigorously or recirculate water with the pump for two minutes. Pour or pump rinsate into application equipment or rinsate collection system. Repeat this rinsing procedure two more times. Then offer for recycling if available or puncture and dispose of in a sanitary landfill, or by incineration, or by other procedures allowed by state and local authorities. If burned stay out of smoke.

WARRANTY DISCLAIMER

The directions for use of this product must be followed carefully. TO THE EXTENT CONSISTENT WITH APPLICABLE LAW, (1) THE GOODS DELIVERED TO YOU ARE FURNISHED "AS IS" BY MANUFACTURER OR SELLER AND (2) MANUFACTURER AND SELLER MAKE NO WARRANTIES, GUARANTEES, OR REPRESENTATIONS OF ANY KIND TO BUYER OR USER, EITHER EXPRESS OR IMPLIED, OR BY USAGE OF TRADE, STATUTORY OR OTHERWISE, WITH REGARD TO THE PRODUCT SOLD, INCLUDING, BUT NOT LIMITED TO MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE, USE, OR ELIGIBILITY OF THE PRODUCT FOR ANY PARTICULAR TRADE USAGE. UNINTENDED CONSEQUENCES, INCLUDING BUT NOT LIMITED TO INEFFECTIVENESS, MAY RESULT BECAUSE OF SUCH FACTORS AS THE PRESENCE OR ABSENCE OF OTHER MATERIALS USED IN COMBINATION WITH THE GOODS, OR THE MANNER OF USE OR APPLICATION, INCLUDING WEATHER, ALL OF WHICH ARE BEYOND THE CONTROL OF MANUFACTURER OR SELLER AND ASSUMED BY BUYER OR USER. THIS WRITING CONTAINS ALL OF THE REPRESENTATIONS AND AGREEMENTS BETWEEN BUYER, MANUFACTURER AND SELLER, AND NO PERSON OR AGENT OF MANUFACTURER OR SELLER HAS ANY AUTHORITY TO MAKE ANY REPRESENTATION OR WARRANTY OR AGREEMENT RELATING IN ANY WAY TO THESE GOODS.

LIMITATION OF LIABILITY

TO THE EXTENT CONSISTENT WITH APPLICABLE LAW, IN NO EVENT SHALL MANUFACTURER OR SELLER BE LIABLE FOR SPECIAL, INCIDENTAL, OR CONSEQUENTIAL DAMAGES, OR FOR DAMAGES IN THEIR NATURE OF PENALTIES RELATING TO THE GOODS SOLD, INCLUDING USE, APPLICATION, HANDLING, AND DISPOSAL. TO THE EXTENT CONSISTENT WITH APPLICABLE LAW, MANUFACTURER OR SELLER SHALL NOT BE LIABLE TO BUYER OR USER BY WAY OF INDEMNIFICATION TO BUYER OR TO CUSTOMERS OF BUYER, IF ANY, OR FOR ANY DAMAGES OR SUMS OF MONEY, CLAIMS OR DEMANDS WHATSOEVER, RESULTING FROM OR BY REASON OF, OR RISING OUT OF THE MISUSE, OR FAILURE TO FOLLOW LABEL WARNINGS OR INSTRUCTIONS FOR USE, OF THE GOODS SOLD BY MANUFACTURER OR SELLER TO BUYER. ALL SUCH RISKS SHALL BE ASSUMED BY THE BUYER, USER, OR ITS CUSTOMERS. TO THE EXTENT CONSISTENT WITH APPLICABLE LAW, BUYER'S OR USER'S EXCLUSIVE REMEDY, AND MANUFACTURER'S OR SELLER'S TOTAL LIABILITY SHALL BE FOR DAMAGES NOT EXCEEDING THE COST OF THE PRODUCT.

If you do not agree with or do not accept any of directions for use, the warranty disclaimers, or limitations on liability, do not use the product, and return it unopened to the Seller, and the purchase price will be refunded.

RV100918 [5]

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All other trademarks are the property of their respective owners.

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

Product Name: **Polaris® Herbicide**
EPA Reg. No.: 228-534
Product Type: Herbicide

Company Name: Nufarm Americas Inc.
11901 S. Austin Avenue
Alsip, IL 60803
1-800-345-3330

Telephone Numbers: **For Chemical Emergency, Spill, Leak, Fire, Exposure, or Accident,**
Call CHEMTREC Day or Night: 1-800-424-9300
For Medical Emergencies Only, Call 1-877-325-1840

This product is an EPA FIFRA registered pesticide. Some classifications on this SDS are not exactly the same as on the FIFRA label. Certain sections are superseded by federal law governed by EPA for a registered pesticide. Please see Section 15. REGULATORY INFORMATION for explanation.

2. HAZARDS IDENTIFICATION

PHYSICAL HAZARDS:
Not hazardous

HEALTH HAZARDS:
Not hazardous

ENVIRONMENTAL HAZARDS:
Not hazardous

SIGNAL WORD:
None Required

HAZARD STATEMENTS:
Not hazardous in accordance with 29CFR 1910.1200 (Hazcom 2012)

PRECAUTIONARY STATEMENTS
Use with appropriate protective equipment.

3. COMPOSITION / INFORMATION ON INGREDIENTS

COMPONENTS	CAS NO.	% BY WEIGHT
Isopropylamine Salt of Imazapyr	81510-83-0	26.8 – 28.5
Other Ingredients	Trade Secret	Trade Secret

Synonyms: 2-[4,5-dihydro-4-methyl-4-(1-methylethyl)-5-oxo-1H-imidazol-2-yl]-3-pyridinecarboxylic acid

Ingredients not precisely identified are proprietary or non-hazardous. Values are not product specifications.

4. FIRST AID MEASURES

If Inhaled: Move person to fresh air. Seek medical attention if symptoms develop.
If in Eyes: Hold eye open and rinse slowly and gently with water for sever minutes. Remove contact lenses, if present, after the first 5 minutes, then continue rinsing eye. Seek medical attention if irritation persists.
If on Skin or Clothing: Take off contaminated clothing. Rinse skin immediately with plenty of water Seek medical attention if irritation persists.

If Swallowed: Have person sip a glass of water if able to swallow. Do not induce vomiting unless told to do so by the poison control center or doctor. Do not give anything by mouth to an unconscious person. Seek medical attention if symptoms develop
Most Important symptoms/effects, acute and delayed: None expected.
Indication of Immediate medical attention and special treatment if needed: Immediate medical attention is not generally required. For ingestion there is no specific antidote available. Treat symptomatically.

5. FIRE FIGHTING MEASURES

Extinguishing Media: Use media that is suitable for the surrounding fire.
Special Fire Fighting Procedures: Firefighters should wear NIOSH approved self-contained breathing apparatus and full fire-fighting turn out gear. Dike area to prevent runoff and contamination of water sources. Dispose of fire control water later.
Unusual Fire and Explosion Hazards: This product is not flammable or combustible. If water is used to fight fire, contain runoff, using dikes to prevent contamination of water supplies. Dispose of fire control water later.
Hazardous Decomposition Materials (Under Fire Conditions): May produce gases such as oxides of carbon, hydrogen and nitrogen.

6. ACCIDENTAL RELEASE MEASURES

Personal Precautions: Wear appropriate protective gear for the situation. See Personal Protection information in Section 8.
Environmental Precautions: Prevent material from entering public sewer systems or any waterways. Do not flush to drain. Large spills to soil or similar surfaces may necessitate removal of topsoil. The affected area should be removed and placed in an appropriate container for disposal.
Methods for Containment: Dike spill using absorbent or impervious materials such as earth, sand or clay. Collect and contain contaminated absorbent and dike material for disposal.
Methods for Cleanup and Disposal: Pump any free liquid into an appropriate closed container. Absorb residues with an inert material and place in a suitable container for disposal. Decontaminate tools and equipment following cleanup. See Section 13: DISPOSAL CONSIDERATIONS for more information.
Other Information: Large spills may be reportable to the National Response Center (800-424-8802) and to state and/or local agencies.

7. HANDLING AND STORAGE

HANDLING:
Avoid contact with skin, eyes, or clothing. Avoid breathing spray mist. Users should wash hands before eating, drinking, chewing gum, using tobacco, or using the toilet. Remove clothing immediately if pesticide gets inside. Then wash thoroughly and put on clean clothing.

Spray solutions of this product should be mixed, stored, and applied only in stainless steel, fiberglass, plastic, and plastic-lined steel containers. DO NOT mix, store, or apply this product or spray solutions of this product in unlined steel (except stainless steel) containers or spray tanks.

STORAGE:
Do not store below 10° F. Do not contaminate water, food, or feed by storage or disposal.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Engineering Controls:
Where engineering controls are indicated by specific use conditions or a potential for excessive exposure, use local exhaust ventilation at the point of generation.

Personal Protective Equipment:
Eye/Face Protection: To avoid contact with eyes, wear chemical goggles or shielded safety glasses. **Skin Protection:** To avoid contact with skin wear long-sleeved shirt and long pants, shoes plus socks, chemical-resistant gloves made of any waterproof material Washing facilities should be readily accessible to the work area.
Respiratory Protection: Not normally required. If vapors or mists exceed acceptable levels, wear NIOSH approved air-purifying respirator with cartridges/canisters approved for use against pesticides.
General Hygiene Considerations: Personal hygiene is an important work practice exposure control measure and the following general measures should be taken when working with or handling this material: 1) do not store,

use and/or consume foods, beverages, tobacco products, or cosmetics in areas where this material is stored; 2) wash hands and face carefully before eating, drinking, using tobacco, applying cosmetics or using the toilet.

Exposure Guidelines:

	OSHA		ACGIH		
Component	**TWA**	**STEL**	**TWA**	**STEL**	**Unit**
Imazapyr	NE	NE	NE	NE	
Other Ingredients	NE	NE	NE	NE	

NE = Not Established

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance:	Blue liquid
Odor:	Faint ammonia like
Odor threshold:	No data available
pH:	6.26 (1% w/w dilution in DIW)
Melting point:	No data available
Initial boiling point and boiling range	No data available
Flash point:	>212º F (>100º C)
Evaporation rate:	No data available
Flammability (solid, gas):	No data available
Upper/lower flammability or explosive limits:	No data available
Vapor pressure:	No data available
Vapor density:	No data available
Relative density:	1.057 g/mL @ 20º C
Solubility(ies):	No data available
Partition coefficient: n-octanol/water:	No data available
Autoignition temperature:	No data available
Decomposition temperature:	No data available
Viscosity:	3.766 cSt @20º C; 1.988 cSt @ 40º C
VOC Emission Potential (%):	-0.13 (TGA)

Note: Physical data are typical values, but may vary from sample to sample. A typical value should not be construed as a guaranteed analysis or as a specification.

10. STABILITY AND REACTIVITY

Reactivity: Not reactive.
Chemical Stability: This material is stable under normal handling and storage conditions.
Possibility of Hazardous Reactions: Will not occur
Conditions to Avoid: Excessive heat. Do not store near heat or flame. Do not mix or store this product or solutions of this product in unlined steel containers
Incompatible Materials: Strong oxidizing agents: bases and acids.
Hazardous Decomposition Products: Under fire conditions may produce gases such as oxides of carbon, hydrogen and nitrogen.

11. TOXICOLOGICAL INFORMATION

Likely Routes of Exposure: Eye contact, Skin contact
Eye Contact: Minimally irritating. May cause irritation, redness and tearing.
Skin Contact: Slightly toxic and no more than mildly irritating based on toxicity studies.
Ingestion: Low toxicity based on toxicity studies.
Inhalation: Low toxicity based on toxicity studies.
Delayed, immediate and chronic effects of exposure: None expected.
Toxicological Data:
Data from laboratory studies conducted on Imazapyr Technical:
Oral: Rat LD_{50}: >5,000 mg/kg

Dermal: Rabbit LD_{50}: >5,000 mg/kg
Inhalation: Rat 4-hr LC_{50}: >2.07 mg/l (no mortalities highest dose attainable)
Eye Irritation: Rabbit: Minimally irritating (MMTS= 6.0)
Skin Irritation: Rabbit: Slightly irritating (PDII=0.8)
Skin Sensitization: Not a contact sensitizer in guinea pigs following repeated skin exposure.

Subchronic (Target Organ) Effects: For imazapyr, no adverse effects at approximately 1,700 mg/kg/day (highest dose tested).
Carcinogenicity / Chronic Health Effects: Imazapyr did not cause cancer in laboratory animals. EPA has classified imazapyr as a Group E (evidence of non-carcinogenicity for humans) carcinogen.
Reproductive Toxicity: The results of animal studies with imazapyr gave no indication of a fertility impairing effect.
Developmental Toxicity: No indications of a developmental toxic / teratogenic effect were seen in animal studies with imazapyr.
Genotoxicity: For imazapyr, no mutagenic effect was found in various tests with microorganisms and mammals.

Assessment Carcinogenicity: None listed with ACGIH, IARC, NTP or OSHA.

12. ECOLOGICAL INFORMATION

Ecotoxicity:
Data on Imazapyr:

96-hour LC_{50} Bluegill:	>100 mg/l	Bobwhite Quail 8-day Dietary LC_{50}:	>5,000 ppm
96-hour LC_{50} Rainbow Trout:	>100 mg/l	Bobwhite Quail Oral LD_{50}:	>2,150 mg/kg
48-hour EC_{50} Daphnia:	>100 mg/l	Mallard Duck 8-day Dietary LC_{50}:	>5,000 ppm
14-day EC_{50} Duckweed:	0.024 mg/l	Mallard Duck Oral LD_{50}:	>2,150 mg/kg
7-day EC_{50} Green Algae:	71 mg/l	Honey Bee LD_{50}:	>100 mg/bee

Environmental Fate:
Imazapyr is degraded by microbial metabolism and can be relatively persistent in soils. It has an average half-life in soils that ranges from 2 weeks to 5 months. Half-lives tend to be shorter in forest litter and soils. Imazapyr is water-soluble and variably binds to organic materials in the soils. Although the potential to leach is high, leaching is limited under typical field conditions. In water, imazapyr can be rapidly degraded by photolysis with a half-life averaging 2 days. Due to its rapid photodegradation by sunlight, water contamination by imazapyr is generally not of concern.

13. DISPOSAL CONSIDERATIONS

Waste Disposal Method:
Pesticide wastes are acutely hazardous. Improper disposal of excess pesticide, spray mixture, or rinsate is a violation of Federal Law. If these wastes cannot be disposed of by use according to label instructions, contact your State Pesticide or Environmental Control Agency, or the Hazardous Waste representative at the nearest EPA Regional Office for guidance.

Container Handling and Disposal:

Nonrefillable Containers 5 Gallons or Less: Nonrefillable container. Do not reuse or refill this container. Triple rinse container (or equivalent) promptly after emptying.

Triple rinse as follows: Empty the remaining contents into application equipment or a mix tank and drain for 10 seconds after the flow begins to drip. Fill the container 1/4 full with water and recap. Shake for 10 seconds. Pour rinsate into application equipment or a mix tank or store rinsate for later use or disposal. Drain for 10 seconds after the flow begins to drip. Repeat this procedure two more times. Then offer for recycling or reconditioning, or puncture and dispose of in a sanitary landfill, or by other procedures approved by State and local authorities. Plastic containers are also disposable by incineration, or, if allowed by State and local authorities, by burning. If burned stay out of smoke.

Nonrefillable containers larger than 5 gallons: Nonrefillable container. Do not reuse or refill this container. Offer for recycling if available. Triple rinse or pressure rinse container (or equivalent) promptly after emptying.

Triple rinse as follows: Empty the remaining contents into application equipment or a mix tank. Fill the container 1/4 full with water. Replace and tighten closures. Tip container on its side and roll it back and forth, ensuring at least one complete revolution, for 30 seconds. Stand the container on its end and tip it back and forth several times. Turn the container over onto its other end and tip it back and forth several times. Empty

the rinsate into application equipment or a mix tank or store rinsate for later use or disposal. Repeat this procedure two more times.

Pressure rinse as follows: Empty the remaining contents into application equipment or a mix tank and continue to drain for 10 seconds after the flow begins to drip. Hold container upside down over application equipment or mix tank or collect rinsate for later use or disposal. Insert pressure rinsing nozzle in the side of the container, and rinse at about 40 psi for at least 30 seconds. Drain for 10 seconds after the flow begins to drip.

Refillable containers larger than 5 gallons: Refillable container. Refill this container with pesticide only. Do not reuse this container for any other purpose. Cleaning the container before final disposal is the responsibility of the person disposing of the container. Cleaning before refilling is the responsibility of the refiller. To clean the container before final disposal, empty the remaining contents from this container into application equipment or a mix tank. Fill the container about 10% full with water and, if possible, spray all sides while adding water. Agitate vigorously or recirculate water with the pump for two minutes. Pour or pump rinsate into application equipment or rinsate collection system. Repeat this rinsing procedure two more times.

14. TRANSPORTATION INFORMATION

Follow the precautions indicated in Section 7: HANDLING AND STORAGE of this SDS.

DOT
Not Regulated

IMDG
Not Regulated

IATA
Not Regulated

15. REGULATORY INFORMATION

EPA FIFRA INFORMATION

This chemical is a pesticide product registered by the United States Environmental Protection Agency and is subject to certain labeling requirements under federal pesticide law. These requirements differ from the classification criteria and hazard information required for safety data sheets (SDS), and for workplace labels of non-pesticide chemicals. The hazard information required on the pesticide label is reproduced below. The pesticide label also includes other important information, including directions for use.

CAUTION. No human or domestic animal hazard statements are required. Follow instructions for Personal Protective Equipment and User Safety Recommendations.

U.S. FEDERAL REGULATIONS

TSCA Inventory: This product is exempted from TSCA because it is solely for FIFRA regulated use.

SARA Hazard Notification/Reporting:
Hazard Categories Under Criteria of SARA Title III Rules (40 CFR Part 370):
Not hazardous

Section 313 Toxic Chemical(s):
None

Reportable Quantity (RQ) under U.S. CERCLA:
None

RCRA Waste Code:
Under RCRA, it is the responsibility of the product user to determine at the time of disposal, whether a material containing the product or derived from the product should be classified as a hazardous waste.

State Information:
Other state regulations may apply. Check individual state requirements.

California Proposition 65: Not Listed.

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16. OTHER INFORMATION

National Fire Protection Association (NFPA) Hazard Rating:
Rating for this product: Health: 1 **Flammability:** 0 **Reactivity:** 0
Hazards Scale: 0 = Minimal 1 = Slight 2 = Moderate 3 = Serious 4 = Severe

This Safety Data Sheet (SDS) serves different purposes than and DOES NOT REPLACE OR MODIFY THE EPA-ACCEPTED PRODUCT LABELING (attached to and accompanying the product container). This SDS provides important health, safety and environmental information for employers, employees, emergency responders and others handling large quantities of the product in activities generally other than product use, while the labeling provides that information specifically for product use in the ordinary course.

Use, storage and disposal of pesticide products are regulated by the EPA under the authority of the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) through the product labeling, and all necessary and appropriate precautionary, use, storage, and disposal information is set forth on that labeling. It is a violation of Federal law to use a pesticide product in any manner not prescribed on the EPA-accepted label.

Although the information and recommendations set forth herein (hereinafter “Information”) are presented in good faith and believed to be correct as of the date hereof, Nufarm Americas Inc. makes no representations as to the completeness or accuracy thereof. Information is supplied upon the condition that the persons receiving same will make their own determination as to its suitability for their purposes prior to use. In no event will Nufarm Americas Inc. be responsible for damages of any nature whatsoever resulting from the use of or reliance upon Information. NO REPRESENTATIONS OR WARRANTIES, EITHER EXPRESS OR IMPLIED, OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE OR OF ANY OTHER NATURE ARE MADE HEREUNDER WITH RESPECT TO INFORMATION OR THE PRODUCT TO WHICH INFORMATION REFERS AND ALL SUCH WARRANTIES ARE HEREBY SPECIFICALLY DISCLAIMED.

Date of Issue: May 11, 2020 **Supersedes:** April 12, 2015

Polaris is a registered trademark of Nufarm Americas Inc.

Specimen Label

AMINOPYRALID	GROUP	4	HERBICIDE

CORTEVA™ agriscience

Milestone®

HERBICIDE

™® Trademarks of Corteva Agriscience and its affiliated companies

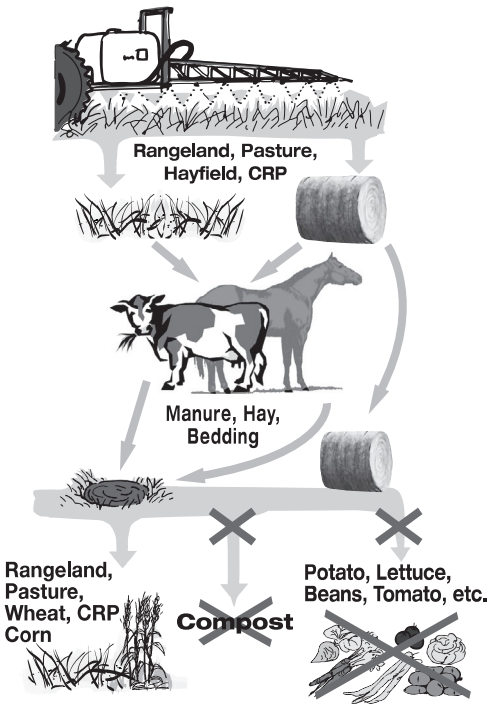
- **For control of annual and perennial broadleaf weeds including invasive and noxious weeds, certain annual grasses, and certain woody plants and vines on:**
  - **rangeland, permanent grass pastures (including grasses grown for hay*), Conservation Reserve Program (CRP);**
  - **non-crop areas for example, airports, barrow ditches, communication transmission lines, electric power and utility rights-of-way, fencerows, gravel pits, industrial sites, military sites, mining and drilling areas, oil and gas pads, non-irrigation ditch banks, parking lots, petroleum tank farms, pipelines, roadsides, railroads, storage areas, dry storm water retention areas, substations, unimproved rough turf grasses;**
  - **natural areas (open space) for example, campgrounds, parks, prairie management, trailheads and trails, recreation areas, wildlife openings, and wildlife habitat and management areas including seasonally dry flood plains, deltas, marshes, prairie potholes, or vernal pools;**
  - **including grazed areas in and around these sites.**

***Hay from grass treated with Milestone within the preceding 18 months can only be used on the farm or ranch where the product is applied unless allowed by supplemental labeling.**

IMPORTANT USE PRECAUTIONS AND RESTRICTIONS TO PREVENT INJURY TO DESIRABLE PLANTS

- Carefully read the section ***"Restrictions in Hay or Manure Use."***
- It is mandatory to follow the ***"Use Precautions and Restrictions"*** section of this label.
- Manure and urine from animals consuming grass or hay treated with this product may contain enough aminopyralid to cause injury to sensitive broadleaf plants.
- Hay can only be used on the farm or ranch where product is applied unless allowed by supplemental labeling.
- Consult with a Corteva Agriscience representative if you do not understand the Use Precautions and Use Restrictions. **Call 1-800-258-3033 Customer Information Group.**

Forage and Manure Management



Not for Sale, Sale into, Distribution, and/or Use in Nassau and Suffolk counties of New York State.

Active Ingredient:	
Triisopropanolammonium salt of 2-pyridine carboxylic acid, 4-amino-3,6-dichloro-	40.6%
Other Ingredients	59.4%
Total	100.0%

Acid Equivalent: aminopyralid (2-pyridine carboxylic acid, 4-amino-3,6-dichloro-) - 21.1% - 2 lb/gal

Container Use Directions

1 - Tip

Tilt container to angle as shown and fill head to desired amount – use vertical scale for measuring. Container should be closed.

2 - Level

Hold container up-right and check the amount for accuracy. Add or subtract as needed, using pour-back scale as guide.

3 - Dispense

Remove cap on head and pour into sprayer or other devices. No fluid will pour from the main container. Replace cap for storage in sealed condition.

Precautionary Statements

Hazards to Humans and Domestic Animals

EPA Reg. No. 62719-519

Keep Out of Reach of Children

CAUTION

Causes Moderate Eye Irritation

Avoid contact with eyes or clothing.

Personal Protective Equipment (PPE)

Applicators and other handlers must wear:

- Long-sleeved shirt and long pants
- Shoes plus socks

Follow manufacturer's instructions for cleaning/maintaining PPE. If no such instructions for washables exist, use detergent and hot water. Keep and wash PPE separately from other laundry.

User Safety Recommendations

Users should:

- Wash hands before eating, drinking, chewing gum, using tobacco or using the toilet.
- Remove clothing/PPE immediately if pesticide gets inside. Then wash thoroughly and put on clean clothing.
- Remove PPE immediately after handling this product. Wash the outside of gloves before removing. As soon as possible, wash thoroughly and change into clean clothing.

First Aid

If in eyes: Hold eye open and rinse slowly and gently with water for 15-20 minutes. Remove contact lenses, if present, after the first 5 minutes, then continue rinsing. Call a poison control center or doctor for treatment advice.

Have the product container or label with you when calling a poison control center or doctor or going for treatment. You may also contact 1-800-992-5994 for emergency medical treatment information.

Environmental Hazards

Do not apply directly to water. Take care to minimize the incidental overspray along the shoreline when applying to terrestrial plants at the water's edge or to water in areas where surface water is present. Do not apply directly to intertidal areas below the mean high water mark. Do not contaminate water when disposing of equipment washwater or rinsate.

This chemical has properties and characteristics associated with chemicals detected in groundwater. The use of this chemical in areas where soils are permeable, particularly where the water table is shallow, may result in groundwater contamination. Application around a cistern or well may result in contamination of drinking water or groundwater.

Directions for Use

It is a violation of Federal law to use this product in a manner inconsistent with its labeling.

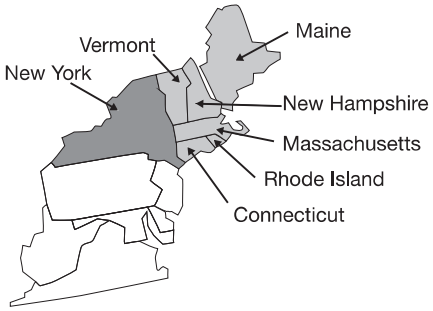
Read all Directions for Use carefully before applying.

This product is not intended for reformulation or repackaging into other end-use products.

Do not apply this product in a way that will contact workers or other persons, either directly or through drift. Only protected handlers may be in the area during application. For any requirements specific to your State or Tribe, consult the agency responsible for pesticide regulation.

Not for Sale, Sale into, Distribution, and/or Use in Nassau and Suffolk counties of New York State.

Not for use on pastures in Connecticut, Maine, Massachusetts, New Hampshire, New York, Rhode Island, and Vermont. All other labeled uses are permitted in these states including grazed areas in and around these sites.



Grey = states where use in pasture is not permitted

Agricultural Use Requirements

Use this product only in accordance with its labeling and with the Worker Protection Standard, 40 CFR part 170. This Standard contains requirements for the protection of agricultural workers on farms, forests, nurseries, and greenhouses, and handlers of agricultural pesticides. It contains requirements for training, decontamination, notification, and emergency assistance. It also contains specific instructions and exceptions pertaining to the statements on this label about Personal Protective Equipment (PPE) and restricted-entry interval. The requirements in this box only apply to uses of this product that are covered by the Worker Protection Standard.

Do not enter or allow worker entry into treated areas during the restricted entry interval (REI) of 48 hours.

PPE required for early entry to treated areas that is permitted under the Worker Protection Standard and that involves contact with anything that has been treated, such as plants, soil, or water, is:

- Coveralls
- Chemical-resistant gloves made of any waterproof material as polyethylene or polyvinyl chloride
- Shoes plus socks
- Protective eyewear

Non-Agricultural Use Requirements

The requirements in this box apply to uses of this product that are NOT within the scope of the Worker Protection Standard for Agricultural Pesticides (40 CFR Part 170). The WPS does not pertain to non-agricultural use on sites, such as, rangeland, permanent grass pastures, or non-cropland. See the Agricultural Use Requirements section below for information where the WPS applies.

Entry Restrictions for Non-WPS Uses: For applications on rangeland and permanent grass pastures (not harvested for hay) and non-cropland areas, do not enter or allow worker entry into treated areas until sprays have dried.

Storage and Disposal

Do not contaminate water, food, feed, or fertilizer by storage or disposal.

Pesticide Storage: If this product is exposed to subfreezing temperatures, the active ingredient may crystallize and settle out of solution. Under these conditions the product should be warmed to at least 40°F and agitated well to dissolve any crystallized active ingredient prior to use.

Pesticide Disposal: Wastes resulting from the use of this product may be disposed of on site or at an approved waste disposal facility. Open dumping is prohibited.

Nonrefillable containers 5 gallons or less:

Container Handling: Nonrefillable container. Do not reuse or refill this container. Offer for recycling if available, or puncture and dispose of in a sanitary landfill, or by incineration, or by other procedures allowed by state and local authorities.

Specimen Label Revised 04-04-23

Storage and Disposal (Cont.)

Triple rinse or pressure rinse container (or equivalent) promptly after emptying. **Triple rinse** as follows: Empty the remaining contents into application equipment or a mix tank and drain for 10 seconds after the flow begins to drip. Fill the container 1/4 full with water and recap. Shake for 10 seconds. Pour rinsate into application equipment or a mix tank or store rinsate for later use or disposal. Drain for 10 seconds after the flow begins to drip. Repeat this procedure two more times. **Pressure rinse** as follows: Empty the remaining contents into application equipment or a mix tank and continue to drain for 10 seconds after the flow begins to drip. Hold container upside down over application equipment or mix tank and continue to drain for 10 seconds after the flow begins to drip. Hold container upside down over application equipment or mix tank or collect rinsate for later use or disposal. Insert pressure rinsing nozzle in the side of the container, and rinse at about 40 psi for at least 30 seconds. Drain for 10 seconds after the flow begins to drip.

Refillable containers larger than 5 gallons:
Container Handling: Refillable container. Refill this container with pesticide only. Do not reuse this container for any other purpose. Cleaning the container before final disposal is the responsibility of the person disposing of the container. Cleaning before refilling is the responsibility of the refiller. To clean the container before final disposal, empty the remaining contents from this container into application equipment or a mix tank. Fill the container about 10% full with water. Agitate vigorously or recirculate water with the pump for two minutes. Pour or pump rinsate into application equipment or rinsate collection system. Repeat this rinsing procedure two more times.

Nonrefillable containers larger than 5 gallons:
Container Handling: Nonrefillable container. Do not reuse or refill this container. Offer for recycling if available, or puncture and dispose of in a sanitary landfill, or by incineration, or by other procedures allowed by state and local authorities.
Triple rinse or pressure rinse container (or equivalent) promptly after emptying. **Triple rinse** as follows: Empty the remaining contents into application equipment or a mix tank. Fill the container 1/4 full with water. Replace and tighten closures. Tip container on its side and roll it back and forth, ensuring at least one complete revolution, for 30 seconds. Stand the container on its end and tip it back and forth several times. Turn the container over onto its other end and tip it back and forth several times. Empty the rinsate into application equipment or a mix tank or store rinsate for later use or disposal. Repeat this procedure two more times. **Pressure rinse** as follows: Empty the remaining contents into application equipment or a mix tank and continue to drain for 10 seconds after the flow begins to drip. Hold container upside down over application equipment or mix tank and continue to drain for 10 seconds after the flow begins to drip. Hold container upside down over application equipment or mix tank or collect rinsate for later use or disposal. Insert pressure rinsing nozzle in the side of the container, and rinse at about 40 psi for at least 30 seconds. Drain for 10 seconds after the flow begins to drip.

Resistance Management Guidelines

This product contains aminopyralid, a Group 4 synthetic auxin. Appropriate resistance-management strategies should be followed.

- Development of plant populations resistant to this herbicide mode of action is usually not a problem on rangeland, permanent grass pastures, Conservation Reserve Program (CRP), or non-cropland sites since these sites receive infrequent pesticide applications.
- In croplands, use an effective integrated pest management (IPM) program, integrating tillage or other mechanical methods, crop rotation, or other cultural control methods into weed control programs whenever practical.
- Similar looking biotypes of a given weed species occurring in a treated area may vary in their susceptibility to a herbicide. Application of a herbicide below its labeled rate may allow more tolerant weeds to survive and a shift to more tolerant biotypes within the treated area.
- Where identified, spreading of resistant weeds to other fields may be prevented by cleaning harvesting and tillage equipment before moving to other areas and by planting weed-free seed.
- Contact your extension specialist, certified crop consultant, or a Corteva Agriscience customer service representative 1-800-258-3033 for the latest resistance-management information.

Use Precautions

- Applications made during periods of intense rainfall, to soils saturated with water, surfaces paved with materials such as asphalt or concrete, or soils through which rainfall will not readily penetrate may result in runoff and movement of Milestone. Injury to crops may result if treated soil and/or runoff water containing Milestone is washed or moved onto land used to produce crops. Exposure to Milestone may injure or kill susceptible crops and other plants such as grapes, soybeans, tobacco, sensitive ornamentals.
- **Grass revegetation**:
  - Milestone can be used to control broadleaf plants in grass revegetation programs. Consult Corteva Agriscience literature for more details about Milestone applications and grass stand establishment.
- **Application before seeding grasses**
  - Milestone can be applied to control broadleaf weeds prior to grass planting. Grass seed germination and seedling development can be adversely effected by many factors such as seed viability and seedling vigor, soil condition (sub-optimal soil temperatures or soil water content), weather after planting, seedbed preparation and seed placement, disease, insects, or animals. Milestone applications will help to reduce competition from weeds and improve the chance for successful grass stand establishment. Some grass species are more sensitive to Milestone; consult Corteva Agriscience literature for more details.
  - **Postemergence applications on grass:** During the season of establishment, Milestone should be applied only after perennial grasses are well established (have developed a good secondary root system and show good vigor). Most perennial grasses are tolerant to Milestone at this stage of development. Milestone may suppress certain established grasses such as smooth bromegrass (*Bromus inermis*), especially when plants are stressed by adverse environmental conditions. Plants should recover from this transient suppression with the onset of environmental conditions favorable to grass growth and upon release from weed competition.
- **Seeding Broadleaf Plants (Forbs) and Wildflowers**
  Milestone can be applied in the summer to control broadleaf weeds prior to forb planting. Forbs can be seeded 90 days after a summer application as a dormant fall planting or the following spring. Consult Corteva Agriscience literature for details.
- **Field Bioassay Instructions:** In fields previously treated with this product, plant short test rows of the intended rotational crop across the original direction of application in a manner to sample variability in field conditions such as soil texture, soil organic matter, soil pH, rainfall pattern, or drainage. The field bioassay can be initiated one year after the last application of aminopyralid in that field. Observe the test crop for symptoms of herbicidal activity such as poor stand (effect on seed germination), chlorosis (yellowing), epinasty, necrosis (dead leaves or shoots), or stunting (reduced growth). If herbicidal symptoms do not occur, the test crop can be grown. If there is apparent herbicidal activity, do not plant the field to the intended rotational crop; plant only to wheat, forage grasses, native grasses, or grasses grown for hay.

Consult with a Corteva Agriscience representative if you do not understand the Use Precautions and Use Restrictions. Call 1-800-258-3033 for more information.

Pasture and Rangeland Restrictions

- **Do not use grasses treated with Milestone in the preceding 18 months for hay intended for export outside the United States.**
- **Hay from areas treated with Milestone in the preceding 18 months CANNOT be distributed or made available for sale off the farm or ranch where harvested unless allowed by supplemental labeling.**
- **Hay from areas treated with Milestone in the preceding 18 months CANNOT be used for silage, haylage, baleage, and green chop unless allowed by supplemental labeling.**
- **Do not move hay made from grass treated with Milestone within the preceding 18 months off farm unless allowed by supplemental labeling.**
- **Do not use hay or straw from areas treated with Milestone within the preceding 18 months or manure from animals feeding on hay treated with Milestone in compost.**
- **Do not use grasses treated with Milestone in the preceding 18 months for seed production.**

Restrictions for All Uses

Maximum Application Rate: On all labeled use sites, do not broadcast apply more than 7 fl oz per acre of Milestone per year. The total amount of Milestone applied broadcast, as a re-treatment, and/or spot treatment cannot exceed 7 fl oz per acre per year. Spot treatments may be applied at an equivalent broadcast rate of up to 0.22 lb acid equivalent (14 fl oz of Milestone) per acre per year; however, not more than 50% of an acre may be treated at that rate. Do not apply more than a total of 0.11 lb acid equivalent (7 fl oz) per acre of Milestone per year as a result of broadcast, spot, or repeat applications.

Obtain Required Permits: Consult with appropriate state or local water authorities before applying this product around public waters. State or local public agencies may require permits.

- **Avoiding Injury to Non-Target Plants:** Do not aerially apply Milestone within 50 feet of a border downwind (in the direction of wind movement), or allow spray drift to come in contact with any broadleaf crop or other desirable broadleaf plants, including, but not limited to, alfalfa, cotton, dry beans, flowers, grapes, lettuce, potatoes, radishes, soybeans, sugar beets, sunflowers, tobacco, tomatoes or other broadleaf or vegetable crop, fruit trees, ornamental plants, or soil where sensitive crops are growing or will be planted. Avoid application under conditions that may allow spray drift because very small quantities of spray may seriously injure susceptible crops. Read and consider the Spray Drift Management and Aerial Drift Reduction Advisory to help minimize the potential for spray drift.
- **Chemigation:** Do not apply this product through any type of irrigation system.
- **Do not contaminate water intended for irrigation or domestic purposes.** Do not treat inside banks or bottoms of irrigation ditches, either dry or containing water, or other channels that carry water that may be used for irrigation or domestic purposes.
- Do not apply this product to lawns, turf, ornamental plantings, urban walkways, driveways, tennis courts, golf courses, athletic fields, commercial sod operations, or other high-maintenance, fine turfgrass areas, or similar areas.
- Trees adjacent to or in a treated area can occasionally be affected by root uptake of Milestone. Do not apply Milestone within the root zone of desirable trees unless such injury can be tolerated. Use special caution near roses and leguminous trees such as locusts, redbud, mimosa, and caragana.
- Do not treat frozen soil where runoff could damage sensitive plants.
- **Grazing and Haying Restrictions:** There are no restrictions on grazing or grass hay harvest following application of Milestone at labeled rates. Cutting hay too soon after spraying weeds will reduce weed control. Wait 14 days after herbicide application to cut grass hay to allow herbicide to work. Do not transfer grazing animals from areas treated with Milestone to areas where sensitive broadleaf crops occur without first allowing 3 days of grazing on an untreated pasture. Otherwise, urine and manure may contain enough aminopyralid to cause injury to sensitive broadleaf plants.
- **Grazing Poisonous Plants:** Herbicide application may increase palatability of certain poisonous plants. Do not allow livestock to graze treated areas until poisonous plants are dry and no longer palatable to livestock.
- **Restrictions in Hay or Manure Use:**
  - ♦ Do not use aminopyralid-treated plant residues, including grass, wood plants, trees, hay, or straw from areas treated within the preceding 18 months, in compost, mulch wood chips, or mushroom spawn.
  - ♦ Do not use manure from animals that have eaten aminopyralid-treated forage or hay within the previous 3 days in compost, mulch, or mushroom spawn. Livestock must have 3 days of eating non-aminopyralid-treated materials in order to clear their system of aminopyralid. Do not use aminopyralid-treated plants in areas where commercially grown mushrooms or susceptible broadleaf plants may be grown.
  - ♦ Do not spread manure from animals that have consumed aminopyralid-treated forage or hay within the previous 3 days on land used for growing susceptible broadleaf crops.
  - ♦ Manure from animals that have consumed aminopyralid-treated forage or hay within the previous 3 days may only be used on areas used for pasture, grass grown for seed, wheat, and corn.
  - ♦ Do not plant a broadleaf crop (including soybeans, sunflower, tobacco, vegetables, field beans, peanuts, and potatoes) in fields or areas treated with aminopyralid or manure from animals that have grazed forage or eaten hay harvested from aminopyralid-treated areas until an adequately sensitive field bioassay is conducted to determine that the aminopyralid concentration in the soil is at level that is not injurious to the crop to be planted.
  - ♦ Do not plant a broadleaf crop in fields or areas treated in the previous year with manure from animals that have consumed aminopyralid-treated forage or hay until an adequately sensitive field bioassay is conducted to determine that the aminopyralid concentration in the soil is at level that is not injurious to the crop to be planted.
  - ♦ To promote herbicide decomposition, plant residues should be evenly incorporated in the surface soil or burned. Breakdown of aminopyralid in plant residues or manure is more rapid under warm, moist soil conditions and may be enhanced by supplemental irrigation.
- **Crop Rotation:** Do not rotate to any crop from rangeland, permanent pasture, or CRP acres within one year following treatment. Cereals and corn can be planted one year after treatment. Broadleaf crops are sensitive to aminopyralid residues in the soil and prediction of crop safety by field bioassay (see instructions below) is the BEST way to determine planting options. Broadleaf crops such as canola, flax, and alfalfa can require **at least** 2 to 3 years depending on the crop and environmental conditions. More sensitive crops such as soybeans, tobacco, peanuts, potatoes, and peas may require a longer plant-back interval and should not be planted until a field bioassay shows that the level of aminopyralid present in the soil will not adversely affect that broadleaf crop.

Spray Drift Management

THE APPLICATOR IS RESPONSIBLE FOR AVOIDING OFF-SITE SPRAY DRIFT. BE AWARE OF NEARBY NON-TARGET SITES AND ENVIRONMENTAL CONDITIONS.

Avoid application under conditions that may allow spray drift because very small quantities of spray, which may not be visible, may injure susceptible crops. This product should be applied only when the potential for drift to adjacent sensitive areas (e.g., residential areas, bodies of water, non-target crops, and other plants) is minimal (e.g., when wind is blowing away from the sensitive areas). A drift control aid may be added to the spray solution to further reduce the potential for drift. If a drift control aid is used, follow the use directions and precautions on the manufacturer's label. Do not use a thickening agent with Microfoil, Thru-Valve booms, or other spray delivery systems that cannot accommodate thickened spray solutions.

Importance of Droplet Size
An effective way to reduce spray drift is to apply large droplets. Use the largest droplets that provide target pest control. While applying larger droplets will reduce spray drift, the potential for drift will be greater if applications are made improperly or under unfavorable environmental conditions.

Ground Equipment: With ground equipment, spray drift can be lessened by keeping the spray boom as low as possible; by applying 10 gallons or more of spray per acre; by keeping the operating spray pressures at the manufacturer's specified minimum pressures for the specific nozzle type used (low pressure nozzles are available from spray equipment manufacturers); and by spraying when the wind velocity is low (follow state regulations). Avoid calm conditions which may be conducive to thermal inversions. Direct sprays no higher than the tops of target vegetation and keep spray pressures low enough to provide coarse spray droplets to minimize drift.

Aerial Application: Avoid spray drift at the application site. The interaction of many equipment-related and weather-related factors determine the potential for spray drift. Users are responsible for considering all these factors when making decisions.

The following drift management requirements must be followed to avoid off-target drift movement from aerial applications:

1. The boom length must not exceed 75% of the fixed wing span and must be located at least 8 to 10 inches below the trailing edge of the fixed wing; the boom length must not exceed 85% of the rotary blade.
2. Nozzles should be pointed backward parallel with the air stream or not pointed downward more than 45 degrees.

State and local regulations must be followed.

The applicator should be familiar with, and take into account, the information covered in the following **Aerial Drift Reduction Advisory**. This information is advisory in nature and does not supersede mandatory label requirements.

Aerial Drift Reduction Advisory

Information on Droplet Size: The most effective way to reduce drift potential is to apply large droplets. The best drift management strategy is to apply the largest droplets that provide sufficient coverage and control. Applying larger droplets reduces drift potential, but will not prevent drift if applications are made improperly or under unfavorable environmental conditions (see Wind, Temperature and Humidity, and Temperature Inversions).

Controlling Droplet Size:

- **Volume** - Use high flow rate nozzles to apply the highest practical spray volume. Nozzles with higher rated flows produce larger droplets.
- **Pressure** - Do not exceed the nozzle manufacturer's specified pressures. For many nozzle types lower pressure produces larger droplets. When higher flow rates are needed, use higher flow rate nozzles instead of increasing pressure.
- **Number of Nozzles** - Use the minimum number of nozzles that will provide uniform coverage.
- **Nozzle Orientation** - Orient nozzles so that the spray is released parallel to the airstream to produce larger droplets than other orientations. Significant deflection from horizontal will reduce droplet size and increase drift potential.
- **Nozzle Type** - Use a nozzle type that is designed for the intended application. With most nozzle types, narrower spray angles produce larger droplets. Consider using low-drift nozzles. Solid stream nozzles oriented straight back produce the largest droplets and the lowest drift.

Boom Length: The distance of the outer most operating nozzles on the boom must not exceed 75% of wingspan for airplanes or 85% of rotor blade diameter for helicopters.

Application Height: Applications should not be made at a height greater than 10 feet above the top of the largest plants unless a greater height is required for aircraft safety. Making applications at the lowest height that is safe reduces exposure of droplets to evaporation and wind.

Swath Adjustment: When applications are made with a crosswind, the swath will be displaced downwind. Therefore, on the up and downwind edges of the field, the applicator must compensate for this displacement by adjusting the path of the aircraft upwind. Swath adjustment distance should increase with increasing drift potential (higher wind, smaller drops, etc.).

Wind: Drift potential is lowest between wind speeds of 2 to 10 mph. However, many factors including droplet size and equipment type determine drift potential at any given speed. Application should be avoided when wind speeds are below 2 mph due to variable wind direction and high inversion potential. **Note**: Local terrain such as valleys and ravines can influence wind patterns. Every applicator should be familiar with local wind patterns and how they affect spray drift.

Temperature and Humidity: When making applications in low relative humidity, set up equipment to produce larger droplets to compensate for evaporation. Droplet evaporation is most severe when conditions are both hot and dry.

Temperature Inversions: Applications should not occur during a local, low-level temperature inversion because drift potential is high. Temperature inversions restrict vertical air mixing, which causes small suspended droplets to remain in a concentrated cloud. This cloud can move in unpredictable directions due to the light variable winds common during inversions. Temperature inversions are characterized by increasing temperatures with altitude and are common on nights with limited cloud cover and light to no wind. They begin to form as the sun sets and often continue into the morning. Their presence can be indicated by ground fog; however, if fog is not present, inversions can also be identified by the movement of the smoke from a ground source or an aircraft smoke generator. Smoke that layers and moves laterally in a concentrated cloud (under low wind conditions) indicates an inversion, while smoke that moves upward and rapidly dissipates indicates good vertical air mixing.

Sprayer Clean-Out Instructions

It is recommended to use separate spray equipment on highly sensitive crops such as tobacco, soybeans, potatoes, peanuts, and tomatoes.

Do not use spray equipment used to apply Milestone for other applications to land planted to, or to be planted to, broadleaf plants unless it has been determined that all residues of this herbicide have been removed by thorough cleaning of equipment.

Equipment used to apply Milestone should be thoroughly cleaned before reusing to apply any other chemicals as follows:

1. Rinse and flush application equipment thoroughly after use. Dispose of rinse water in non-cropland area away from water supplies.
2. Rinse a second time, adding 1 quart of household ammonia or tank cleaning agent for every 25 gallons of water. Circulate the solution through the entire system so that all internal surfaces are contacted (15 to 20 minutes). Let the solution stand for several hours, preferably overnight.
3. Flush the solution out of the spray tank through the boom.
4. Rinse the system twice with clean water, recirculating and draining each time.
5. Spray nozzles and screens should be removed and cleaned separately.

Do not apply this product with mist blower systems that deliver very fine spray droplets. Use of mist blower equipment can reduce control achieved with the herbicide and increase spray drift potential.

Use Information

Apply the specified rate of Milestone as a coarse low-pressure spray. Do not apply this product with mist blower systems that deliver very fine spray droplets. Spray volume should be sufficient to uniformly cover foliage or intended application site. Increase the spray volume to ensure thorough and uniform coverage when target vegetation is tall and/or dense. To enhance foliage wetting and coverage, a non-ionic agricultural surfactant or other adjuvant may be added to the spray mixture as specified by the adjuvant label.

Milestone may be applied by ground or aerial application equipment on any registered use site specified on this label.

Ground Broadcast Application: Higher spray volumes (greater than 10 gallons per acre) generally provide better coverage and better control, particularly in dense and/or tall foliage.

Aerial Broadcast Application: Do not apply less than 2 gallons per acre total spray volume. Five gallons per acre or greater will generally provide better coverage and better control, particularly in dense and/or tall foliage.

High-Volume Foliar Application: High volume foliar treatments may be applied at rates equivalent to a maximum of 7 fl oz per acre per year. Use sufficient spray volume to thoroughly and uniformly wet foliage and stems.

For basal bark and cut stubble and all types of cut surface applications, see woody plant section.

Low-Volume Foliar Treatment

To control susceptible woody plants, use Milestone alone or in tank mixes with other herbicides in water. The spray concentration of Milestone tank mixes and total spray volume per acre should be adjusted according to the size and density of target woody plants and type of spray equipment used. With low-volume application, use sufficient spray volume to obtain uniform coverage of target plants including the surfaces of all foliage, stems, and root collars.

For best results, an adjuvant should be added to all spray mixtures. Match equipment and delivery rate of spray nozzles to height and density of woody plants. When treating tall, dense brush, a truck-mounted spray gun with spray tips that deliver up to 2 gallons per minute at 40 to 60 psi may be required. Backpack or other types of specialized spray equipment with spray tips that deliver less than 1 gallon of spray per minute may be appropriate for short, low to moderate density brush.

Spot Application: Spot treatments may be applied at an equivalent broadcast rate of up to 0.22 lb acid equivalent (14 fl oz of Milestone) per acre per year; however, not more than 50% of an acre may be treated at that rate. Do not apply more than a total of 0.11 lb acid equivalent (7 fl oz) per acre of Milestone per year as a result of broadcast, spot, or repeat applications. Spray volume should be sufficient to thoroughly and uniformly wet the weed foliage, but not to the point of runoff. Repeat treatments may be made, but the total amount of Milestone applied must not exceed 7 fl oz per acre per year. To prevent misapplication, spot treatments should be applied with a calibrated sprayer with a known volume per acre. Table 1 shows Milestone amount to mix for various sprayer outputs in gallons per acre (GPA).

Table 1: Amount of Milestone **(in mL)** to mix in **1 gallon of water**

Gallons per acre	Milestone amount (in mL) to mix to achieve target application rates		
GPA	**5 fl oz/a**	**7 fl oz/a**	**14 fl oz/a**
20	7.5	10.5	21.0
30	5.0	7.0	14.0
40	3.8	5.3	10.5
50	3.0	4.2	8.4
60	2.5	3.5	7.0
70	2.1	3.0	6.0
80	1.9	2.6	5.3
90	1.7	2.3	4.7
100	1.5	2.1	4.2

Use a syringe to measure cc

Note: Table 1 above shows mixes for various sprayer outputs in gallons per acre (GPA).

Conversions:

1 tsp = 5 mL	30 ml = 1 fluid ounce	1 cc = 1 mL
3 tsp = 1 Tbsp	2 Tbsp = 1 fluid ounce	

Mixing Instructions

Mixing with Water: To prepare the spray, add about half the required amount of water in the spray tank. Then, with agitation, add the specified amount of Milestone and other herbicides (if tank mixing). Finally, with continued agitation, add the rest of the water and additives such as adjuvants, surfactants, or drift control and deposition aids.

Addition of Surfactants or Adjuvants on All Labeled Use Sites: The addition of a high quality non-ionic surfactant (of at least 80% active principal) or adjuvant at 0.25 to 0.5% volume per volume (1 to 2 quarts per 100 gallons of spray) is recommended to enhance herbicide activity under adverse environmental conditions (such as, high temperature, low relative humidity, drought conditions, dusty plant surfaces) or when weeds are heavily pubescent or more mature.

Tank Mixing with Other Herbicides: Milestone may be applied in tank mix combination with labeled rates of other herbicides provided: (1) the tank mix product is labeled for the timing and method of application for the use site to be treated, (2) mixing is not prohibited by the label of the tank mix product(s), and (3) that the tank mix combination is physically compatible (see tank mix compatibility testing below). When tank mixing, use only in accordance with the restrictions, precautions, and limitations on the respective product labels.

- It is the pesticide user's responsibility to ensure that all products are registered for the intended use. Read and follow the applicable restrictions and limitations and directions for use on all product labels involved in tank mixing. Users must follow the most restrictive directions for use and precautionary statements of each product in the tank mixture.
- Do not exceed specified application rates. If products containing the same active ingredient are mixed, do not exceed the maximum allowable active ingredient use rates.
- For direct injection or other spray equipment where the product formulations will be mixed in undiluted form, special care should be taken to ensure tank mix compatibility.
- Always perform a compatibility test (jar test) to ensure the compatibility of products to be used in tank mixture.

Tank Mix Compatibility Testing: Perform a jar test prior to mixing in a spray tank to ensure compatibility of Milestone and other pesticides or carriers. Use a clear glass jar with lid and mix ingredients in the same order and proportions as will be used in the spray tank. The mixture is compatible if the materials mix readily when the jar is inverted several times. The mixture should remain stable after standing for 30 minutes or, if separation occurs, should readily remix if agitated. An incompatible mixture is indicated by separation into distinct layers that do not readily remix when agitated, and/or the presence of flakes, precipitates, gels, or heavy oily film in the jar. Use of an appropriate compatibility aid may resolve mix incompatibility. If the mixture is incompatible do not use that tank mix partner in tank mixtures.

Invert Emulsion Spray Mixtures
Milestone can be applied in an invert emulsion using oil and an appropriate inverting agent. Follow label directions of the inverting agent.

Mixing with Sprayable Liquid Fertilizer Solutions: Milestone is usually compatible with liquid fertilizer solutions. It is anticipated that Milestone will not require a compatibility agent for mixing with fertilizers; however, a compatibility test (jar test) should be made prior to mixing. Jar tests are particularly important when a new batch of fertilizer or pesticide is used, when water sources change, or when tank mixture ingredients or concentrations are changed. Compatibility may be determined by mixing the spray components in the desired order and proportions in a clear glass jar before large scale mixing of spray components in the spray tank.

Note: The lower the temperature of the liquid fertilizer, the greater the likelihood of mixing problems. Use of a compatibility aid may be required if Milestone is mixed with a 2,4-D-containing product and liquid fertilizer. **Mixing Milestone and 2,4-D in N-P or N-P-K liquid fertilizer solutions is more difficult than mixing with straight nitrogen fertilizer and should not be attempted without first conducting a successful compatibility jar test.** Agitation in the spray tank must be vigorous to be comparable with jar test agitation. Apply the spray mixture the same day it is prepared while maintaining continuous agitation. Rinse the spray tank thoroughly after use.

Note: Foliar-applied liquid fertilizers themselves can cause yellowing of the foliage of forage grasses and other vegetation.

Use Rates and Timing

Milestone may be applied as a broadcast spray by ground or aerial equipment or as a spot application to control weeds including, but not limited to, those listed on this label. When a rate range is given, use the higher rate to control weeds at advanced growth stages or when under less-than-favorable growing conditions. For optimum uptake and translocation of Milestone, avoid mowing, haying, shredding, burning, or soil disturbance in treated areas for at least 14 days following application.

Milestone provides post emergence control and preemergence control of emerging seedlings of susceptible weeds and re-growth of certain perennial weeds following application. Preventing establishment of weeds will depend upon application rate, season of application, and environmental conditions after application.

Milestone can provide long-term control of susceptible weeds. The length of control is dependent upon the application rate, condition and growth stage of target weeds, environmental conditions at and following application, and the density and vigor of competing desirable vegetation. Long-term weed control is most effective where grass vegetation is allowed to recover from overgrazing, drought, etc., and compete with weeds.

Milestone can be an important component of integrated vegetation management programs designed to renovate or restore desired plant communities. To maximize and extend the benefits of weed control provided by Milestone, it is important that other vegetation management practices, including proper grazing management, biological control agents, replanting, fertilization, prescribed fire, etc., be used in appropriate sequences and combinations to further alleviate the adverse effects of weeds on desirable plant species and to promote development of desired plant communities. Agricultural and natural resources specialists with federal and state government agencies can provide guidance on best management practices and development of integrated vegetation management programs.

Plants Controlled

The following weeds and woody plants will be controlled with the rates of Milestone indicated below in Table 2. For best results, most weeds and woody plants should be treated when they are actively growing and under conditions favorable for growth. Use a higher rate in the rate range when growing conditions are less than favorable or when weed foliage is tall and dense, or when optimal longer term residual control is desired. Milestone also provides preemergence control of germinating seeds or seedlings of susceptible weeds following application.

Table 2: Weeds and Woody Plants Controlled
Note: Numbers in parentheses (-) refer to specific use directions for a particular weed species.

Common Name	Scientific Name	Rate Range (fl oz/acre)	Life Cycle	Plant Family
amaranth, spiny	*Amaranthus spinosus*	4 to 7	annual	Amaranthaceae
bedstraw	*Galium spp.*	4 to 7	perennial	Rubiaceae
beggarticks	*Bidens spp.*	4 to 7	annual	Asteracea
broomweed, annual	*Amphiachyris dracunculoides*	4 to 7	annual	Asteraceae
burdock, common	*Arctium minus*	4 to 7	biennial	Asteraceae
buttercup, hairy	*Ranunculus sardous*	4 to 7	annual	Ranunculaceae
buttercup, tall	*Ranunculus acris*	4 to 7	perennial	Ranunculaceae
buttercup spp	*Ranunculus spp*	4 to 7	various	Ranunculaceae

Table 2: Weeds and Woody Plants Controlled (Cont.)
Note: Numbers in parentheses (-) refer to specific use directions for a particular weeds species.

Common Name	Scientific Name	Rate Range (fl oz/acre)	Life Cycle	Plant Family
camelthorn	*Alhagi pseudalhagi*	5 to 7	perennial	Fabaceae
cat's ear, common	*Hypochaeris radicata*	5 to 7	perennial	Asteracea
cat's ear	*Hypochaeris spp*	5 to 7	perennial	Asteracea
chamomile, scentless	*Matricaria inodora*	4 to 7	annual	Asteraceae
chicory	*Cichorium intybus*	4 to 6	perennial	Asteraceae
chickweed	*Stellaria media*	7	annual	Caryophyllaceae
cinquefoil, sulfur (1)	*Potentilla recta*	4 to 7	perennial	Rosaceae
cocklebur	*Xanthium strumarium*	3 to 5	annual	Asteraceae
clover	*Trifolium spp.*	5 to 7	perennial	Fabaceae
crazyweed	*Oxytropisp*	5 to 7	perennial	Fabaceae
croton, tropic	*Croton glandulosus*	3 to 5	annual	Euphorbiaceae
crownvetch	*Securigera varia*	5 to 7	perennial	Fabaceae
cudweed, purple	*Gamochaeta purpurea*	4 to 7	annual	Asteraceae
daisy, oxeye (1)	*Leucanthemum vulgare*	4 to 7	perennial	Asteraceae
dock, curly	*Rumex crispus*	4 to 7	perennial	Polygonaceae
evening primrose, cutleaf	*Oenothera laciniata*	4 to 7	annual	Onagraceae
fiddleneck	*Amsinckia spp*	4 to 7	annual	Boraginaceae
fireweed	*Epilobium angustifolium*	5 to 7	perennial	Onagraceae
fleabane, flax-leaf	*Conyza bonariensis*	4 to 7	annual	Asteraceae
fleabane, hairy	*Conyza bonariensis*	5 to 7	annual/biennial	Asteraceae
hawkweed, orange (2)	*Hieracium aurantiacum*	4 to 7	perennial	Asteraceae
hawkweed, yellow (2)	*Hieracium caespitosum*	4 to 7	perennial	Asteraceae
henbane, black	*Hyoscyamus niger*	5 to 7	annual/biennial	Solanaceae
henbit	*Lamium amplexicaule*	5 to 7	annual/ biennial	Lamiaceae
hogweed, giant	*Heracleum mantegazzianum*	7	perennial	Apiaceae
horsenettle, Carolina	*Solanum carolinense*	4 to 7	perennial	Solanaceae
horseweed (marestail)	*Conyza canadensis*	4 to 7	annual	Asteraceae
ironweed, tall	*Vernonia gigantea*	5 to 7	perennial	Asteraceae
ironweed, western	*Vernonia baldwinii*	7	perennial	Asteraceae
knapweed, diffuse (3)	*Centaurea diffusa*	5 to 7	biennial/ perennial	Asteraceae
knapweed, meadow	*Centaurea debeauxii*	5 to 7	perennial	Asteraceae
knapweed, Russian (4)	*Acroptilon repens*	5 to 7	perennial	Asteraceae
knapweed, spotted (3)	*Centaurea stoebe*	5 to 7	biennial/ perennial	Asteraceae
knapweed, squarrose	*Centaurea virgata*	5 to 7	biennial/ perennial	Asteraceae
knapweeds	*Centaurea spp.*	5 to 7	biennial/ perennial	Asteraceae
knotweeds, Japanese, bohemian (11)	*Reynoutria japonica*	7 to 14	perennial	Polygonaceae
kudzu	*Pueraria montana*	7	perennial	Fabaceae
lady's thumb	*Polygonum persicaria*	3 to 5	annual	Polygonaceae
lambsquarters	*Chenopodium album*	5 to 7	annual	Chenopodiaceae
lespedeza, annual	*Lespedeza striata*	5 to 7	annual	Fabaceae
licorice, wild	*Glycyrrhiza lepidota*	7	perennial	Fabaceae
locoweed	*Astragalus spp.*	5 to 7	perennial	Fabaceae
locust, black	*Robinia pseudoacacia*	7	woody perennial	Fabaceae
locust, honey	*Gleditsia triacanthos*	7	woody perennial	Fabaceae
loosestrife, purple (12)	*Lythrum salicaria*	7 to 14	perennial	Lythraceae
mayweed, scentless	*Tripleurospermum perforate*	4 to 7	annual	Asteraceae
mayweed, stinking	*Anthemis cotula*	7	annual	Asteraceae
medic, black	*Medicago lupulina*	4 to 7	perennial	Fabaceae
mimosa	*Albizia julibrissin*	7	woody perennial	Fabaceae
mullein (5)	*Verbascum spp.*	7	biennial	Scrophulariaceae
nightshade, silverleaf	*Solanum elaeagnifolium*	4 to 7	perennial	Solanaceae
oxtongue, bristly	*Picris echioides*	5 to 7	biennial	Asteraceae
pea, Swainson	*Sphaerophysa salsula*	5 to 7	perennial	Fabaceae

Table 2: Weeds and Woody Plants Controlled (Cont.)
Note: Numbers in parentheses (-) refer to specific use directions for a particular weeds species.

Common Name	Scientific Name	Rate Range (fl oz/acre)	Life Cycle	Plant Family
povertyweed	*Iva axillaris*	5 to 7	perennial	Asteraceae
ragweed, common	*Ambrosia artemisiifolia*	3 to 5	annual	Asteraceae
ragweed, western	*Ambrosia psilostachya*	4 to 7	perennial	Asteraceae
ragweed, giant	*Ambrosia trifida*	4 to 7	annual	Asteraceae
ragwort, tansy	*Senecio jacobaea*	5 to 7	perennial	Asteraceae
redbud	*Cercis Canadensis*	7	woody perennial	Fabaceae
rush skeletonweed	*Chondrilla juncea*	5 to 7	perennial	Asteraceae
sicklepod	*Cassia obtusifolia*	7	perennial	Fabaceae
smartweed, Pennsylvania	*Polygonum pensylvanicum*	3 to 5	annual	Polygonaceae
sneezeweed, bitter	*Helenium amarum*	4 to 7	annual	Asteraceae
soda apple, tropical (6)	*Solanum viarum*	5 to 7	perennial	Solanaceae
sowthistle, annual	*Sonchus oleraceae*	7	annual	Asteraceae
sowthistle, perennial	*Sonchus arvensis*	3 to 5	perennial	Asteraceae
spanishneedles	*Bidens bipinnata*	4 to 7	annual	Asteraceae
St. Johnswort, common	*Hypericum perforatum*	5 to 7	perennial	Clusiaceae
stiltgrass, Japanese	*Microstegium vimineum*	5 to 7	annual	Poaceae
starthistle, Malta (7)	*Centaurea melitensis*	3 to 5	annual	Asteraceae
starthistle, purple (7)	*Centaurea calcitrapa*	3 to 5	biennial	Asteraceae
starthistle, yellow (7)	*Centaurea solstitialis*	3 to 5	annual	Asteraceae
sunflower, common	*Helianthus annuus*	4 to 7	annual	Asteraceae
sweetclover, white	*Melilotus albus*	5 to 7	biennial	Fabaceae
sweetclover, yellow	*Melilotus officinalis*	5 to 7	biennial	Fabaceae
teasel	*Dipsacus spp.*	4 to 7	biennial	Dipsacaceae
thistle, artichoke	*Cynara cardunculus*	5 to 7	perennial	Asteracea
thistle, blessed milk	*Silybum marianum*	4 to 7	biennial	Asteraceae
thistle, bull (8)	*Cirsium vulgare*	3 to 5	biennial	Asteraceae
thistle, Canada (9)	*Cirsium arvense*	5 to 7	perennial	Asteraceae
thistle, woolly distaff	*Carthamus lanatus*	4 to 7	annual	Asteraceae
thistle, Italian	*Carduus pycnocephalus*	7	annual	Asteraceae
thistle, musk (8)	*Carduus nutans*	3 to 5	biennial	Asteraceae
thistle, plumeless (8)	*Carduus acanthoides*	3 to 5	biennial	Asteraceae
thistle, Scotch	*Onopordum acanthium*	5 to 7	biennial	Asteracea
thistle, Russian (preemergence)	*Salsola spp*	7	annual	Chenopodiaceae
tree of heaven	*Ailanthus altissima*	7	perennial	Simaroubaceae
vetch	*Vicia spp.*	3 to 7	perennial	Fabaceae
willoweed, panicle	*Epilobium brachycarpum*	5 to 7	annual	Onagraceae
wisteria	*Wisteria brachybotris*	7	woody perennial	Fabaceae
wormwood, absinth(10)	*Artemisia absinthium*	6 to 7	perennial	Asteraceae
yarrow, common	*Achillea millefolium*	7	perennial	Asteraceae

(1) **Sulfur cinquefoil or oxeye daisy:** Apply Milestone at 4 to 6 fl oz per acre to plants in the pre-bud stage of development.
(2) **Orange or yellow hawkweeds:** Apply Milestone at 4 to 7 fl oz per acre to plants in the bolting stage of development.
(3) **Diffuse, spotted, and squarrose knapweeds:** Apply Milestone at 5 to 7 fl oz per acre when plants are actively growing with the optimum time of application occurring from rosette to the bolting stages of development or in the fall. Plants will be controlled by mid-summer and fall applications even though plants may not show any changes in form or stature the year of application.
(4) **Russian knapweed:** Apply Milestone at 5 to 7 fl oz per acre to plants in the spring and summer at early bud to flowering stages and to dormant plants in the fall.
(5) M**ullein**: Apply to the rosette stage
(6) **Tropical soda apple:** Apply Milestone at 5 to 7 fl oz per acre at any growth stage, but application by flowering will reduce seed production potential.
(7) **Malta, purple, and yellow starthistle:** Apply Milestone at 3 to 5 fl oz per acre to plants at the rosette through bolting growth stages.
(8) **Bull, musk, and plumeless thistles:** Apply Milestone at 3 to 5 fl oz per acre in the spring and early summer to rosette or bolting plants or in the fall to seedlings and rosettes. Apply at 4 to 5 fl oz when plants are at the late bolt through early flowering growth stages. 2,4-D at 1 lb ae per acre should be tank-mixed with Milestone starting at the late bud stages
(9) **Canada thistle:** Apply Milestone at 5 to 7 fl oz per acre in the spring after all plants have fully emerged (some may be budding) until the oldest plants are in full flower stage. Use the higher rate when applying to the flower stage. Applications are also effective in the fall before a killing frost. Use higher rates for older/dense stands or for longer residual control.

(10) **Absinth wormwood:** Apply 6 to 7 fl oz per acre before wormwood is 12 inches tall. When applying by air on CRP, coverage is important and a minimum of 3 GPA is specified. Remove old duff and litter by fire or mowing for best results

(11) **Invasive knotweeds:** Japanese, Bohemian, giant knotweeds: Optimum suppression of invasive knotweeds with Milestone herbicide is obtained when applications are made to plants that are at least 3 to 4 feet tall. Results of field trials conducted in the western U.S. indicate that high volume applications (100 gpa or greater) of Milestone at 7 fl oz per acre or a spot treatment rate up to 14 fl oz per acre applied in summer will provide good control of invasive knotweeds. In the upper Midwest, mowing in summer followed by fall application of Milestone (prior to frost) provided the best control. Infestations of invasive knotweed that are mowed should be allowed to regrow to at least 3 feet in height prior to herbicide treatment. Monitoring and follow-up herbicide treatments on regrowth will be necessary to control resprouts and achieve long-term control.

(12) **Purple loosestrife:** For optimum control apply Milestone at 7 fl oz per acre plus 1 pint to 1 quart of 2,4-D amine or 1 to 2 quarts of Garlon 3A. Spot treatments may also be made by applying Milestone at 14 fl oz (see Spot treatment section of the label) with or without the addition of 2,4-D or Garlon 3A.

(13) **Fiddleneck:** For optimum control apply Milestone at 4 to 7 fl oz per acre when the plants are young and before flowering. Use higher rates if the plants are older and larger. In California optimal application timing is November through March.

For Control or Suppression of Medusahead Rye

Milestone applied broadcast at 7 to14 fl oz per acre can suppress or control medusahead rye (*Taeniatherum caput-medusae)* and downy brome *(Bromus tectorum,* also called cheatgrass*)*. The key to optimum results is the timing of application. Applications should be made in late summer prior to rains and seed germination in order to provide the best possibility of suppression or control. In general, control or suppression will be poor if any of the seeds have germinated prior to application even if they have not yet emerged through the soil surface. Tank mixes with Accord XRT II at 12 fl oz per acre, where a non-selective herbicide can be used or where desired grasses are dormant and will not be harmed, will aid in control. Spot treatment restrictions (see spot treatment section) apply for rates above 7 fl oz per acre for broadcast applications.

Control of Terrestrial Weeds Near and Up to the Water's Edge

Milestone can be used to treat terrestrial weeds that extend up to the water's edge. **Do not apply directly to water.** This product must not be used to treat vegetation standing in the water. When controlling terrestrial weed species near and up to the water's edge, take precautions to minimize incidental overspray to the adjacent water. Consult local public water control authorities before applying this product near public waters. Permits may be required to treat such areas. Apply the specified rate (listed in Table 2) of Milestone as a coarse low-pressure spray as ground broadcast or spot applications. Do not apply aerially for control of weeds growing at or near the water's edge. Spray volume should be sufficient to uniformly cover foliage. Increase the spray volume to ensure thorough and uniform coverage when target vegetation is tall and/or dense. It is also permissible to treat target weeds within dry non-irrigation ditches and seasonally dry transitional areas between upland and lowland sites (such as flood plains, deltas, marshes, prairie potholes, or vernal pools) but only at times when those sites are dry and are forecasted or managed by water control systems to remain dry for at least 2 weeks following application.

Use Rate Restrictions:
Do not broadcast apply more than 7 fl oz per acre of Milestone per year.

The total amount of Milestone applied broadcast, as a re-treatment, and/or spot treatment cannot exceed 7 fl oz per acre per year. Spot treatments may be applied at an equivalent broadcast rate of up to 0.22 lb acid equivalent (14 fl oz of Milestone) per acre per year; however, not more than 50% of an acre may be treated at that rate. Do not apply more than a total of 0.11 lb acid equivalent (7 fl oz) per acre of Milestone per year as a result of broadcast, spot, or repeat applications.

Woody Plant Control

Milestone may be applied to control woody plants by any application method listed on the label on any site listed.

Milestone may be applied alone or in tank-mix combinations with labeled rates of other herbicides provided: (1) the tank mix product is labeled for the timing and method of application for the use site to be treated, and (2) mixing is not prohibited by the label of the registered tank mixed products. Use as directed in the Directions For Use section of the tank-mix partner. Follow Mixing Instructions.

Add Milestone to tank mixes for improved brush control on species such as alder, aspen, blackberry, boxelder, cherry, coyote brush, conifers, cottonwood, elm, maple, poplar, oak, brooms (Scotch, Spanish, French, Portuguese), gorse, hackberry, Russian and Autumn olive, salt-cedar.

Low or High Volume Foliar Applications:
For broad spectrum brush control using a foliar application, Milestone may be added to tank mixes with the following products or other products labeled for use on the intended site:

Tank Mix Product	EPA Reg. No.	Active Ingredient(s)
Accord XRT II	62719-556	Glycine, N-(phosphonomethyl)-, compd. with N-methylmethanamine (1:1)
Arsenal Powerline Herbicide	241-431	Imazapyr, isopropylamine salt
DMA 4 Herbicide	62719-3	2,4-D, dimethylamine salt
Garlon 4 Ultra	62719-527	Triclopyr, butoxyethyl ester
Remedy Ultra	62719-552	Triclopyr, butoxyethyl ester
Tordon 101 Mixture	62719-5	2,4-D triisopropanolamine salt; Picloram triisopropanolamine salt
Tordon 22K	62719-6	Picloram-potassium
Tordon K	62719-17	Picloram-potassium
Transline	62719-259	Clopyralid, monoethanolamine salt
Garlon XRT	62719-553	Triclopyr, butoxyethyl ester
Garlon 3A	62719-37	Triclopyr, triethylamine salt
Rodeo	62719-324	Glyphosate; Glyphosate-isopropylammonium

Low Volume Basal Bark Applications:
To control susceptible woody plants with stems less than 6 inches in basal diameter, apply herbicide mix (see below for rates) with a backpack or knapsack sprayer using low pressure and a solid cone or flat fan nozzle. Spray the basal parts of brush and tree trunks to a height of 12 to 15 inches from the ground in a manner that thoroughly wets the lower stems but not to the point of runoff. The use of a Spraying Systems Y2 nozzle or similar nozzle is recommended, which will narrow the spray pattern to target individual stems. Herbicide concentration should vary with tree diameter, bark thickness, volume used per acre, and susceptibility of species treated. Apply anytime, including the winter months, except when snow or water prevent spraying to the ground line or when stem surfaces are saturated with water.

Milestone may be used as a low volume basal treatment alone, for sensitive woody species in the Fabaceae family (legumes), or in combination with other products such as Garlon 4 Ultra, Garlon XRT, or Remedy Ultra for broader control of other sensitive woody species. Applications should not exceed the maximum use rate per acre for the site.

Mix Milestone at 0.5 to 5% v/v alone or with Garlon 4 Ultra or Garlon XRT in a commercially available basal diluent (or other oils or basal diluents as recommended by the manufacturer). The basal oil should be compatible with a water soluble herbicides such as Milestone. See Table 3 to calculate the amount of Milestone that can be applied per acre at the various volumes and rates. Make a stable tank mixture for basal bark application by first combining each product with a compatibility agent prior to final mixing in the desired ratio. If using a tank mix, mix the oil-based products such as Garlon 4 Ultra thoroughly with basal oil and add any other oil-based products before adding the water-based products. If the mixture stands for more than 30 minutes, reagitation may be required.

Oil and water based mixtures can separate over time. Long-term storage is not recommended without vigorous agitation prior to use or without a recommended compatibility agent.

Use caution when treating areas adjacent to susceptible and desirable species to avoid root uptake and possible injury when using Milestone or other soil active herbicides

Low Volume Stem Bark Band Treatment
To control susceptible woody plants (see Table 2) with stems less than 6 inches in basal diameter, mix 0.5 to 5 gallons of Milestone in enough oil to make 100 gallons of spray mixture. Apply with a backpack or knapsack sprayer using low pressure and a solid cone or flat fan nozzle.

Apply the spray in a 6-inch to 10-inch wide band that completely encircles the stem. Spray in a manner that completely wets the bark, but not to the point of runoff. The treatment band may be positioned at any height up to the first major branch. For best results apply the band as low as possible. Spray mixture concentration should vary with size and susceptibility of species to be treated. Applications may be made anytime, including winter months.

Table 3:

% of Milestone in Basal Mix	Fluid ounces of Milestone by GPA (gallons per acre)						
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
1.0	1.3	2.6	3.8	5.1	6.4	7.7	9.0
1.5	1.9	3.8	5.8	7.7	9.6	11.5	13.4
2.0	2.6	5.1	7.7	10.2	12.8		
2.5	3.2	6.4	9.6	12.8			
3.0	3.8	7.7	11.5				
3.5	4.5	9.0	13.4				
4.0	5.1	10.2					
5.0	6.4	12.8					

within spot treatment labeled rate

in excess of spot treatment labeled rate

NOTE: Avoid treating high density of stems adjacent to desirable trees with roots in the treatment zone. See Table 4 for guidance on estimated volume per acre by treated stem density. Trees adjacent to or in a treated area can occasionally be affected by root uptake of Milestone. Applications of Milestone within the root zone of desirable trees should not be made unless injury can be tolerated. Severe injury or plant death can occur if used near roses or leguminous trees such as locusts, redbud, mimosa, and caragana.

Table 4:

Estimated gallons of spray solution per acre for basal bark applications on various stem densities per acre		
	Volume Range	Target Spacing
Number of Stems per Acre	(gallons per acre)	(feet between brush/trees)
250	1.0 to 1.7	8.4
500	2.0 to 3.3	5.9
750	3.0 to 5.0	4.9
1000	4.0 to 6.6	4.2
1250	5.0 to 8.3	3.8
1500	5.9 to 9.9	3.4

Cut surface

Apply Milestone in the cut surface applications listed below for control of susceptible tree species such as legumes like albizia, mimosa, locust, etc. Mixtures of Milestone and Garlon 3A or Garlon 4 Ultra may be effective on species other than legumes such as elm, maple, oak and conifers.

Cut surface applications may be used successfully at any season except during periods of heavy sap flow of certain species - for example, maples in the spring.

Cut-Stump Treatment

Apply Milestone as a 10% dilution v/v in water, by spraying or painting all the exposed cambium layer on the freshly cut surface. The cambium area next to the bark is the most vital area to wet.

With Tree Injector Method

Apply by injecting 1 milliliter of 10% v/v Milestone in water through the bark at intervals of 3 to 4 inches between centers of the injector wound. The injections should completely surround the tree at any convenient height. Note: No Worker Protection Standard worker entry restrictions or worker notification requirements apply when this product is injected directly into plants.

With Hack and Squirt Method

Make cuts around the tree trunk at a convenient height with a hatchet or similar equipment so that the cuts overlap slightly and make a continuous circle around the trunk. Spray 1 milliliter of 10% v/v Milestone in water into the pocket created between the bark and the inner stem/trunk by each cut.

With Frill or Girdle Method

Make a single girdle through the bark completely around the tree at a convenient height. The frill should allow for the herbicide to remain next to the inner stem and absorb into the plant. Wet the cut surface with 10% v/v Milestone in water.

For use in Hawaii only:
Incision Point Application (IPA) also known as Tree Injection or Hack and Squirt

For control of susceptible tree species such as albizia and other legumes and susceptible tree species, make cuts around the tree trunk at a convenient height with a machete, hatchet, or similar equipment so that the cuts are about 6 inches apart between centers. Inject 0.5 to 1 milliliter of undiluted Milestone into the pocket created between the bark and the inner stem/trunk by each cut as soon as possible after cutting. The cambium area next to the bark is the most vital area to wet.

Preemergent Weed Control

Typically Milestone is used as a post emergent herbicide but it has preemergent activity on susceptible weeds. Use Milestone as a preemergence spray prior to weed seed germination. Control will depend upon species susceptibility, application timing, and environmental conditions such as precipitation following application. When applied at rates lower than 7 fl oz per acre, Milestone can provide short-term control of some susceptible weeds, but when applied at 7 fl oz (broadcast) or 14 fl oz (spot treatment), weed control is extended.

Best results for use as a preemergent application for total vegetation control are obtained if Milestone at 7 fl oz per acre is tank mixed with other herbicides to broaden the weed spectrum and to control grasses. If grasses and broadleaf weeds tolerant to Milestone are present at the time of application or will germinate on the site, then tank mixtures with other herbicides such as the products listed below, or flumioxazin, diuron, or other herbicides labeled for total vegetation control applications.

Tank Mix Product	EPA Reg. No.	Active Ingredient(s)
Accord XRT II	62719-556	Glycine, N-(phosphonomethyl)-, compd. with N-methylmethanamine (1:1)
Rodeo	62719-324	Glyphosate; Glyphosate-isopropylammonium
Dimension 2EW	62719-542	Dithiopyr
Dimension EC	62719-426	Dithiopyr
Oust X Herbicide	432-1552	Sulfometuron
Esplanade 200 SC	432-1516	Indaziflam

SPOT TREATMENTS FOR AREAS SUCH AS SUBJECT POLES, SUBSTATIONS, AND OTHER SMALL AREAS

Spot treatments may be applied at an equivalent broadcast rate of up to 0.22 lb acid equivalent (14 fl oz of Milestone) per acre per year to small spots for clearing around utility subject poles to help prevent fire damage, on small substations, and other spot areas. To prevent misapplication, spot treatments should be applied with a calibrated sprayer.

Supplemental Labeling

For Distribution and Use Only in the following states: AL, AR, AZ, CO, FL, GA, ID, KS, KY, LA, MO, MS, MT, ND, NE, NM, NV, OK, SD, TN, TX, UT, WY

For Use on Grass Harvested for Hay Intended for Distribution or Sale Off the Farm or Ranch

For Use On Grass Harvested for Silage, Haylage, Baleage, or Green Chop Intended for Use On the Farm or Ranch

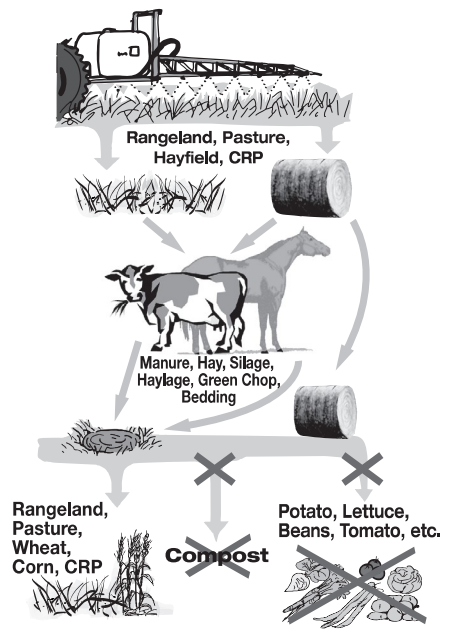
Use Precautions and Restrictions

Consult with a Corteva Agriscience representative if you do not understand the Use Precautions and Restrictions. Call 800-258-3033 for more information.

IMPORTANT USE PRECAUTIONS AND RESTRICTIONS TO PREVENT INJURY TO DESIRABLE PLANTS

- It is mandatory to follow the ***Use Precautions and Restrictions*** section of this product label.
- Manure and urine from animals consuming treated grass or forage may contain enough aminopyralid to cause injury to sensitive broadleaf plants.
- The Applicator must provide the land manager with a copy of the Corteva Agriscience Stewardship instructions regarding uses of forage from areas treated with aminopyralid.

Forage and Manure Management



- **Do not use grasses treated with Milestone in the preceding 18 months for hay intended for export outside the United States.**
- **Do not use hay or straw from areas treated with Milestone within the preceding 18 months, or manure from animals feeding on hay treated with Milestone, in compost.**
- **Do not use grasses treated within the preceding 18 months for seed production.**
- **Milestone is highly active against many broadleaf plant species.** Do not use this product on areas where loss of desirable broadleaf forage plants, including legumes, cannot be tolerated.
- **Seeding Legumes:** Do not plant forage legumes until a soil bioassay has been conducted to determine if aminopyralid or metsulfuron concentration remaining in the soil will adversely affect the legume establishment.
- **Grazing and Haying Restrictions:** There are no restrictions on grazing or grass hay harvest following application of Milestone at labeled rates. Cutting hay too soon after spraying weeds will reduce weed control. Wait 14 days after herbicide application to cut grass hay to allow herbicide to work. Do not transfer grazing animals from areas treated with Milestone to areas where sensitive broadleaf crops occur without first allowing 3 days of grazing on an untreated pasture. Otherwise, urine and manure may contain enough aminopyralid to cause injury to sensitive broadleaf plants.
- **Grazing Poisonous Plants:** Herbicide application may increase palatability of certain poisonous plants. Do not graze treated areas until poisonous plants are dry and no longer palatable to livestock.
- **Transfer of Animals Feeding on Milestone-Treated Forage:** Do not transfer animals grazing or feeding on hay from areas treated with Milestone to areas where sensitive broadleaf crop occur without first allowing 3 days of grazing on an untreated pasture. Otherwise, urine and manure may contain enough aminopyralid to cause injury to sensitive broadleaf plants.
- **Restrictions in Hay or Manure Use:**
  - Do not use treated plant residues, including hay or straw from areas treated within the preceding 18 months in compost, mulch or mushroom spawn.
  - Do not use manure from animals that have grazed forage or eaten hay harvested from treated areas within the previous 3 days in compost, mulch, or mushroom spawn.
  - Do not spread manure from animals that have grazed or consumed forage or hay from treated areas within the previous 3 days on land used for growing broadleaf crops.
  - Manure from animals that have grazed forage or eaten hay harvested from aminopyralid-treated areas within the previous 3 days may only be used on pasture grasses, grass grown for seed, and wheat.
  - Do not plant a broadleaf crop in fields treated in the previous year with manure from animals that have grazed forage or eaten hay harvested from aminopyralid-treated areas until an adequately sensitive field bioassay is conducted to determine that the aminopyralid residues in the soil is at level that is not injurious to the crop to be planted.
  - To promote herbicide decomposition, plant residues should be evenly incorporated in the surface soil or burned. Breakdown of aminopyralid in plant residues or manure is more rapid under warm, moist soil conditions and may be accelerated by supplemental irrigation.
- **Crop Rotation:** Do not rotate to cropland for one year following an application of Milestone. Do not plant a broadleaf crop until an adequately sensitive field bioassay shows that the level of aminopyralid present in the soil will not adversely affect that broadleaf crop.
- **Field Bioassay Instructions:** In fields previously treated with this product, plant short test rows of the intended rotational crop across the original direction of application in a manner to sample variability in field conditions such as soil texture, soil organic matter, soil pH, rainfall pattern, or drainage. The field bioassay can be initiated one year after the last application of aminopyralid in that field. Observe the test crop for symptoms of herbicidal activity, such as poor stand (effect on seed germination), chlorosis (yellowing), and necrosis (dead leaves or shoots), or stunting (reduced growth). If herbicidal symptoms do not occur, the test crop can be grown. If there is apparent herbicidal activity, do not plant the field to the intended rotational crop; plant only to wheat, forage grasses, native grasses, or grasses grown for hay.
- Trees adjacent to or in a treated area can occasionally be affected by root uptake of Milestone through movement into the soil. Do not apply Milestone within the root zone of desirable trees unless such injury can be tolerated. Use special caution near roses and leguminous trees such as locusts, redbud, mimosa, and caragana.

Supplemental Labeling

For Distribution and Use Only in the State of Washington

Rangeland, Permanent Grass Pastures, CRP Acres, Non-Cropland Areas, Non-Irrigation Ditch Banks, Natural Areas, and Grazed Areas In and Around These Sites

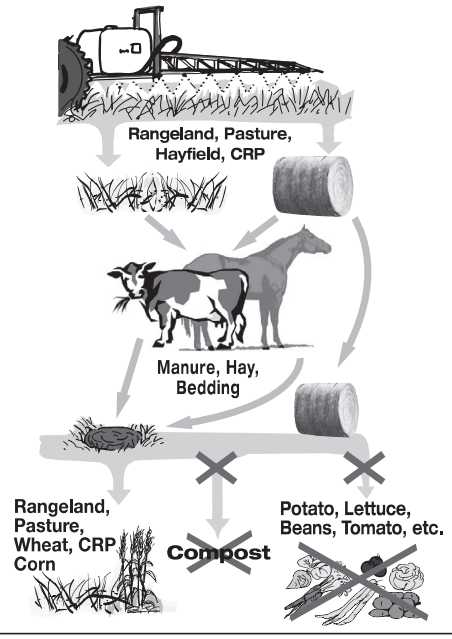
Use Precautions and Restrictions

Consult with a Corteva Agriscience representative if you do not understand the Use Precautions and Restrictions. Call 800-258-3033 for more information.

IMPORTANT USE PRECAUTIONS AND RESTRICTIONS TO PREVENT INJURY TO DESIRABLE PLANTS

- Carefully read the section ***Restrictions in Hay or Manure Use*.**
- It is mandatory to follow the ***Use Precautions and Restrictions*** section of this label.
- Manure and urine from animals consuming grass or hay treated with this product may contain enough aminopyralid to cause injury to sensitive broadleaf plants.
- Hay can only be used on the farm or ranch where product is applied unless allowed by supplemental labeling.

Forage and Manure Management



Pasture and Rangeland Restrictions

- **Do not use grasses treated with Milestone in the preceding 18 months for hay intended for export outside the United States.**
- **Hay from areas treated with Milestone in the preceding 18 months CANNOT be distributed or made available for sale off the farm or ranch where harvested unless allowed by supplemental labeling.**
- **Hay from areas treated with Milestone in the preceding 18 months CANNOT be used for silage, haylage and baleage and green chop unless allowed by supplemental labeling.**
- **Do not move hay made from grass treated with Milestone within the preceding 18 months off farm unless allowed by supplemental labeling.**
- **Do not use hay or straw from areas treated with Milestone within the preceding 18 months or manure from animals feeding on hay treated with Milestone in compost.**
- **Do not use grasses treated with Milestone in the preceding 18 months for seed production.**

Terms and Conditions of Use

If terms of the following Warranty Disclaimer, Inherent Risks of Use, and Limitation of Remedies are not acceptable, return unopened package at once to the seller for a full refund of purchase price paid. To the extent permitted by law, otherwise, use by the buyer or any other user constitutes acceptance of the terms under Warranty Disclaimer, Inherent Risks of Use and Limitation of Remedies.

Warranty Disclaimer

Corteva Agriscience warrants that this product conforms to the chemical description on the label and is reasonably fit for the purposes stated on the label when used in strict accordance with the directions, subject to the inherent risks set forth below. To the extent permitted by law, Corteva Agriscience MAKES NO OTHER EXPRESS OR IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE OR ANY OTHER EXPRESS OR IMPLIED WARRANTY.

Inherent Risks of Use

It is impossible to eliminate all risks associated with use of this product. Crop injury, lack of performance, or other unintended consequences may result because of such factors as use of the product contrary to label instructions (including conditions noted on the label, such as unfavorable temperatures, soil conditions, etc.), abnormal conditions (such as excessive rainfall, drought, tornadoes, hurricanes), presence of other materials, the manner of application, or other factors, all of which are beyond the control of Corteva Agriscience or the seller. To the extent permitted by law, all such risks shall be assumed by buyer.

Limitation of Remedies

To the extent permitted by law, the exclusive remedy for losses or damages resulting from this product (including claims based on contract, negligence, strict liability, or other legal theories), shall be limited to, at Corteva Agriscience's election, one of the following:

1. Refund of purchase price paid by buyer or user for product bought, or
2. Replacement of amount of product used.

To the extent permitted by law, Corteva Agriscience shall not be liable for losses or damages resulting from handling or use of this product unless Corteva Agriscience is promptly notified of such loss or damage in writing. To the extent permitted by law, in no case shall Corteva Agriscience be liable for consequential or incidental damages or losses.

The terms of the Warranty Disclaimer, Inherent Risks of Use and this Limitation of Remedies cannot be varied by any written or verbal statements or agreements. No employee or sales agent of Corteva Agriscience or the seller is authorized to vary or exceed the terms of the Warranty Disclaimer or this Limitation of Remedies in any manner.

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Produced for
Corteva Agriscience LLC
9330 Zionsville Road
Indianapolis, IN 46268

Label Code: CD02-879-023
Replaced Label: CD02-879-021

EPA accepted 06/02/2020

Revisions:

1. At end of booklet, added use/text from EPA-accepted supplemental labels for grass harvested for hay.
2. Related to change of company name and contact information for company 62719 accepted by EPA January 5, 2021:
   - o Legal entity updates.

SAFETY DATA SHEET

Milestone®

Version	Revision Date:	SDS Number:	Date of last issue: -
1.0	06/29/2022	800080004418	Date of first issue: 06/29/2022

Corteva Agriscience™ encourages you and expects you to read and understand the entire SDS as there is important information throughout the document. This SDS provides users with information relating to the protection of human health and safety at the workplace, protection of the environment and supports emergency response. Product users and applicators should primarily refer to the product label attached to or accompanying the product container. This Safety Data Sheet adheres to the standards and regulatory requirements of the United States and may not meet the regulatory requirements in other countries.

SECTION 1. IDENTIFICATION

Product name : Milestone®

Manufacturer or supplier's details

COMPANY IDENTIFICATION

Manufacturer/importer : CORTEVA AGRISCIENCE LLC
9330 ZIONSVILLE RD
INDIANAPOLIS, IN, 46268-1053
UNITED STATES

Customer Information Number : 800-992-5994

E-mail address : customerinformation@corteva.com

Emergency telephone : INFOTRAC (CONTRACT 84224).

800-992-5994 or 317-337-6009

Recommended use of the chemical and restrictions on use

Recommended use : End use herbicide product

SECTION 2. HAZARDS IDENTIFICATION

GHS classification in accordance with the OSHA Hazard Communication Standard (29 CFR 1910.1200)

Not a hazardous substance or mixture.

GHS label elements

Not a hazardous substance or mixture.

Other hazards

None known.

SECTION 3. COMPOSITION/INFORMATION ON INGREDIENTS

Substance / Mixture : Mixture

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Components

Chemical name	CAS-No.	Concentration (% w/w)
Aminopyralid Triisopropanolamine Salt	566191-89-7	40.6
1,1',1'-nitrilotripropan-2-ol	122-20-3	>= 1 - < 3
Balance	Not Assigned	> 50

Actual concentration is withheld as a trade secret

SECTION 4. FIRST AID MEASURES

If inhaled	:	Move person to fresh air. If person is not breathing, call an emergency responder or ambulance, then give artificial respiration; if by mouth to mouth use rescuer protection (pocket mask etc). Call a poison control center or doctor for treatment advice.
In case of skin contact	:	Take off contaminated clothing. Rinse skin immediately with plenty of water for 15-20 minutes. Call a poison control center or doctor for treatment advice.
In case of eye contact	:	Hold eyes open and rinse slowly and gently with water for 15-20 minutes. Remove contact lenses, if present, after the first 5 minutes, then continue rinsing eyes. Call a poison control center or doctor for treatment advice.
If swallowed	:	No emergency medical treatment necessary.
Most important symptoms and effects, both acute and delayed	:	None known.
Protection of first-aiders	:	If potential for exposure exists refer to Section 8 for specific personal protective equipment.
Notes to physician	:	No specific antidote. Treatment of exposure should be directed at the control of symptoms and the clinical condition of the patient. Have the Safety Data Sheet, and if available, the product container or label with you when calling a poison control center or doctor, or going for treatment.

SECTION 5. FIRE-FIGHTING MEASURES

Suitable extinguishing media	:	Water spray Alcohol-resistant foam
Unsuitable extinguishing media	:	None known.
Specific hazards during fire fighting	:	Exposure to combustion products may be a hazard to health.
Hazardous combustion products	:	During a fire, smoke may contain the original material in addition to combustion products of varying composition which may be toxic and/or irritating. Combustion products may include and are not limited to: Carbon oxides Nitrogen oxides (NOx) Hydrogen chloride gas
Specific extinguishing methods	:	Remove undamaged containers from fire area if it is safe to do so.

Evacuate area.
Use water spray to cool unopened containers.

Further information : Use extinguishing measures that are appropriate to local circumstances and the surrounding environment.

Special protective equipment for fire-fighters : Wear self-contained breathing apparatus for firefighting if necessary.
Use personal protective equipment.

SECTION 6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures : Use appropriate safety equipment. For additional information, refer to Section 8, Exposure Controls and Personal Protection.

Environmental precautions : Discharge into the environment must be avoided.
Prevent further leakage or spillage if safe to do so.
Prevent spreading over a wide area (e.g., by containment or oil barriers).
Retain and dispose of contaminated wash water.
Local authorities should be advised if significant spillages cannot be contained.

Methods and materials for containment and cleaning up : Clean up remaining materials from spill with suitable absorbant.
Local or national regulations may apply to releases and disposal of this material, as well as those materials and items employed in.
For large spills, provide dyking or other appropriate containment to keep material from spreading. If dyked material can be pumped,
Recovered material should be stored in a vented container.
The vent must prevent the ingress of water as further reaction with spilled materials can take place which could lead to overpressurization of the container.
Keep in suitable, closed containers for disposal.
Wipe up with absorbent material (e.g. cloth, fleece).
See Section 13, Disposal Considerations, for additional information.

SECTION 7. HANDLING AND STORAGE

Advice on safe handling : Do not breathe vapors/dust.
Handle in accordance with good industrial hygiene and safety practice.
Smoking, eating and drinking should be prohibited in the application area.
Take care to prevent spills, waste and minimize release to the environment.
Use appropriate safety equipment. For additional information, refer to Section 8, Exposure Controls and Personal Protection.

Conditions for safe storage : Store in a closed container.
Keep in properly labeled containers.
Store in accordance with the particular national regulations.

Materials to avoid : Strong oxidizing agents

Packaging material : Unsuitable material: None known.

SECTION 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Ingredients with workplace control parameters

Components	CAS-No.	Value type (Form of exposure)	Control parameters / Permissible concentration	Basis
1,1',1'-nitrilotripropan-2-ol	122-20-3	TWA	10 mg/m3	Dow IHG

Engineering measures : Use local exhaust ventilation, or other engineering controls to maintain airborne levels below exposure limit requirements or guidelines. If there are no applicable exposure limit requirements or guidelines, general ventilation should be sufficient for most operations.
Local exhaust ventilation may be necessary for some operations.

Personal protective equipment

Respiratory protection : Respiratory protection should be worn when there is a potential to exceed the exposure limit requirements or guidelines. If there are no applicable exposure limit requirements or guidelines, wear respiratory protection when adverse effects, such as respiratory irritation or discomfort have been experienced, or where indicated by your risk assessment process. For most conditions no respiratory protection should be needed; however, if discomfort is experienced, use an approved air-purifying respirator.

Hand protection

Remarks : Chemical protective gloves should not be needed when handling this material. Consistent with general hygienic practice for any material, skin contact should be minimized.

Eye protection : Use safety glasses (with side shields).

Skin and body protection : No precautions other than clean body-covering clothing should be needed.

SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance : Liquid.

Color : Brown

Odor : Mild

Odor Threshold : No data available

pH : 7.3 (67.6 °F / 19.8 °C)
Method: pH Electrode

Melting point/range : Not applicable

Freezing point		< 14 °F / < -10 °C
Boiling point/boiling range	:	No data available
Flash point	:	> 212 °F / > 100 °C Method: Pensky-Martens Closed Cup ASTM D 93
Evaporation rate	:	No data available
Flammability (solid, gas)	:	Not applicable
Upper explosion limit / Upper flammability limit	:	No data available
Lower explosion limit / Lower flammability limit	:	No data available
Vapor pressure	:	No data available
Relative vapor density	:	No data available
Relative density	:	No data available
Density	:	1.1401 g/cm3 (68 °F / 20 °C) Method: Digital density meter
Solubility(ies)		
Water solubility	:	Soluble
Autoignition temperature	:	none below 400 degC
Viscosity		
Viscosity, dynamic	:	12.2 cP (68 °F / 20 °C) Method: EPA OPPTS 830.7100 (Viscosity)
Explosive properties	:	No
Oxidizing properties	:	No
Surface tension	:	54.4 mN/m, 68 °F / 20 °C

SECTION 10. STABILITY AND REACTIVITY

Reactivity	:	Not classified as a reactivity hazard.
Chemical stability	:	No decomposition if stored and applied as directed. Stable under normal conditions.
Possibility of hazardous reactions	:	Stable under recommended storage conditions. No hazards to be specially mentioned. None known.
Conditions to avoid	:	None known.

Incompatible materials	:	Strong acids Strong bases
Hazardous decomposition products	:	Decomposition products depend upon temperature, air supply and the presence of other materials. Decomposition products can include and are not limited to: Carbon oxides Nitrogen oxides (NOx) Hydrogen chloride gas

SECTION 11. TOXICOLOGICAL INFORMATION

Acute toxicity

Product:

Acute oral toxicity	:	LD50 (Rat, male and female): > 5,000 mg/kg
Acute inhalation toxicity	:	LC50 (Rat, male and female): > 5.79 mg/l Exposure time: 4 h Test atmosphere: dust/mist Assessment: The substance or mixture has no acute inhalation toxicity
Acute dermal toxicity	:	LD50 (Rat, male and female): > 5,000 mg/kg

Components:

Aminopyralid Triisopropanolamine Salt:

Acute oral toxicity	:	LD50 (Rat): > 5,000 mg/kg Remarks: For similar material(s):
Acute inhalation toxicity	:	LC50 (Rat): > 5.79 mg/l Exposure time: 4 h Test atmosphere: dust/mist Assessment: The substance or mixture has no acute inhalation toxicity Remarks: For similar material(s):
Acute dermal toxicity	:	LD50 (Rat): > 5,000 mg/kg Remarks: For similar material(s):

1,1',1'-nitrilotripropan-2-ol:

Acute oral toxicity	:	LD50 (Rat): 4,000 mg/kg
Acute inhalation toxicity	:	(Rat): Exposure time: 8 h Symptoms: No deaths occurred following exposure to a saturated atmosphere. Assessment: The substance or mixture has no acute inhalation toxicity
Acute dermal toxicity	:	LD50 (Rabbit): > 5,000 mg/kg

Skin corrosion/irritation

Product:

Result : No skin irritation

Components:

Aminopyralid Triisopropanolamine Salt:

Result : No skin irritation

1,1',1'-nitrilotripropan-2-ol:

Result : No skin irritation

Serious eye damage/eye irritation

Product:

Result : No eye irritation

Components:

Aminopyralid Triisopropanolamine Salt:

Result : No eye irritation

1,1',1'-nitrilotripropan-2-ol:

Result : Eye irritation

Respiratory or skin sensitization

Product:

Species : Guinea pig
Assessment : Does not cause skin sensitization.

Components:

Aminopyralid Triisopropanolamine Salt:

Assessment : Does not cause skin sensitization.
Remarks : For similar active ingredient(s).
Did not cause allergic skin reactions when tested in guinea pigs.

Remarks : For respiratory sensitization:
No relevant data found.

1,1',1'-nitrilotripropan-2-ol:

Assessment : Does not cause skin sensitization.
Remarks : Did not cause allergic skin reactions when tested in guinea pigs.
Did not cause allergic skin reactions when tested in humans.

Remarks : For respiratory sensitization:

No relevant data found.

Germ cell mutagenicity

Components:

Aminopyralid Triisopropanolamine Salt:

Germ cell mutagenicity - Assessment : For similar active ingredient(s)., Aminopyralid., In vitro genetic toxicity studies were predominantly negative., Animal genetic toxicity studies were negative.

1,1',1'-nitrilotripropan-2-ol:

Germ cell mutagenicity - Assessment : In vitro genetic toxicity studies were negative., Animal genetic toxicity studies were negative.

Carcinogenicity

Components:

Aminopyralid Triisopropanolamine Salt:

Carcinogenicity - Assessment : For similar active ingredient(s)., Aminopyralid., Did not cause cancer in laboratory animals.

1,1',1'-nitrilotripropan-2-ol:

Carcinogenicity – Assessment : Did not cause cancer in laboratory animals.

IARC No ingredient of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC.

OSHA No component of this product present at levels greater than or equal to 0.1% is on OSHA's list of regulated carcinogens.

NTP No ingredient of this product present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by NTP.

Reproductive toxicity

Components:

Aminopyralid Triisopropanolamine Salt:

Reproductive toxicity - Assessment : For similar active ingredient(s)., Aminopyralid., In animal studies, did not interfere with reproduction.
For similar active ingredient(s)., Aminopyralid., Did not cause birth defects or other effects in the fetus even at doses which caused toxic effects in the mother.

1,1',1'-nitrilotripropan-2-ol:

Reproductive toxicity - Assessment : In animal studies, did not interfere with reproduction.

Did not cause birth defects or any other fetal effects in laboratory animals.

STOT-single exposure

Product:

Assessment : Evaluation of available data suggests that this material is not an STOT-SE toxicant.

Components:

Aminopyralid Triisopropanolamine Salt:

Assessment : Evaluation of available data suggests that this material is not an STOT-SE toxicant.

1,1',1'-nitrilotripropan-2-ol:

Assessment : Evaluation of available data suggests that this material is not an STOT-SE toxicant.

STOT-repeated exposure

Product:

Assessment : Evaluation of available data suggests that this material is not an STOT-RE toxicant.

Repeated dose toxicity

Components:

Aminopyralid Triisopropanolamine Salt:

Remarks : For similar active ingredient(s).
Aminopyralid.
In animals, effects have been reported on the following organs:
Gastrointestinal tract.

1,1',1'-nitrilotripropan-2-ol:

Remarks : Based on available data, repeated exposures are not anticipated to cause significant adverse effects.

Aspiration toxicity

Product:

Based on physical properties, not likely to be an aspiration hazard.

Components:

Aminopyralid Triisopropanolamine Salt:

Based on physical properties, not likely to be an aspiration hazard.

1,1',1'-nitrilotripropan-2-ol:

Based on physical properties, not likely to be an aspiration hazard.

SECTION 12. ECOLOGICAL INFORMATION

Ecotoxicity

Product:

Toxicity to fish	:	LC50 (Oncorhynchus mykiss (rainbow trout)): 360 mg/l Exposure time: 96 h Test Type: static test Method: OECD Test Guideline 203 or Equivalent LC50 (Cyprinodon variegatus (sheepshead minnow)): > 100 mg/l Exposure time: 96 h Test Type: static test
Toxicity to daphnia and other aquatic invertebrates	:	EC50 (Daphnia magna (Water flea)): > 460 mg/l Exposure time: 48 h Test Type: static test LC50 (saltwater mysid Mysidopsis bahia): > 104 mg/l Exposure time: 96 h Test Type: static test
Toxicity to algae/aquatic plants	:	Remarks: For similar material(s): Material is very highly toxic to aquatic organisms on an acute basis (LC50/EC50 <0.1 mg/L in the most sensitive species). ErC50 (Myriophyllum spicatum): 0.363 mg/l Exposure time: 14 d Remarks: For similar material(s): NOEC (Myriophyllum spicatum): 0.0639 mg/l Exposure time: 14 d Remarks: For similar material(s): ErC50 (Pseudokirchneriella subcapitata (green algae)): > 1,000 mg/l Exposure time: 72 h Remarks: For similar material(s):
Toxicity to soil dwelling organisms	:	LC50 (Eisenia fetida (earthworms)): > 10,000 mg/kg Exposure time: 14 d End point: survival
Toxicity to terrestrial organisms	:	Remarks: Material is practically non-toxic to birds on an acute basis (LD50 > 2000 mg/kg). Material is practically non-toxic to birds on a dietary basis (LC50 > 5000 ppm). dietary LC50 (Colinus virginianus (Bobwhite quail)): > 21422 mg/kg diet.

oral LD50 (Colinus virginianus (Bobwhite quail)): > 10,000 ppm

oral LD50 (Apis mellifera (bees)): > 460 micrograms/bee

contact LD50 (Apis mellifera (bees)): > 460 micrograms/bee

Ecotoxicology Assessment

Acute aquatic toxicity : Very toxic to aquatic life.

Chronic aquatic toxicity : Very toxic to aquatic life with long lasting effects.

Components:

Aminopyralid Triisopropanolamine Salt:

Toxicity to fish : LC50 (Oncorhynchus mykiss (rainbow trout)): 360 mg/l
Exposure time: 96 h
Remarks: For similar material(s):

Toxicity to daphnia and other aquatic invertebrates : EC50 (Daphnia magna (Water flea)): > 460 mg/l
Exposure time: 48 h
Remarks: For similar material(s):

Toxicity to algae/aquatic plants : ErC50 (Myriophyllum spicatum): 0.363 mg/l
Exposure time: 14 d
Remarks: For similar material(s):

NOEC (Myriophyllum spicatum): 0.0639 mg/l
Exposure time: 14 d
Remarks: For similar material(s):

ErC50 (Pseudokirchneriella subcapitata (green algae)): > 1,000 mg/l
Exposure time: 72 h
Remarks: For similar material(s):

Toxicity to terrestrial organisms : Remarks: Based on information for a similar material:, Material is practically non-toxic to birds on an acute basis (LD50 > 2000 mg/kg)., Material is practically non-toxic to birds on a dietary basis (LC50 > 5000 ppm).

Ecotoxicology Assessment

Acute aquatic toxicity : Very toxic to aquatic life.

Chronic aquatic toxicity : Very toxic to aquatic life with long lasting effects.

1,1',1'-nitrilotripropan-2-ol:

Toxicity to fish : Remarks: Material is practically non-toxic to aquatic organisms on an acute basis (LC50/EC50/EL50/LL50 >100 mg/L in the most sensitive species tested).

LC50 (Leuciscus idus (Golden orfe)): 3,158.4 mg/l

Exposure time: 96 h
Test Type: static test
Method: DIN 38412

Toxicity to daphnia and other aquatic invertebrates : EC50 (Daphnia magna (Water flea)): > 500 mg/l
Exposure time: 48 h
Test Type: static test
Method: OECD Test Guideline 202 or Equivalent

Toxicity to algae/aquatic plants : EC50 (alga Scenedesmus sp.): 710 mg/l
End point: Growth rate inhibition
Exposure time: 72 h
Test Type: static test
Method: EU Method C.3 (Algal Inhibition test)

Toxicity to microorganisms : EC10 (activated sludge): > 1,195 mg/l
Exposure time: 30 min

Persistence and degradability

Components:

Aminopyralid Triisopropanolamine Salt:

Biodegradability : Remarks: For similar material(s):
Aminopyralid.
Material is not readily biodegradable according to OECD/EEC guidelines.

1,1',1'-nitrilotripropan-2-ol:

Biodegradability : Remarks: Biodegradation under aerobic static laboratory conditions is high (BOD20 or BOD28/ThOD > 40%).
Biodegradation rate may increase in soil and/or water with acclimation.
Material is not readily biodegradable according to OECD/EEC guidelines.

aerobic
Result: Not biodegradable
Biodegradation: 0 %
Exposure time: 28 d
Method: OECD Test Guideline 301F or Equivalent
Remarks: 10-day Window: Fail

ThOD : 2.35 kg/kg

Photodegradation : Test Type: Half-life (indirect photolysis)
Sensitizer: OH radicals
Rate constant: 1.2E-10 cm3/s
Method: Estimated.

Bioaccumulative potential

Components:

Aminopyralid Triisopropanolamine Salt:

Partition coefficient: n-octanol/water : Remarks: For similar active ingredient(s).
Aminopyralid.
Bioconcentration potential is low (BCF < 100 or Log Pow < 3).

1,1',1'-nitrilotripropan-2-ol:

Bioaccumulation : Species: Fish
Bioconcentration factor (BCF): < 0.57
Exposure time: 42 d
Method: Measured

Partition coefficient: n-octanol/water : log Pow: -0.015 (73 °F / 23 °C)
Method: Measured
Remarks: Bioconcentration potential is low (BCF < 100 or Log Pow < 3).

Balance:

Partition coefficient: n-octanol/water : Remarks: No relevant data found.

Mobility in soil

Components:

Aminopyralid Triisopropanolamine Salt:

Distribution among environmental compartments : Remarks: For similar active ingredient(s).
Aminopyralid.
Potential for mobility in soil is very high (Koc between 0 and 50).

1,1',1'-nitrilotripropan-2-ol:

Distribution among environmental compartments : Koc: 10
Method: Estimated.
Remarks: Potential for mobility in soil is very high (Koc between 0 and 50).

Balance:

Distribution among environmental compartments : Remarks: No relevant data found.

Other adverse effects

Components:

Aminopyralid Triisopropanolamine Salt:

Results of PBT and vPvB assessment : This substance is not considered to be persistent, bioaccumulating and toxic (PBT). This substance is not considered to be very persistent and very bioaccumulating (vPvB).

Ozone-Depletion Potential	:	Remarks: This substance is not on the Montreal Protocol list of substances that deplete the ozone layer.

1,1',1'-nitrilotripropan-2-ol:

Results of PBT and vPvB assessment	:	This substance is not considered to be persistent, bioaccumulating and toxic (PBT). This substance is not considered to be very persistent and very bioaccumulating (vPvB).
Ozone-Depletion Potential	:	Remarks: This substance is not on the Montreal Protocol list of substances that deplete the ozone layer.

Balance:

Results of PBT and vPvB assessment	:	This substance has not been assessed for persistence, bioaccumulation and toxicity (PBT).
Ozone-Depletion Potential	:	Remarks: This substance is not on the Montreal Protocol list of substances that deplete the ozone layer.

SECTION 13. DISPOSAL CONSIDERATIONS

Disposal methods

Waste from residues	:	If wastes and/or containers cannot be disposed of according to the product label directions, disposal of this material must be in accordance with your local or area regulatory authorities. This information presented below only applies to the material as supplied. The identification based on characteristic(s) or listing may not apply if the material has been used or otherwise contaminated. It is the responsibility of the waste generator to determine the toxicity and physical properties of the material generated to determine the proper waste identification and disposal methods in compliance with applicable regulations. If the material as supplied becomes a waste, follow all applicable regional, national and local laws.

SECTION 14. TRANSPORT INFORMATION

International Regulations

UNRTDG

UN number	:	UN 3082
Proper shipping name	:	ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S. (Aminopyralid Triisopropanolamine Salt)
Class	:	9
Packing group	:	III
Labels	:	9

IATA-DGR

UN/ID No.	:	UN 3082
Proper shipping name	:	Environmentally hazardous substance, liquid, n.o.s. (Aminopyralid Triisopropanolamine Salt)
Class	:	9
Packing group	:	III
Labels	:	Miscellaneous
Packing instruction (cargo aircraft)	:	964
Packing instruction (passenger aircraft)	:	964

IMDG-Code

UN number	:	UN 3082
Proper shipping name	:	ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S. (Aminopyralid Triisopropanolamine Salt)
Class	:	9
Packing group	:	III
Labels	:	9
EmS Code	:	F-A, S-F
Marine pollutant	:	yes
Remarks	:	Stowage category A

Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code

Not applicable for product as supplied.

Domestic regulation

49 CFR

Not regulated as a dangerous good

Further information

Marine Pollutants assigned UN number 3077 and 3082 in single or combination packaging containing a net quantity per single or inner packaging of 5L or less for liquids or having a net mass per single or inner packaging of 5 KG or less for solids may be transported as non-dangerous goods as provided in section 2.10.2.7 of IMDG code, IATA Special provision A197, and ADR/RID special provision 375.

Special precautions for user

The transport classification(s) provided herein are for informational purposes only, and solely based upon the properties of the unpackaged material as it is described within this Safety Data Sheet. Transportation classifications may vary by mode of transportation, package sizes, and variations in regional or country regulations.

SECTION 15. REGULATORY INFORMATION

SARA 311/312 Hazards	:	No SARA Hazards
SARA 313	:	This material does not contain any chemical components with known CAS numbers that exceed the threshold (De Minimis) reporting levels established by SARA Title III, Section 313.

US State Regulations

Pennsylvania Right To Know

1,1',1'-nitrilotripropan-2-ol 122-20-3

The ingredients of this product are reported in the following inventories:

TSCA : Product contains substance(s) not listed on TSCA inventory.

TSCA list

No substances are subject to a Significant New Use Rule.

No substances are subject to TSCA 12(b) export notification requirements.

Federal Insecticide, Fungicide and Rodenticide Act

EPA Registration Number : 62719-519

This chemical is a pesticide product registered by the Environmental Protection Agency and is subject to certain labeling requirements under federal pesticide law. These requirements differ from the classification criteria and hazard information required for safety data sheets, and for workplace labels of non-pesticide chemicals. Following is the hazard information as required on the pesticide label:

CAUTION

Causes moderate eye irritation

SECTION 16. OTHER INFORMATION

Information Source and References
This SDS is prepared by Product Regulatory Services and Hazard Communications Groups from information supplied by internal references within our company.

Full text of other abbreviations

Dow IHG : Dow Industrial Hygiene Guideline
Dow IHG / TWA : Time weighted average

AIIC - Australian Inventory of Industrial Chemicals; ASTM - American Society for the Testing of Materials; bw - Body weight; CERCLA - Comprehensive Environmental Response, Compensation, and Liability Act; CMR - Carcinogen, Mutagen or Reproductive Toxicant; DIN - Standard of the German Institute for Standardisation; DOT - Department of Transportation; DSL - Domestic Substances List (Canada); ECx - Concentration associated with x% response; EHS - Extremely Hazardous Substance; ELx - Loading rate associated with x% response; EmS - Emergency Schedule; ENCS - Existing and New Chemical Substances (Japan); ErCx - Concentration associated with x% growth rate response; ERG - Emergency Response Guide; GHS - Globally Harmonized System; GLP - Good Laboratory Practice; HMIS - Hazardous Materials Identification System; IARC - International Agency for Research on Cancer; IATA - International Air Transport Association; IBC - International Code for the Construction and Equipment of Ships carrying Dangerous Chemicals in Bulk; IC50 - Half maximal inhibitory concentration; ICAO - International Civil Aviation Organization; IECSC - Inventory of Existing Chemical Substances in China; IMDG - International Maritime Dangerous Goods; IMO - International Maritime Organization; ISHL - Industrial Safety and Health Law (Japan); ISO - International Organisation for Standardization; KECI -

Korea Existing Chemicals Inventory; LC50 - Lethal Concentration to 50 % of a test population; LD50 - Lethal Dose to 50% of a test population (Median Lethal Dose); MARPOL - International Convention for the Prevention of Pollution from Ships; MSHA - Mine Safety and Health Administration; n.o.s. - Not Otherwise Specified; NFPA - National Fire Protection Association; NO(A)EC - No Observed (Adverse) Effect Concentration; NO(A)EL - No Observed (Adverse) Effect Level; NOELR - No Observable Effect Loading Rate; NTP - National Toxicology Program; NZIoC - New Zealand Inventory of Chemicals; OECD - Organization for Economic Co-operation and Development; OPPTS - Office of Chemical Safety and Pollution Prevention; PBT - Persistent, Bioaccumulative and Toxic substance; PICCS - Philippines Inventory of Chemicals and Chemical Substances; (Q)SAR - (Quantitative) Structure Activity Relationship; RCRA - Resource Conservation and Recovery Act; REACH - Regulation (EC) No 1907/2006 of the European Parliament and of the Council concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals; RQ - Reportable Quantity; SADT - Self-Accelerating Decomposition Temperature; SARA - Superfund Amendments and Reauthorization Act; SDS - Safety Data Sheet; TCSI - Taiwan Chemical Substance Inventory; TECI - Thailand Existing Chemicals Inventory; TSCA - Toxic Substances Control Act (United States); UN - United Nations; UNRTDG - United Nations Recommendations on the Transport of Dangerous Goods; vPvB - Very Persistent and Very Bioaccumulative

Revision Date : 06/29/2022

Product code: GF-871

The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text.

US / EN

Specimen Label

TRICLOPYR CHOLINE	GROUP	4	HERBICIDE

CORTEVA™ agriscience

Vastlan®

HERBICIDE

® ™ Trademarks of Dow AgroSciences, DuPont or Pioneer and their affiliated companies or respective owners

For the control of woody plant species and annual and perennial broadleaf weeds on

- **range and permanent grass pastures, grasses grown for hay, Conservation Reserve Program (CRP) sites;**
- **forest sites, conifer and tree plantations, and Christmas tree plantations;**
- **non-crop areas for example, airports, barrow ditches, communication transmission lines or structures, manufacturing and storage sites, electrical power and utility rights-of-way, fencerows, gravel pits, industrial sites, military lands, mining and drilling areas, non-irrigation ditch banks, oil and gas pads, parking lots, petroleum tank farms, pipelines, railroads, roadsides, storage areas, storm water retention areas, substations, unimproved rough turf grasses, vacant lots and other non-crop residential areas, and around farm buildings;**
- **natural areas (open space) for example, campgrounds, parks, prairie management, trails and trailheads, recreation areas, wildlife openings and wildlife habitat and management areas;**
- **including grazed areas on these sites; and**
- **aquatic sites**

For use in New York State, comply with Section 24(c) Special Local Need labeling for Vastlan, SLN NY-160004.

Active Ingredient:

Triclopyr choline: 2-[(3,5,6-trichloro-2-pyridinyl)oxy] acetic acid, choline salt	54.72%
Other Ingredients	45.28%
Total	100.0%

Acid equivalent: triclopyr – 39.02% - 4 lb/gal

Precautionary Statements

Hazard to Humans and Domestic Animals

EPA Reg. No. 62719-687

Keep Out of Reach of Children

WARNING

May be fatal if swallowed • Causes substantial but temporary eye injury • Prolonged or frequently repeated skin contact may cause allergic reactions in some individuals.

Do not get in eyes, on skin, or on clothing. Wash thoroughly after handling and before eating, drinking, chewing gum, using tobacco, or using the toilet. Remove and wash contaminated clothing before reuse.

Personal Protective Equipment (PPE)

Applicators and other handlers must wear:

- Protective eyewear
- Long-sleeved shirt and long pants
- Shoes plus socks
- Waterproof gloves

Discard clothing and other absorbent materials that have been drenched or heavily contaminated with this product's concentrate. Do not reuse them.

Follow manufacturer's instructions for cleaning/maintaining PPE. If no such instructions for washables exist, use detergent and hot water. Keep and wash PPE separately from other laundry.

Engineering Controls

When handlers use closed systems, enclosed cabs, or aircraft in a manner that meets the requirements listed in the Worker Protection Standard (WPS) for agricultural pesticides (40 CFR 170.240(d)(4-6)), the handler PPE requirements may be reduced or modified as specified in the WPS.

User Safety Recommendations

Users should:

- Remove clothing/PPE immediately if pesticide gets inside. Then wash thoroughly and put on clean clothing.
- Remove PPE immediately after handling this product. Wash the outside of gloves before removing. As soon as possible, wash thoroughly and change into clean clothing.

First Aid

If in eyes: Hold eye open and rinse slowly and gently with water for 15-20 minutes. Remove contact lenses, if present, after the first 5 minutes, then continue rinsing eye. Call a poison control center or doctor for treatment advice.

If swallowed: Call a poison control center or doctor immediately for treatment advice. Have person sip a glass of water if able to swallow. Do not induce vomiting unless told to do so by a poison control center or doctor. Do not give anything by mouth to an unconscious person.

Have the product container or label with you when calling a poison control center or doctor, or going for treatment. You may also contact 1-800-992-5994 for emergency medical treatment information.

Environmental Hazards

Do not contaminate water when cleaning equipment or disposing of equipment washwaters. Under certain conditions, treatment of aquatic weeds can result in oxygen depletion or loss due to decomposition of dead plants, which may contribute to fish suffocation. This loss can cause fish suffocation. Therefore, to minimize this hazard, do not treat more than one-third to one-half of the water area in a single operation and wait at least 10 to 14 days between treatments. Begin treatment along the shore and proceed outwards in bands to allow fish to move into untreated areas. Consult with the State agency for fish and game before applying to public water to determine if a permit is needed.

This chemical has properties and characteristics associated with chemicals detected in groundwater. The use of this chemical in areas where soils are permeable, particularly where the water table is shallow, may result in groundwater contamination.

Directions for Use

It is a violation of Federal law to use this product in a manner inconsistent with its labeling.

Read all Directions for Use carefully before applying.

Do not apply this product in a way that will contact workers or other persons, either directly or through drift. Only protected handlers may be in the area during application. For any requirements specific to your state or tribe, consult the agency responsible for pesticide regulation

Agricultural Use Requirements

Use this product only in accordance with its labeling and with the Worker Protection Standard, 40 CFR Part 170. This Standard contains requirements for the protection of agricultural workers on farms, forests, nurseries, and greenhouses, and handlers of agricultural pesticides. It contains requirements for training, decontamination, notification, and emergency assistance. It also contains specific instructions and exceptions pertaining to the statements on this label about personal protective equipment (PPE), and restricted-entry interval. The requirements in this box only apply to uses of this product that are covered by the Worker Protection Standard.

Do not enter or allow worker entry into treated areas during the restricted entry interval (REI) of 24 hours.

Agricultural Use Requirements (Cont.)

PPE required for early entry to treated areas that is permitted under the Worker Protection Standard and that involves contact with anything that has been treated, such as plants, soil, or water, is:

- Protective eyewear
- Coveralls
- Shoes plus socks
- Waterproof gloves

Non-Agricultural Use Requirements

The requirements in this box apply to uses of this product that are NOT within the scope of the Worker Protection Standard for Agricultural Pesticides (40 CFR Part 170). The WPS applies when this product is used to produce agricultural plants on farms, forests, nurseries, or greenhouses.

Entry Restrictions for Non-WPS Uses: For applications to non-cropland areas, do not allow entry into areas until sprays have dried, unless applicator and other handler PPE is worn.

Storage and Disposal

Do not contaminate water, food, or feed by storage and disposal. Open dumping is prohibited.
Pesticide Storage: Agitate before use.
Pesticide Disposal: Wastes resulting from the use of this product must be disposed of on site or at an approved waste disposal facility.

Nonrefillable containers 5 gallons or less:
Container Handling: Nonrefillable container. Do not reuse or refill this container. Offer for recycling if available or puncture and dispose of in a sanitary landfill, or by incineration, or by other procedures allowed by state and local authorities.

Triple rinse or pressure rinse container (or equivalent) promptly after emptying. **Triple rinse** as follows: Empty the remaining contents into application equipment or a mix tank and drain for 10 seconds after the flow begins to drip. Fill the container 1/4 full with water and recap. Shake for 10 seconds. Pour rinsate into application equipment or a mix tank or store rinsate for later use or disposal. Drain for 10 seconds after the flow begins to drip. Repeat this procedure two more times. **Pressure rinse** as follows: Empty the remaining contents into application equipment or a mix tank and continue to drain for 10 seconds after the flow begins to drip. Hold container upside down over application equipment or mix tank or collect rinsate for later use or disposal. Insert pressure rinsing nozzle in the side of the container, and rinse at about 40 psi for at least 30 seconds. Drain for 10 seconds after the flow begins to drip.

Refillable containers 5 gallons or larger:
Container Handling: Refillable container. Refill this container with pesticide only. Do not reuse this container for any other purpose. Cleaning the container before final disposal is the responsibility of the person disposing of the container. Cleaning before refilling is the responsibility of the refiller. To clean the container before final disposal, empty the remaining contents from this container into application equipment or a mix tank. Fill the container about 10% full with water. Agitate vigorously or recirculate water with the pump for two minutes. Pour or pump rinsate into application equipment or rinsate collection system. Repeat this rinsing procedure two more times.

Nonrefillable containers 5 gallons or larger:
Container Handling: Nonrefillable container. Do not reuse or refill this container. Offer for recycling if available or puncture and dispose of in a sanitary landfill, or by incineration, or by other procedures allowed by state and local authorities.

Triple rinse or pressure rinse container (or equivalent) promptly after emptying. **Triple rinse** as follows: Empty the remaining contents into application equipment or a mix tank. Fill the container 1/4 full with water. Replace and tighten closures. Tip container on its side and roll it back and forth, ensuring at least one complete revolution, for 30 seconds. Stand the container on its end and tip it back and forth several times. Turn the container over onto its other end and tip it back and forth several times. Empty the rinsate into application equipment or a mix tank or store rinsate for later use or disposal. Repeat this procedure two more times. **Pressure rinse** as follows: Empty the remaining contents into application equipment or a mix tank and continue to drain for 10 seconds after the flow begins to drip. Hold container upside down over application equipment or mix tank or collect rinsate for later use or disposal. Insert pressure rinsing nozzle in the side of the container, and rinse at about 40 psi for at least 30 seconds. Drain for 10 seconds after the flow begins to drip.

Product Information for All Use Sites

Use Vastlan® for the control of woody plants and broadleaf weeds in range and pasture, grasses grown for hay, Conservation Reserve Program (CRP) sites; forest sites, conifer and tree plantations, and Christmas tree plantations; non-crop areas for example, airports, barrow ditches, communication transmission lines or structures, manufacturing and storage sites, electrical power and utility rights-of-way, fencerows, gravel pits, industrial sites, military lands, mining and drilling areas, non-irrigation ditch banks, oil and gas pads, parking lots, petroleum tank farms, pipelines, railroads, roadsides, storage areas, storm water retention areas, substations, unimproved rough turf grasses, vacant lots and other non-crop residential areas, and around farm buildings; natural areas (open space) for example, campgrounds, parks, prairie management, trails and trailheads, recreation areas, wildlife openings and wildlife habitat and management areas and aquatic sites.

Obtain Required Permits: Consult with appropriate state or local water authorities before applying this product to public waters. State or local public agencies may require permits.

Use Precautions

When making applications to control unwanted plants on banks or shorelines of moving water sites, minimize overspray to open water.

It is permissible to treat non-irrigation ditch banks, seasonally dry wetlands (such as flood plains, deltas, marshes, swamps, or bogs), and transitional areas between upland and lowland sites.

It is the pesticide user's responsibility to ensure that all products in the listed mixtures are registered for the intended use. Users must follow the most restrictive directions for use and precautionary statements of each product in the tank mixture.

Use Restrictions

For use in New York State, comply with Section 24(c) Special Local Need labeling for Vastlan, SLN NY-160004.

Chemigation: Do not apply this product through any type of irrigation system.

Do not apply Vastlan directly to, or otherwise permit it to come into direct contact with, grapes, tobacco, vegetable crops, flowers, or other desirable broadleaf plants. Do not permit spray mists containing Vastlan to drift onto such plants.

Do not apply to salt water bays or estuaries.

Do not apply directly to un-impounded rivers or streams.

Do not apply where runoff water may flow onto agricultural land as injury to crops may result.

Do not apply with a mistblower.

Irrigation waters:

Do not apply on ditches or canals currently being used to transport irrigation water or that will be used for irrigation within 4 months following treatment. It is permissible to treat non-irrigation ditch banks and the outer banks of irrigation ditches.

Water treated with Vastlan may not be used for irrigation purposes for 120 days after application or until residue levels of Vastlan are determined by laboratory analysis, or other appropriate means of analysis, to be 1 ppb or less.

Seasonal Irrigation Waters: Vastlan may be applied during the off-season to surface waters that are used for irrigation on a seasonal basis provided that there is a minimum of 120 days between applying Vastlan and the first use of treated water for irrigation purposes, or until residue levels of Vastlan are determined by laboratory analysis, or other appropriate means of analysis, to be 1 ppb or less.

Irrigation Canals/Ditches: Do not apply Vastlan to irrigation canals/ditches unless the 120-day restriction on irrigation water usage can be observed or residue levels of Vastlan are determined by laboratory analysis, or other appropriate means of analysis, to be 1 ppb or less.

Restrictions for Potable Water Intakes for Emerged Aquatic Weed Control – Lakes, Reservoirs, Ponds:
See chart below for specific setback distances near functioning potable water intakes.
Note: Existing potable water intakes which are no longer in use, such as those replaced by potable water wells or connections to a municipal water system, are not considered to be functioning potable water intakes. These setback restrictions do not apply to terrestrial applications made adjacent to potable water intakes.

	Vastlan Application Rate			
Area Treated	1.5 qt/acre	3 qt/acre	4.5 qt/acre	6 qt/acre
(acres)	Setback Distance (ft)			
4	0	200	400	500
>4 - 8	0	200	700	900
>8 - 16	0	200	700	1000
>16	0	200	900	1300

To apply Vastlan around and within the distances noted above from a functioning potable water intake, the intake must be turned off until the triclopyr level in the intake water is determined to be 0.4 parts per million (ppm) or less by laboratory analysis or immunoassay.

Recreational Use of Water in Treatment Area: There are no restrictions on use of water in the treatment area for recreational purposes, including swimming and fishing.

Livestock Use of Water from Treatment Area: There are no restrictions on livestock consumption of water from the treatment area.

Restrictions for Potable Water Intakes for Submerged Weed Control – Lakes, Reservoirs, Ponds:
For applications of Vastlan to control submerged weeds in lakes, reservoirs, or ponds that contain a functioning potable water intake for human consumption, see the chart below to determine the minimum setback distances of the application from the functioning potable water intakes.

Area Treated (acres)	Concentration of Triclopyr Acid in Water (ppm ae)				
	0.75 ppm	1 ppm	1.5 ppm	2 ppm	2.5 ppm
	Required Setback Distance (ft) from Potable Water Intake				
<4	300	400	600	800	1000
>4 – 8	420	560	840	1120	1400
>8 – 16	600	800	1200	1600	2000
>16 – 32	780	1040	1560	2080	2600
>32 acres, calculate a setback using the formula for the appropriate rate	Setback (ft) = (800*ln (acres) – 160)/3.33	Setback (ft) = (800*ln (acres) – 160)/2.50	Setback (ft) = (800*ln (acres) – 160)/1.67	Setback (ft) = (800*ln (acres) – 160)/1.25	Setback (ft) = (800*ln (acres) – 160)

Example Calculation 1: to apply 2.5 ppm Vastlan to 50 acres:

Setback in feet = (800 x ln (50 acres) - 160
= (800 x 3.912) – 160
= 2970 feet

Example Calculation 2: to apply 0.75 ppm Vastlan to 50 acres:

$$\text{Setback in feet} = \frac{(800 \times \ln(50 \text{ acres}) - 160}{3.33}$$

$$= \frac{(800 \times 3.912) - 160}{3.33}$$

= 892 feet

Note: Existing potable water intakes which are no longer in use, such as those replaced by potable water wells or connections to a municipal water system, are not considered to be functioning potable water intakes. These setback restrictions do not apply to terrestrial applications made adjacent to potable water intakes.

To apply Vastlan around and within the distances noted above from a functioning potable water intake, the intake must be turned off until the triclopyr level in the intake water is determined to be 0.4 parts per million (ppm) or less by laboratory analysis or immunoassay.

Maximum Use Rates

- Apply no more than 6 lb ae of triclopyr (6 quarts of Vastlan) per acre per year on aquatic sites.
- Apply no more than 2 lb ae of triclopyr (2 quarts of Vastlan) per acre per growing season on range and pasture sites, including rights-of-way, fence rows or any area where grazing or harvesting of hay is allowed.
- On forestry sites, Vastlan may be used at rates up to 6 lb ae of triclopyr (6 quarts of Vastlan) per acre per year.
- For all terrestrial use sites other than range, pasture, forestry sites, and grazed/hayed areas, the maximum application rate is 9 lb ae of triclopyr (9 quarts of Vastlan) per acre per year.
- See Maximum Labeled Rate versus Spray Volume per Acre table below for relationship between mixing rate, spray volume and maximum application rate.

Maximum Labeled Rate versus Spray Volume per Acre

Total Spray Volume (gal/acre)	Maximum Rate of Vastlan		
	Range and Pasture Sites[1] (gal/100 gal of spray)	Forestry Sites[2] (gal/100 gal of spray)	Non-Cropland Sites[3] (gal/100 gal of spray)
400	Do not use	0.375	0.57
300	Do not use	0.5	0.75
200	Do not use	0.75	1.125
100	0.5	1.5	2.25
50	1	3	4.5

Maximum Labeled Rate versus Spray Volume per Acre (Cont.)

Total Spray Volume (gal/acre)	Maximum Rate of Vastlan		
	Range and Pasture Sites[1] (gal/100 gal of spray)	Forestry Sites[2] (gal/100 gal of spray)	Non-Cropland Sites[3] (gal/100 gal of spray)
40	1.25	3.75	5.63
30	1.67	5	7.5
20	2.5	7.5	11.25
10	5	15	22.5

[1]Do not exceed the maximum use rate of 2 lb ae of triclopyr (2 quarts of Vastlan)/acre/year.
[2]Do not exceed the maximum use rate of 6 lb ae of triclopyr (6 quarts of Vastlan)/acre/year.
[3]Do not exceed the maximum use rate of 9 lb ae of triclopyr (9 quarts of Vastlan)/acre/year on non-cropland use sites other than rangeland, pasture, forestry, and grazed/hayed areas.

Use the higher dosage rates in the chart when woody plants approach an average of 15 feet in height or when the brush covers more than 60% of the area to be treated. If lower rates are used on hard to control species, resprouting may occur the year following treatment.

Haying Restrictions

Haying (harvesting of dried forage)
- Do not harvest hay for 14 days after application.

Slaughter Restriction: During the season of application, withdraw livestock from grazing treated grass at least 3 days before slaughter.

Avoiding Injurious Spray Drift

Make applications only when there is little or no hazard from spray drift. Small quantities of spray, which may not be visible, may seriously injure susceptible plants. Do not spray when wind is blowing toward susceptible crops or ornamental plants that are near enough to be injured. It is suggested that a continuous smoke column at or near the spray site or a smoke generator on the spray equipment be used to detect air movement, lapse conditions, or temperature inversions (stable air). If the smoke layers or indicates a potential of hazardous spray drift, do not spray.

Spray Drift Management
Avoiding spray drift at the application site is the responsibility of the applicator. The interaction of many equipment and weather related factors determine the potential for spray drift. The applicator and the grower are responsible for considering all these factors when making decisions.

Aerial Application:
The following drift management requirements must be followed to avoid off-target drift movement from aerial applications with aerial applications:

1. The distance of the outer most operating nozzles on the boom must not exceed 3/4 the length of the wingspan or rotor.
2. Nozzles must always point backward parallel with the air stream and never be pointed downwards more than 45 degrees.

Where states have more stringent regulations, they must be observed.

The applicator should be familiar with and take into account the information covered in the following Aerial Drift Reduction Advisory, below.

Aerial Drift Reduction Advisory
Information on Droplet Size: The most effective way to reduce drift potential is to apply large droplets. The best drift management strategy is to apply the largest droplets that provide sufficient coverage and control. Applying larger droplets reduces drift potential, but will not prevent drift if applications are made improperly, or under unfavorable environmental conditions (see Wind, Temperature and Humidity, and Temperature Inversions).

For aerial application on rights-of-way or other areas near susceptible crops, apply through a Microfoil† or Thru-Valve boom†, or use an agriculturally labeled drift control additive. Other drift reducing systems or thickened sprays prepared by using high viscosity inverting systems may be used if they are made as drift-free as mixtures containing agriculturally labeled thickening agents or applications made with the Microfoil or Thru-Valve boom. Do not use a thickening agent with the Microfoil or Thru-Valve booms, or other systems that cannot accommodate thick sprays. If a spray thickening agent is used, follow all use directions and precautions on the product label.

†Reference within this label to a particular piece of equipment produced by or available from other parties is provided without consideration for use by the reader at its discretion and subject to the reader's independent circumstances, evaluation, and expertise. Such reference by Dow AgroSciences is not intended as an endorsement of such equipment, shall not constitute a warranty (express or implied) of such equipment, and is not intended to imply that other equipment is not available and equally suitable. Any discussion of methods of use of such equipment does not imply that the reader should use the equipment other than is advised in directions available from the equipment's manufacturer. The reader is responsible for exercising its own judgment and expertise, or consulting with sources other than Dow AgroSciences, in selecting and determining how to use its equipment.

Controlling Droplet Size:
- **Volume** - Use high flow rate nozzles to apply the highest practical spray volume. Nozzles with higher rated flows produce larger droplets.
- **Pressure** - Do not exceed the nozzle manufacturer's recommended pressures. For many nozzle types, lower pressure produces larger droplets. When higher flow rates are needed, use higher flow rate nozzles instead of increasing pressure.
- **Number of Nozzles** - Use the minimum number of nozzles that provide uniform coverage.
- **Nozzle Orientation** - Orienting nozzles so that the spray is released parallel to the airstream produces larger droplets than other orientations and is the recommended practice. Significant deflection from horizontal will reduce droplet size and increase drift potential.
- **Nozzle Type** - Use a nozzle type that is designed for the intended application. With most nozzle types, narrower spray angles produce larger droplets. Consider using low-drift nozzles. Solid stream nozzles oriented straight back produce the largest droplets and the lowest drift.

Boom Length: The distance of the outer most operating nozzles on the boom must not exceed 75% of wingspan or rotor diameter.

Application Height: Applications should not be made at a height greater than 10 feet above the top of the largest plants unless a greater height is required for aircraft safety. Making applications at the lowest height that is safe reduces exposure of droplets to evaporation and wind.

Swath Adjustment: When applications are made with a crosswind, the swath will be displaced downwind. Therefore, on the up and downwind edges of the field, the applicator must compensate for this displacement by adjusting the path of the aircraft upwind. Swath adjustment distance should increase, with increasing drift potential (higher wind, smaller drops, etc.).

Wind: Drift potential is lowest between wind speeds of 2 to 10 mph. However, many factors, including droplet size and equipment type, determine drift potential at any given speed. Application should be avoided below 2 mph due to variable wind direction and high inversion potential. **Note:** Local terrain can influence wind patterns. Every applicator should be familiar with local wind patterns and how they affect spray drift.

Temperature and Humidity: When making applications in low relative humidity, set up equipment to produce larger droplets to compensate for evaporation. Droplet evaporation is most severe when conditions are both hot and dry.

Temperature Inversions: Applications should not occur during a local, low level temperature inversion because drift potential is high. Temperature inversions restrict vertical air mixing, which causes small suspended droplets to remain in a concentrated cloud. This cloud can move in unpredictable directions due to the light variable winds common during inversions. Temperature inversions are characterized by increasing temperatures with altitude and are common on nights with limited cloud cover and light to no wind. They begin to form as the sun sets and often continue into the morning. Their presence can be indicated by ground fog; however, if fog is not present, inversions can also be identified by the movement of the smoke from a ground source or an aircraft smoke generator. Smoke that layers and moves laterally in a concentrated cloud (under low wind conditions) indicates an inversion, while smoke that moves upward and rapidly dissipates indicates good vertical air mixing.

Sensitive Areas: The pesticide should only be applied when the potential for drift to adjacent sensitive areas (e.g., residential areas, bodies of water, known habitat for threatened or endangered species, non-target crops) is minimal (e.g., when wind is blowing away from the sensitive areas).

Ground Equipment: To aid in reducing spray drift, Vastlan should be used in thickened (high viscosity) spray mixtures using an agriculturally labeled drift control additive, high viscosity invert system, or equivalent as directed by the manufacturer. With ground equipment, spray drift can be reduced by keeping the spray boom as low as possible; by applying 20 gallons or more of spray per acre; by keeping the operating spray pressures at the lower end of the manufacturer's recommended pressures for the specific nozzle type used (low pressure nozzles are available from spray equipment manufacturers); and by spraying when wind velocity is low (follow state regulations). In hand-gun applications, select the minimum spray pressure that will provide adequate plant coverage (without forming a mist). Do not apply with nozzles that produce a fine-droplet spray.

High Volume Leaf-Stem Treatment: To minimize spray drift, do not use pressure exceeding 50 psi at the spray nozzle and keep sprays no higher than brush tops. An agriculturally labeled thickening agent may be used to reduce drift.

Use Information

Use Vastlan at rates of 0.75 to 9 quarts of Vastlan per acre to control broadleaf weeds and woody plants. In all cases, use the amount specified in enough water to give uniform and complete coverage of the plants to be controlled. Refer to Maximum Use Rates paragraph - follow defined rates restrictions based on use sites and whether or not grazing or haying is involved.

Surfactants
For best results, use a surfactant with foliar applications and apply when woody plants and weeds are actively growing. When hard to control species such as ash, blackgum, choke cherry, elm, maples, oaks, pines, or winged elm are prevalent and during applications made in late summer when the plants are mature or during drought conditions, use the higher rates of Vastlan alone or in combination with Milestone, Opensight, Tordon® or other herbicides to broaden the spectrum of activity.

Tank Mixing
Before using any recommended tank mixtures, read the directions and all use precautions and restrictions on all labels in the tank mix. Prior to large scale batch mixing, conduct a "jar test" for spray mixture compatibility by mixing each component in the required order and proportion in a clear glass jar. **Note:** If tank mixing with glyphosate herbicides, mix the Vastlan with at least 75% of the total spray volume desired and ensure that Vastlan is well mixed before adding the glyphosate herbicides to avoid incompatibility. When using Vastlan in combination with Freelexx, 2,4-D amine (like DMA 4 IVM) or low volatile ester herbicides, generally the higher rates should be used for satisfactory brush control.

A surfactant should be added to the spray tank last or as recommended on the product label. If combined with emulsifiable concentrate herbicides, moderate continuous adequate agitation is required.
It is the pesticide user's responsibility to ensure that all products are registered for the intended use. Read and follow the applicable restrictions and limitations and directions for use on all product labels involved in tank mixing. Users must follow the most restrictive directions for use and precautionary statements of each product in the tank mixture.

Broadcast Applications With Ground Equipment
Apply using equipment that will ensure uniform coverage of the spray volumes applied. To improve spray coverage, add a non-ionic surfactant. See Maximum Labeled Rate versus Spray Volume per Acre table below for relationship between mixing rate, spray volume and maximum application rate.

Aerial Application
Aerial sprays should be applied using suitable drift control. (See Use Precautions and Restrictions.) Add a non-ionic surfactant. See Maximum Labeled Rate versus Spray Volume per Acre table above for relationship between mixing rate, spray volume and maximum application rate.

Woody Plant Control With Ground Equipment for Noncropland sites

High Volume Foliage Treatment

For control of woody plants, use Vastlan at the rate of 3 to 9 quarts per 100 gallons of spray solution, or Vastlan at 0.75 to 3 quarts may be tank mixed with Freelexx, 2,4-D (like DMA 4 IVM, or low volatile esters), or products such as Milestone, Opensight, Tordon* and diluted to make 100 gallons of spray solution. Apply at a volume of 100 to 400 gallons of total spray per acre depending upon size and density of woody plants. Applications should be sufficient to provide thorough plant coverage. (See Use Precautions and Restrictions.) Do not exceed maximum allowable use rates per acre.

* Tordon is not registered for use in the states of California and Florida. This product is a restricted use pesticide. Check to ensure tank mix partners are state registered before use. See this product label for more information.

Low Volume Foliage Treatment

To control susceptible woody plants, apply up to 9 quarts of Vastlan in 10 to 100 gallons of finished spray. The maximum volume of the finish spray applied to an acre is limited by the maximum use rate per site type (See Maximum Use Rate section - Range and Pasture, Grazing, Haying sites 2 lb ae, Forestry and aquatic sites 6 lb ae, and all other sites 9 lb ae triclopyr). For best results, a surfactant should be added to all spray mixtures. The spray concentration of Vastlan and total spray volume per acre should be adjusted according to the size and density of target woody plants and kind of spray equipment used. With low volume sprays, use sufficient spray volume to obtain uniform coverage of target plants including the surfaces of all foliage, stems, and root collars (see Use Precautions and Restrictions). Match equipment and delivery rate of spray nozzles to height and density of woody plants. When treating tall, dense brush, a truck mounted spray gun with spray tips that deliver up to 2 gallons per minute at 40 to 60 psi may be required. Backpack or other types of specialized spray equipment with spray tips that deliver less than 1 gallon of spray per minute may be appropriate for short, low to moderate density brush.

Tank Mixing: As a low volume foliar spray, up to 9 quarts of Vastlan may be applied in tank mix combination with Tordon* or Graslan L* in 10 to 100 gallons of finished spray. The maximum volume of the finish spray applied to an acre is limited by the maximum use rate per site type (See Maximum Use Rate section - Range and Pasture, Grazing, Haying sites 2 lb ae, Forestry and aquatic sites 6 lb ae, and all other sites 9 lb ae triclopyr).

* Tordon and Graslan L are not registered for use in the states of California and Florida. These products are restricted use pesticides. See product labels for more information.

Foliage Treatment (Non-Grazed/Non-Hayed Areas)

Use 6 to 9 quarts of Vastlan alone or in a tank mix combination with other herbicides such as Freelexx, 2,4-D (like DMA 4 IVM, or low volatile esters) or Milestone, Opensight, Tordon*, or Graslan L* and apply in a total spray volume of 10 to 30 gallons per acre. Use the higher rates and volumes when plants are dense or under drought conditions.

Interspersed areas in non-grazed/hayed rights-of-ways that may be subject to grazing or haying may be spot treated with this rate if the treated area comprises no more than 10% of the total grazed/hayed area.

* Tordon and Graslan L are not registered for use in the states of California and Florida. These products are restricted use pesticides. See product labels for more information.

Foliage Treatment (Range and Pasture and Grazed/Hayed Areas)

Use 1 to 2 quarts of Vastlan per acre. Apply as a broadcast spray in a total volume of 10 gallons or more per acre. Apply anytime the weeds are actively growing. Tank mixtures can be made with other herbicides registered for use on grazed/hayed sites such as Milestone, Opensight, PastureGard HL, Surmount, Freelexx, or Tordon* or Graslan L.*

* Tordon and Graslan L are not registered for use in the states of California and Florida. These products are restricted use pesticides. Check to ensure tank mix partners are state registered before use. See product labels for more information.

Weed Resistance Management

Triclopyr, the active ingredient in this product, is a Group 4 herbicide based on the mode of action classification system of the Weed Science Society of America. Any weed population may contain or develop plants resistant to Group 4 herbicides. Resistant weeds may dominate the weed population if these herbicides are used repeatedly in the same field. Such resistant weed plants may not be effectively managed using Group 4 herbicides but may be effectively managed utilizing other herbicides alone or in mixtures from different herbicide Groups that are labeled for control of these weeds and/or by using cultural or mechanical practices. Consult your local company representative, state cooperative extension service, professional consultants, or other qualified authorities to determine appropriate actions for treating specific resistant weeds.

Best Management Practices:

Proactively implementing diversified weed control strategies to minimize selection for weed populations resistant to one or more herbicides is recommended. A diversified weed management program may include the use of multiple herbicides with different modes of action and overlapping weed spectrum with or without tillage operations and/or other cultural practices. Research has demonstrated that using the labeled rate and directions for use is important to delay the selection for resistant weeds. Scouting after a herbicide application is important because it can facilitate the early identification of weed shifts and/or weed resistance and thus provide direction on future weed management practices. One of the best ways to contain resistant weed populations is to implement measures to avoid allowing weeds to reproduce by seed or to proliferate vegetatively. Cleaning equipment between sites and avoiding movement of plant material between sites will greatly aid in reducing the spread of resistant weed seed.

Woody Plants and Weeds Controlled

alder
arrowwood
ash
aspen
Australian pine
bear clover (bearmat)
beech
birch
blackberry
blackgum
Brazilian pepper
broom, Scotch, French, Spanish, Portugese
cascara
ceanothus
cherry
chinquapin
choke cherry
cottonwood
crataegus (hawthorn)
Douglas fir
dogwood
elderberry
elm
gallberry
gorse
hazel
hornbean
kudzu[1]
locust
madrone
maples
melaleuca (seedlings)
mulberry
oaks
persimmon
pine
poison ivy
poison oak
poplar
Russian olive 1/
salt-bush (*Baccharis* spp.)
salt cedar[2]
salmonberry
sassafras
scotch broom
sumac
sweetbay magnolia
sweetgum
sycamore
tanoak
thimbleberry
tulip poplar
waxmyrtle
western hemlock
wild rose
willow
winged elm

[1]For complete control, re-treatment may be necessary.
[2]Use cut surface treatments for best results.

Annual and Perennial Broadleaf Weeds

bindweed
burdock
Canada thistle
chicory
clover
curly dock
dandelion
field bindweed
ground ivy
lambsquarter
lespedeza
Mexican petunia
plantain
purple loosestrife 2/
oxalis
ragweed
smartweed
Spanish needles/ common beggarthicks
tansy ragwort
thistle
tropical soda apple
vetch
wedelia
wild lettuce

Aquatic Weeds

alligatorweed
American lotus
American frogbit
aquatic sodaapple
Eurasian watermilfoil
milfoil species
nuphar (spatterdock)
parrotfeather*
phragmites 3/
pickerelweed
pennywort
purple loosestrife
Waterhyacinth
Waterlily
Waterprimose
Watershield

*Re-treatment may be needed to achieve desired level of control.

1/ Russian olive

Apply Vastlan at 3 quarts per acre plus Milestone® and a non-ionic surfactant at 0.25 to 0.5% v/v or 1 quart/acre of crop oil concentrate or methylated seed oil. Treatments can be made to small (usually less than 6 feet in height) trees or to regrowth of trees after cutting, mowing, or shredding operations. For foliar applications, apply until foliage is wet, but not to runoff. When treating regrowth of mowed trees, allow time for the plants to re-grow and develop adequate leaf area for a foliar application. This may mean the application will need to be done the year after cutting or, at least, in September or October after mowing the previous winter or early spring.

These treatments may need to be re-applied in subsequent years to achieve the desired level of long term control if trees resprout after the initial treatment

2/ Purple Loosestrife
Purple loosestrife can be controlled with foliar applications of Vastlan. For broadcast applications, use a minimum of 4.5 to 6 quarts of Vastlan per acre. Apply Vastlan when purple loosestrife is at the bud to mid-flowering stage of growth. Follow-up applications for control of regrowth should be made the following year in order to achieve increased control of this weed species. For all applications, a non-ionic surfactant should be added to the spray mixture. Follow all directions and use precautions on the label of the surfactant. Thorough wetting of the foliage and stems is necessary to achieve satisfactory control. A minimum spray volume of 50 gallons per acre is needed for ground broadcast applications.

If using a backpack sprayer, a spray mixture containing 0.75% to 1.25% Vastlan should be used. All purple loosestrife plants should be thoroughly wetted.

3/ Phragmites (*Phragmites australis*)
Phragmites can be selectively controlled with foliar applications of Vastlan. For broadcast applications, a minimum of 2 1/4 lb ae of triclopyr (2 1/4 quarts of Vastlan) per acre should be used. For optimum control, apply Vastlan when phragmites is in the early state of growth, 1/2 to 3 feet in height, prior to seed head development. Follow-up applications for control of regrowth may be made the following year in order to achieve increased control of this weed species. For all applications, a non-ionic surfactant labeled for aquatics should be added to the spray mixture. Follow all directions and use precautions on the label of the surfactant. Thorough wetting of the foliage and stems is necessary to achieve satisfactory control. A minimum spray volume of 50 gallons per acre is recommended for ground broadcast applications.

If a backpack sprayer is used, a spray mixture containing 0.75% to 1.25% of Vastlan should be used. All phragmites foliage should be thoroughly wetted.

Aerial application by helicopter may be needed when treating restoration sites that are inaccessible, remote, difficult to traverse, isolated, or otherwise unsuited to ground application, or in circumstances where invasive exotic weeds dominate native plant populations over extensive areas and efforts to restore native plant diversity are being conducted. By air, apply in a minimum spray volume of 30 gallons per acre.

Cut Surface Treatments

Individual plant treatments such as cut surface applications may be used on any use site listed on this label at a maximum use rate of 6 or 9 quarts of Vastlan (6 lb ae on forestry sites and 9 lb ae of triclopyr on other sites) per acre. These types of applications are made directly to ungrazed parts of plants and, therefore, are not restricted by the grazing maximum rate of 2 quarts of Vastlan (2 lb ae of triclopyr) per acre on a grazed site.

To control unwanted hardwood trees such as elm, maple, oak and conifers in labeled sites, apply Vastlan, either undiluted or diluted in a 1 to 1 ratio with water, as directed below.

Tree Injector Method
Apply by injecting 1/2 milliliter of undiluted Vastlan or 1 milliliter of the diluted solution through the bark at intervals of 3 to 4 inches between centers of the injector wound. The injections should completely surround the tree at any convenient height. **Note: No Worker Protection Standard worker entry restrictions or worker notification requirements apply when this product is injected directly into plants.**

Hack and Squirt Method
Make cuts around the tree trunk at a convenient height with a hatchet or similar equipment so that the cuts overlap slightly and make a continuous circle around the trunk. Spray 1/2 milliliter of undiluted Vastlan or 1 milliliter of the diluted solution into the pocket created between the bark and the inner stem/trunk by each cut.

Frill or Girdle Method
Make a single girdle through the bark completely around the tree at a convenient height. The frill should allow for the herbicide to remain next to the inner stem and absorb into the plant. Wet the cut surface with undiluted or diluted solution.

Both of the above methods may be used successfully at any season except during periods of heavy sap flow of certain species - for example, maples.

Stump Treatment
Spray or paint the cut surfaces of freshly cut stumps and stubs with undiluted Vastlan. The cambium area next to the bark is the most vital area to wet.

Chemical Mowing

Vastlan may be applied to the cut surfaces of weed or brush stubble under the deck of a rotary mower such as the Brown Brush Monitor or other equipment that is designed to uniformly apply the herbicide. This method of application may be used for control of annual and perennial broadleaf weeds and for suppression and stem density reduction of woody species. Apply when growing conditions are favorable and there is active plant growth.

Application

Broadleaf Weed Control: Apply at labeled rates for Vastlan under the section "Broadcast Applications with Ground Equipment - Broadleaf Weed Control". Apply the specified rate in a minimum spray volume of 3 gallons per acre. Follow label directions for herbicides that may be applied in tank mix combination with Vastlan to improve weed control or broaden the spectrum of weeds controlled.

Woody Plant Control: For suppression and stem density reduction of woody species, use 2.25 to 4.5 quarts of Vastlan in a minimum spray volume of 5 gallons per acre. Follow label directions under the woody plant control for herbicides that may be applied in tank mix combination with Vastlan to improve control or broaden the spectrum of woody plants controlled.

Tank mixing: For possible increased effectiveness of this treatment, Vastlan may be tank mixed with other herbicides such as Milestone, Tordon*, Graslan L* or imazapyr. Follow all product use directions and do not exceed maximum labeled use rates.

* Tordon and Graslan L are not registered for use in the states of California and Florida. These products are restricted use pesticides. See product labels for more information.

Forest Management Applications

For best control from broadcast applications of Vastlan, add a surfactant and use a spray volume which will provide thorough plant coverage. Recommended spray volumes are usually 10 to 25 gallons per acre by air or 10 to 100 gallons per acre by ground. For spray volumes less than 50 gallons per acre the addition of a non-ionic surfactant will improve spray coverage. Nozzles or additives that produce larger droplets of spray may require higher spray volumes to maintain brush control.

Forest Site Preparation
Use up to 6 quarts of Vastlan alone and apply in a total spray volume of 10 to 30 gallons per acre or Vastlan may be used in a tank mix with other herbicides such as Graslan L*, Freelexx, or 2,4-D amine or low volatile ester in a total spray volume of 10 to 30 gallons per acre. Use a non-ionic surfactant for all foliar applications.

*Graslan L is not registered for use in the states of California and Florida. This product is a restricted use pesticide. Check to ensure tank mix partners are state registered before use. See product label for more information.

Note: Conifers planted sooner than one month after treatment with Vastlan at less than 4 lb ae of triclopyr (4 quarts of Vastlan) per acre or sooner than two months after treatment at 4 to 6 lb ae of triclopyr (4 to 6 quarts of Vastlan) per acre may be injured. When tank mixtures of herbicides are used for forest site preparation, labels for all products in the mixture must be consulted and the longest waiting period before conifer planting must be used.

Directed Spray Applications in Tree Plantations such as for Conifer Release
To release conifers or desirable trees from competing vegetation, mix 3 to 6 quarts of Vastlan in enough water to make 100 gallons of spray mixture. To improve spray coverage, add a non-ionic surfactant. The spray mixture should be directed onto foliage of competitive vegetation using knapsack or backpack sprayers with flat fan nozzles or equivalent any time after vegetation has reached full leaf size, but before autumn coloration. When treating woody plants, it is best if the majority of treated plants are less than 6 feet in height to ensure adequate spray coverage. Use care to direct spray away from contact with foliage of conifers and desirable vegetation as injury or death could occur.

Note: Spray may cause temporary damage and growth suppression where contact with conifers occurs; however, injured conifers should recover and grow normally. Over-the-top spray applications can kill pines.

Broadcast Applications for Conifer Release in the Northeastern United States
To release spruce, fir, red pine and white pine from competing hardwoods, such as red maple, sugar maple, striped maple, alder, birch (white, yellow or gray), aspen, ash, pin cherry and *Rubus* spp. and perennial and annual broadleaf weeds, use Vastlan at rates of 1.5 to 3 quarts per acre alone or with Freelexx, 2,4-D (like DMA 4 IVM), or a low volatile ester to provide no more than 4 lb ae per acre from both products. Apply in late summer or early fall after conifers have formed their over wintering buds and hardwoods are in full leaf and prior to autumn coloration.

Broadcast Applications for Douglas-fir Release in the Pacific Northwest and California

To release Douglas-fir from susceptible competing vegetation such as broadleaf weeds, alder, blackberry, or Scotch broom, apply Vastlan at 1 to 1.5 quarts per acre alone or in combination with other herbicides to broaden the spectrum of activity. Apply in early spring after hardwoods begin growth and before Douglas-fir bud break ("early foliar" hardwood stage) or after Douglas-fir seasonal growth has "hardened off" (set winter buds) in late summer, but while hardwoods are still actively growing. When treating after Douglas-fir bud set, apply prior to onset of autumn coloration in hardwood foliage. **Note:** Treatments applied during active Douglas-fir shoot growth (after spring bud break and prior to bud set) may cause injury to Douglas-fir trees.

Christmas Tree Plantations

Use Vastlan for the control of woody plants and annual and perennial broadleaf weeds in established Christmas tree plantations. For best results, apply when woody plants and weeds are actively growing. Vastlan does not control weeds which have not emerged at the time of application. If lower rates are used on hard to control woody species, resprouting may occur the year following treatment. Brush over 8 feet tall is difficult to treat efficiently using hand equipment such as backpack or knapsack sprayers. When treating large brush or trees or hard to control species such as ash, blackgum, choke cherry, elm, hazel, madrone, maples, oaks or sweetgum, and for applications made during drought conditions or in late summer when the leaves are mature, use the higher rates of Vastlan or use cut surface applications (see Cut Surface section above). For foliar applications, use a surfactant and apply in enough water to give uniform and complete coverage of the plants to be controlled. Applications made under drought conditions may provide less than desirable results.

Use Precautions:

- Newly seeded turf (alleyways, etc.) should be mowed two or three times before treatment with Vastlan.
- Use Vastlan where legumes, such as clover, are present only if injury and possible control of legumes can be tolerated.

Use Restrictions:

- Do not use on newly seeded grass until well established as indicated by vigorous growth and development of secondary root system and tillering
- Do not reseed Christmas tree areas treated with Vastlan for a minimum of three weeks after application.
- Apply Vastlan only to established Christmas trees that were planted at least one full year prior to application.
- **Do not apply with 2,4-D containing products.**

Application

Apply in late summer or early autumn after terminal growth of Christmas trees has hardened off but before leaf drop of the target weeds. Apply at a rate of 0.75 to 1.75 quarts of Vastlan per acre as a foliar spray directed toward the base of Christmas trees. Use sufficient spray volume to provide uniform coverage of target plants (20 to 100 gallons per acre). Application rates of Vastlan directed for Christmas trees will only suppress some well established woody plants that are greater than 2 to 3 years old (see table below). Broadcast sprays may also be applied in bands between the rows of planted trees. Use spray equipment that will ensure uniform coverage of the desired spray volume.

Vastlan can cause needle and branch injury to Christmas trees. To minimize injury to Christmas trees, direct sprays so as to avoid or minimize contact with foliage. Blue spruce, white spruce, balsam fir, and Frasier fir are less susceptible to injury than white pine and Douglas-fir.

Application Rates and Species Controlled (or also see list above):

Vastlan		
0.75 quart/acre	1.25 to 1.5 quarts/acre	1.75 quarts/acre
clover dandelion dock, curly lambsquarters lespedeza plantain, broadleaf plantain, buckhorn ragweed, common vetch	bindweed, field (TG) blackberry[1] chicory (s) fireweed ivy, ground lettuce, wild oxalis poison ivy smartweed (TG) thistle, Canada (TG) violet, wild Virginia creeper[1]	arrowwood (SDL) aspen beech (SDL) birch (SDL) chinquapin cottonwood (SDL) elderberry grape, wild mulberry (SDL) poplar (SDL) sassafras (SDL) sumac (SDL) sycamore (SDL)

(TG) Top growth control, retreatment may be necessary
(S) Suppression
(SDL) Seedlings less than 2 to 3 years old
[1]Use 1.5 quarts per acre rate

Directed Applications

To control hardwoods such as red maple, sugar maple, striped maple, sweetgum, red and white oaks, ash, alder, birch, aspen, and pin cherry, mix 0.19 to1 pint of Vastlan in enough water to make 3 gallons of spray mixture. For directed applications, do not exceed 6 quarts of Vastlan per acre per year. To improve coverage, add a non-ionic agricultural surfactant to the spray. This spray mixture should be directed onto foliage of competitive hardwoods using knapsack or backpack sprayers with flat fan nozzles or equivalent any time after hardwoods have reached full leaf size, but before autumn coloration (when plants are actively growing). The majority of treated hardwoods should be less than 8 feet in height to ensure adequate spray coverage. **Note:** To prevent Christmas tree injury, care should be taken to direct spray away from contact with Christmas tree foliage.

Aquatic and Wetland Sites

Use Vastlan for control of emersed, submersed and floating aquatic plants in aquatic sites such as ponds, lakes, reservoirs, non-irrigation canals, and ditches which have little or no continuous outflow, marshes and wetlands, including broadleaf and woody vegetation on banks and shores within or adjacent to these and other aquatic sites.

Obtain Required Permits: Consult with appropriate state or local water authorities before applying this product to public waters. State or local public agencies may require permits.

Aquatic Application Methods

Use a non-ionic surfactant in the spray mixture to improve control with foliar applications. Follow all directions and use precautions on the aquatic surfactant label.

Surface Application

Use a spray boom, handgun or other similar suitable equipment mounted on a boat or vehicle. Thorough wetting of foliage is essential for maximum effectiveness. Use 20 to 200 gallons per acre of spray mixture. Special precautions such as the use of low spray pressure, large droplet producing nozzles, or addition of a labeled thickening agent may minimize spray drift in areas near sensitive crops.

Aerial Application (Helicopter Only)

Apply with a helicopter using a Microfoil or Thru-Valve boom, or a drift control additive in the spray solution. Apply in a minimum of 10 gallons of total spray mix per acre. Do not apply when weather conditions favor drift to sensitive areas. See label section on aerial application directions and precautions.

Floating and Emerged Weeds

Apply when plants are actively growing. For control of waterhyacinth, alligatorweed (see specific directions below), and other susceptible emerged and floating herbaceous weeds and woody plants, apply 1.5 to 6 quarts of Vastlan per acre as a foliar application using surface or aerial equipment. Use higher rates in the rate range when plants are mature, when the weed mass is dense, or for difficult to control species. Repeat as necessary to control regrowth and plants missed in the previous operation, but do not exceed a total of 6 quarts of Vastlan per acre per annual growing season.

Aquatic Weeds

alligatorweed	parrotfeather[1]	purple loosestrife
aquatic sodaapple	phragmites	waterprimrose
Eurasian watermilfoil	pickerelweed	
milfoil species	pennywort	

[1]Re-treatment may be needed to achieve desired level of control.

Alligatorweed

Apply Vastlan at 2 to 6 quarts per acre to control alligatorweed. It is important to thoroughly wet all foliage with the spray mixture. For best results, add an approved non-ionic aquatic surfactant to the spray mixture. Alligatorweed growing outside the margins of a body of water can be controlled with this treatment. However, alligatorweed growing in water will only be partially controlled. Top growth above the water will be controlled, but the plant will likely regrow from tissue below the water surface.

Restrictions for Potable Water Intakes for Emerged Aquatic Weed Control – Lakes, Reservoirs, Ponds:

See chart below for specific setback distances near functioning potable water intakes.

Note: Existing potable water intakes which are no longer in use, such as those replaced by potable water wells or connections to a municipal water system, are not considered to be functioning potable water intakes. These setback restrictions do not apply to terrestrial applications made adjacent to potable water intakes.

	Vastlan Application Rate			
Area Treated	**1.5 qt/acre**	**3 qt/acre**	**4.5 qt/acre**	**6 qt/acre**
(acres)	**Setback Distance (ft)**			
4	0	200	400	500
>4 - 8	0	200	700	900
>8 - 16	0	200	700	1000
>16	0	200	900	1300

To apply Vastlan around and within the distances noted above from a functioning potable water intake, the intake must be turned off until the triclopyr level in the intake water is determined to be 0.4 parts per million (ppm) or less by laboratory analysis or immunoassay.

Recreational Use of Water in Treatment Area: There are no restrictions on use of water in the treatment area for recreational purposes, including swimming and fishing.
Livestock Use of Water from Treatment Area: There are no restrictions on livestock consumption of water from the treatment area.

Submerged Weeds

For control of Eurasian watermilfoil and other susceptible submerged weeds in ponds, lakes, reservoirs, and in non-irrigation canals or ditches that have little or no continuous outflow, apply Vastlan as either a surface or subsurface application. Select rates according to the rate chart below to provide a triclopyr concentration of 0.75 to 2.5 ppm ae in treated water. Use higher rates in the rate range in areas of greater water exchange. These areas may require a repeat application. However, total application of Vastlan must not exceed an application rate of 2.5 ppm of triclopyr for the treatment area per annual growing season.

Apply in spring or early summer when Eurasian watermilfoil or other submersed weeds are actively growing.

Areas near susceptible crops or other desirable broadleaf plants may be treated by subsurface injection applied by boat to avoid spray drift.

Surface Application
Apply the desired amount of Vastlan as either a concentrate or a spray mixture in water. However, use a minimum spray volume of 5 gallons per acre. Do not apply when weather conditions favor drift to sensitive areas.

Average water depth (feet) x 0.678 x target concentration (ppm) = gallons of Vastlan per surface acre treated.

Example: to achieve a 2 ppm concentration of triclopyr in water averaging 4 feet deep

4 x 0.678 x 2 ppm = 5.4 gallons of Vastlan per surface acre treated

	Concentration of Triclopyr Acid in Water (ppm ae)				
	0.75 ppm	**1 ppm**	**1.5 ppm**	**2 ppm**	**2.5 ppm**
Water Depth (ft)	**Gallons of Vastlan per Surface Acre at Specified Depth**				
1	0.5	0.7	1.0	1.4	1.7
2	1.0	1.4	2.0	2.7	3.4
3	1.5	2.0	3.1	4.1	5.1
4	2.0	2.7	4.1	5.4	6.8
5	2.5	3.4	5.1	6.8	8.5
6	3.1	4.1	6.1	8.1	10.2
7	3.6	4.7	7.1	9.5	11.9
8	4.1	5.4	8.1	10.8	13.6
9	4.6	6.1	9.2	12.2	15.3
10	5.1	6.8	10.2	13.6	17.0
15	7.6	10.2	15.3	20.3	25.4
20	10.2	13.6	20.3	27.1	33.9

Subsurface Application
Apply desired amount of Vastlan per acre directly into the water through boat-mounted distribution systems. When treating target plants that are 6 feet below the surface of the water, trailing hoses should be used along with an aquatic approved sinking agent (except California).

Restrictions for Potable Water Intakes for Submerged Weed Control – Lakes, Reservoirs, Ponds:
For applications of Vastlan to control submerged weeds in lakes, reservoirs or ponds that contain a functioning potable water intake for human consumption, see the chart below to determine the minimum setback distances of the application from the functioning potable water intakes.

Area Treated (acres)	Concentration of Triclopyr Acid in Water (ppm ae)				
	0.75 ppm	1 ppm	1.5 ppm	2 ppm	2.5 ppm
	Required Setback Distance (ft) from Potable Water Intake				
<4	300	400	600	800	1000
>4 – 8	420	560	840	1120	1400
>8 – 16	600	800	1200	1600	2000
>16 – 32	780	1040	1560	2080	2600
>32 acres, calculate a setback using the formula for the appropriate rate	Setback (ft) = (800*ln (acres) – 160)/3.33	Setback (ft) = (800*ln (acres) – 160)/2.50	Setback (ft) = (800*ln (acres) – 160)/1.67	Setback (ft) = (800*ln (acres) – 160)/1.25	Setback (ft) = (800*ln (acres) – 160)

Example Calculation 1: to apply 2.5 ppm Vastlan to 50 acres:

Setback in feet = (800 x ln (50 acres) - 160
= (800 x 3.912) – 160
= 2970 feet

Example Calculation 2: to apply 0.75 ppm Vastlan to 50 acres:

Setback in feet = $\frac{(800 \times \ln (50 \text{ acres}) - 160}{3.33}$
= $\frac{(800 \times 3.912) - 160}{3.33}$
= 892 feet

Note: Existing potable water intakes which are no longer in use, such as those replaced by potable water wells or connections to a municipal water system, are not considered to be functioning potable water intakes. These setback restrictions do not apply to terrestrial applications made adjacent to potable water intakes.

To apply Vastlan around and within the distances noted above from a functioning potable water intake, the intake must be turned off until the triclopyr level in the intake water is determined to be 0.4 parts per million (ppm) or less by laboratory analysis or immunoassay.

Wetland Sites

Wetlands include flood plains, deltas, marshes, swamps, bogs, and transitional areas between upland and lowland sites. Wetlands may occur within noncropland, rangeland, pastures, forests, wildlife habitat restoration and management areas and similar sites as well as areas adjacent to or surrounding domestic water supply reservoirs, lakes and ponds.

For control of woody plants and broadleaf weeds in wetland sites, follow use directions and application methods on this label for terrestrial sites.

Note: Consult local public water control authorities before applying this product in and around public water. Permits may be required to treat such areas.

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1. Refund of purchase price paid by buyer or user for product bought, or
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Produced for
Dow AgroSciences LLC
9330 Zionsville Road
Indianapolis, IN 46268

Label Code: CD02-409-020
Replaced Label: D02-409-002

EPA accepted 12/06/17

Revisions:

Rebranded for Corteva.

SAFETY DATA SHEET

Vastlan™

Version	Revision Date:	SDS Number:	Date of last issue: -
1.0	03/31/2022	800080005428	Date of first issue: 03/31/2022

Corteva Agriscience™ encourages you and expects you to read and understand the entire SDS as there is important information throughout the document. This SDS provides users with information relating to the protection of human health and safety at the workplace, protection of the environment and supports emergency response. Product users and applicators should primarily refer to the product label attached to or accompanying the product container. This Safety Data Sheet adheres to the standards and regulatory requirements of the United States and may not meet the regulatory requirements in other countries.

SECTION 1. IDENTIFICATION

Product name : Vastlan™

Manufacturer or supplier's details

COMPANY IDENTIFICATION

Manufacturer/importer : CORTEVA AGRISCIENCE LLC
9330 ZIONSVILLE RD
INDIANAPOLIS, IN, 46268-1053
UNITED STATES

Customer Information Number : 800-992-5994

E-mail address : customerinformation@corteva.com

Emergency telephone : INFOTRAC (CONTRACT 84224).

800-992-5994 or 317-337-6009

Recommended use of the chemical and restrictions on use

Recommended use : End use herbicide product

SECTION 2. HAZARDS IDENTIFICATION

GHS classification in accordance with the OSHA Hazard Communication Standard (29 CFR 1910.1200)

Acute toxicity (Oral) : Category 4

Eye irritation : Category 2A

Skin sensitization : Sub-category 1B

Specific target organ toxicity - repeated exposure : Category 2

™ ® Trademarks of Corteva Agriscience and its affiliated companies.

GHS label elements

Hazard pictograms :

Signal Word : Warning

Hazard Statements : H302 Harmful if swallowed.
H317 May cause an allergic skin reaction.
H319 Causes serious eye irritation.
H373 May cause damage to organs through prolonged or repeated exposure.

Precautionary Statements :

Prevention:

P260 Do not breathe dust/ fume/ gas/ mist/ vapors/ spray.
P264 Wash skin thoroughly after handling.
P270 Do not eat, drink or smoke when using this product.
P272 Contaminated work clothing must not be allowed out of the workplace.
P280 Wear protective gloves/ eye protection/ face protection.

Response:

P301 + P312 + P330 IF SWALLOWED: Call a POISON CENTER/ doctor if you feel unwell. Rinse mouth.
P302 + P352 IF ON SKIN: Wash with plenty of soap and water.
P305 + P351 + P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P314 Get medical advice/ attention if you feel unwell.
P333 + P313 If skin irritation or rash occurs: Get medical advice/ attention.
P337 + P313 If eye irritation persists: Get medical advice/ attention.
P363 Wash contaminated clothing before reuse.

Disposal:

P501 Dispose of contents/ container to an approved waste disposal plant.

Other hazards

None known.

SECTION 3. COMPOSITION/INFORMATION ON INGREDIENTS

Substance / Mixture : Mixture

Components

Chemical name	CAS-No.	Concentration (% w/w)
Triclopyr, Choline salt	1048373-85-8	54.72
Choline, hydroxide	123-41-1	>= 3 - < 10
Glycerol	56-81-5	>= 1 - < 3
Balance	Not Assigned	> 30

Actual concentration is withheld as a trade secret

SECTION 4. FIRST AID MEASURES

If inhaled	:	Move person to fresh air. If person is not breathing, call an emergency responder or ambulance, then give artificial respiration; if by mouth to mouth use rescuer protection (pocket mask etc). Call a poison control center or doctor for treatment advice.
In case of skin contact	:	Take off contaminated clothing. Wash skin with soap and plenty of water for 15-20 minutes. Call a poison control center or doctor for treatment advice. Wash clothing before reuse. Shoes and other leather items which cannot be decontaminated should be disposed of properly.
In case of eye contact	:	Hold eyes open and rinse slowly and gently with water for 15-20 minutes. Remove contact lenses, if present, after the first 5 minutes, then continue rinsing eyes. Call a poison control center or doctor for treatment advice. Suitable emergency eye wash facility should be available in work area.
If swallowed	:	Call a poison control center or doctor immediately for treatment advice. Have person sip a glass of water if able to swallow. Do not induce vomiting unless told to do so by the poison control center or doctor. Never give anything by mouth to an unconscious person.
Most important symptoms and effects, both acute and delayed	:	None known.
Protection of first-aiders	:	First Aid responders should pay attention to self-protection and use the recommended protective clothing (chemical resistant gloves, splash protection). If potential for exposure exists refer to Section 8 for specific personal protective equipment.
Notes to physician	:	No specific antidote. Treatment of exposure should be directed at the control of symptoms and the clinical condition of the patient. Have the Safety Data Sheet, and if available, the product container or label with you when calling a poison control center or doctor, or going for treatment.

SECTION 5. FIRE-FIGHTING MEASURES

Suitable extinguishing media	:	Water spray Alcohol-resistant foam
Unsuitable extinguishing media	:	None known.
Specific hazards during fire fighting	:	Exposure to combustion products may be a hazard to health. Do not allow run-off from firefighting to enter drains or water courses.
Hazardous combustion products	:	During a fire, smoke may contain the original material in addition to combustion products of varying composition which may be toxic and/or irritating.

Combustion products may include and are not limited to:
Nitrogen oxides (NOx)
Carbon oxides

Specific extinguishing methods	:	Remove undamaged containers from fire area if it is safe to do so. Evacuate area. Use extinguishing measures that are appropriate to local circumstances and the surrounding environment. Use water spray to cool unopened containers.
Further information	:	Collect contaminated fire extinguishing water separately. This must not be discharged into drains. Fire residues and contaminated fire extinguishing water must be disposed of in accordance with local regulations.
Special protective equipment for fire-fighters	:	In the event of fire, wear self-contained breathing apparatus. Use personal protective equipment.

SECTION 6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures	:	Use personal protective equipment. Use appropriate safety equipment. For additional information, refer to Section 8, Exposure Controls and Personal Protection.
Environmental precautions	:	If the product contaminates rivers and lakes or drains inform respective authorities. Discharge into the environment must be avoided. Prevent further leakage or spillage if safe to do so. Prevent spreading over a wide area (e.g., by containment or oil barriers). Retain and dispose of contaminated wash water. Local authorities should be advised if significant spillages cannot be contained. Prevent from entering into soil, ditches, sewers, underwater. See Section 12, Ecological Information.
Methods and materials for containment and cleaning up	:	Clean up remaining materials from spill with suitable absorbant. Local or national regulations may apply to releases and disposal of this material, as well as those materials and items employed in. For large spills, provide dyking or other appropriate containment to keep material from spreading. If dyked material can be pumped, Recovered material should be stored in a vented container. The vent must prevent the ingress of water as further reaction with spilled materials can take place which could lead to overpressurization of the container. Keep in suitable, closed containers for disposal. Wipe up with absorbent material (e.g. cloth, fleece). Soak up with inert absorbent material (e.g. sand, silica gel, acid binder, universal binder, sawdust). See Section 13, Disposal Considerations, for additional information.

SECTION 7. HANDLING AND STORAGE

Advice on safe handling : Persons susceptible to skin sensitization problems or asthma, allergies, chronic or recurrent respiratory disease should not be employed in any process in which this mixture is being used.
Do not breathe vapors/dust.
Do not smoke.
Handle in accordance with good industrial hygiene and safety practice.
Avoid exposure - obtain special instructions before use.
Smoking, eating and drinking should be prohibited in the application area.
Do not get on skin or clothing.
Avoid inhalation of vapor or mist.
Do not swallow.
Do not get in eyes.
Avoid contact with skin and eyes.
Take care to prevent spills, waste and minimize release to the environment.
Use appropriate safety equipment. For additional information, refer to Section 8, Exposure Controls and Personal Protection.

Conditions for safe storage : Store in a closed container.
Containers which are opened must be carefully resealed and kept upright to prevent leakage.
Keep in properly labeled containers.
Store in accordance with the particular national regulations.

Materials to avoid : Strong oxidizing agents

Packaging material : Unsuitable material: None known.

SECTION 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Ingredients with workplace control parameters

Components	CAS-No.	Value type (Form of exposure)	Control parameters / Permissible concentration	Basis
Glycerol	56-81-5	TWA (mist, respirable fraction)	5 mg/m3	OSHA Z-1
		TWA (mist, total dust)	15 mg/m3	OSHA Z-1

Engineering measures : Use local exhaust ventilation, or other engineering controls to maintain airborne levels below exposure limit requirements or guidelines. If there are no applicable exposure limit requirements or guidelines, general ventilation should be sufficient for most operations.
Local exhaust ventilation may be necessary for some operations.

Personal protective equipment

Respiratory protection : Respiratory protection should be worn when there is a potential to exceed the exposure limit requirements or guidelines. If there are no applicable exposure limit requirements or

guidelines, wear respiratory protection when adverse effects, such as respiratory irritation or discomfort have been experienced, or where indicated by your risk assessment process. For most conditions no respiratory protection should be needed; however, if discomfort is experienced, use an approved air-purifying respirator.

Hand protection

Remarks : Use gloves chemically resistant to this material. Examples of preferred glove barrier materials include: Butyl rubber. Natural rubber ("latex"). Neoprene. Nitrile/butadiene rubber ("nitrile" or "NBR"). Polyethylene. Ethyl vinyl alcohol laminate ("EVAL"). Polyvinyl chloride ("PVC" or "vinyl"). NOTICE: The selection of a specific glove for a particular application and duration of use in a workplace should also take into account all relevant workplace factors such as, but not limited to: Other chemicals which may be handled, physical requirements (cut/puncture protection, dexterity, thermal protection), potential body reactions to glove materials, as well as the instructions/specifications provided by the glove supplier.

Eye protection : Use chemical goggles.

Skin and body protection : Use protective clothing chemically resistant to this material. Selection of specific items such as face shield, boots, apron, or full body suit will depend on the task.

SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance	:	Liquid.
Color	:	Black
Odor	:	Characteristic
Odor Threshold	:	No data available
pH	:	7.0 (68 °F / 20 °C) Method: pH Electrode
Melting point/range	:	Not applicable
Freezing point		No data available
Boiling point/boiling range	:	No data available
Flash point	:	> 212 °F / > 100 °C Method: Pensky-Martens Closed Cup ASTM D 93, closed cup
Evaporation rate	:	No data available
Flammability (solid, gas)	:	No data available
Upper explosion limit / Upper flammability limit	:	No data available

Lower explosion limit / Lower flammability limit	:	No data available
Vapor pressure	:	No data available
Relative vapor density	:	No data available
Density	:	1.235 g/cm3 (68 °F / 20 °C) Method: Digital density meter
Solubility(ies)		
Water solubility	:	No data available
Autoignition temperature	:	No data available
Viscosity		
Viscosity, dynamic	:	No data available
Explosive properties	:	No data available
Oxidizing properties	:	No data available

SECTION 10. STABILITY AND REACTIVITY

Reactivity	:	Not classified as a reactivity hazard.
Chemical stability	:	No decomposition if stored and applied as directed. Stable under normal conditions.
Possibility of hazardous reactions	:	Stable under recommended storage conditions. No hazards to be specially mentioned. None known.
Conditions to avoid	:	None known.
Incompatible materials	:	None.
Hazardous decomposition products	:	Decomposition products depend upon temperature, air supply and the presence of other materials. Decomposition products can include and are not limited to: Nitrogen oxides (NOx) Carbon oxides

SECTION 11. TOXICOLOGICAL INFORMATION

Acute toxicity

Product:

Acute oral toxicity	:	LD50 (Rat, female): 1,000 mg/kg Method: OECD Test Guideline 423 Remarks: For similar material(s):
Acute inhalation toxicity	:	LC50 (Rat, male and female): > 5.85 mg/l Exposure time: 4 h Test atmosphere: dust/mist Method: OECD Test Guideline 403 Symptoms: No deaths occurred at this concentration.

Assessment: The substance or mixture has no acute inhalation toxicity
Remarks: For similar material(s):

Acute dermal toxicity : LD50 Dermal (Rat, male and female): > 5,000 mg/kg
Method: OECD Test Guideline 402
Symptoms: No deaths occurred at this concentration.

Components:

Triclopyr, Choline salt:

Acute oral toxicity : LD50 (Rat, female): 577 - 630 mg/kg
Remarks: For similar active ingredient(s).

LD50 (Rat, male): 692 - 729 mg/kg
Remarks: For similar active ingredient(s).

Acute inhalation toxicity : Remarks: Prolonged excessive exposure to dust may cause adverse effects.
Dust may cause irritation to upper respiratory tract (nose and throat).

LC50 (Rat): > 2.6 mg/l
Exposure time: 4 h
Test atmosphere: dust/mist
Assessment: The substance or mixture has no acute inhalation toxicity
Remarks: For similar active ingredient(s).

Acute dermal toxicity : LD50 (Rat): > 2,000 mg/kg
Symptoms: No deaths occurred at this concentration.
Assessment: The substance or mixture has no acute dermal toxicity
Remarks: For similar active ingredient(s).

Choline, hydroxide:

Acute oral toxicity : Remarks: Oral LD50 has not been determined due to corrosivity.

Glycerol:

Acute oral toxicity : LD50 (Rat): > 11,500 mg/kg
Remarks: Excessive exposure may cause:
Central nervous system effects.
Observations in humans include:
Altered blood sugar levels.

Acute inhalation toxicity : LC50 (Rat): > 2.75 mg/l
Exposure time: 4 h
Test atmosphere: dust/mist
Symptoms: No deaths occurred following exposure to a saturated atmosphere.
Assessment: The substance or mixture has no acute inhalation toxicity

Acute dermal toxicity : LD50 (Guinea pig): >= 56,750 mg/kg

Skin corrosion/irritation

Product:

Species : Rabbit
Result : No skin irritation

Components:

Choline, hydroxide:

Result : Corrosive

Glycerol:

Result : No skin irritation

Serious eye damage/eye irritation

Product:

Species : Rabbit
Result : Eye irritation

Components:

Triclopyr, Choline salt:

Result : Eye irritation

Choline, hydroxide:

Result : Corrosive

Glycerol:

Result : No eye irritation

Respiratory or skin sensitization

Product:

Species : Mouse
Result : The product is a skin sensitizer, sub-category 1B.
Remarks : For similar material(s):

Components:

Triclopyr, Choline salt:

Assessment : The product is a skin sensitizer, sub-category 1B.
Remarks : For similar active ingredient(s).
Prolonged or frequently repeated skin contact may cause allergic skin reactions in some individuals.
With the dilute mix, no allergic skin reaction is expected.

Germ cell mutagenicity

Components:

Glycerol:

Germ cell mutagenicity - Assessment : In vitro genetic toxicity studies were negative.

Carcinogenicity

Components:

Triclopyr, Choline salt:

Carcinogenicity - Assessment : For similar active ingredient(s)., Did not cause cancer in laboratory animals.

Glycerol:

Carcinogenicity - Assessment : For the major component(s):, Did not cause cancer in laboratory animals.

IARC No ingredient of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC.

OSHA No component of this product present at levels greater than or equal to 0.1% is on OSHA's list of regulated carcinogens.

NTP No ingredient of this product present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by NTP.

Reproductive toxicity

Components:

Triclopyr, Choline salt:

Reproductive toxicity - Assessment : For similar active ingredient(s)., In laboratory animal studies, effects on reproduction have been seen only at doses that produced significant toxicity to the parent animals.
For similar active ingredient(s)., Did not cause birth defects or other effects in the fetus even at doses which caused toxic effects in the mother.

Glycerol:

Reproductive toxicity - Assessment : Reproductive effects seen in female animals are believed to be due to altered nutritional states resulting from extremely high doses of glycerine given in the diet. Similar effects have been seen in animals fed synthetic diets.
Did not cause birth defects or any other fetal effects in laboratory animals.

STOT-single exposure

Product:

Assessment : Evaluation of available data suggests that this material is not an STOT-SE toxicant.

Components:

Triclopyr, Choline salt:

Assessment : Evaluation of available data suggests that this material is not an STOT-SE toxicant.

Choline, hydroxide:

Assessment : May cause respiratory irritation.

Glycerol:

Assessment : Evaluation of available data suggests that this material is not an STOT-SE toxicant.

STOT-repeated exposure

Components:

Choline, hydroxide:

Assessment : May cause damage to organs through prolonged or repeated exposure.

Repeated dose toxicity

Components:

Triclopyr, Choline salt:

Remarks : For similar active ingredient(s).
In animals, effects have been reported on the following organs:
Kidney.
Liver.

Choline, hydroxide:

Remarks : No relevant data found.

Glycerol:

Remarks : Excessive exposure to glycerine may cause increased fat levels in blood.

Aspiration toxicity

Product:

Based on physical properties, not likely to be an aspiration hazard.

Components:

Triclopyr, Choline salt:
Based on physical properties, not likely to be an aspiration hazard.

Choline, hydroxide:
Aspiration into the lungs may occur during ingestion or vomiting, causing tissue damage or lung injury.

Glycerol:
Based on physical properties, not likely to be an aspiration hazard.

SECTION 12. ECOLOGICAL INFORMATION

Ecotoxicity

Components:

Triclopyr, Choline salt:

Toxicity to fish	:	Remarks: For similar active ingredient(s). Material is slightly toxic to aquatic organisms on an acute basis (LC50/EC50 between 10 and 100 mg/L in the most sensitive species tested). LC50 (Oncorhynchus mykiss (rainbow trout)): 117 mg/l Exposure time: 96 h Remarks: For similar active ingredient(s).
Toxicity to daphnia and other aquatic invertebrates	:	LC50 (Daphnia magna (Water flea)): 133 mg/l Exposure time: 48 h Remarks: For similar active ingredient(s).
Toxicity to algae/aquatic plants	:	ErC50 (Pseudokirchneriella subcapitata (green algae)): 87.7 mg/l End point: Biomass Exposure time: 96 h Remarks: For similar material(s):

Ecotoxicology Assessment

Chronic aquatic toxicity	:	Harmful to aquatic life with long lasting effects.

Glycerol:

Toxicity to fish	:	LC50 (Pimephales promelas (fathead minnow)): >= 885 mg/l Exposure time: 96 h Test Type: static test Method: Method Not Specified.
Toxicity to daphnia and other aquatic invertebrates	:	LC50 (Daphnia magna (Water flea)): 1,955 mg/l Exposure time: 48 h Test Type: static test Method: Method Not Specified.

Toxicity to algae/aquatic plants	:	EC50 (Other): 2,900 mg/l End point: Growth inhibition (cell density reduction) Exposure time: 192 h Test Type: static test Method: Method Not Specified.
Toxicity to microorganisms	:	EC50 (activated sludge): > 1,000 mg/l Exposure time: 3 h Method: OECD 209 Test

Persistence and degradability

Components:

Triclopyr, Choline salt:

Biodegradability	:	Remarks: For similar active ingredient(s). Biodegradation under aerobic static laboratory conditions is high (BOD20 or BOD28/ThOD > 40%).

Glycerol:

Biodegradability	:	Result: Readily biodegradable. Remarks: Material is readily biodegradable. Passes OECD test(s) for ready biodegradability. Biodegradation: 63 % Exposure time: 14 d Method: OECD Test Guideline 301C or Equivalent Remarks: 10-day Window: Not applicable
ThOD	:	1.22 kg/kg

Bioaccumulative potential

Components:

Triclopyr, Choline salt:

Partition coefficient: n-octanol/water	:	Remarks: For similar active ingredient(s). Bioconcentration potential is low (BCF < 100 or Log Pow < 3).

Choline, hydroxide:

Partition coefficient: n-octanol/water	:	Remarks: No relevant data found.

Glycerol:

Partition coefficient: n-octanol/water	:	log Pow: -1.76 (68 °F / 20 °C) Method: Measured Remarks: Bioconcentration potential is low (BCF < 100 or Log Pow < 3).

Balance:

Partition coefficient: n-	:	Remarks: No relevant data found.

octanol/water

Mobility in soil

Components:

Triclopyr, Choline salt:

Distribution among environmental compartments : Remarks: For similar active ingredient(s).
Triclopyr.
Potential for mobility in soil is very high (Koc between 0 and 50).

Choline, hydroxide:

Distribution among environmental compartments : Remarks: No relevant data found.

Glycerol:

Distribution among environmental compartments : Koc: 1
Method: Estimated.
Remarks: Potential for mobility in soil is very high (Koc between 0 and 50).
Given its very low Henry's constant, volatilization from natural bodies of water or moist soil is not expected to be an important fate process.

Balance:

Distribution among environmental compartments : Remarks: No relevant data found.

Other adverse effects

Components:

Triclopyr, Choline salt:

Results of PBT and vPvB assessment : This substance has not been assessed for persistence, bioaccumulation and toxicity (PBT).

Ozone-Depletion Potential : Remarks: This substance is not on the Montreal Protocol list of substances that deplete the ozone layer.

Choline, hydroxide:

Results of PBT and vPvB assessment : This substance has not been assessed for persistence, bioaccumulation and toxicity (PBT).

Ozone-Depletion Potential : Remarks: This substance is not on the Montreal Protocol list of substances that deplete the ozone layer.

Glycerol:

Results of PBT and vPvB assessment : This substance is not considered to be persistent, bioaccumulating and toxic (PBT). This substance is readily biodegradable and thus is not considered persistent or very persistent (P or vP).

Ozone-Depletion Potential : Remarks: This substance is not on the Montreal Protocol list

of substances that deplete the ozone layer.

Balance:

Results of PBT and vPvB assessment	:	This substance has not been assessed for persistence, bioaccumulation and toxicity (PBT).
Ozone-Depletion Potential	:	Remarks: This substance is not on the Montreal Protocol list of substances that deplete the ozone layer.

SECTION 13. DISPOSAL CONSIDERATIONS

Disposal methods

Waste from residues	:	If wastes and/or containers cannot be disposed of according to the product label directions, disposal of this material must be in accordance with your local or area regulatory authorities. This information presented below only applies to the material as supplied. The identification based on characteristic(s) or listing may not apply if the material has been used or otherwise contaminated. It is the responsibility of the waste generator to determine the toxicity and physical properties of the material generated to determine the proper waste identification and disposal methods in compliance with applicable regulations. If the material as supplied becomes a waste, follow all applicable regional, national and local laws.

SECTION 14. TRANSPORT INFORMATION

International Regulations

UNRTDG
Not regulated as a dangerous good

IATA-DGR
Not regulated as a dangerous good

IMDG-Code
Not regulated as a dangerous good

Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code
Not applicable for product as supplied.

Domestic regulation

49 CFR
Not regulated as a dangerous good

SECTION 15. REGULATORY INFORMATION

SARA 311/312 Hazards	:	Acute toxicity (any route of exposure) Respiratory or skin sensitization Specific target organ toxicity (single or repeated exposure) Serious eye damage or eye irritation

SARA 313 : This material does not contain any chemical components with known CAS numbers that exceed the threshold (De Minimis) reporting levels established by SARA Title III, Section 313.

US State Regulations

Pennsylvania Right To Know

Glycerol	56-81-5

The ingredients of this product are reported in the following inventories:

TSCA : Product contains substance(s) not listed on TSCA inventory.

TSCA list

No substances are subject to a Significant New Use Rule.

No substances are subject to TSCA 12(b) export notification requirements.

Federal Insecticide, Fungicide and Rodenticide Act

EPA Registration Number : 62719-687

This chemical is a pesticide product registered by the Environmental Protection Agency and is subject to certain labeling requirements under federal pesticide law. These requirements differ from the classification criteria and hazard information required for safety data sheets, and for workplace labels of non-pesticide chemicals. Following is the hazard information as required on the pesticide label:

WARNING

May be fatal if swallowed.
Causes substantial but temporary eye injury
Prolonged or frequently repeated skin contact may cause allergic reactions in some individuals.

SECTION 16. OTHER INFORMATION

Information Source and References
This SDS is prepared by Product Regulatory Services and Hazard Communications Groups from information supplied by internal references within our company.

Full text of other abbreviations

OSHA Z-1	:	USA. Occupational Exposure Limits (OSHA) - Table Z-1 Limits for Air Contaminants
OSHA Z-1 / TWA	:	8-hour time weighted average

AIIC - Australian Inventory of Industrial Chemicals; ASTM - American Society for the Testing of Materials; bw - Body weight; CERCLA - Comprehensive Environmental Response, Compensation, and Liability Act; CMR - Carcinogen, Mutagen or Reproductive Toxicant; DIN - Standard of the German Institute for Standardisation; DOT - Department of Transportation; DSL - Domestic Substances List (Canada); ECx - Concentration associated with x% response; EHS - Extremely

Hazardous Substance; ELx - Loading rate associated with x% response; EmS - Emergency Schedule; ENCS - Existing and New Chemical Substances (Japan); ErCx - Concentration associated with x% growth rate response; ERG - Emergency Response Guide; GHS - Globally Harmonized System; GLP - Good Laboratory Practice; HMIS - Hazardous Materials Identification System; IARC - International Agency for Research on Cancer; IATA - International Air Transport Association; IBC - International Code for the Construction and Equipment of Ships carrying Dangerous Chemicals in Bulk; IC50 - Half maximal inhibitory concentration; ICAO - International Civil Aviation Organization; IECSC - Inventory of Existing Chemical Substances in China; IMDG - International Maritime Dangerous Goods; IMO - International Maritime Organization; ISHL - Industrial Safety and Health Law (Japan); ISO - International Organisation for Standardization; KECI - Korea Existing Chemicals Inventory; LC50 - Lethal Concentration to 50 % of a test population; LD50 - Lethal Dose to 50% of a test population (Median Lethal Dose); MARPOL - International Convention for the Prevention of Pollution from Ships; MSHA - Mine Safety and Health Administration; n.o.s. - Not Otherwise Specified; NFPA - National Fire Protection Association; NO(A)EC - No Observed (Adverse) Effect Concentration; NO(A)EL - No Observed (Adverse) Effect Level; NOELR - No Observable Effect Loading Rate; NTP - National Toxicology Program; NZIoC - New Zealand Inventory of Chemicals; OECD - Organization for Economic Co-operation and Development; OPPTS - Office of Chemical Safety and Pollution Prevention; PBT - Persistent, Bioaccumulative and Toxic substance; PICCS - Philippines Inventory of Chemicals and Chemical Substances; (Q)SAR - (Quantitative) Structure Activity Relationship; RCRA - Resource Conservation and Recovery Act; REACH - Regulation (EC) No 1907/2006 of the European Parliament and of the Council concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals; RQ - Reportable Quantity; SADT - Self-Accelerating Decomposition Temperature; SARA - Superfund Amendments and Reauthorization Act; SDS - Safety Data Sheet; TCSI - Taiwan Chemical Substance Inventory; TECI - Thailand Existing Chemicals Inventory; TSCA - Toxic Substances Control Act (United States); UN - United Nations; UNRTDG - United Nations Recommendations on the Transport of Dangerous Goods; vPvB - Very Persistent and Very Bioaccumulative

Revision Date : 03/31/2022

Product code: GF-3169

The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text.

US / EN

Specimen Label

TRICLOPYR	GROUP	4	HERBICIDE

CORTEVA™ agriscience

Garlon® 4 Ultra

HERBICIDE

™®Trademarks of Corteva Agriscience and its affiliated companies

For the control of woody plants and vines, and annual and perennial broadleaf weeds on:

- **forest sites;**
- **non cropland areas including: electrical power and utility rights-of-way, industrial sites, non-irrigation ditch banks, pipelines, railroads, roadsides; and**
- **natural areas and wildlife habitat and management areas;**
- **including grazed areas on all of these listed sites.**

Active Ingredient:

triclopyr: 2-[(3,5,6-trichloro-2-pyridinyl)oxy] acetic acid, butoxyethyl ester	60.45%
Other Ingredients	39.55%
Total	100.00%

Acid equivalent: triclopyr – 43.46% - 4 lb/gal

Precautionary Statements

Hazards to Humans and Domestic Animals

EPA Reg. No. 62719-527

Keep Out of Reach of Children

CAUTION

Causes Moderate Eye Irritation • Harmful If Swallowed • Prolonged Or Frequently Repeated Skin Contact May Cause Allergic Reactions In Some Individuals

Avoid contact with skin, eyes, or clothing. Wash thoroughly with soap and water after handling and before eating, drinking, chewing gum, using tobacco, or using the toilet.

Personal Protective Equipment (PPE)

Applicators and other handlers who handle this pesticide must wear:

- Long-sleeved shirt and long pants
- Chemical-resistant gloves made of barrier laminate, nitrile rubber ≥14 mils, neoprene rubber ≥14 mils, or viton ≥14 mils
- Shoes plus socks

Follow the manufacturer's instructions for cleaning/maintaining PPE. If no such instructions for washables, use detergent and hot water. Keep and wash PPE separately from other laundry.

Engineering Controls

When handlers use closed systems, enclosed cabs, or aircraft in a manner that meets the requirements listed in the Worker Protection Standard (WPS) for agricultural pesticides (40 CFR 170.240(d)(4-6)), the handler PPE requirements may be reduced or modified as specified in the WPS.

User Safety Recommendations

Users should:

- Remove clothing/PPE immediately if pesticide gets inside. Then wash thoroughly and put on clean clothing.
- Remove PPE immediately after handling this product. Wash the outside of gloves before removing. As soon as possible, wash thoroughly and change into clean clothing.

First Aid

If on skin or clothing: Take off contaminated clothing. Rinse skin immediately with plenty of water for 15-20 minutes. Call a poison control center or doctor for treatment advice.
If in eyes: Hold eye open and rinse slowly and gently with water for 15-20 minutes. Remove contact lenses, if present, after the first 5 minutes, then continue rinsing eye. Call a poison control center or doctor for treatment advice.
If swallowed: Call a poison control center or doctor immediately for treatment advice. Have person sip a glass of water if able to swallow. Do not induce vomiting unless told to do so by a poison control center or doctor. Do not give anything by mouth to an unconscious person.

Have the product container or label with you when calling a poison control center or doctor, or going for treatment. You may also contact 1-800-992-5994 for emergency medical treatment information.

Environmental Hazards

This pesticide is toxic to fish. Do not apply directly to water, to areas where surface water is present, or to intertidal areas below the mean high water mark. Do not contaminate water when cleaning equipment or disposing of equipment washwaters.

This chemical has properties and characteristics associated with chemicals detected in groundwater. The use of this chemical in areas where soils are permeable, particularly where the water table is shallow, may result in groundwater contamination.

Directions for Use

It is a violation of Federal law to use this product in a manner inconsistent with its labeling.
Read all Directions for Use carefully before applying.

Do not apply this product in a way that will contact workers or other persons, either directly or through drift. Only protected handlers may be in the area during application. For any requirements specific to your state or tribe, consult the agency responsible for pesticide regulation.

Agricultural Use Requirements

Use this product only in accordance with its labeling and with the Worker Protection Standard, 40 CFR Part 170. This standard contains requirements for the protection of agricultural workers on farms, forests, nurseries, and greenhouses, and handlers of agricultural pesticides. It contains requirements for training, decontamination, notification, and emergency assistance. It also contains specific instructions and exceptions pertaining to the statements on this label about personal protective equipment (PPE) and restricted-entry interval. The requirements in this box only apply to uses of this product that are covered by the Worker Protection Standard.

Do not enter or allow worker entry into treated areas during the restricted entry interval (REI) of 12 hours.

PPE required for early entry to treated areas that is permitted under the Worker Protection Standard and that involves contact with anything that has been treated, such as plants, soil, or water, is:

- Coveralls
- Chemical-resistant gloves made of barrier laminate, nitrile rubber ≥14 mils, neoprene rubber ≥14 mils, or viton ≥14 mils
- Shoes plus socks

Non-Agricultural Use Requirements

The requirements in this box apply to uses of this product that are NOT within the scope of the Worker Protection Standard for Agricultural Pesticides (40 CFR Part 170). The WPS applies when this product is used to produce agricultural plants on farms, forests, nurseries, or greenhouses.

Entry Restrictions for Non-WPS Uses: Do not enter or allow others to enter the treated area until sprays have dried.

Storage and Disposal

Do not contaminate water, food, or feed by storage and disposal.
Pesticide Storage: Store above 28°F or agitate before use.
Pesticide Disposal: Wastes resulting from the use of this product must be disposed of on site or at an approved waste disposal facility. Open dumping is prohibited.

Storage and Disposal (Cont.)

Nonrefillable containers 5 gallons or less:
Container Handling: Nonrefillable container. Do not reuse or refill this container.
Triple rinse or pressure rinse container (or equivalent) promptly after emptying. **Triple rinse** as follows: Empty the remaining contents into application equipment or a mix tank and drain for 10 seconds after the flow begins to drip. Fill the container 1/4 full with water and recap. Shake for 10 seconds. Pour rinsate into application equipment or a mix tank or store rinsate for later use or disposal. Drain for 10 seconds after the flow begins to drip. Repeat this procedure two more times. **Pressure rinse** as follows: Empty the remaining contents into application equipment or a mix tank and continue to drain for 10 seconds after the flow begins to drip. Hold container upside down over application equipment or mix tank or collect rinsate for later use or disposal. Insert pressure rinsing nozzle in the side of the container, and rinse at about 40 psi for at least 30 seconds. Drain for 10 seconds after the flow begins to drip. Then offer for recycling if available or puncture and dispose of in a sanitary landfill, or by incineration, or by other procedures allowed by state and local authorities.

Refillable containers 5 gallons or larger:
Container Handling: Refillable container. Refill this container with pesticide only. Do not reuse this container for any other purpose. Cleaning the container before final disposal is the responsibility of the person disposing of the container. Cleaning before refilling is the responsibility of the refiller. To clean the container before final disposal, empty the remaining contents from this container into application equipment or a mix tank. Fill the container about 10% full with water and, if possible, spray all sides while adding water. If practical, agitate vigorously or recirculate water with the pump for two minutes. Pour or pump rinsate into application equipment or rinsate collection system. Repeat this rinsing procedure two more times. Then offer for recycling if available, or puncture and dispose of in a sanitary landfill, or by incineration, or by other procedures allowed by state and local authorities.

Nonrefillable containers 5 gallons or larger:
Container Handling: Nonrefillable container. Do not reuse or refill this container.
Triple rinse or pressure rinse container (or equivalent) promptly after emptying. **Triple rinse** as follows: Empty the remaining contents into application equipment or a mix tank. Fill the container 1/4 full with water. Replace and tighten closures. Tip container on its side and roll it back and forth, ensuring at least one complete revolution, for 30 seconds. Stand the container on its end and tip it back and forth several times. Turn the container over onto its other end and tip it back and forth several times. Empty the rinsate into application equipment or a mix tank or store rinsate for later use or disposal. Repeat this procedure two more times. **Pressure rinse** as follows: Empty the remaining contents into application equipment or a mix tank and continue to drain for 10 seconds after the flow begins to drip. Hold container upside down over application equipment or mix tank or collect rinsate for later use or disposal. Insert pressure rinsing nozzle in the side of the container, and rinse at about 40 psi for at least 30 seconds. Drain for 10 seconds after the flow begins to drip. Then offer for recycling if available, or puncture and dispose of in a sanitary landfill, or by incineration, or by other procedures allowed by state and local authorities.

Product Information

Garlon® 4 Ultra herbicide is recommended for the control of woody plants and vines, and herbaceous broadleaf weeds on forest sites, conifer plantations, non-cropland areas, including airports, barrow ditches, communication transmission lines, electrical power and utility rights-of-way, fencerows, gravel pits, industrial sites, military lands, mining and drilling areas, non-irrigation ditch banks, oil and gas pads, parking lots, petroleum tank farms, pipelines, railroads, roadsides, storage areas, storm water retention areas, substations, unimproved rough turf grasses, vacant lots and other non-crop residential areas; and natural areas (open space) for example campgrounds, parks, prairie management, trials and trialheads, recreation areas, wildlife openings, and wildlife habitat and management areas including grazed area on all these listed sites.

Use Precautions

When applying this product in tank mix combination, follow all applicable use directions and precautions on each manufacturer's label. It is the pesticide user's responsibility to ensure that all products in the listed mixtures are registered for the intended use. Users must follow the most restrictive directions for use and precautionary statements of each product in the tank mixture.

Sprays applied directly to Christmas trees may result in conifer injury. When treating unwanted vegetation in Christmas tree plantations, care should be taken to direct sprays away from conifers.

Garlon 4 Ultra is formulated as a low volatile ester. However, the combination of spray contact with impervious surfaces, such as roads and rocks, and increasing ambient air temperatures, may result in an increase in the volatility potential for this herbicide, increasing a risk for off-target injury to sensitive crops such as grapes and tomatoes.

Use Restrictions

Chemigation: Do not apply this product through any type of irrigation system.

Do not apply Garlon 4 Ultra directly to, or otherwise permit it to come into direct contact with cotton, grapes, peanuts, soybeans, tobacco, vegetable crops, flowers, citrus, or other desirable broadleaf plants. Do not permit spray mists containing it to drift onto such plants.

It is permissible to treat non-irrigation ditch banks, seasonally dry wetlands (such as flood plains, deltas, marshes, swamps, or bogs) and transitional areas between upland and lowland sites where surface water is not present except in isolated pockets due to uneven or unlevel conditions. Do not apply to open water (such as lakes, reservoirs, rivers, streams, creeks, salt water bays, or estuaries).

Do not apply on ditches that are used to transport irrigation water. Do not apply where runoff or irrigation water may flow onto agricultural land as injury to crops may result.

Do not apply this product using mist blowers.

Maximum Use Rates

- Apply no more than 2 lb ae of triclopyr (2 quarts of Garlon 4 Ultra) per acre per growing season on range and pasture sites, or any area where grazing or harvesting hay is allowed.
- On forestry sites, apply no more than 6 lb ae of triclopyr (6 quarts of Garlon 4 Ultra) per acre per year.
- For all use sites other than range, pasture, forestry sites, and grazed /hayed areas, apply no more than 8 lb ae triclopyr (8 quarts of Garlon 4 Ultra) per acre per year.
- See Table 1 below for relationship between mixing rate, spray volume, and maximum application rate.

Grazing
- There are no grazing restrictions for livestock or dairy animals on treated areas
- Portions of grazed areas that intersect treated non-cropland and rights-of-way sites may be treated at up to 8 lb ae per acre if the area to be treated on the day of application comprises no more than 10% of the total grazable area.

Haying (harvesting of dried forage)
- Do not harvest hay for 14 days after application.

Slaughter Restriction: During the season of application, withdraw livestock from grazing treated grass at least 3 days before slaughter.

Avoid Injurious Spray Drift
Make applications only when there is little or no hazard from spray drift. Small quantities of spray, which may not be visible, may seriously injure susceptible plants. Do not spray when wind is blowing toward susceptible crops or ornamental plants that are near enough to be injured. It is suggested that a continuous smoke column at or near the spray site or a smoke generator on the spray equipment be used to detect air movement, lapse conditions, or temperature inversions (stable air). If the smoke layers or indicates a potential of hazardous spray drift, do not spray.

Aerial Application (Helicopter Only): For aerial application on rights-of-way or other areas near susceptible crops, apply through a Microfoil[1] or Thru-Valve[1] boom, or other drift control application equipment and/or use an agriculturally labeled drift control additive. If a spray thickening agent is used, follow all use recommendations and precautions on the product label. Spray only when the wind velocity is low (follow state regulations). Avoid application during air inversions.

[1] Reference within this label to a particular piece of equipment produced by or available from other parties is provided without consideration for use by the reader at its discretion and subject to the reader's independent circumstances, evaluation, and expertise. Such reference by Corteva Agriscience is not intended as an endorsement of such equipment, shall not constitute a warranty (express or implied) of such equipment, and is not intended to imply that other equipment is not available and equally suitable. Any discussion of methods of use of such equipment does not imply that the reader should use the equipment other than is advised in directions available from the equipment's manufacturer. The reader is responsible for exercising its own judgment and expertise, or consulting with sources other than Corteva Agriscience, in selecting and determining how to use its equipment.

Spray Drift Management
Avoiding spray drift at the application site is the responsibility of the applicator. The interaction of many equipment and weather related factors determine the potential for spray drift. The applicator and the grower are responsible for considering all these factors when making decisions.

The following drift management requirements must be followed to avoid off-target drift movement from aerial applications:

- The distance of the outer most operating nozzles on the boom must not exceed 3/4 the length of the rotor.
- Nozzles must always point backward parallel with the air stream and never be pointed downwards more than 45 degrees.

Where states have more stringent regulations, they must be observed.

The applicator should be familiar with and take into account the information covered in the following Aerial Drift Reduction Advisory. [This information is advisory in nature and does not supersede mandatory label requirements.]

Aerial Drift Reduction Advisory
Information on Droplet Size: The most effective way to reduce drift potential is to apply large droplets. The best drift management strategy is to apply the largest droplets that provide sufficient coverage and control. Applying larger droplets reduces drift potential but will not prevent drift if applications are made improperly, or under unfavorable environmental conditions (see Wind, Temperature and Humidity, and Temperature Inversions).

Controlling Droplet Size:
- **Volume** - Use high flow rate nozzles to apply the highest practical spray volume. Nozzles with higher rated flows produce larger droplets.
- **Pressure** - Do not exceed the nozzle manufacturer's recommended pressures. For many nozzle types lower pressure produces larger droplets. When higher flow rates are needed, use higher flow rate nozzles instead of increasing pressure.
- **Number of Nozzles** - Use the minimum number of nozzles that provide uniform coverage.
- **Nozzle Orientation** - Orienting nozzles so that the spray is released parallel to the airstream produces larger droplets than other orientations and is the recommended practice. Significant deflection from horizontal will reduce droplet size and increase drift potential.
- **Nozzle Type** - Use a nozzle type that is designed for the intended application. With most nozzle types, narrower spray angles produce larger droplets. Consider using low-drift nozzles. Solid stream nozzles oriented straight back produce the largest droplets and the lowest drift.

Boom Length: For some use patterns, reducing the effective boom length to less than 3/4 of the rotor length may further reduce drift without reducing swath width.

Application Height: Applications should not be made at a height greater than 10 feet above the top of the largest plants unless a greater height is required for aircraft safety. Making applications at the lowest height that is safe reduces exposure of droplets to evaporation and wind.

Swath Adjustment: When applications are made with a crosswind, the swath will be displaced downwind. Therefore, on the up and downwind edges of the field, the applicator must compensate for this displacement by adjusting the path of the aircraft upwind. Swath adjustment distance should increase, with increasing drift potential (higher wind, smaller drops, etc.).

Wind: Drift potential is lowest between wind speeds of 2 to 10 mph. However, many factors, including droplet size and equipment type, determine drift potential at any given speed. Application should be avoided below 2 mph due to variable wind direction and high inversion potential. **Note**: Local terrain can influence wind patterns. Every applicator should be familiar with local wind patterns and how they affect spray drift.

Temperature and Humidity: When making applications in low relative humidity, set up equipment to produce larger droplets to compensate for evaporation. Droplet evaporation is most severe when conditions are both hot and dry.

Temperature Inversions: Applications should not occur during a local, low level temperature inversion because drift potential is high. Temperature inversions restrict vertical air mixing, which causes small suspended droplets to remain in a concentrated cloud. This cloud can move in unpredictable directions due to the light variable winds common during inversions. Temperature inversions are characterized by increasing temperatures with altitude and are common on nights with limited cloud cover and light to no wind. They begin to form as the sun sets and often continue into the morning. Their presence can be indicated by ground fog; however, if fog is not present, inversions can also be identified by the movement of the smoke from a ground source or an aircraft smoke generator. Smoke that layers and moves laterally in a concentrated cloud (under low wind conditions) indicates an inversion, while smoke that moves upward and rapidly dissipates indicates good vertical air mixing.

Sensitive Areas: The pesticide should only be applied when the potential for drift to adjacent sensitive areas (e.g., residential areas, bodies of water, known habitat for threatened or endangered species, non-target crops) is minimal (e.g., when wind is blowing away from the sensitive areas).

Ground Equipment: To aid in reducing spray drift potential when making ground applications near susceptible crops or other desirable broadleaf plants, Garlon 4 Ultra should be used in thickened (high viscosity) spray mixtures using an agriculturally labeled drift control additive, high viscosity invert system, or equivalent as directed by the manufacturer. When using a spray thickening or inverting additive, follow all use directions and precautions on the product label. With ground equipment, spray drift can be reduced by keeping the spray boom as low as possible; by applying 20 gallons or more of spray per acre; by keeping the operating spray pressures at the lower end of the manufacturer's recommended pressures for the specific nozzle type used (low pressure nozzles are available from spray equipment manufacturers); and by spraying when wind velocity is low. Do not apply with nozzles that produce a fine droplet spray. Select nozzles and pressures which provide adequate plant coverage, but minimize the production of fine spray particles.

High Volume Leaf-Stem Treatment: To minimize spray drift, keep sprays no higher than brush tops and keep spray pressures low enough to provide coarse spray droplets. A agriculturally labeled thickening agent may be used to reduce spray drift.

Mixing Directions for all use sites

Garlon 4 Ultra may be foliarly applied by diluting with water or by preparing an oil-water emulsion. For woody plant control, an oil-water emulsion performs more dependably under a broader range of conditions than a straight water dilution and is recommended for aerial applications.

Oil-Water Mixture Sprays
Prepare a premix of oil, surfactant and Garlon 4 Ultra in a separate container using diesel fuel, fuel oil, or kerosene plus an emulsifier such as Sponto 712 or Triton X-100. Use a jar test to check spray mix compatibility before preparing oil-water emulsion sprays in the mixing tank. Do not allow any water or mixtures containing water to get into the premix or Garlon 4 Ultra since a thick "invert" (water in oil) emulsion may form that will be difficult to break. Such an emulsion may also be formed if the premix of Garlon 4 Ultra is put into the mixing tank before the addition of water. Fill the spray tank about one-half full with water, then slowly add the premix with continuous agitation and complete filling the tank with water. Continue moderate agitation.

Oil Mixture Sprays for Basal Treatment
Prepare oil-based spray mixtures using either a commercially available basal oil, kerosene diesel fuel, or No. 1 or No. 2 fuel oil. Substitute other oils or diluents only as recommended by the oil or diluent's manufacturer. When mixing an oil mixture, read and follow the use directions and precautions on the manufacturer's product label. Add Garlon 4 Ultra to the required amount of oil in the spray tank or mixing tank and mix thoroughly. If the mixture stands over four hours, reagitation is required.

Oil Mixtures of Garlon 4 Ultra and Tordon 22K: Tordon 22K and Garlon 4 Ultra may be used in tank mix combination for basal bark treatment of woody plants. These herbicides are incompatible and will not form a stable mixture when mixed together directly in oil. Make a stable tank mixture for basal bark application by first combining each product with a compatibility agent prior to final mixing in the desired ratio. Tordon 22K is not registered for use in the states of California and Florida.

Herbicide Resistance Management

Triclopyr, the active ingredient in this product, is a Group 4 herbicide based on the mode of action classification system of the Weed Science Society of America.

Any weed population may contain or develop plants resistant to Group 4 herbicides. Resistant weeds may dominate the weed population if these herbicides are used repeatedly in the same field. Such resistant weed plants may not be effectively managed using Group 4 herbicides but may be effectively managed utilizing other herbicides alone or in mixtures from a different herbicide Groups that are labeled for control of these weeds and/or by using cultural or mechanical practices. However, a herbicide mode of action classification by itself may not adequately address specific weeds that are resistant to specific herbicides.

Rotate the use of Garlon 4 Ultra or other Group 4 herbicides within a growing season sequence or among growing seasons with different herbicide groups that control the same weeds in a field.

Use tank mixtures with herbicides from a different group if such use is permitted; where information on resistance in target weed species is available, use less the resistance-prone partner at a rate that will control the target weed(s) equally as well as the more resistance-prone partner. Consult your local extension service or certified crop advisor if you are unsure as to which active ingredient is less prone to resistance.

Adopt an integrated weed management program for herbicide use that includes scouting and uses historical information related to herbicide use and crop rotation that considers tillage (or other mechanical control methods), cultural, biological, and other management practices.

Scout after a herbicide application to monitor weed populations for early signs of resistance development. Indicators of possible herbicide resistance include: (1) failure to control a weed species normally controlled by the herbicide at the dose applied, especially if control is achieved on adjacent weeds; (2) a spreading patch of non-controlled plants of a particular weed species; (3) surviving plants mixed with controlled individuals of the same species. If resistance is suspected, prevent weed seed production in the affected area by an alternative herbicide from a different group or by mechanical method such as hoeing, mowing or tillage. Prevent movement of resistant weed seeds to other fields by cleaning harvesting and tillage equipment when moving between fields, and planting clean seed.

If a weed population continues to progress after treatment with this product, discontinue use of this product, and switch to another management strategy or herbicide with a different mode of action, if available.

Contact your local extension specialist or certified crop advisor for additional pesticide resistance management or integrated weed management recommendations for specific use sites.

Plants Controlled by Garlon 4 Ultra

Woody Plants Controlled

Common Name	Scientific Name	Life Cycle	Plant Family
acacia, twisted	*Acacia tortuosa*	perennial	Fabaceae
alder	*Aldus spp.*	perennial	Betulaceae
arrowwood	*Viburnum ventanum*	perennial	Caprifoliaceae
ash	*Fraxinus spp.*	perennial	Oleaceae
aspen	*Populus tremuloides*	perennial	Salicaceae
bear clover (bearmat)	*Chamaebatia foliolosa*	perennial	Fabaceae
beech	*Fagus spp.*	perennial	Fagaceae
birch	*Betula spp.*	perennial	Betulaceae
blackberry	*Rubus spp.*	perennial	Rosaceae
blackbrush	*Acacia rigidula*	perennial	Fabaceae
blackgum	*Nyssa salvatica*	perennial	Cornaceae
boxelder (1)	*Acer negundo*	perennial	Aceraceae
Brazilian pepper	*Schinus terebinthifolius*	perennial	Anacardiaceae
buckthorn	*Rhamnus spp.*	perennial	Rhamnaceae
cascara	*Rhamnus pushiana*	perennial	Rhamnaceae
ceanothus	*Ceanothus spp.*	perennial	Rhamnaceae
cherry	*Prunus spp.*	perennial	Rosaceae
cherry, choke	*Prunus virginiana*	perennial	Rosaceae
Chinquapin	*Quercus muhlenbergii*	perennial	Fagaceae
Cottonwood	*Populus deltoides*	perennial	Salicaceae
crataegus (hawthorn)	*Crataegus spp.*	perennial	Rosaceae
creeper, Virginia (1)	*Parthenocissus quinquefolia*	perennial	Vitaceae
Dogwood	*Cornus spp.*	perennial	Cornaceae
Douglas-fir	*Psuedotsuga menziesii*	perennial	Pinaceae
elderberry	*Sambucus Canadensis*	perennial	Caprifoliaceae
elm	*Ulmus, spp*	perennial	Ulmaceae
elm, winged	*Ulmus alata*	perennial	Ulmaceae
gallberry	*Ilex coriacea*	perennial	Aquifoliaceae
granjeno	*Celtis ehrenbergiana*	perennial	Ulmaceae
guajillo	*Acacia berlandieri*	perennial	Fabaceae
guava	*Psidium guajava*	perennial	Myrtaceae
gorse	*Ulex europaeus*	perennial	Fabaceae
hazel	*Corylus americana*	perennial	Betulaceae
hickory	*Carya spp.*	perennial	Juglandaceae
hornbeam	*Carpinus spp.*	perennial	Betulaceae
huisache (suppression)	*Acacia farnesiana*	perennial	Fabaceae
ivy, poison	*Tooxicodendron radicans*	perennial	Anacardiaceae
kudzu	*Pueraria lobata*	perennial	Fabaceae
locust	*Robinia spp.*	perennial	Fabaceae
madrone	*Arbutus spp.*	perennial	Ericaceae
magnolia, sweetbay	*Magnolia viginiana*	perennial	Magnoliaceae
maples	*Acer spp.*	perennial	Aceraceae
maple, bigleaf (1)	*Acer macrophyllum*	perennial	Aceraceae
milkweed vine (1)	*Asclepias spp.*	perennial	Asclepiaceae
mulberry	*Morus spp.*	perennial	Moraceae
myrtle. wax	*Morella cerifera*	perennial	Myricaceae
oaks	*Quercus spp.*	perennial	Fagaceae

Plants Controlled by Garlon 4 Ultra (Cont.)

Woody Plants Controlled

Common Name	Scientific Name	Life Cycle	Plant Family
oak, poison	*Toxicodendron diversilobum*	perennial	Anacardiaceae
Osage orange	*Maclura pomifera*	perennial	Moraceae
peppervine	*Ampelopsis arborea*	perennial	Vitaceae
persimmon	*Disospyros spp.*	perennial	Ebenaceae
pine	*Pinus spp.*	perennial	Pinaceae
poplar	*Populus spp.*	perennial	Salicaceae
poplar, tulip	*Liriodendron tulipifera*	perennial	Magnoliaceae
primrose, willow	*Ludwigia peruviana*	perennial	Onagraceae
rose, wild	*Rosa spp.*	perennial	Rosaceae
salmonberry	*Rubus spectabalis*	perennial	Rosaceae
saltbush (silver myrtle)	*Baccharis spp*	perennial	Asteraceae
saltcedar	*Tamarix spp.*	perennial	Tamariaceae
sassafrass	*Sassafras spp.*	perennial	Lauraceae
scotchbroom	*Cytisus scoparius*	perennial	Fabaceae
sumac	*Rhus spp.*	perennial	Anacardiaceae
sweetgum	*Liquidamber styraciflura*	perennial	Hamamelidaceae
sycamore	*Platanus occidentalis*	perennial	Plantanaceae
tanoak	*Notholithocarpus densiflorus*	perennial	Fagaceae
tree of heaven	*Ailanthus altissima*	perennial	Simaroubaceae
trumpet creeper (1)	*Campsis radicans*	perennial	Bignoniaceae
willow	*Salix spp.*	perennial	Saliciaceae

[1]For best control, use either a basal bark or cut stump treatment.
[2]For complete control, re-treatment may be necessary.

Annual and Perennial Broadleaf Weeds

Common Name	Scientific Name	Life Cycle	Plant Family
beggarweed, creeping	*Desmodium incanum*	perennial	Fabaceae
bindweed, field (top growth)	*Convolvulus arvensis*	perennial	Convolulaceae
burdock, common	*Arctium minus*	biennial	Asteraceae
carrot, wild	*Daucus carota*	biennial	Apiaceae
chicory	*Cichorium intybus*	perennial	Asteraceae
cinquefoil, sulfur (2)	*Potentilla recta*	perennial	Rosaceae
clover	*Trifolium spp.*	perennial	Fabaceae
dandelion (top growth)	*Taraxacum oficinale*	perennial	Asteraceae
dock, curly	*Rumex crispus*	perennial	Polygonaceae
dogfennel	*Eupatorium capillifolium*	perennial	Asteraceae
goldenrod	*Solidago spp.*	perennial	Asteraceae
ivy, ground	*Glecoma hederacea*	perennial	Lamiaceae
kudzu	*Pueraria montana*	perennial	Fabaceae
lambsquarters	*Chenopodium spp.*	annual	Chenopodiaceae
lespedeza, annual	*Lespedeza striata*	annual	Fabaceae
lespedeza, Sericea (1)	*Lespedeza cuneata*	perennial	Fabaceae
lettuce, prickly	*Latuca serriola*	annual	Asteraceae
matchweed	*Lippia nodiflora*	perennial	Verbanaceae
medic, black	*Medicago lupulina*	perennial	Fabaceae
mustard	*Brassica spp.*	annual	Brassicaceae
mustard, garlic (4)	*Alliaria petiolata*	biennial	Brassicaceae
plantain	*Plantago spp.*	annual	Plantaginaceae
ragweed, common	*Ambrosia artemisiifolia*	annual	Asteraceae
ragweed, western	*Ambrosia psilostachya*	perennial	Asteraceae
smartweed, Pennsylvania	*Polygonum pensylvanicum*	annual	Polygonaceae
soda apple, tropical (3)	*Solanum viarum*	perennial	Solanaceae
thistle, bull	*Cirsium vulgare*	biennial	Asteraceae
thistle, Canada	*Cirsium arvense*	perennial	Asteraceae
vetch	*Vicia spp.*	perennial	Fabaceae
violet, wild	*Viola papilionacea*	perennial	Violaceae
yarrow, common	*Achillea millefolium*	perennial	Asteraceae

1. **Sericea lespedeza:** Apply 1 to 2 pints of Garlon 4 Ultra per acre. For best results, apply after maximum foliage development in the late spring to early summer, but prior to bloom.
2. **Sulfur cinquefoil:** Apply 1 to 2 pints of Garlon 4 Ultra per acre. For best results, apply to plants in the rosette stage.
3. **Tropical soda apple:** Apply 2 pints of Garlon 4 Ultra per acre when tropical soda apple plants reach the first flower stage. For best results, apply in a total spray volume of 40 gallons per acre using ground equipment. An agricultural surfactant may be added at the manufacturer's recommended rate to provide more complete wetting and coverage of the foliage. Spot treatments may be used to control sparse plant stands. For spot treatment use a 1 to 1.5% solution of Garlon 4 Ultra in water (1 to 1 1/2 gallons of Garlon 4 Ultra in 100 gallons total spray mixture) and spray the entire plant to completely wet the foliage. **In Florida**, control of tropical soda apple may be improved by using the following management practices:
   - Mow plants to a height of 3 inches every 50 to 60 days or whenever they reach flowering. Continue the mowing operation through April.
   - In late May to June (50 to 60 days after the April mowing), apply Garlon 4 Ultra as a broadcast treatment.
   - Use spot treatment to control any remaining plants or thin stands of plants that germinate following a broadcast treatment
4. **Garlic mustard:** apply as a 1.25 to 2.5% v/v foliar spray-to-wet application

Use Information

Use Garlon 4 Ultra at rates of 1 to 8 quarts per acre to control broadleaf weeds and woody plants. It is suggested that rates higher in this rate range be used to control woody plants. In all cases, use the amount specified in enough water to give uniform and complete coverage of the plants to be controlled. The order of addition to the spray tank is water, spray thickening agent (if used), surfactant (if used), additional herbicide (if used), and Garlon 4 Ultra. If a standard agricultural surfactant is used, use at a rate of 1 to 2 quarts per acre. Use continuous adequate agitation.

Before using any recommended tank mixtures, read the directions and all precautions on both labels.

For best results apply when woody plants and weeds are actively growing. When hard to control species such as ash, blackgum, choke cherry, elm, maples (other than vine or big leaf), oaks, pines, or winged elm are prevalent, during applications made during late summer when the plants are mature, or during drought conditions, use the higher rates of Garlon 4 Ultra alone or in combination with Graslan L or Tordon 22K herbicide. Graslan L and Tordon 22K are restricted use pesticides. Graslan L and Tordon 22K are not registered for use in the states of California and Florida.

When using Garlon 4 Ultra in combination with Freelexx or a 2,4-D low volatile ester herbicide, generally the higher rates of Garlon 4 Ultra should be used for satisfactory brush control.

Use the higher dosage rates when brush approaches an average of 15 feet in height or when the brush covers more than 60% of the area to be treated. If lower rates are used on hard to control species, resprouting may occur the year following treatment.

On sites where easy to control brush species dominate, rates less than those listed may be effective. Consult state or local extension personnel for such information.

Foliage Treatment With Ground Equipment

High Volume Foliage Treatment

For control of woody plants, use Garlon 4 Ultra at the rate of 2 to 6 quarts per 100 gallons of spray mixture, or Garlon 4 Ultra at 2 to 4 quarts may be tank mixed with labeled rates of Freelexx or a 2,4-D low volatile ester herbicide, Graslan L, or Tordon 22K and diluted to make 100 gallons of spray. Do not apply more than 2 gallons of Garlon 4 Ultra per acre. Apply at a volume of 100 to 400 gallons of total spray per acre depending upon size and density of woody plants. Graslan L and Tordon 22K are not registered for use in the states of California and Florida. When tank mixing, follow applicable use directions and precautions on each manufacturer's label.

Depending upon the size and density of the woody plants, apply sufficient spray volume to thoroughly wet all leaves, stems, and root collars. To minimize spray drift, select the minimum spray pressure that provides adequate plant coverage without forming a mist and direct sprays no higher than the top of the target plants. Use a drift control additive cleared for application to growing crops to reduce spray drift. Before using any tank mixture, read the directions and use precautions on both labels. For best results, apply when woody plants and weeds are actively growing.

Table 1: The following table is provided as a guide to the user to achieve the proper rate of Garlon 4 Ultra on forestry and non-cropland sites.

Total Spray Volume (gallons/acre)	Rate of Garlon 4 Ultra	
	Forestry Sites (qt/100 gallons of spray)[1]	Non-Cropland Sites (qt/100 gallons of spray)[2]
400	1.5	2
300	2	2.7
200	3	4
100	6	8
50	12	16
40	15	20
30	20	26.7
20	30	40
10	60	80

[1] Do not exceed the maximum use rate of 6 quarts of Garlon 4 Ultra (6 lb ae of triclopyr) per acre per year.

[2] Do not exceed the maximum use rate of 8 quarts of Garlon 4 Ultra (8 lb ae of triclopyr) per acre per year for non-grazable areas, or 2 quarts (2 lb ae of triclopyr) per acre per year for grazed areas, except on portions of grazed areas that meet the following requirement. Portions of grazed areas that intersect treated non-cropland, rights-of-way and forestry sites may be treated at up to 8 lb ae per acre if the area to be treated on the day of application comprises no more than 10% of the total grazable area.

Low Volume Foliar Treatment

To control susceptible woody plants, mix up to 5% v/v of Garlon 4 Ultra in water and apply 10 to 100 gallons of finished spray. The spray concentration of Garlon 4 Ultra and total spray volume per acre should be adjusted according to the size and density of target woody plants and kind of spray equipment used. With low volume sprays, use sufficient spray volume to obtain uniform coverage of target plants including the surfaces of all foliage, stems, and root collars (see Use Precautions and Restrictions). For best results, a surfactant should be added to all spray mixtures. Match equipment and delivery rate of spray nozzles to height and density of woody plants. When treating tall, dense brush, a truck mounted spray gun with spray tips that deliver up to 2 gallons per minute at 40 to 60 psi may be required. Backpack or other types of specialized spray equipment with spray tips that deliver less than 1 gallon of spray per minute may be appropriate for short, low to moderate density brush.

See Table 1 for relationship between mixing rate, spray volume and maximum application rate.

Tank Mixing: As a low volume foliar spray, up to 9 quarts of Garlon 4 Ultra may be applied in tank mix combination with labeled rates of Tordon 22K or Graslan L in 10 to 100 gallons of finished spray. Graslan L and Tordon 22K are not registered for use in the states of California and Florida.

Broadcast Applications With Ground Equipment

Apply Garlon 4 Ultra using equipment that will assure thorough and uniform coverage at spray volumes applied. See Table 1 for relationship between mixing rate, spray volume and maximum application rate.

Woody Plant Control

Foliage Treatment: Use 4 to 8 quarts of Garlon 4 Ultra in enough water to make 5 gallons or more per acre of total spray, or 1 1/2 to 3 quarts of Garlon 4 Ultra may be combined with labeled rates of Freelexx or a 2,4-D low volatile ester, Graslan L, or Tordon 22K in sufficient water to make 5 gallons or more per acre of total spray. Graslan L and Tordon 22K are not registered for use in the states of California and Florida.

Broadleaf Weed Control

Use Garlon 4 Ultra at rates of 1 to 4 quarts in a total volume of 5 gallons or more per acre as a water spray mixture. Apply anytime weeds are actively growing. Garlon 4 Ultra at 0.25 to 3 quarts may be tank mixed with labeled rates of Freelexx or a 2,4-D amine or low volatile ester, Tordon 22K, or Graslan L to improve the spectrum of activity. For thickened (high viscosity) spray mixtures, Garlon 4 Ultra can be mixed with diesel oil or other inverting agent. When using an inverting agent, read and follow the use directions and precautions on the product label. Graslan L and Tordon 22K are not registered for use in the states of California and Florida.

Aerial Application (Helicopter Only)

Aerial sprays should be applied using suitable drift control (see Use Precautions and Restrictions).

Foliage Treatment (Utility and Pipeline Rights-of-Way)

Use 4 to 8 quarts of Garlon 4 Ultra alone, or 3 to 4 quarts of Garlon 4 Ultra in a tank mix combination with labeled rates of Freelexx or a 2,4-D low volatile ester, Graslan L or Tordon 22K and apply in a total spray volume of 10 to 30 gallons per acre. Use the higher rates and volumes when plants are dense or under drought conditions. Graslan L and Tordon 22K are not registered for use in the states of California and Florida.

Portions of grazed areas that intersect treated non-cropland, rights-of-way and forestry sites may be treated at up to 8 lb ae per acre if the area to be treated on the day of application comprises no more than 10% of the total grazable area.

Basal Bark, Dormant Stem and Cut Surface Treatments for use on all sites

Individual plant treatments such as basal bark and cut surface applications may be used on any use site listed on this label at a maximum use rate of 8 quarts of Garlon 4 Ultra (8 lb ae of triclopyr) per acre. These types of applications are made directly to ungrazed parts of plants and, therefore, are not restricted by the grazing maximum rate of 2 quarts of Garlon 4 Ultra (2 lb ae of triclopyr) per acre.

Conventional Basal Bark Treatment
To control susceptible woody plants with stems less than 6 inches in basal diameter, mix 1 to 5 gallons of Garlon 4 Ultra in enough oil to make 100 gallons of spray mixture. Apply with backpack sprayer or power spraying equipment using low pressure (20 to 40 psi). Spray the basal parts of brush and tree trunks to a height of 12 to 15 inches from the ground, thoroughly wetting the indicated area. Spray until runoff at the ground line is noticeable. Old or rough bark requires more spray than smooth young bark. Apply anytime, including the winter months, except when snow or water prevent spraying to the ground line. **Mixing with oil requires vigorous agitation to form an oil solution.** Once a solution is formed it will stay stable.

Low Volume Basal Bark Treatment
To control susceptible woody plants with stems less than 6 inches in basal diameter, mix 20 to 30 gallons of Garlon 4 Ultra in enough oil to make 100 gallons of spray mixture. Apply with a backpack or sprayer using low pressure and a solid cone or flat fan nozzle. Spray the basal parts of brush and tree trunks to a height of 12 to 15 inches from the ground in a manner that thoroughly wets the lower stems, including the root collar area, but not to the point of runoff. Herbicide concentration should vary with size and susceptibility of species treated. Treatments may be applied throughout the year including when snow is present. Efficacy may be reduced when stem surfaces are saturated with water. See Table 1 for relationship between mixing rate, spray volume and maximum application rate. **Mixing with oil requires vigorous agitation to form an oil solution.** Once a solution is formed it will stay stable.

Garlon 4 Ultra Plus Milestone for basal bark applications
Mix Garlon 4 Ultra with Milestone in a commercially available basal diluent (or other oils or basal diluents as recommended by the manufacturer); the basal oil should be compatible with a water soluble herbicide such as Milestone. Make a stable tank mixture for basal bark application by first combining each product with a compatibility agent prior to final mixing in the desired ratio. If using a tank mix, mix the oil-based products such as Garlon 4 Ultra thoroughly with basal oil and add any other oil-based products before adding the water based products. If the mixture stands for more than 30 minutes, reagitation may be required. Oil and water based mixtures can separate over time. Long-term storage is not recommended without vigorous agitation prior to use or without a recommended compatibility agent.

Garlon 4 Ultra Plus Tordon 22K in Oil Tank Mix: Garlon 4 Ultra and Tordon 22K may be used in tank mix combination as a low volume basal bark treatment to improve control of certain woody species such as ash, elm, maple, poplar, aspen, hackberry, oak, oceanspray, birch, hickory, pine, tanoak, cherry, locust, sassafras, and multiflora rose. (See product bulletin for mixing instructions.) Tordon 22K is not registered for use in the states of California and Florida.

Streamline Basal Bark Treatment (Southern States)
To control or suppress susceptible woody plants for conifer release, mix 20 to 30 gallons of Garlon 4 Ultra in enough oil to make 100 gallons of spray mixture. Streamline basal bark treatments are most effective on stems less than 4 inches in basal diameter. Apply with a backpack sprayer or using equipment that provides a directed straight stream spray. Apply the spray in a 2- to 3-inch wide band to one side of stems less than 3 inches in basal diameter. When the optimum amount of spray mixture is applied, the treated zone should widen to encircle the stem within approximately 30 minutes. Treat both sides of stems which are 3 to 4 inches in basal diameter. Direct the spray at bark that is approximately 12 to 24 inches above ground. Pines (loblolly, slash, shortleaf, and Virginia) up to 2 inches in diameter breast height (dbh) can be controlled by directing the spray at a point approximately 4 feet above ground. Vary spray mixture concentration with size and susceptibility of the species being treated. Better control is achieved when spray is applied to thin juvenile bark and above rough thickened mature bark. This technique is not recommended for scrub and live oak species, including blackjack, turkey, post, live, bluejack and laurel oaks, or bigleaf maple. Apply anytime, including winter months, except when snow or water prevents spraying at the desired height above ground level. **Note:** Best results with some hardwood species occur when applications are made from approximately 6 weeks prior to leaf expansion in the spring until approximately 2 months after leaf expansion is completed. **Mixing with oil requires vigorous agitation to form an oil solution.** Once a solution is formed it will stay stable.

Low Volume Stem Bark Band Treatment (North Central and Lake States)
The treatment band may be positioned at any height up to the first major branch. For best results apply the band as low as possible. Spray mixture concentration should vary with size and susceptibility of species to be treated. **Mixing with oil requires vigorous agitation to form an oil solution.** Once a solution is formed it will stay stable.

Thinline Basal Bark Treatment
To control susceptible woody plants with stems less than 6 inches in diameter, apply Garlon 4 Ultra, either undiluted or mixed at 50 to 75% v/v with oil, in a thin stream to all sides of the lower stems. The stream should be directed horizontally to apply a narrow band of Garlon 4 Ultra around each stem or clump. Use a minimum of 2 to 15 milliliters of Garlon 4 Ultra or oil mixture with Garlon 4 Ultra to treat single stems and from 25 to 100 milliliters to treat clumps of stems. Use an applicator metered or calibrated to deliver the small amounts required. **Mixing with oil requires vigorous agitation to form an oil solution.** Once a solution is formed it will stay stable.

Dormant Stem Treatment
Dormant stem treatments will control susceptible woody plants and vines with stems less than 2 inches in diameter. Plants with stems greater than 2 inches in diameter may not be controlled and resprouting may occur. This treatment method is best suited for sites with dense, small diameter brush. Dormant stem treatments of Garlon 4 Ultra can also be used as a chemical side-trim for controlling lateral branches of larger trees that encroach onto roadside, utility, or other rights-of-way.

High volume and low volume applications using backpacks deliver approximately the same amount of herbicide per acre but differ in delivery volumes to achieve that rate.

High Volume Applications
Mix 4 to 8 quarts of Garlon 4 Ultra in 2 to 3 gallons of crop oil concentrate or other recommended oil and add this mixture to enough water to make 100 gallons of spray solution. Use continuous adequate agitation. Apply using low pressure (20 to 40 psi). In western states, apply anytime after woody plants are dormant and most of the foliage has dropped. In other areas apply anytime within 10 weeks of budbreak, generally February through April. Garlon 4 Ultra may be mixed with 4 quarts of Weedone 170 herbicide to improve the control of black cherry and broaden the spectrum of herbicidal activity. Do not apply to wet or saturated bark as poor control may result.

Low Volume Applications
Mix Garlon 4 Ultra at 4 to 6 gallons and 2 to 3 gallons of crop oil concentrate or other recommended oil and add this mixture to enough water to make 100 gallons of spray solution. Use continuous adequate agitation. Apply with backpack or other low volume spraying equipment, using low pressure (20 to 40 psi). Garlon 4 Ultra may be mixed with other herbicides to broaden the spectrum of herbicidal activity. Do not apply to wet or saturated bark as poor control may result.

Cut Surface
Cut surface applications with Garlon 4 Ultra can be made anytime after cutting up to re-sprouting. After re-sprouting basal bark or foliar applications are more suitable.

Basal Cut Stump Treatment
To control resprouting, mix 20 to 30 gallons of Garlon 4 Ultra in enough oil to make 100 gallons of spray mixture. Apply with a backpack or sprayer using low pressures and a solid cone or flat fan nozzle. Spray the root collar area and any exposed roots of root suckering species, sides of the stump, and the outer portion of the cut surface, including the cambium, until thoroughly wet, but not to the point of runoff. Spray mixture concentration should vary with size and susceptibility of species treated, using the higher rate for larger stumps, stumps with thicker bark or harder to control plants. Apply anytime, including in winter months, except when snow or water prevent spraying to the ground line. **Mixing with oil requires vigorous agitation to form an oil solution.** Once a solution is formed it will stay stable.

Cut Stump Treatment
To control resprouting of difficult to control species like saltcedar and other *Tamarix* species, bigleaf maple, tanoak, Oregon myrtle, and other susceptible species, apply Garlon 4 Ultra as a 50% dilution v/v in water by spraying all the exposed cambium layer on the freshly cut surface, or use undiluted Garlon 4 Ultra immediately after cutting. Use of undiluted Garlon 4 Ultra is most effective for hard-to-control species. Treatments may be applied throughout the year; however, control may be reduced with treatment during periods of moisture stress as in late summer or

early spring sap flow. Cut stumps so that they are approximately level to facilitate uniform coverage of Garlon 4 Ultra. Use an applicator that can be calibrated to deliver the small amounts of material required.

Forest Management Applications

All application methods described on this label may be used on forest management sites.

For broadcast applications, apply 1 to 6 quarts of Garlon 4 Ultra per acre in a total spray volume of 5 to 25 gallons per acre by air or 10 to 100 gallons per acre by ground. Use spray volumes sufficient to provide thorough coverage of treated foliage. Nozzles or additives that produce larger droplets of spray may require higher spray volumes to provide adequate coverage.

Plant Back Interval for Conifers: Conifers planted sooner than one month after treatment with Garlon 4 Ultra at less than 4 quarts per acre or sooner than two months after treatment at 4 to 6 quarts per acre may be injured. When tank mixtures of herbicides are used for forest site preparation, labels for all products in the mixture should be consulted and the longest recommended waiting period observed.

Forest Site Preparation (Not For Conifer Release)
Southern States Including Alabama, Arkansas, Delaware, Florida, Georgia, Louisiana, Maryland, Mississippi, North Carolina, Oklahoma, South Carolina, Tennessee, Texas, and Virginia: To control susceptible woody plants and broadleaf weeds, apply Garlon 4 Ultra at a rate of 4 to 6 quarts per acre. To broaden the spectrum of woody plants and broadleaf weeds controlled, apply 2 to 4 quarts of Garlon 4 Ultra per acre in tank mix combination with labeled rates of Graslan L or Tordon 22K. Graslan L and Tordon 22K are not registered for use in the state of Florida. Where grass control is also desired, Garlon 4 Ultra, alone or in combination with Tordon 22K or Graslan L, may be applied with labeled rates of other herbicides registered for grass control in forests. Use of tank mix products must be in accordance with the most restrictive of label limitations and precautions. Do not exceed labeled application rates. Garlon 4 Ultra cannot be tank mixed with any product containing a label prohibition against such mixing.

In Western, Northeastern, North Central, and Lake States (States Not Listed Above as Southern States): To control susceptible woody plants and broadleaf weeds, apply Garlon 4 Ultra at a rate of 3 to 6 quarts per acre. To broaden the spectrum of woody plants and broadleaf weeds controlled, apply 1.5 to 3 quarts per acre of Garlon 4 Ultra in tank mix combination with labeled rates of Graslan L, Tordon 22K, or Freelexx or a 2,4-D low volatile ester or Freelexx. Graslan L and Tordon 22K are not registered for use in the state of California. Where grass control is also desired, Garlon 4 Ultra, alone or in tank mix combination with Graslan L or Tordon 22K, may be applied with labeled rates of other herbicides registered for grass control in forests. When applying tank mixes, follow applicable use directions and precautions on each product label.

Southern Coastal Flatwoods: To control susceptible broadleaf weeds and woody species such as gallberry and wax-myrtle, and for partial control of saw-palmetto, apply 2 to 4 quarts of Garlon 4 Ultra per acre. To broaden the spectrum of species controlled to include fetterbush, staggerbush, titi, and grasses, apply 2 to 3 quarts per acre of Garlon 4 Ultra in tank mix combination with labeled rates of Arsenal Applicator's Concentrate herbicide. Where control of gallberry, wax-myrtle, broadleaf weeds, and grasses is desired, apply 2 to 3 quarts of Garlon 4 Ultra per acre in tank mix combination with labeled rates of Accord Concentrate or Accord SP herbicide.

These treatments may be broadcast during site preparation of flat planted or bedded sites or, on bedded sites, applied in bands over the top of beds. For best results, apply in late summer or fall. Efficacy may not be satisfactory when applications are made in early season prior to August. **Note:** Do not apply after planting pines.

Directed Sprays Applications for Conifer Release
To release conifers from competing hardwoods and brush such as red maple, sugar maple, striped maple, sweetgum, red and white oaks, ash, hickory, alder, birch, aspen, pin cherry, *Ceanothus* spp., blackberry, chinquapin, and poison oak, mix 4 to 20 quarts of Garlon 4 Ultra in enough water to make 100 gallons of spray mixture. This spray mixture should be directed onto foliage of competitive hardwoods using backpack sprayers with flat fan nozzles or equivalent anytime after the hardwoods and brush have reached full leaf size, but before autumn coloration. The majority of treated hardwoods and brush should be less than 6 feet in height to ensure adequate spray coverage. Care should be taken to direct spray solutions away from contact with conifer foliage, particularly foliage of desirable pines. See Table 1 for relationship between mixing rate, spray volume and maximum application rate.

Note: Spray may cause temporary damage and growth suppression where contact with conifers occurs; however, injured conifers should recover and grow normally. Over-the-top spray applications can kill pines.

Broadcast Applications for Mid-Rotation Understory Brush Control in Southern Coastal Flatwoods Pine Stands (Ground Equipment Only)
For control of susceptible species, such as gallberry and wax-myrtle, and broadleaf weeds, apply 2 to 4 quarts of Garlon 4 Ultra per acre. To broaden the spectrum of woody plants controlled to include fetterbush, staggerbush, and titi, apply 2 to 3 quarts of Garlon 4 Ultra per acre in tank mix combination with labeled rates of Arsenal Applicator's Concentrate. Saw-palmetto will be partially controlled by use of Garlon 4 Ultra at 4 quarts per acre or by mixtures of Garlon 4 Ultra at 2 to 3 quarts per acre in tank mix combination with either Arsenal Applicator's Concentrate or Escort herbicide. These mixtures should be broadcast applied over target understory brush species, **but to prevent injury to pines, make applications underneath the foliage of pines.** Apply sprays in 30 gallons or more per acre of total volume. For best results, apply in late summer or fall. Efficacy may not be satisfactory when applications are made in early season prior to August.

Broadcast Applications for Conifer Release in the Pacific Northwest and California
Dormant Conifers Before Bud Swell (Excluding Pines): To control or suppress deciduous hardwoods such as vine maple, bigleaf maple, alder, scotch broom, or willow **before leaf-out**, or evergreen hardwoods such as madrone, chinquapin, and *Ceanothus* spp., use Garlon 4 Ultra at 1 to 2 quarts per acre. Use diesel or fuel oil as a diluent, or use water plus 1 to 2 gallons per acre of diesel oil or a suitable surfactant or oil substitute at manufacturer's recommended rates. **Mixing with oil as the only diluent requires vigorous agitation to form an oil solution.** Once a solution is formed it will stay stable.

Conifer Plantations (Excluding Pines) After Hardwoods Begin Growth and Before Conifer Bud Break ("Early Foliar" Hardwood Stage): Use Garlon 4 Ultra at 1 to 1.5 quarts alone or with Freelexx or 2,4-D low volatile ester herbicide in water carrier to provide no more than 3 lb ae per acre from both products. After conifer bud break, these sprays may cause more serious injury to the crop trees. Use of a surfactant may cause unacceptable injury to conifers especially after bud break.

Conifer Plantations (Excluding Pines) After Conifers Harden Off In Late Summer and While Hardwoods Are Still Growing Actively: Use Garlon 4 Ultra at rates of 1 to 1.5 quarts per acre alone or with Freelexx or a 2,4-D low volatile ester. Treat as soon after conifer bud hardening as possible so that hardwoods and brush are actively growing. Use of oil, oil substitute, or surfactant may cause unacceptable injury to the conifers.

Broadcast Applications for Conifer Release in the Eastern United States
To release spruce, fir, red pine, and white pine from competing hardwoods such as red maple, sugar maple, striped maple, alder, birch (white, yellow, and grey), aspen, ash, pin cherry, and *Rubus* spp. and perennial and annual broadleaf weeds, use Garlon 4 Ultra at rates of 1.5 to 3 quarts per acre alone or with Freelexx or a 2,4-D amine or low volatile ester. Apply in late summer or early fall after conifers have formed their overwintering buds and hardwoods are in full leaf and prior to autumn coloration.

Broadcast Applications for Conifer Release in the Lake States Region
To release spruce, fir, and red pine from competing hardwoods such as aspen, birch, maple, cherry, willow, oak, hazel, and *Rubus* spp. and perennial and annual broadleaf weeds, use Garlon 4 Ultra at rates of 1.5 to 3 quarts per acre. Apply in late summer or early fall after conifers have formed their overwintering buds and hardwoods are in full leaf and prior to autumn coloration.

Basal Bark and Dormant Stem Treatments

Individual plant treatments such as basal bark and cut surface applications may be used on any use site listed on this label at a maximum use rate of 8 lb ae of triclopyr per acre. See above in the section **Basal Bark, Dormant Stem and Cut Surface Treatments for use on all site** for more use information.

Low Volume Basal Bark Treatment
To control susceptible woody plants such as mesquite, huisache, red maple, red and white oak, birches and aspen with stems less than 6 inches in basal diameter.

Streamline Basal Bark Treatment
To control or suppress susceptible woody plants such as mesquite, huisache, red maple, white and red oak, elbowbush, greenbriar, hackberry, pricklyash, yaupon and wild grape

Cut Stump, Basal Cut Stump, Dormant Stem, Thinline Basal Bark Treatments
To control resprouting, apply undiluted Garlon 4 Ultra to wet the cambium and adjacent wood around the entire circumference of cut stumps. Treatments may be applied throughout the year; however, control may be reduced with treatment during periods of moisture stress as in late summer. Cut stumps so that they are approximately level to facilitate uniform coverage of Garlon 4 Ultra. Use an applicator which can be calibrated to deliver the small amounts of material required.

Growing Point and Leaf Base (Crown) Treatment of Yucca
Prepare a 2% v/v solution of Garlon 4 Ultra in basal oil, diesel or fuel oil (13 fl oz of Garlon 4 Ultra in 5 gallons of spray mixture). Thoroughly wet the center of the plant including growing point and leaf bases to the soil surface. Complete coverage of leaves is not necessary.

Terms and Conditions of Use

If terms of the following Warranty Disclaimer, Inherent Risks of Use, and Limitation of Remedies are not acceptable, return unopened package at once to the seller for a full refund of purchase price paid. To the extent permitted by law, otherwise, use by the buyer or any other user constitutes acceptance of the terms under Warranty Disclaimer, Inherent Risks of Use and Limitation of Remedies.

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Corteva Agriscience warrants that this product conforms to the chemical description on the label and is reasonably fit for the purposes stated on the label when used in strict accordance with the directions, subject to the inherent risks set forth below. To the extent permitted by law, Corteva Agriscience MAKES NO OTHER EXPRESS OR IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE OR ANY OTHER EXPRESS OR IMPLIED WARRANTY.

Inherent Risks of Use

It is impossible to eliminate all risks associated with use of this product. Plant injury, lack of performance, or other unintended consequences may result because of such factors as use of the product contrary to label instructions (including conditions noted on the label, such as unfavorable temperature, soil conditions, etc.), abnormal conditions (such as excessive rainfall, drought, tornadoes, hurricanes), presence of other materials, the manner of application, or other factors, all of which are beyond the control of Corteva Agriscience or the seller. To the extent permitted by law, all such risks shall be assumed by buyer.

Limitation of Remedies

To the extent permitted by law, the exclusive remedy for losses or damages resulting from this product (including claims based on contract, negligence, strict liability, or other legal theories), shall be limited to, at Corteva Agriscience's election, one of the following:

1. Refund of purchase price paid by buyer or user for product bought, or
2. Replacement of amount of product used.

To the extent permitted by law, Corteva Agriscience shall not be liable for losses or damages resulting from handling or use of this product unless Corteva Agriscience is promptly notified of such loss or damage in writing. To the extent permitted by law, in no case shall Corteva Agriscience be liable for consequential or incidental damages or losses.

The terms of the Warranty Disclaimer, Inherent Risks of Use and this Limitation of Remedies cannot be varied by any written or verbal statements or agreements. No employee or sales agent of Corteva Agriscience or the seller is authorized to vary or exceed the terms of the Warranty Disclaimer or this Limitation of Remedies in any manner.

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Produced for
Corteva Agriscience LLC
9330 Zionsville Road
Indianapolis, IN 46268

Label Code: CD02-329-021
Replaced Label: CD02-329-020

EPA accepted 02/05/18

Revisions:

1. Legal entity updates.

SAFETY DATA SHEET

Garlon 4 Ultra

Version	Revision Date:	SDS Number:	Date of last issue: -
1.0	03/31/2022	800080004588	Date of first issue: 03/31/2022

Corteva Agriscience™ encourages you and expects you to read and understand the entire SDS as there is important information throughout the document. This SDS provides users with information relating to the protection of human health and safety at the workplace, protection of the environment and supports emergency response. Product users and applicators should primarily refer to the product label attached to or accompanying the product container. This Safety Data Sheet adheres to the standards and regulatory requirements of the United States and may not meet the regulatory requirements in other countries.

SECTION 1. IDENTIFICATION

Product name : Garlon 4 Ultra

Manufacturer or supplier's details

COMPANY IDENTIFICATION

Manufacturer/importer : CORTEVA AGRISCIENCE LLC
9330 ZIONSVILLE RD
INDIANAPOLIS, IN, 46268-1053
UNITED STATES

Customer Information Number : 800-992-5994

E-mail address : customerinformation@corteva.com

Emergency telephone : INFOTRAC (CONTRACT 84224).

800-992-5994 or 317-337-6009

Recommended use of the chemical and restrictions on use

Recommended use : End use herbicide product

SECTION 2. HAZARDS IDENTIFICATION

GHS classification in accordance with the OSHA Hazard Communication Standard (29 CFR 1910.1200)

Skin sensitization : Sub-category 1B

Specific target organ toxicity - repeated exposure : Category 2 (Kidney)

GHS label elements

Hazard pictograms :

Signal Word : Warning

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Hazard Statements : H317 May cause an allergic skin reaction.
H373 May cause damage to organs (Kidney) through prolonged or repeated exposure.

Precautionary Statements :

Prevention:

P260 Do not breathe dust/ fume/ gas/ mist/ vapors/ spray.
P272 Contaminated work clothing must not be allowed out of the workplace.
P280 Wear protective gloves.

Response:

P302 + P352 IF ON SKIN: Wash with plenty of soap and water.
P314 Get medical advice/ attention if you feel unwell.
P333 + P313 If skin irritation or rash occurs: Get medical advice/ attention.
P363 Wash contaminated clothing before reuse.

Disposal:

P501 Dispose of contents/ container to an approved waste disposal plant.

Other hazards

None known.

SECTION 3. COMPOSITION/INFORMATION ON INGREDIENTS

Substance / Mixture : Mixture

Components

Chemical name	CAS-No.	Concentration (% w/w)
Triclopyr-2-butoxyethyl ester	64700-56-7	60.45
Balance	Not Assigned	>= 30 - < 40

Actual concentration is withheld as a trade secret

SECTION 4. FIRST AID MEASURES

If inhaled : Move person to fresh air. If person is not breathing, call an emergency responder or ambulance, then give artificial respiration; if by mouth to mouth use rescuer protection (pocket mask etc). Call a poison control center or doctor for treatment advice.

In case of skin contact : Take off contaminated clothing. Wash skin with soap and plenty of water for 15-20 minutes. Call a poison control center or doctor for treatment advice.
Wash clothing before reuse. Shoes and other leather items which cannot be decontaminated should be disposed of properly.

In case of eye contact : Hold eyes open and rinse slowly and gently with water for 15-20 minutes. Remove contact lenses, if present, after the first 5 minutes, then continue rinsing eyes. Call a poison control center or doctor for treatment advice.

If swallowed : Call a poison control center or doctor immediately for treatment advice. Have person sip a glass of water if able to swal-

low. Do not induce vomiting unless told to do so by the poison control center or doctor.
Never give anything by mouth to an unconscious person.

Most important symptoms and effects, both acute and delayed	:	None known.
Protection of first-aiders	:	First Aid responders should pay attention to self-protection and use the recommended protective clothing (chemical resistant gloves, splash protection). If potential for exposure exists refer to Section 8 for specific personal protective equipment.
Notes to physician	:	No specific antidote. Treatment of exposure should be directed at the control of symptoms and the clinical condition of the patient. Have the Safety Data Sheet, and if available, the product container or label with you when calling a poison control center or doctor, or going for treatment.

SECTION 5. FIRE-FIGHTING MEASURES

Suitable extinguishing media	:	Water spray Alcohol-resistant foam
Unsuitable extinguishing media	:	None known.
Specific hazards during fire fighting	:	Exposure to combustion products may be a hazard to health. Do not allow run-off from fire fighting to enter drains or water courses.
Hazardous combustion products	:	During a fire, smoke may contain the original material in addition to combustion products of varying composition which may be toxic and/or irritating. Combustion products may include and are not limited to: Nitrogen oxides (NOx) Hydrogen chloride gas Carbon oxides
Specific extinguishing methods	:	Remove undamaged containers from fire area if it is safe to do so. Evacuate area. Use extinguishing measures that are appropriate to local circumstances and the surrounding environment. Use water spray to cool unopened containers.
Further information	:	Collect contaminated fire extinguishing water separately. This must not be discharged into drains. Fire residues and contaminated fire extinguishing water must be disposed of in accordance with local regulations.
Special protective equipment for fire-fighters	:	In the event of fire, wear self-contained breathing apparatus. Use personal protective equipment.

SECTION 6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emer-	:	Use personal protective equipment. Use appropriate safety equipment. For additional information,

gency procedures		refer to Section 8, Exposure Controls and Personal Protection.
Environmental precautions	:	If the product contaminates rivers and lakes or drains inform respective authorities. Discharge into the environment must be avoided. Prevent further leakage or spillage if safe to do so. Prevent spreading over a wide area (e.g., by containment or oil barriers). Retain and dispose of contaminated wash water. Local authorities should be advised if significant spillages cannot be contained. Prevent from entering into soil, ditches, sewers, underwater. See Section 12, Ecological Information.
Methods and materials for containment and cleaning up	:	Clean up remaining materials from spill with suitable absorbant. Local or national regulations may apply to releases and disposal of this material, as well as those materials and items employed in. For large spills, provide dyking or other appropriate containment to keep material from spreading. If dyked material can be pumped, Recovered material should be stored in a vented container. The vent must prevent the ingress of water as further reaction with spilled materials can take place which could lead to overpressurization of the container. Keep in suitable, closed containers for disposal. Wipe up with absorbent material (e.g. cloth, fleece). Neutralize with chalk, alkali solution or ammonia. Soak up with inert absorbent material (e.g. sand, silica gel, acid binder, universal binder, sawdust). See Section 13, Disposal Considerations, for additional information.

SECTION 7. HANDLING AND STORAGE

Advice on safe handling	:	Persons susceptible to skin sensitization problems or asthma, allergies, chronic or recurrent respiratory disease should not be employed in any process in which this mixture is being used. Do not breathe vapors/dust. Do not smoke. Handle in accordance with good industrial hygiene and safety practice. Avoid exposure - obtain special instructions before use. Smoking, eating and drinking should be prohibited in the application area. Do not get on skin or clothing. Avoid inhalation of vapor or mist. Do not swallow. Avoid contact with skin and eyes. Avoid contact with eyes. Take care to prevent spills, waste and minimize release to the environment.

Use appropriate safety equipment. For additional information, refer to Section 8, Exposure Controls and Personal Protection.

Conditions for safe storage : Store in a closed container.
Containers which are opened must be carefully resealed and kept upright to prevent leakage.
Keep in properly labeled containers.
Store in accordance with the particular national regulations.

Materials to avoid : Do not store near acids.
Strong oxidizing agents

Packaging material : Unsuitable material: None known.

SECTION 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Ingredients with workplace control parameters

Components	CAS-No.	Value type (Form of exposure)	Control parameters / Permissible concentration	Basis
Triclopyr-2-butoxyethyl ester	64700-56-7	TWA	2 mg/m3	Dow IHG

Engineering measures : Use local exhaust ventilation, or other engineering controls to maintain airborne levels below exposure limit requirements or guidelines. If there are no applicable exposure limit requirements or guidelines, general ventilation should be sufficient for most operations.

Personal protective equipment

Respiratory protection : Respiratory protection should be worn when there is a potential to exceed the exposure limit requirements or guidelines. If there are no applicable exposure limit requirements or guidelines, wear respiratory protection when adverse effects, such as respiratory irritation or discomfort have been experienced, or where indicated by your risk assessment process. For most conditions no respiratory protection should be needed; however, if discomfort is experienced, use an approved air-purifying respirator.

Hand protection

Remarks : Use gloves chemically resistant to this material when prolonged or frequently repeated contact could occur. Examples of preferred glove barrier materials include: Butyl rubber. Chlorinated polyethylene. Polyethylene. Ethyl vinyl alcohol laminate ("EVAL"). Examples of acceptable glove barrier materials include: Natural rubber ("latex"). Neoprene. Nitrile/butadiene rubber ("nitrile" or "NBR"). Polyvinyl chloride ("PVC" or "vinyl"). Viton. NOTICE: The selection of a specific glove for a particular application and duration of use in a workplace should also take into account all relevant workplace factors such as, but not limited to: Other chemicals which may be handled, physical requirements (cut/puncture protection, dexterity, thermal protection), potential body reactions to glove materials, as well as the instructions/specifications provided by the glove supplier.

Eye protection : Use safety glasses (with side shields).

Skin and body protection	:	Use protective clothing chemically resistant to this material. Selection of specific items such as face shield, boots, apron, or full body suit will depend on the task.

SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance	:	Liquid.
Color	:	Yellow
Odor	:	Mild
Odor Threshold	:	No data available
pH	:	3.36 (73 °F / 23 °C) Concentration: 1 % Method: pH Electrode (1% aqueous suspension)
Melting point/range	:	Not applicable
Freezing point		No data available
Boiling point/boiling range	:	No data available
Flash point	:	> 212 °F / > 100 °C Method: Pensky-Martens Closed Cup ASTM D 93, closed cup
Evaporation rate	:	No data available
Flammability (solid, gas)	:	No data available
Upper explosion limit / Upper flammability limit	:	No data available
Lower explosion limit / Lower flammability limit	:	No data available
Vapor pressure	:	No data available
Relative vapor density	:	No data available
Density	:	1.11 g/cm3 (68 °F / 20 °C) Method: Digital density meter
Solubility(ies) Water solubility	:	emulsifies
Autoignition temperature	:	> 617 °F / > 325 °C
Viscosity Viscosity, dynamic	:	23.4 mPa.s (68 °F / 20 °C)

10.8 mPa.s (104 °F / 40 °C)

Explosive properties : No

Oxidizing properties : No significant increase (>5C) in temperature.

SECTION 10. STABILITY AND REACTIVITY

Reactivity : Not classified as a reactivity hazard.

Chemical stability : No decomposition if stored and applied as directed.
Stable under normal conditions.

Possibility of hazardous reactions : Stable under recommended storage conditions.
No hazards to be specially mentioned.
None known.

Conditions to avoid : None known.

Incompatible materials : None.

Hazardous decomposition products : Decomposition products depend upon temperature, air supply and the presence of other materials.
Decomposition products can include and are not limited to:
Nitrogen oxides (NOx)
Hydrogen chloride gas
Carbon oxides

SECTION 11. TOXICOLOGICAL INFORMATION

Acute toxicity

Product:

Acute oral toxicity : LD50 (Rat, female): 3,200 mg/kg
Method: OECD Test Guideline 425

Acute inhalation toxicity : LC50 (Rat, male and female): > 5.05 mg/l
Exposure time: 4 h
Test atmosphere: dust/mist
Method: OECD Test Guideline 403
Symptoms: No deaths occurred at this concentration.
Assessment: The substance or mixture has no acute inhalation toxicity

Acute dermal toxicity : LD50 (Rat, male and female): > 5,000 mg/kg
Method: OECD Test Guideline 402

Components:

Triclopyr-2-butoxyethyl ester:

Acute oral toxicity : LD50 (Rat, male and female): 803 mg/kg

Acute inhalation toxicity : LC50 (Rat): > 4.8 mg/l
Exposure time: 4 h
Test atmosphere: dust/mist
Symptoms: The LC50 value is greater than the Maximum

Attainable Concentration.
Assessment: The substance or mixture has no acute inhalation toxicity

Acute dermal toxicity : LD50 (Rabbit): > 2,000 mg/kg
Symptoms: No deaths occurred at this concentration.
Assessment: The substance or mixture has no acute dermal toxicity

Skin corrosion/irritation

Product:

Species : Rabbit
Method : OECD Test Guideline 404
Result : Mild skin irritation

Components:

Triclopyr-2-butoxyethyl ester:

Species : Rabbit
Result : No skin irritation

Serious eye damage/eye irritation

Product:

Species : Rabbit
Result : No eye irritation

Components:

Triclopyr-2-butoxyethyl ester:

Species : Rabbit
Result : No eye irritation

Respiratory or skin sensitization

Product:

Test Type : Local lymph node assay (LLNA)
Species : Mouse
Result : The product is a skin sensitizer, sub-category 1B.

Components:

Triclopyr-2-butoxyethyl ester:

Species : Guinea pig
Assessment : The product is a skin sensitizer, sub-category 1B.

Germ cell mutagenicity

Components:

Triclopyr-2-butoxyethyl ester:

Germ cell mutagenicity - Assessment : In vitro genetic toxicity studies were negative., Animal genetic toxicity studies were negative.

Carcinogenicity

Components:

Triclopyr-2-butoxyethyl ester:

Carcinogenicity - Assessment : For similar active ingredient(s)., Triclopyr., Did not cause cancer in laboratory animals.

IARC No ingredient of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC.

OSHA No component of this product present at levels greater than or equal to 0.1% is on OSHA's list of regulated carcinogens.

NTP No ingredient of this product present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by NTP.

Reproductive toxicity

Components:

Triclopyr-2-butoxyethyl ester:

Reproductive toxicity - Assessment : For similar active ingredient(s)., Triclopyr., In laboratory animal studies, effects on reproduction have been seen only at doses that produced significant toxicity to the parent animals. Has been toxic to the fetus in laboratory animals at doses toxic to the mother., Did not cause birth defects in laboratory animals.

STOT-single exposure

Product:

Assessment : Evaluation of available data suggests that this material is not an STOT-SE toxicant.

Components:

Triclopyr-2-butoxyethyl ester:

Assessment : Evaluation of available data suggests that this material is not an STOT-SE toxicant.

STOT-repeated exposure

Components:

Triclopyr-2-butoxyethyl ester:

Target Organs : Kidney

Assessment : May cause damage to organs through prolonged or repeated exposure.

Repeated dose toxicity

Components:

Triclopyr-2-butoxyethyl ester:

Remarks : In animals, effects have been reported on the following organs:
Kidney.
Liver.

Aspiration toxicity

Product:

Based on available information, aspiration hazard could not be determined.

Components:

Triclopyr-2-butoxyethyl ester:

Based on physical properties, not likely to be an aspiration hazard.

SECTION 12. ECOLOGICAL INFORMATION

Ecotoxicity

Product:

Toxicity to fish : LC50 (Lepomis macrochirus (Bluegill sunfish)): 0.44 mg/l
Exposure time: 96 h
Method: OECD Test Guideline 203 or Equivalent
Remarks: For similar material(s):

LC50 (Oncorhynchus mykiss (rainbow trout)): 0.984 mg/l
Exposure time: 96 h
Method: OECD Test Guideline 203 or Equivalent

Toxicity to daphnia and other aquatic invertebrates : EC50 (Daphnia magna (Water flea)): 0.35 mg/l
Exposure time: 48 h
Method: OECD Test Guideline 202 or Equivalent
Remarks: For similar material(s):

Toxicity to algae/aquatic plants : EbC50 (Pseudokirchneriella subcapitata (green algae)): 11 mg/l
End point: Biomass
Exposure time: 72 h
Method: OECD Test Guideline 201 or Equivalent
Remarks: For similar material(s):

Toxicity to terrestrial organisms : oral LD50 (Colinus virginianus (Bobwhite quail)): 1,350 mg/kg
Remarks: Based on information for a similar material:

Components:

Triclopyr-2-butoxyethyl ester:

Toxicity to fish	:	LC50 (Lepomis macrochirus (Bluegill sunfish)): 0.36 mg/l Exposure time: 96 h Test Type: flow-through test
Toxicity to daphnia and other aquatic invertebrates	:	EC50 (Daphnia magna (Water flea)): 2.9 mg/l Exposure time: 48 h Method: OECD Test Guideline 202
Toxicity to algae/aquatic plants	:	ErC50 (Pseudokirchneriella subcapitata (green algae)): > 3.00 mg/l End point: Growth rate inhibition Exposure time: 96 h Method: OECD Test Guideline 201 ErC50 (Myriophyllum spicatum): 0.0473 mg/l Exposure time: 14 d NOEC (Myriophyllum spicatum): 0.00722 mg/l Exposure time: 14 d
M-Factor (Acute aquatic toxicity)	:	10
Toxicity to fish (Chronic toxicity)	:	NOEC (Rainbow trout (Oncorhynchus mykiss)): 0.0263 mg/l
Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity)	:	NOEC (Daphnia magna (Water flea)): 1.6 mg/l End point: number of offspring Exposure time: 21 d LOEC (Daphnia magna (Water flea)): 5.1 mg/l End point: number of offspring Exposure time: 21 d MATC (Maximum Acceptable Toxicant Level) (Daphnia magna (Water flea)): 2.9 mg/l End point: number of offspring Exposure time: 21 d
M-Factor (Chronic aquatic toxicity)	:	10
Toxicity to soil dwelling organisms	:	LC50 (Eisenia fetida (earthworms)): > 1,042 mg/kg Exposure time: 14 d
Toxicity to terrestrial organisms	:	oral LD50 (Colinus virginianus (Bobwhite quail)): 735 mg/kg bodyweight. Exposure time: 21 d dietary LC50 (Colinus virginianus (Bobwhite quail)): 1890 mg/kg diet. Exposure time: 8 d oral LD50 (Apis mellifera (bees)): > 110 µg/bee Exposure time: 48 h

End point: mortality

contact LD50 (Apis mellifera (bees)): > 100 µg/bee
Exposure time: 48 h
End point: mortality

Persistence and degradability

Components:

Triclopyr-2-butoxyethyl ester:

Biodegradability	:	Result: Not readily biodegradable. Biodegradation: 18 % Exposure time: 28 d Method: OECD Test Guideline 301B or Equivalent Remarks: 10-day Window: Fail
Biochemical Oxygen Demand (BOD)	:	0.004 kg/kg
ThOD	:	1.39 kg/kg
Stability in water	:	Test Type: Hydrolysis Degradation half life (half-life): 8.7 d (25 °C) pH: 7
Photodegradation	:	Rate constant: 2.3E-11 cm3/s Method: Estimated.

Bioaccumulative potential

Components:

Triclopyr-2-butoxyethyl ester:

Bioaccumulation	:	Species: Fish Bioconcentration factor (BCF): 110
Partition coefficient: n-octanol/water	:	log Pow: 4.62 pH: 7 Remarks: Bioconcentration potential is moderate (BCF between 100 and 3000 or Log Pow between 3 and 5).

Balance:

Partition coefficient: n-octanol/water	:	Remarks: No relevant data found.

Mobility in soil

Components:

Triclopyr-2-butoxyethyl ester:

Distribution among environmental compartments	:	Remarks: Calculation of meaningful sorption data was not possible due to very rapid degradation in the soil. For the degradation product: Triclopyr. Potential for mobility in soil is very high (Koc between 0 and

50).

Stability in soil : Test Type: aerobic degradation
Dissipation time: 144 - 1,248 h

Balance:

Distribution among environmental compartments : Remarks: No relevant data found.

Other adverse effects

Components:

Triclopyr-2-butoxyethyl ester:

Results of PBT and vPvB assessment : This substance is not considered to be persistent, bioaccumulating and toxic (PBT). This substance is not considered to be very persistent and very bioaccumulating (vPvB).

Ozone-Depletion Potential : Remarks: This substance is not on the Montreal Protocol list of substances that deplete the ozone layer.

Balance:

Results of PBT and vPvB assessment : This substance has not been assessed for persistence, bioaccumulation and toxicity (PBT).

Ozone-Depletion Potential : Remarks: This substance is not on the Montreal Protocol list of substances that deplete the ozone layer.

SECTION 13. DISPOSAL CONSIDERATIONS

Disposal methods

Waste from residues : If wastes and/or containers cannot be disposed of according to the product label directions, disposal of this material must be in accordance with your local or area regulatory authorities. This information presented below only applies to the material as supplied. The identification based on characteristic(s) or listing may not apply if the material has been used or otherwise contaminated. It is the responsibility of the waste generator to determine the toxicity and physical properties of the material generated to determine the proper waste identification and disposal methods in compliance with applicable regulations.
If the material as supplied becomes a waste, follow all applicable regional, national and local laws.

SECTION 14. TRANSPORT INFORMATION

International Regulations

UNRTDG

UN number : UN 3082
Proper shipping name : ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S. (Triclopyr-2-butoxyethyl ester)

Class	:	9
Packing group	:	III
Labels	:	9

IATA-DGR

UN/ID No.	:	UN 3082
Proper shipping name	:	Environmentally hazardous substance, liquid, n.o.s. (Triclopyr-2-butoxyethyl ester)
Class	:	9
Packing group	:	III
Labels	:	Miscellaneous
Packing instruction (cargo aircraft)	:	964
Packing instruction (passenger aircraft)	:	964

IMDG-Code

UN number	:	UN 3082
Proper shipping name	:	ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S. (Triclopyr-2-butoxyethyl ester)
Class	:	9
Packing group	:	III
Labels	:	9
EmS Code	:	F-A, S-F
Marine pollutant	:	yes
Remarks	:	Stowage category A

Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code

Not applicable for product as supplied.

Domestic regulation

49 CFR

Not regulated as a dangerous good

Further information

Marine Pollutants assigned UN number 3077 and 3082 in single or combination packaging containing a net quantity per single or inner packaging of 5L or less for liquids or having a net mass per single or inner packaging of 5 KG or less for solids may be transported as non-dangerous goods as provided in section 2.10.2.7 of IMDG code, IATA Special provision A197, and ADR/RID special provision 375.

Special precautions for user

The transport classification(s) provided herein are for informational purposes only, and solely based upon the properties of the unpackaged material as it is described within this Safety Data Sheet. Transportation classifications may vary by mode of transportation, package sizes, and variations in regional or country regulations.

SECTION 15. REGULATORY INFORMATION

SARA 311/312 Hazards	:	Respiratory or skin sensitization Specific target organ toxicity (single or repeated exposure)

SARA 313 : The following components are subject to reporting levels established by SARA Title III, Section 313:

Triclopyr-2-butoxyethyl ester	64700-56-7	>= 50 - < 70 %
2-butoxyethanol	111-76-2	>= 0.1 - < 1 %
2-Butoxyethyl Chloroacetate	5330-17-6	>= 0.1 - < 1 %

US State Regulations

Pennsylvania Right To Know

Triclopyr-2-butoxyethyl ester 64700-56-7

The ingredients of this product are reported in the following inventories:

TSCA : Product contains substance(s) not listed on TSCA inventory.

TSCA list

No substances are subject to a Significant New Use Rule.

No substances are subject to TSCA 12(b) export notification requirements.

Federal Insecticide, Fungicide and Rodenticide Act

EPA Registration Number : 62719-527

This chemical is a pesticide product registered by the Environmental Protection Agency and is subject to certain labeling requirements under federal pesticide law. These requirements differ from the classification criteria and hazard information required for safety data sheets, and for workplace labels of non-pesticide chemicals. Following is the hazard information as required on the pesticide label:

CAUTION

Causes moderate eye irritation
Harmful if swallowed
Prolonged or frequently repeated skin contact may cause allergic reactions in some individuals.

SECTION 16. OTHER INFORMATION

Information Source and References
This SDS is prepared by Product Regulatory Services and Hazard Communications Groups from information supplied by internal references within our company.

Full text of other abbreviations

Dow IHG : Dow Industrial Hygiene Guideline
Dow IHG / TWA : Time Weighted Average (TWA):

AIIC - Australian Inventory of Industrial Chemicals; ASTM - American Society for the Testing of Materials; bw - Body weight; CERCLA - Comprehensive Environmental Response, Compensation, and Liability Act; CMR - Carcinogen, Mutagen or Reproductive Toxicant; DIN - Standard of the German Institute for Standardisation; DOT - Department of Transportation; DSL - Domestic Substances List (Canada); ECx - Concentration associated with x% response; EHS - Extremely Hazardous Substance; ELx - Loading rate associated with x% response; EmS - Emergency Schedule; ENCS - Existing and New Chemical Substances (Japan); ErCx - Concentration associated with x% growth rate response; ERG - Emergency Response Guide; GHS - Globally Harmonized System; GLP - Good Laboratory Practice; HMIS - Hazardous Materials Identification System; IARC - International Agency for Research on Cancer; IATA - International Air Transport Association; IBC - International Code for the Construction and Equipment of Ships carrying Dangerous Chemicals in Bulk; IC50 - Half maximal inhibitory concentration; ICAO - International Civil Aviation Organization; IECSC - Inventory of Existing Chemical Substances in China; IMDG - International Maritime Dangerous Goods; IMO - International Maritime Organization; ISHL - Industrial Safety and Health Law (Japan); ISO - International Organisation for Standardization; KECI - Korea Existing Chemicals Inventory; LC50 - Lethal Concentration to 50 % of a test population; LD50 - Lethal Dose to 50% of a test population (Median Lethal Dose); MARPOL - International Convention for the Prevention of Pollution from Ships; MSHA - Mine Safety and Health Administration; n.o.s. - Not Otherwise Specified; NFPA - National Fire Protection Association; NO(A)EC - No Observed (Adverse) Effect Concentration; NO(A)EL - No Observed (Adverse) Effect Level; NOELR - No Observable Effect Loading Rate; NTP - National Toxicology Program; NZIoC - New Zealand Inventory of Chemicals; OECD - Organization for Economic Co-operation and Development; OPPTS - Office of Chemical Safety and Pollution Prevention; PBT - Persistent, Bioaccumulative and Toxic substance; PICCS - Philippines Inventory of Chemicals and Chemical Substances; (Q)SAR - (Quantitative) Structure Activity Relationship; RCRA - Resource Conservation and Recovery Act; REACH - Regulation (EC) No 1907/2006 of the European Parliament and of the Council concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals; RQ - Reportable Quantity; SADT - Self-Accelerating Decomposition Temperature; SARA - Superfund Amendments and Reauthorization Act; SDS - Safety Data Sheet; TCSI - Taiwan Chemical Substance Inventory; TSCA - Toxic Substances Control Act (United States); UN - United Nations; UNRTDG - United Nations Recommendations on the Transport of Dangerous Goods; vPvB - Very Persistent and Very Bioaccumulative

Revision Date : 03/31/2022

Product code: GF-1529

The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text.

US / EN

Cambistat®

Trimtect is a foliar-applied shrub growth regulator that will reduce trimming and other maintenance costs. Trimtect extends trimming cycles and increases pruning efficiency.

Active Ingredient:	By Wt
Paclobutrazol: (R*, R*)-(±)-ß-[(4-chlorophenyl) Methyl]-ą-(1,1-dimethylethyl)-1H-1,2,4-triazole-1-ethanol	22.3%
Other Ingredients:	77.7%
Total:	**100%**

NET CONTENTS: ½ gallon (1.89 L), 1 gallon (3.78 L), 5 gallons (18.9 L), 2L (67.6 fl oz), 2.5 gallons (9.5 L)

Contains 2 lbs. active ingredient per gallon

KEEP OUT OF REACH OF CHILDREN

CAUTION

Si usted no entiende la etiqueta, busque a alguien para que se la explique a usted en detalle. (If you do not understand the label, find someone to explain it to you in detail.)

See Side/Back Panel for Additional Precautionary Statements, First Aid and Directions for Use

EPA Reg. No. 74779-3 **EPA Est. No.** 63416-MN-001

Distributed for:

Rainbow Treecare™
Scientific Advancements

Rainbow Treecare Scientific Advancements
11571 K-Tel Dr.
Minnetonka, MN 55343
1-877-ARBORIST
1-877-272-6747
www.treecarescience.com

FIRST AID	
IF INHALED	• Move person to fresh air. • If person is not breathing, call 911 or ambulance, then give artificial respiration, preferably mouth-to-mouth, if possible. • Call a poison control center or doctor for further treatment advice.
IF SWALLOWED:	• Call a poison control center or doctor immediately for treatment advice. • Have person sip a glass of water if able to swallow. • Do not induce vomiting unless told to do so by a poison control center or doctor. • Do not give anything by mouth to an unconscious person.
IF ON SKIN OR CLOTHING	• Take off contaminated clothing. • Rinse skin immediately with plenty of water for 15-20 minutes. • Call a poison control center or doctor for treatment advice.
IF IN EYES:	•Hold eye open and rinse slowly and gently with water for 15-20 minutes. • Remove contact lenses, if present, after the first 5 minutes, then continue rinsing eye. • Call a poison control center or doctor for treatment advice.
Have the product container or label with you when calling a poison control center or doctor or going for treatment.	
HOT LINE NUMBER For 24-Hour Medical Emergency Assistance (Human or Animal), or Chemical Emergency Assistance (Spill, Leak, or Accident). Call CHEMTREC at **1-800-424-9300.**	

PRECAUTIONARY STATEMENTS

HAZARDS TO HUMANS AND DOMESTIC ANIMALS

CAUTION: Harmful if absorbed through skin. Harmful if inhaled. Harmful if swallowed. Avoid contact with skin, eyes, or clothing. Wash thoroughly with soap and water after handling and before eating, drinking, chewing gum, using tobacco, or using the toilet. Wear long sleeved shirt, long pants, socks, shoes and gloves. Remove and wash contaminated clothing before reuse. Avoid breathing spray mist.

Personal Protective Equipment (PPE)
Some materials that are chemical-resistant to this product are listed below. If you want more options, follow the instructions for category F on an EPA chemical resistance category selection chart.

Applicators and other handlers must wear:
- Long-sleeved shirt and long pants
- Chemical-resistant gloves made of any water proof material
- Shoes plus socks.

Applicators and other handlers are also recommended to wear protective eyewear.

Follow manufacturer's instructions for cleaning/maintaining PPE. If no such instructions for washables, use detergent and hot water. Keep and wash PPE separately from other laundry.

USER SAFETY RECOMMENDATIONS

Users should:

- Wash hands before eating, drinking, chewing gum, using tobacco or using the toilet.
- Remove clothing immediately if pesticide gets inside. Then wash thoroughly and put on clean clothing.
- Remove PPE immediately after handling this product. Wash the outside of gloves before removing. As soon as possible, wash thoroughly and change into clean clothing.

ENVIRONMENTAL HAZARDS

Do not apply directly to water, to areas where surface water is present or to intertidal areas below the mean high water mark. Do not contaminate water when cleaning equipment or disposing of equipment wash water.

PHYSICAL OR CHEMICAL HAZARDS

Do not use or store near heat or open flame.

DIRECTIONS FOR USE

It is a violation of Federal law to use this product in a manner inconsistent with its labeling.

FAILURE TO FOLLOW THE USE DIRECTIONS AND PRECAUTIONS ON THIS LABEL MAY RESULT IN PLANT INJURY OR LESS THAN OPTIMAL GROWTH REDUCTION.

Do not apply this product in a way that will contact workers or other persons, either directly or through drift. Only protected handlers may be in the area during application. For any requirements specific to your State or Tribe, consult the agency responsible for pesticide regulation.

General Information

Cambistat™ is a plant growth regulator that slows the vegetative growth of plants by inhibiting gibberellin biosynthesis. Cambistat™ is designed to gently and predictably slow the growth of trees. A single application provides a long lasting reduction of vegetative growth, effectively extending the trimming cycle of trees and reducing the amount of woody growth that must be removed. In addition, use of Cambistat™ may cause other plant growth effects that are beneficial for trees such as increased root density, improved drought and heat resistance, and higher tolerance to insects and diseases. Cambistat will also benefit trees that are too large for their growing site and increase the longevity of trees growing in stressful environments. Cambistat™ may be applied by soil injection or basal soil drench.

Cambistat™ may be used on utility rights-of-way, residential areas, urban areas, and other non-crop areas.

Indications of Tree Response:

Cambistat™ is readily absorbed by plant roots and is translocated to the actively growing points. Initially, an intense greening of the foliage may occur in response to Cambistat™ treatment. Long-term effects include: shortened internodes and smaller, thicker leaves. Visible results may be seen in as little as 2 months but measurable growth reduction may take as long as a year to occur.

General Use Precautions

- Apply at recommended rates and follow safety precautions.
- Non-fruit or nut bearing trees that are not specified on this label may be treated if all other label directions are followed.
- The degree and duration of Cambistat™ applications can be affected by local soil and environmental conditions. Carefully read and follow label instructions to ensure effectiveness.
- Retreat every 3 years or wait until the effects from the previous application subside.
- Heavily compacted soils around trees may need to be vertical mulched, aerated or receive other remedial soil compaction treatments for Cambistat™ to effectively promote root growth.
- Localized stunting or injury of turfgrass or other non-target plants immediately adjacent to the treatment site may occur if Cambistat flows off of the application site.
- Avoid Cambistat™ basal drench applications on inclines and other areas where treated soil is likely to be washed away from the base of the tree by rainfall or irrigation.
- Shrubs and/or herbaceous ornamentals next to treated trees may be affected if their roots extend into the treatment zone.
- Do not treat sugar maple trees that will be tapped for sugar within one year.
- Do not treat fruit or nut trees that will be harvested within one year.
- Do not treat severely stressed trees or trees in rapid decline.
- Do not apply Cambistat™ through any irrigation system.

DOSING

It is important to apply the proper dose to the tree you are treating. Use the following steps to determine the required dose:

1) Correctly identify the tree species.
2) Measure tree diameter at breast height (DBH). (See determining DBH)
3) Locate the correct dosage rate category for your species (See tables 2 and 3).
4) Locate the amount of material to use based on the category and DBH of your species (See tables 4 and 5).
5) Determine if any rate reductions are necessary (See Dosage Reduction Considerations).

DETERMINING DBH

Single Stem: Measure the standard DBH of the tree at 4' 6" above the soil.

Multiple Individual Trees Growing in Close Proximity: For trees that have grown close together, measure the DBH of each stem and treat each tree individually. You may need to make rate reductions due to the overlapping canopies (See Dosage Reduction Considerations). Also, because of close proximity of trees, it may be necessary to apply Cambistat to outer perimeter of clumped trees.

Multi-stem Split Below DBH: For a tree that has multiple stems splitting below DBH, measure the tree at the narrowest point between the root flare and the split.

Stem Clusters: For trees that are grown too close together to be treated as individual trees, measure the DBH of each stem and add the measurements together. You may need to make rate reductions due to overlapping canopies (see Dosage Reduction Considerations). Also, because of close proximity of trees, it may be necessary to apply Cambistat to outer perimeter of clumped trees.

Tree Splits at DBH: For a tree that splits into two or more stems at DBH, measure and add the diameter of the stems and measure the narrowest point below the split. Take the average of these values.

DOSAGE REDUCTION CONSIDERATIONS

Canopy Missing: Look at the canopy of the tree and compare it to a "normal" canopy for that trunk diameter. For example, if a tree is missing large branches from storm damage or utility line clearance pruning it is necessary to estimate the percentage of canopy missing and subtract this percentage from the dosage amount. i.e. subtract 30% from dosage if 30% is missing from the canopy.

Canopy Suppression: Trees growing in close proximity to other trees, multi-stemmed trees, and trees growing in clusters may have overlapping canopies. Your judgment is required to compare the canopies of these trees to the "normal" canopy for trees with similar trunk diameter. It may be necessary to reduce the dosage amount based on the percent of suppression and canopy overlap.

Stressed or Declining Trees: Dosage rates for trees that have lost canopy from construction damage, storm damage, insects, disease, girdling roots and/or other types of stress must be reduced to minimize the risk of over-regulation. A full dose of Cambistat applied to a tree with small, thin, or declining canopy may result in smaller leaves and a sparse canopy.

- Reduce the dosage rate on highly stressed trees by 25% or more
- Trees that show significant stress and are in rapid decline are NOT good candidates for treatment.
- For stressed trees, consider that additional canopy may decline before treatment response begins so you may need to reduce the dose by more than what is presently missing.

Trees with Confined or Compromised Root Systems: Trees in sidewalk boxes, above ground planters, and new transplants may absorb Cambistat from the treatment area in a higher proportion than a tree with a full root system. Reduce the dosage rate by 25% or more.

MIXING PROCEDURE

Dilute 1 part Cambistat with 11 parts water. To make a large Ready to use solution, combine 1 quart of Cambistat with 11 quarts of water to make 3 gallons of solution. See table 1 for additional examples. When mixing large amounts of Cambistat, mix only the amount that will be used within that day. Cambistat is best applied with equipment that has constant agitation.

Table 1: Examples of the volumes of Cambistat and Water needed to make Ready-to-Use solution.

Volume of Cambistat	Volume of Water	Makes
1 qt	11 quarters	3 gallons
1 gallon	11 gallons	12 gallons
4 gallons	44 gallons	48 gallons

If applying mixture to compacted soils, high clay content soils, or other hard-to-wet soils, use a nonionic, organosilicone wetting agent (surfactant) to increase penetration of the soil. Mix approximately ½ ounce surfactant per 3 gallons or 1 pint surfactant per 100 gallons. Follow all label directions and precautions on the surfactant product label.

APPLICATION METHODS

Soil Injection

Inject the Ready to Use solution approximately 2-6 inches deep at 50-200 psi using the volumes in Table 5. Orient injection orifices to release the diluted product horizontally at the point of injection. Divide the required dose evenly among injection sites spaced as uniformly as possible around the base of the tree.

As an example, if you are using the HTI 2000 soil injector, the standard injection volume per site is 250 mls. You will divide the total dose a tree requires by 250 mls to determine the number of injection sites. If the number of injection sites is a fraction, for example, you have a 12 inch tree in the B category. The total dose for the tree is 1200 ml of diluted solution. Dividing 1200 ml by 250 mls/injection site = 4.8 injection sites. In this case, you will inject 4 locations with 250 mls each and a 5th injection sites with 200 mls (see table 6 for partial hole volumes). This will deliver the total dose of 1200 mls for the tree.

Position the injection sites to release the diluted Cambistat™ as close as possible to the point of contact between the soil and the tree beneath the soil so that the solution is readily absorbed by the tree (Figure 1). Locate injection sites next to buttress roots (Figure 1). For trees less than 6 inches DBH, use at least 4 injection sites evenly spaced around the tree.

Soil Basal Drench

Carefully dig a shallow furrow 2 – 6 inches deep around the base of the tree. If treating an individual tree, use the volumes determined in Table 4. If treating multiple trees, a Ready-To-Use solution can be created by using the volumes in Table 5. Carefully pour the Ready-To-Use solution evenly around the tree into the furrow using an applicator that provides a controlled flow. Make the application at the point of contact between the soil and the tree trunk (Figure 2). After the diluted product has been absorbed by the soil, refill the furrow with untreated soil. Note: If making an application on a slope, a soil dam may be created to contain the application within the furrow.

APPLICATION TIMING

For a more manicured look, apply Cambistat™ to trees 30 to 180 days before they are pruned. To allow some regrowth and a more natural look, apply Cambistat™ at the time of pruning.

Soil applications can be made throughout the year, except when the soil is frozen or saturated with water. Note: When applied to the soil, Cambistat™ is absorbed by tree roots and translocated to the growing points (sub-apical meristems) in response to evaporative water loss (transpiration). If applications are made after leaf drop, uptake of Cambistat™ will not occur until development of new leaves and resumption of transpiration.

For questions, contact Rainbow Treecare Scientific Advancements at 877-272-6747.

Table 2: LANDSCAPE APPLICATION Tree reference list and dosage rates.

Species	Category	Species	Category	Species	Category
Acacia	F	Hickory	E	Olive - Black	F
Ailanthus	D	Holly - American	E	Olive - European	E
Alder	F	Holly – Nellie Stevens	E	Olive - Russian	E
Anaqua	E	Holly - Yaupon	B	Orchid Tree - Hong Kong	C
Arborvitae	F	Horsechestnut	C	Osage Orange	F
Ash	F	Huisache	E	Palms	F
Aspen	F	Ironwood / Hornbeam	D	Paloverde	E
Australian Bottle	C	Jacaranda	F	Paulownia	E
Australian Pine	A	Japanese Tree Lilac	E	Pear - Ornamental	F
Bald Cypress	F	Juniper	F	Pecan	E
Banyan - Ficus	F	Katsura - Japanese	A	Persimmon	C
Basswood, American	A	Larch	F	Photinia	E
Baytree	E	Laurel	F	Pines*	F
Beech	E	Leyland Cypress	F	Plum - Ornamental	E
Birch	F	Linden	A	Poinciana	F
Bischofia	F	Locust - Black	F	Raintree - Golden	F
Black Gum / Tupelo	B	Locust - Honey	E	Redcedar - Eastern	F
Black Olive	F	Lombardy Poplar	F	Redwood	F
Bottlebrush	F	Lysiloma	F	Rosewood / Tipuana	C
Boxelder	A	Magnolia	F	Russian Olive	E
Buckeye	D	Mahogany	F	Saltcedar	F
Buttonwood	F	Maple - Amur	B	Sassafrass	E
California Pepper	C	Maple - Bigleaf	D	Sea Grape	E
Camphor	E	Maple - Japanese (caution)**	A	Soapberry	E
Catalpa	E	Maple - Norway	B	Spruce*	F
Cedar – Deodora	E	Maple - Red	B	Sugarberry /Southern Hackberry	F
Cedar - all others	F	Maple - Silver	D	Sumac - African	E
Cherry - Black	F	Maple - Sugar	B	Sycamore	F
Cherry - Ornamental	E	Melaleuca	F	Tabebuia	F
Cherry - Laurel	E	Mesquite	F	Tallow - Chinese	F
Chinaberry	E	Mimosa	E	Tallowwood	F
Chinese Pistache	E	Mountain Ash	B	Tamarisk	F
Cottonwood*	F	Mulberry	F	Tepeguaje	E
Crabapple	F	Oak – Black	E	Tulip / Yellow Poplar	F
Crape Myrtle	B	Oak – Blackjack	E	Tupelo / Black Gum	B
Cryptomeria	F	Oak – Bur	D	Walnut	E
Cypress	B	Oak - Laurel	F	Waxmyrtle - Pacific	F
Ebony - Texas	F	Oak - Live - (<10")	B	Willow	F
Elm - Cedar	B	Oak - Live (>10")	E	Xylosma	C
Elm - Chinese/Lacebark	A	Oak - Pin	E	Yellow Poplar / Tulip	F
Elm - Siberian	A	Oak - Post	E	Yew	F
Elm - (all others)	B	Oak - Red	E	Zelkova	B
Eucalyptus	F	Oak - Sand Shinnery	E		
Ficus	F	Oak - Scarlet	E		
Fir	F	Oak - Shumard	E		
Ginkgo	F	Oak - Valley	F		
Gumbo Limbo	F	Oak - Water	E		
Hackberry	F	Oak - White	D		
Hawthorn	C	Oak - Willow	E		

Call 877-ARBORIS(T) (877-272-6747) for questions.

*These species typically show less growth reduction compared to other species.
**Japanese Maple can be easily over regulated, field reports suggest ½ A rate may be more appropriate.

Table 3: RIGHTS-OF-WAY APPLICATIONS: Tree reference list and dosage rates.

Species	Category	Species	Category	Species	Category
Acacia	F	Hickory	E	Oak - Willow	E
Ailanthus	D	Holly - American	E	Oleander	C
Alder	F	Holly – Nellie Stevens	E	Olive - Black	F
Anaqua	E	Holly - Yaupon	B	Olive - European	E
Arborvitae	F	Hong Kong Orchid Tree	C	Olive - Russian	E
Ash	F	Horsechestnut	C	Orchid Tree - Hong Kong	C
Aspen	F	Huisache	E	Osage Orange	F
Australian Bottle	C	Ironwood / Hornbeam	D	Palms	F
Australian Pine	B	Jacaranda	F	Paloverde	E
Bald Cypress	F	Juniper	F	Paulownia	E
Banyan - Ficus	F	Katsura - Japanese	B	Pear - Ornamental	F
Basswood - American (>10")	B	Larch	F	Pecan	E
Basswood - American (<10")	A	Laurel	F	Persimmon	C
Baytree	E	Lilac - Japanese	E	Photinia	E
Beech	E	Linden (>10")	B	Pines*	F
Birch	F	Linden (<10")	A	Plum - Ornamental	E
Bischofia	F	Locust - Black	F	Poinciana	F
Black Gum / Tupelo	C	Locust - Honey	E	Poplar - Lombardy	F
Bottlebrush	F	Lombardy Poplar	F	Raintree - Golden	F
Boxelder	B	Lysiloma	F	Redbud	A
Buckeye	D	Magnolia	F	Redcedar - Eastern	F
Buttonwood	F	Mahogany	F	Redwood	F
California Pepper	C	Maple - Amur	B	Rosewood / Tipuana	C
Camphor	E	Maple - Bigleaf	E	Saltcedar	F
Catalpa	F	Maple - Japanese (caution)**	A	Sassafrass	E
Cedar – Deodora	E	Maple - Norway (>10")	C	Sea Grape	E
Cedar - all others	F	Maple - Norway (<10")	B	Soapberry	E
Cherry - Black	F	Maple - Red (>10")	C	Spruce*	F
Cherry - Laurel	E	Maple - Red (<10")	B	Sugarberry /Southern	F
Cherry - all others	E	Maple - Silver (>10")	D	Hackberry	E
Chinaberry	E	Maple - Silver (<10")	C	Sumac - African	A
Chinese Pistache	E	Maple - Sugar (>10")	C	Sweetgum (Eastern US)	B
Cottonwood*	F	Maple - Sugar (<10")	B	Sweetgum (Western US)	F
Crabapple	F	Melaleuca	F	Sycamore	F
Crape Myrtle	C	Mesquite	E	Tabebuia	F
Cryptomeria	F	Mimosa	E	Tallow - Chinese Tamarisk	F
Cypress - Leyland	F	Mountain Ash	B	Tepeguaje	E
Cypress - all others	B	Mulberry	F	Tulip / Yellow Poplar	F
Dogwood - CAUTION**	A	Oak – Black	E	Tupelo / Black Gum	C
Ebony - Texas	F	Oak – Blackjack	E	Walnut	E
Elm - Cedar	B	Oak – Bur	D	Waxmyrtle - Pacific	F
Elm - Chinese/Lacebark	A	Oak - Laurel	F	Willow	F
Elm - Siberian	A	Oak - Live (>10")	E	Xylosma	C
Elm -all others (>10")	C	Oak - Live (<10")	C	Yellow Poplar / Tulip	F
Elm -all others (<10")	B	Oak - Pin	E	Yew	F
Eucalyptus	F	Oak - Post	E	Zelkova	B
Ficus	F	Oak - Red	E		
Fir	F	Oak - Sand Shinnery	E		
Ginkgo	F	Oak - Scarlet	E		

Call 877-ARBORIS(T) (877-272-6747) for questions.

*These species typically show less growth reduction compared to other species.
**Dogwood and Japanese Maples are very sensitive to Cambistat and can be easily over regulated, field reports suggest 1/2 A rate may be more appropriate.

Table 4: Cambistat individual dose rate sheet. Mix the required volume of Cambistat with the required volume of water.

Dia. of Tree at Breast Height (DBH) (Inches)	Category A		Category B		Category C		Category D		Category E		Category F	
	ml Cambistat	ml water	ml Cambistat	ml water	ml Cambistat	ml water	ml Cambistat	ml water	ml Cambistat	ml water	ml Cambistat	ml water
4	17	185	23	250	42	460	46	510	50	550	67	735
5	21	230	28	310	52	575	57	630	63	690	83	920
6	25	275	33	370	63	690	69	760	75	825	100	1100
7	44	480	58	645	73	805	80	885	88	965	117	1285
8	50	550	67	735	83	920	92	1000	100	1100	133	1470
9	56	620	75	825	94	1030	103	1135	113	1240	150	1650
10	63	690	83	920	104	1145	115	1260	125	1375	167	1835
11	69	755	92	1010	115	1260	126	1390	138	1515	183	2020
12	75	825	100	1100	125	1375	138	1515	150	1650	200	2200
13	81	900	108	1190	135	1490	149	1640	163	1790	217	2385
14	88	965	117	1285	146	1605	160	1765	175	1925	233	2570
15	94	1030	125	1375	156	1720	172	1895	188	2065	250	2750
16	100	1100	133	1470	167	1835	183	2020	200	2200	267	2935
17	106	1170	142	1560	177	1950	195	2145	213	2340	283	3120
18	113	1240	150	1650	188	2065	206	2270	225	2475	300	3300
19	119	1310	158	1745	198	2177	218	2395	238	2615	317	3485
20	125	1375	167	1835	208	2290	229	2520	250	2750	333	3670
21	131	1445	175	1925	219	2410	241	2650	263	2890	350	3850
22	138	1515	183	2020	229	2520	252	2775	275	3025	367	4035
23	144	1580	192	2110	240	2635	264	2900	288	3165	383	4220
24	150	1650	200	2200	250	2750	275	3025	300	3300	400	4400
25	156	1720	208	2295	260	2865	287	3150	313	3440	417	4585
26	162	1787	217	2385	271	2980	298	3277	325	3575	433	4765
27	169	1855	225	2475	281	3095	310	3400	338	3715	450	4950
28	175	1925	233	2570	292	3210	321	3530	350	3850	467	5135
29	181	1995	242	2660	302	3320	332	3660	363	3990	483	5320
30	188	2060	250	2750	313	3440	344	3780	375	4125	500	5500
31	194	2130	258	2840	323	3550	355	3910	388	4265	517	5685
32	200	2200	267	2930	333	3670	367	4035	400	4400	533	5870
33	206	2270	275	3025	345	3780	378	4160	413	4540	550	6050
34	213	2340	283	3120	354	3900	390	4285	425	4675	567	6235
35	219	2405	292	3210	365	4010	401	4410	438	4810	583	6415
36	225	2475	300	3300	375	4125	413	4540	450	4950	600	6600
37	231	2545	308	3390	386	4240	424	4664	463	5090	617	6780
38	238	2610	317	3480	396	4355	435	4790	475	5225	633	6970
39	244	2680	325	3575	406	4470	447	4915	488	5365	650	7150
40	250	2750	333	3670	417	4585	458	5040	500	5500	667	7335
41	256	2820	342	3760	427	4700	470	5168	513	5640	683	7520
42	263	2890	350	3850	438	4815	481	5295	525	5775	700	7700
43	269	2955	358	3940	448	4930	493	5420	538	5915	717	7885
44	275	3025	367	4035	458	5040	504	5545	550	6050	733	8065
45	281	3095	375	4125	469	5155	516	5670	563	6190	750	8250
46	288	3160	383	4220	479	5270	527	5800	575	6325	767	8435
47	294	3230	392	4310	490	5385	539	5924	588	6463	783	8615

Table 5: Ready-To-Use (RTU) rate sheet and the number of soil injection holes needed (based on 250ml delivered per hole). Make a RTU solution by combining 11 parts of water with 1 part of Cambistat.

Dia. of Tree at Breast Height (DBH) (Inches)	Category A		Category B		Category C		Category D		Category E		Category F	
	mL of Ready-To-Use solution	# of injection sites	mL of Ready-To-Use solution	# of injection sites	mL of Ready-To-Use solution	# of injection sites	mL of Ready-To-Use solution	# of injection sites	mL of Ready-To-Use solution	# of injection sites	mL of Ready-To-Use solution	# of injection sites
4	202*	BD**	273*	BD**	500	BD**	550	BD**	600	BD**	800	3.2
5	251*	BD**	338*	BD**	625	BD**	688	BD**	750	3	1000	4
6	300*	BD**	403*	BD**	750	3	825	3.3	900	3.6	1200	4.8
7	525	BD**	700	BD**	875	3.5	963	3.9	1050	4.2	1400	5.6
8	600	BD**	800	3.2	1000	4	1100	4.4	1200	4.8	1600	6.4
9	675	BD**	900	3.6	1125	4.5	1238	5	1350	5.4	1800	7.2
10	750	3	1000	4	1250	5	1375	5.5	1500	6	2000	8
11	825	3.3	1100	4.4	1375	5.5	1513	6.1	1650	6.6	2200	8.8
12	900	3.6	1200	4.8	1500	6	1650	6.6	1800	7.2	2400	9.6
13	975	3.9	1300	5.2	1625	6.5	1788	7.2	1950	7.8	2600	10.4
14	1050	4.2	1400	5.6	1750	7	1925	7.7	2100	8.4	2800	11.2
15	1125	4.5	1500	6	1875	7.5	2063	8.3	2250	9	3000	12
16	1200	4.8	1600	6.4	2000	8	2200	8.8	2400	9.6	3200	12.8
17	1275	5.1	1700	6.8	2125	8.5	2338	9.4	2550	10.2	3400	13.6
18	1350	5.4	1800	7.2	2250	9	2475	9.9	2700	10.8	3600	14.4
19	1425	5.7	1900	7.6	2375	9.5	2613	10.5	2850	11.4	3800	15.2
20	1500	6	2000	8	2500	10	2750	11	3000	12	4000	16
21	1575	6.3	2100	8.4	2625	10.5	2888	11.6	3150	12.6	4200	16.8
22	1650	6.6	2200	8.8	2750	11	3025	12.1	3300	13.2	4400	17.6
23	1725	6.9	2300	9.2	2875	11.5	3163	12.7	3450	13.8	4600	18.4
24	1800	7.2	2400	9.6	3000	12	3300	13.2	3600	14.4	4800	19.2
25	1875	7.5	2500	10	3125	12.5	3438	13.8	3750	15	5000	20
26	1950	7.8	2600	10.4	3250	13	3575	14.3	3900	15.6	5200	20.8
27	2025	8.1	2700	10.8	3375	13.5	3713	14.9	4050	16.2	5400	21.6
28	2100	8.4	2800	11.2	3500	14.0	3850	15.4	4200	16.8	5600	22.4
29	2175	8.7	2900	11.6	3625	14.5	3988	16	4350	17.4	5800	23.2
30	2250	9	3000	12	3750	15	4125	16.5	4500	18	6000	24
31	2325	9.3	3100	12.4	3875	15.5	4263	17.1	4650	18.6	6200	24.8
32	2400	9.6	3200	12.8	4000	16	4400	17.6	4800	19.2	6400	25.6
33	2475	9.9	3300	13.2	4125	16.5	4538	18.2	4950	19.8	6600	26.4
34	2550	10.2	3400	13.6	4250	17	4675	18.7	5100	20.4	6800	27.2
35	2625	10.5	3500	14	4375	17.5	4813	19.3	5250	21	7000	28
36	2700	10.8	3600	14.4	4500	18	4950	19.8	5400	21.6	7200	28.8
37	2775	11.1	3700	14.8	4625	18.5	5088	20.4	5550	22.2	7400	29.6
38	2850	11.4	3800	15.2	4750	19	5225	20.9	5700	22.8	7600	30.4
39	2925	11.7	3900	156	4875	19.5	5363	21.5	5850	23.4	7800	31.2
40	3000	12	4000	16	5000	20	5500	22	6000	24	8000	32
41	3075	12.3	4100	16.4	5125	20.5	5638	22.6	6150	24.6	8200	32.8
42	3150	12.6	4200	16.8	5250	21	5775	23.1	6300	25.2	8400	33.6
43	3225	12.9	4300	17.2	5375	21.5	5913	23.7	6450	25.8	8600	34.4
44	3300	13.2	4400	17.6	5500	22	6050	24.2	6600	26.4	8800	35.2
45	3375	13.5	4500	18	5625	22.5	6188	24.8	6750	27	9000	36
46	3450	13.8	4600	18.4	5750	23	6325	25.3	6900	27.6	9200	36.8
47	3525	14.1	4700	18.8	5875	23.5	6463	25.9	7050	28.2	9400	37.6
48	3600	14.4	4800	19.2	6000	24	6600	26.4	7200	28.8	9600	38.4
49	3675	14.7	4900	19.6	6125	24.5	6738	27	7350	29.4	9800	39.2
50	3750	15	5000	20	6250	25	6875	27.5	7500	30	10000	40

*The dosage rate for this tree has been adjusted down due to sensitivity of small trees in this category.
**Use the basal drench application method to apply Cambistat to trees of this size in this category.

Table 6: Partial hole volumes for soil injection (based on 250 ml delivered per hole)

Partial hole	Volume
.1	25 ml
.2	50 ml
.3	75 ml
.4	100 ml
.5	125 ml
.6	150 ml
.7	175 ml
.8	200 ml
.9	225 ml

Figure 1. Placement of Cambistat™ as a soil-injected treatment.

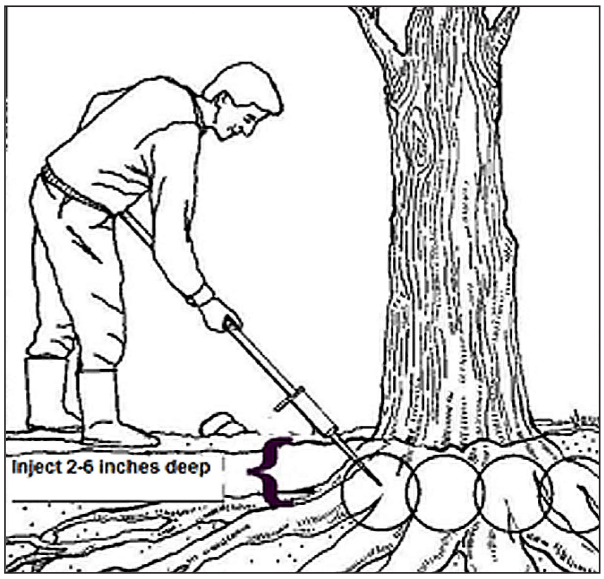
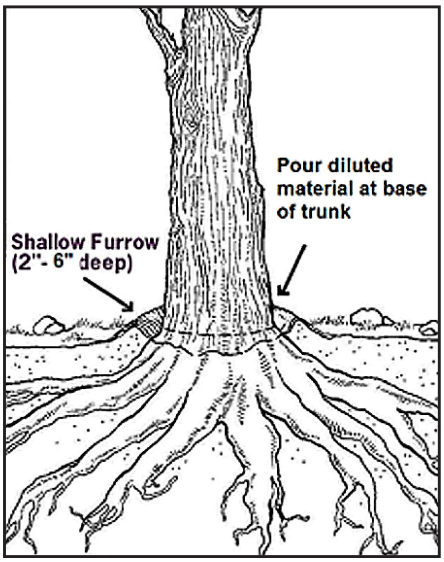


Figure 2. Placement of Cambistat™ as a basal drench.



STORAGE AND DISPOSAL

Do not contaminate water, food or feed by storage or disposal. Open dumping is prohibited. Do not reuse empty container.
Pesticide Storage: Keep container closed when not in use. Do not store near food or feed. Protect from freezing. In case of spill or leak on floor or paved surfaces, soak up with sand, earth, or synthetic absorbent. Remove to chemical waste area.
Pesticide Disposal: Pesticide wastes are toxic. Improper disposal of excess pesticide, spray mixture, or rinsate is a violation of Federal law. If these cannot be disposed of by use according to label instructions, contact your state pesticide or environmental control agency, or the hazardous waste representative at the nearest EPA regional office for guidance.
Container Disposal: Non-refillable container: Do not reuse or refill this container. Triple rinse or pressure rinse container (or equivalent) promptly after emptying. Offer for recycling, if available or puncture and dispose of in a sanitary landfill, or incineration, or if allowed by state and local authorities, by burning. If burned, stay out of smoke.

(non-refillable <5 gallons) Triple rinse as follows: Empty the remaining contents into application equipment or a mix tank and drain for 10 seconds after the flow begins to drip. Fill the container ¼ full with water and recap. Shake for 10 seconds. Pour rinsate into application equipment or a mix tank or store rinsate for later use or disposal. Drain for 10 seconds after the flow begins to drip. Repeat this procedure two more times.

(non-refillable >5 gallons): Triple rinse as follows: Empty the remaining contents into application equipment or mix tank. Fill the container ¼ full with water. Replace and tighten closures. Tip container on its side and roll it back and forth, ensuring at least one complete revolution, for 30 seconds. Stand the container on its end and tip it back and forth several times. Turn the container over onto its other end and tip it back and forth several times. Empty the rinsate into application equipment or a mix tank or store rinsate for later use or disposal. Repeat this procedure two more times.

Pressure rinse as follows: Empty the remaining contents into application equipment or a mix tank and continue to drain for 10 seconds after the flow begins to drip. Hold container upside down over application equipment or mix tank or collect rinsate for later use for disposal. Insert pressure rinsing nozzle in the side of the container, and rinse at about 40 PSI for at least 30 seconds. Drain for 10 seconds after the flow begins to drip.

CONDITIONS OF SALE AND LIMITATION OF WARRANTY AND LIABILITY

Notice: Read the entire Directions For Use and Conditions of Sale and Limitation of Warranty and Liability before buying or using this product. If the terms are not acceptable, return the product at once, unopened, and the purchase price will be refunded.

Follow the Directions For Use carefully. It is impossible to eliminate all risks inherently associated with the use of this product. Tree injury, ineffectiveness or other unintended consequences may result because of such factors as manner of use or application, weather or tree conditions, presence of other materials or other influencing factors in the use of the product, which are beyond the control of RAINBOW TREECARE SCIENTIFIC ADVANCEMENTS or seller. To the extent consistent with applicable law, all such risks shall be assumed by Buyer and User, and Buyer and User agree to hold RAINBOW TREECARE SCIENTIFIC ADVANCEMENTS and Seller harmless for any claims relating to such factors.

RAINBOW TREECARE SCIENTIFIC ADVANCEMENTS warrants that this product conforms to the chemical description on the label and is reasonably fit for the purposes stated in the Directions For Use, subject to the inherent risks referred to above, when used in accordance with directions under normal use conditions. This warranty does not extend to the use of the product contrary to label instructions, or under abnormal conditions or under conditions

not reasonably foreseeable to or beyond the control of Seller or RAINBOW TREECARE SCIENTIFIC ADVANCEMENTS, and Buyer and User assume the risk of any such use. RAINBOW TREECARE MAKES NO WARRANTIES OF MERCHANABILITY OR OF FITNESS FOR A PARTICULAR PURPOSE NOR ANY OTHER EXPRESS OR IMPLIED WARRANTY EXCEPT AS STATED ABOVE.

To the extent consistent with applicable law, RAINBOW TREECARE SCIENTIFIC ADVANCEMENTS or Seller shall not be liable for any incidental, consequential or special damages resulting from the use or handling of this product. **TO THE EXTENT CONSISTENT WITH APPLICABLE LAW, THE EXCLUSIVE REMEDY OF THE USER OR BUYER, AND THE EXCLUSIVE LIABILITY OF RAINBOW TREECARE SCIENTIFIC ADVANCEMENTS AND SELLER FOR ANY AND ALL CLAIMS, LOSSES, INJURIES OR DAMAGES (INCLUDING CLAIMS BASED ON BREACH OF WARRANTY, CONTRACT, NEGLIGENCE, TORT, STRICT LIABLITY OR OTHERWISE) RESULTING FROM THE USE OR HANDLING OF THIS PRODUCT, SHALL BE THE RETURN OF THE PURCHASE PRICE OF THE PRODUCT OR, AT THE ELECTION OF RAINBOW TREECARE OR SELLER, THE REPLACEMENT OF THE PRODUCT.**

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Patent Pending
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Rainbow Treecare™

OPTIONAL MARKETING CLAIMS

Committed to advancing the science of tree care

Reduced [utility] line clearance costs [up to 60%]

Improved customer satisfaction through reduced trimming and healthier trees

Up to 40 to 90% reduction in regrowth [for 3 years]

Up to 90% growth reduction* [*on selected species]

One application lasts up to 3 years

Enhances tree roots by promoting fine root density

Promotes fine root density

Improves drought resistance

Improves heat resistance

Extends trim cycle time

Extends trim cycle
SCIENTIFIC ADVANCEMENTS

Ideal for use on fast-growing trees to reduce growth

Reduces growth of trim cycle-buster trees

Reduces hot-spotting costs

Reduces [utility] line interference outages and increases reliability.

Ideal for application on difficult to access trees [such as in backyards]

Helps trees [by increasing fine root density] [by reducing drought stress] [by slowing trunk and shoot growth of trees in confined areas]

One application lasts up to 3 years [- lasts up to 10 years on some species]

Ideal for use on critical [utility] feeder lines.

Ideal for zone management

Protects investment in boulevard and parking lot trees

Can increase tree longevity in stressful environments

Specially formulated for soil application around trees.

Tree Growth Regulator

[Plant] Growth regulator for trees

Growth Control Uses for Cambistat

- Short Clearances
- Difficult to access trees – backyards
- Zone 1 trees – immediately out of the substation
- Cycle busters – problem trees
- Critical feeder lines – hospitals, industry
- Complete circuits
- Complete System
- Municipal vista management trees
- Favorite trees – parks, schools, government
- Farmstead trees
- Concerned / difficult customers with right-of-way trees

SECTION 1: Product and Company Identification

1.1. Product identifier

Trade name : CAMBISTAT
Product code : EPA Reg. No. 74779-3

1.2. Relevant identified uses of the substance or mixture and uses advised against

1.2.1. Relevant identified uses

Use of the substance/preparation : Plant Growth Regulator

1.2.2. Uses advised against

No data available

1.3. Details of the supplier of the safety data sheet

Rainbow Treecare Scientific Advancements
11571 K-Tel Drive
Minnetonka, MN 55343
Phone: 1-(877) 272-6747 (toll free)
www.treecarescience.com

1.4. Emergency telephone number

Emergency number : (800)-424-9300 (CHEMTREC)

SECTION 2: Hazards identification

Hazard Symbols :

Signal word : WARNING
Hazard statements (health) : Harmful if swallowed, absorbed through the skin or inhaled.
Precautionary statements : Avoid contact with skin, eyes, or clothing.
Avoid breathing spray mist.
Hazard statements (environmental) : Do not apply directly to water, to areas where surface water is present or to intertidal areas below the mean high water mark. Do not contaminate water when cleaning equipment or disposing of equipment wash water or rinsate.
Hazard statements (physical/chemical) : Do not store near heat or open flame.

SECTION 3: Composition/information on ingredients

Chemical Name	CAS Number	%/wt.
Paclobutrazol	76738-62-0	22.3

Ingredients not precisely identified are proprietary or non-hazardous.

SECTION 4: First aid measures

4.1. Description of first aid measures

IF SWALLOWED : Call physician or Poison Control Center immediately for treatment advice. Have the person sip a glass of water if able to swallow. Do not induce vomiting unless told to do so by a Poison Control Center or a physician. Do not give anything by mouth to an unconscious person.

IF INHALED : Move to fresh air. If person is not breathing, call 911 or an ambulance, then give artificial respiration, preferably mouth-to-mouth, if possible. Call a poison control center or doctor for treatment advice.

IF ON SKIN OR CLOTHING : Take off contaminated clothing. Rinse skin immediately with plenty of water for 15-20 minutes. Call a poison control center or physician for treatment advice.

IF IN EYES : Hold eye open and rinse slowly and gently with water for 15-20 minutes. Remove contact lenses, if present, after the first 5 minutes, then continue rinsing eye. Call poison control center or doctor for treatment advice.

Have the product container or label with you when calling a poison control center or doctor or going for treatment. You may also contact the National Poison Control Hotline at 1-800-222-1222 for emergency medical treatment information 24 hours a day, seven days a week.

SECTION 5: Firefighting measures

5.1. Extinguishing media

Suitable extinguishing media : Dry chemical, foam, or CO_2 extinguishing media.

5.2. Special hazards arising from the substance or mixture

Specific Hazards : This product will burn with flames if ignited. This product has a minimum ignition energy between 100 and 300 millijoules. Mechanical sparks, open flames, and certain hot surfaces can serve as ignition sources for this material. Eliminate the presence of mechanical sparks and other ignition sources where dust clouds of this material could form. During a fire, irritating and possibly toxic gases may be generated by thermal decomposition or combustion.

5.3. Advice for firefighters

Protective Equipment : Wear full protective clothing and self-contained breathing apparatus with full facepiece.

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

Personal precautions: Refer to **Section 8 "Exposure controls/personal protection"**

6.2. Environmental precautions

This material should be prevented from contaminating soil or from entering sewage and drainage systems and bodies of water.

6.3. Methods and materials for cleaning up

Control the spill at its source. Contain the spill to prevent from spreading or contaminating soil, or from entering sewage and drainage systems or any body of water. Clean up spills immediately, observing precautions outlined in section 8. Cover entire spill with absorbing material and place into compatible disposal container. Scrub area

with hard water detergent (e.g. commercial products such as Tide, Joy, Spic and Span). Pick up wash liquid with additional absorbent and place into compatible storage container. Once all material is cleaned up and placed in a disposal container, seal the container and arrange for disposition. This material should be prevented from contaminating soil or from entering sewage and drainage systems and bodies of water.

SECTION 7: Handling and storage

KEEP OUT OF REACH OF CHILDREN!

7.1. Precautions for safe handling

Precautions for safe handling : Use in a well-ventilated area.

7.2. Conditions for safe storage, including any incompatibilities

Storage conditions : Do not contaminate water, food or feed by storage or disposal. Keep container closed when not in use. Do not store near food or feed. Protect from freezing. In case of spill or leak on floor or paved surfaces, soak up with sand, earth, or synthetic absorbent. Remove to chemical waste area.

SECTION 8: Exposure controls/personal protection

8.1. Personal protective equipment

Exposure Limit:
OSHA PEL: Not Listed
ACIGH TLV: Not Listed

Individual protection measures:

Wash thoroughly with soap and water after handling and before eating, drinking, chewing gum, using tobacco, or using the toilet. Wear long sleeved shirt and long pants, socks, shoes, and gloves. Remove and wash contaminated clothing before reuse.

Do not apply this product in a way that will contact workers or other persons, either directly or through drift. Only protected handlers may be in the area during application. For any requirements specific to your State or Tribe, consult the state or tribal agency responsible for pesticide regulation.

EYE PROTECTION – Use chemical splash goggles. Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower.

CLOTHING – Wear chemical-resistant (such as nitrile or butyl) gloves, coveralls, socks and chemical-resistant footwear. For overhead exposure, wear chemical-resistant headgear.
GLOVES – Wear chemical-resistant gloves, such as barrier laminate, butyl rubber, nitrile rubber, neoprene rubber, natural rubber, polyvinyl chloride (PVC), viton.

RESPIRATOR – A respirator is not normally required when handling this substance. Use effective engineering controls to comply with the occupational exposure limits.

Discard clothing and other absorbent materials that have been heavily contaminated with this product. Do not reuse them. Follow manufacturer's instructions for cleaning and maintaining PPE. If no such instructions for washables, use detergent and hot water. Keep and wash PPE separately from other laundry. Use a self-contained breathing apparatus in cases of emergency spills, when exposure levels are unknown, or under circumstances where air-purifying respirators may not provide adequate protection. In case of emergency spills, use a NIOSH approved respirator with any N, R, P or HE filter.

8.2. Exposure controls

Engineering Controls:
No applicable information available.

SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

Appearance	:	Off-white/beige liquid
Odor	:	No data available
Odor threshold	:	No data available
pH	:	No data available
Melting/freezing point	:	No data available
Boiling point	:	Approx. 212 °F
Flash point	:	Does not flash
Flammability	:	No data available
Explosive properties	:	No data available
Vapor pressure	:	Paclobutrazol: 7.5 x 10(-9) mmHg @ 68 °F (20 °C)
Vapor density	:	No data available
Relative density	:	1.09 g/ml
Solubility(ies)	:	Water: 26 mb/l @ 20 °C Fat: No applicable information available
Partition coefficient	:	No data available
Auto-ignition temperature	:	No data available
Decomposition temperature	:	No data available
Viscosity	:	No data available

9.2. Other information

No additional information available

SECTION 10: Stability and reactivity

10.1. Reactivity

No applicable information available

10.2. Chemical stability

Stable under standard conditions.

10.3. Possibility of hazardous reactions

No applicable information available

10.4. Conditions to avoid

None known

10.5. Incompatible materials

Oxidizing agents (e.g. chlorates, nitrates)

10.6. Hazardous decomposition products

Can decompose at high temperatures forming toxic gas.

SECTION 11: Toxicological information

11.1. Information on toxicological effects

Based on an evaluation of the ingredients and/or similar products.

ACUTE TOXICITY		
Oral	LD50 rat	>2000 mg/kg body weight
Inhalation	LC50 rat	>250 mg/M^3 air
Dermal	LD50 rat	>2000 mg/kg body weight
Irritation		
Eye Contact	Rabbit	Slightly irritating
Skin Contact	Rabbit	Non-irritating
Respiratory tract	-	No applicable information available
Sensitization	unknown	Not a sensitizer

Carcinogenicity : No evidence of carcinogenicity in 2-year rodent studies.

Mutagenicity : No applicable information available.

Reproductive Toxicity : Dose-related increase in minor skeletal defects and evidence of fetotoxicity in rat studies (urogenital defects). No adverse effects seen on reproductive parameters or reproductive organs in a 2-generational rat study. Liver effects were noted at the highest dose level in the FO females and male and female offspring (active ingredient).

Chronic Toxicity : Evidence of liver toxicity in repeat dose rodent studies at high dose levels. (1250 ppm, 90 day and 2 year tests). No effects noted in rabbit studies.

No adverse health effects are expected in humans at airborne levels below the occupational exposure limit.

NTP/IARC/OSHA listing(s) : No applicable information available.

SETION 12: Ecological information

12.1. Toxicity

ECOTOXICITY:

Fish: LC_{50} : 23.6 ppm

Daphnia: EC_{50} : 33.2 ppm

Bird (8-day dietary – Bobwhite Quail): LC_{50} : >20,000 ppm

Bees: LC_{50} : >50 ug/bee

12.2. Persistence and degradability

No applicable information available.

12.3. Bioaccumulative potential

Soil DT50 0.5-1.0 y in general; in calcareous clay loam (pH 8.8, 14% o.m.), DT50<42 d.; in course sandy loam (pH 6.8, 4% o.m.), DT50>140 d. Stable in water. Mixes in water (after 24 h).

12.4. Mobility in soil

No applicable information available.

SECTION 13: Disposal considerations

13.1. Waste treatment methods

Pesticide disposal:

Do not contaminate water, food or feed by storage or disposal. Open dumping is prohibited. Do not reuse empty container.

Pesticide wastes are toxic. Improper disposal of excess pesticide, spray mixture, or rinsate is a violation of Federal law. If these cannot be disposed of by use according to label instructions, contact your state pesticide or environmental control agency, or the hazardous waste representative at the nearest EPA regional office for guidance.

Container disposal:

Less than or equal to 5 gallons: Non-refillable container. Do not reuse this container to hold materials other than pesticides or dilute pesticides (rinsate). After emptying and cleaning, it may be allowable to temporarily hold rinsate or other pesticide-related materials in the container. Contact your state regulatory agency to determine allowable practices in your state. Triple rinse container (or equivalent) promptly after emptying. Triple rinse as follows: Empty the remaining contents into the application equipment or a mix tank and drain for 10 seconds after the flow begins to drip. Fill the container ¼ full with water and recap. Shake for 10 seconds. Pour rinsate into application equipment or a mix tank or store rinsate for later use or disposal. Drain for 10 seconds after the flow begins to drip. Repeat this procedure two more times. Then offer for recycling, if available, or puncture and dispose of in a sanitary landfill, or by incineration. Do not burn unless allowed by state and local ordinances.

Over 5 gallons: Non-refillable container. Do not reuse this container to hold materials other than pesticides or dilute pesticides (rinsate). After emptying and cleaning, it may be allowable to temporarily hold rinsate or other pesticide-related materials in the container. Contact your state regulatory agency to determine allowable practices in your state. Triple rinse container (or equivalent) promptly after emptying. Triple rinse as follows: Empty the remaining contents into the application equipment or a mix tank. Fill the container ¼ full with water. Replace and tighten closures. Tip container on its side and roll it back and forth, ensuring at least one complete revolution, for 30 seconds. Stand the container on its end and tip it back and forth several times. Empty the rinsate into application equipment or a mix tank or store rinsate for later use or disposal. Repeat this procedure two more times. Then offer for recycling, if available, or puncture and dispose of in a sanitary landfill, or by incineration. Do not burn unless allowed by state and local ordinances.

SECTION 14: Transport information

UN number	: Not applicable
Proper shipping name	: Plant growth inhibitor, modified or regulator
Class	: Not applicable
Packaging group	: Not applicable
NMFC number/class	: 101685/65
Marine pollutant	: Not applicable

SECTION 15: Regulatory information

This chemical is a pesticide product registered by the Environmental Protection Agency and is subject to certain labeling requirements under federal pesticide law. These requirements differ from the classification criteria and hazard information required for safety data sheets, and for workplace labels of non-pesticide chemicals. Following is the hazard information as required on the pesticide label.

EPA signal word	:	CAUTION
Precautionary statements	:	**HAZARDS TO HUMANS AND DOMESTIC ANIMALS** **CAUTION.** Harmful if swallowed, absorbed through the skin, or inhaled. Avoid contact with skin, eyes, or clothing. Avoid breathing spray mist. Wash thoroughly with soap and water after handling and before eating, drinking, chewing gum, using tobacco, or using the toilet. Wear long sleeved shirt and long pants, socks, shoes, and gloves. Remove and wash contaminated clothing before reuse
Pictograms/symbols	:	None

SECTION 16: Other information

MSDS US

***Disclaimer**: The information provided by Rainbow Treecare Scientific Advancements. contained herein is given in good faith and correct to the best of our knowledge. However, the information given is designed only as guidance for safe handling, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification.*

REVISED DATE: May 2015
REVISED FOR: GHS Compliance

APPENDIX 9

Herbicide Fact Sheets

THE COMMONWEALTH OF MASSACHUSETTS
EXECUTIVE OFFICE OF ENERGY AND ENVIRONMENTAL AFFAIRS
Department of Agricultural Resources
251 Causeway Street, Suite 500, Boston, MA 02114
617-626-1700 fax: 617-626-1850 www.mass.gov/agr

FOSAMINE AMMONIUM

Common Trade Name: Krenite, Krenite UT

Chemical Name: Ammonium ethyl carbamoylphosphate

CAS No.: 25954—13—6

GENERAL INFORMATION

Fosamine ammonium is usually applied to plants in the late summer and early fall. It is systemically absorbed by buds, stems and foliage. In most plants, effects of herbicide treatment are not evident until the following spring when buds fail to develop, or develop into miniature spindly leaves that do not provide adequate photosynthesis. The plant consequently dies. Although it is translocated within plants, effective treatment requires the complete coverage of all parts of woody plants. In some species of non-deciduous plants, such as pines and bindweed, leaves may turn brown immediately after application.

ENVIRONMENTAL FATE

Mobility

Fosamine ammonium is a low mobility herbicide and is not readily leached from soil. Soil adsorption coefficients (Kd) for Fosamine ammonium are reported as ranging from 0.22 (low organic sandy barns) to 350 (silt barns) (103). The organic matter adsorption coefficients are more variable and range from 20 to 62, with one adsorption coefficient reported at 7400 (103). There does not appear to be a good correlation between the soil adsorption coefficents and organic matter, clay or silt content of the soil.

In a study using soil thin layer plates to assess mobility, the Rf values (ratio of the compound mobility versus the leading edge of the water movement) for Fosamine ammonium ranged from 0.92 to 0.98 on the four soils tested (103). These Rf values indicate a high mobility pesticide, in contrast to the soil adsorption coefficients and leaching studies which indicate low mobility. This information may reflect the solubility of fosamine ammonium and not its mobility characteristics.

Fosamine arnmonium is strongly adsorbed to soil particles and it is not carried away in precipitation, in spite of its high water solubility. In a laboratory study using inclined soil flats (Fallingston sandy loam), Fosamine ammonium was applied at the rate of 15 lbs a.i/acre followed by simulated rainfall. The Fosamine ammonium remained near the surface of the soil and in the upper part of the flat, thus indicating no appreciable downward or lateral mobility (105). Field studies conducted in Florida, Delaware and Illinois have confirmed the laboratory results and indicate very little or no downward movement in soil of the herbicide or its degradation products (15, 104, 105).

Field studies indicate that Fosamine ammonium has low vertical mobility but, soils with higher adsorption capacities will tend to retard movement more than soil with lower adsorption capacities (15). However, Fosamine ammonium may move with the soil during erosion (14). Due to strong adsorption of fosamine ammonium to soil particles, there is little tendency for ground water contamination or for surface waters to become contaminated

without direct application of the material (14, 15).

In the field studies, the Delaware soil (Keyport silt loam) was the most representative soil of Massachusetts conditions. However, the Fallsington sandy loam which was used in the greenhouse studies represents a close approximation to Massachusetts soils. In these studies Fosamine ammonium exhibited slight tendency to leach in both those soils. Consequently, it is expected that fosamine ammonium will exhibit slight leaching in Massachusetts soils.

Persistence

The major route of Fosamine ammonium degradation is metabolism by soil microorganisms. Fosamine ammonium is stable to degradation by hydrolysis at pH values 5, 7, and 9; it is also stable to photodegradation (10, 14, 101, 102).

Fosamine ammonium is not considered a persistent compound in soils. Under field conditions in Florida, Delaware and Illinois, the half-life of Fosamine ammonium in soils was approximately one week following the application of 10 lbs/acre (104).

In the field, the metabolite carbamoylphosphonic acid (CPA) was found several days after initial soil treatment. All Fosamine ammonium and CPA had disappeared completely by 3 to 6 months (14, 15).

Greenhouse soil studies indicate a half-life of about 10 days, which is in close agreement with the field study half—life (15,104). In the field, Fosamine ammonium was metabolized to CPA more quickly in fine sand than in two silt barns (14, 104).

There is little persistence information in the literature for Fosamine ammonium and the only reported field degradation rates are from one study. This might be a cause for concern were it not for the close agreement in soil half-lives reported, not withstanding the varied location and soils used in the field stu-dies. Moreover, the greenhouse degradation study was also in close agreement with the reported field half-life.

It is assumed that the half-lives reported in the previous study have been obtained in spring to summer conditions, since they were not stated. The degradation of fosamine ammonium was investigated for a one year period in the previous study but, because of the short half-life complete degradation had occurred before the winter. It is expected that fosamine ammonium will be applied in summer or fall only since it must be applied to full foliage for control. Consequently, the lack of winter degradation rates is not a major concern.

With most herbicides soil characteristics and local climatic factors have a pronounced effect on soil half—life. This study suggest that degradation of Fosamine ammonium by soil microorganisms is not influenced by soil characteristics or local climate to any appreciable extent.

Due to the similar persistence of Fosamine ammonium in all locations and soils there is no most representative location. In this case, all sites represent expected persistence. Therefore, the half-life of Fosamine ammonium under Massachusetts condition is expected to be approximately one week.

TOXICITY REVIEW

Acute (Mammalian)

The oral LD5Os have been determined for both the formulated product and the formulated product plus surfactant (41.1 to 42% active ingredient (ai) in both cases). The LD5Os in the male rat were 24,400 mg (ai) (formulated product)/kg and 7,295 mg (ai) (formulated product with surfactant)/kg. Female rats had an LD50 of 5,000 (ai) mg (formulated product with surfactant)/kg. The formulated product has an LD50 of 7,380 mg(ai)/kg (formulated product) in male guinea pigs (107).

Fosamine ammonium was tested in an acute dermal study. 10 ml of the formulated product at a dose of 1,683 mg(ai)/kg resulted in no mortalities and no clinical signs of toxicity (107). The formulation plus surfactant was tested in rabbits and was not a primary eye irritant. There was mild transient erythema in tested skin. No sensitization was found in Guinea pigs (107).

The formulation plus surfactant (0.1 ml) produced transient mild corneal opacity and transient conjunctual irritation. The formulation without the surfactant was not an irritant (107).

Metabolism

The metabolism of Fosamine ammonium in the rat is rapid with 86% in feces and 11% in urine after 48 hrs (103,15). Compounds identified in the feces included 14C radiolabelled fosamine ammonium (86%) and 14C Carbamoylphosphonic Acid (CPA) diammonium salt (14%). The compnunds identified in the urine were also fosamine ammonium and CPA (103).

Subchronic and chronic feeding studies have been performed using several species, for various time periods.

The No Observable Effect Level (NOEL) for Fosamine Ammonium in diet studies for rats (90 day), dog (6 month), and sheep (90 day) were: 5,000/10,000 ppm, (286/572 mg/kg); 1,000 ppm (40 mg/kg) and 2,000/2,500 ppm highest dose tested (HDT) respectively (107). In the feeding studies the dose was increased after a certain time point when effects were not observed at the lower dose. These dose groups are written first dose/increased dose. In the six month dog study, the female dogs receiving 5000/7500/10000 ppm had increased stomach weights (107).

Oncogenicity Studies

Long term carcinogenicity studies are not available. These studies have not been required by EPA as there are no food uses proposed for Krenite.

Mutagenicity Studies

Mutagenicity testing has been done using Fosamine Ammonium formulated product. It was negative in 5 strains of the Ames assay, and negative both with and without activation in Chinese Hamster ovary point mutation assay. Chromosome damage was produced in the in vitro cytogenetic assay using Chinese Hamster ovary cells at 1.6% and 3.2 formulation (nonactivated) and 1.4, 2.8 and 5.7% formulation (activated) (107). There were no compound related increases in chromosomal aberrations in an in vivo bone marrow study and no changes in unscheduled DNA synthesis in rat hepatocytes (107).

Developmental Studies

The developmental studies that have been performed using fosamine ammonium include a one generation/two litter rat study and a rat oral teratogenicity study. The doses in the 90 day reproduction study were 0, 200, 1,000 and 5,000/10,000 ppm (0, 11, 57 and 285/570 mg/kg/d). There were no effects observed on reproduction and lactation in the reproduction study (NOEL = 5,000/10,000 ppm HOT). The doses in the teratogenicity study were 0, 200, 1,000 and 5,000/10,000 ppm (0, 11, 57 and 285/570 mg/kg/d). There were no effects observed on teratogenicity and fetoxicity at the 1,000 ppm dose level(107).

(a) In these discussions the assumptions made for conversion of ppm (diet) to mg/kg/D were:
Species Body weight (kg) Intake (kg)
Rat 0.35 0.020 Mouse 0.03 0.004 Dog 10 0.4

Avian

Unformulated Fosamine ammonium was administered to Mallard ducks and bobwhite quail by intubation in acute toxicity studies. Five birds per species-sex group received doses of 0, 312.5, 625, 1,250, 2,500, and 5,000 mg/kg. The LD50 was greater than 5,000 mg/kg in both the ducks and quail (15, 107).

Ducks and quail were also used in subacute dietary studies at doses of 0, 625, 1,250, 2,500, 5,000 and 10,000 ppm in the diet for 5 days. Basal diet was given for the last three days of the 8 day exposure. The 8 day LC50 in the diet was greater than 10,000 ppm. There was no increase in duck mortality: food consumption was depressed but body weight gain was normal. There was variable quail mortality and food consumption and body weight were decreased as compared with control (15, 107).

Invertebrates:

Fosamine ammonium toxicity has been determined for only a very few microorganisms and invertebrates. The available studies indicate that Fosamine ammonium has a very low acute toxicity to those organisms tested (15):

Fosamine ammonium salt (42% formulation): 48 hr LC5Os range from 1,524 mg/L for Daphnia to 10,000 mg/L for bees sprayed with the herbicide.

Aquatic Species (fish):

Fosamine ammonium has a very low toxicity to those fish species tested.

Fosamine ammonium salt (42% formulation): 96 hr LC5Os range from 670 mg/L for bluegill sunfish to 8,290 mg/L for coho salmon (15).

Except for the LC5O of 670 mg/L for the bluegill sunfish, reported adult fish LC5Os are all in excess of 1000 mg/L. (15) The yolk-sac fry stage in salmonids was the most sensitive to Fosamine ammonium.

Threshold-effect concentrations of Krenite for salmonids in partial life-cycle studies are less than 75 times the maximum theoretical concentration of Krenite that would be found in shallow waters due to direct overhead spray application (15).

SUMMARY

Fosamine ammonium is not persistent in the environment and is a low mobility herbicide in soil. Fosamine ammonium has a low potential to leach to groundwater or to reach surface waters from surface runoff. With acute oral LD5Os in rats of greater than 5,000 mg/kg, Fosamine ammonium is considered to be of low acute and subchronic mammalian toxicity. Subchronic exposures to Fosamine ammonium resulted in NOELS of greater than 1,000 ppm in a 6 month dog study. Mutagenicity test were negative in all but one case and there are no carcinogenicity data for this active ingredient. Fosamine ammonium is also considered to have very low aquatic and invertebrate acute toxicity.

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THE COMMONWEALTH OF MASSACHUSETTS
EXECUTIVE OFFICE OF ENERGY AND ENVIRONMENTAL AFFAIRS
Department of Agricultural Resources
251 Causeway Street, Suite 500, Boston, MA 02114
617-626-1700 fax: 617-626-1850 www.mass.gov/agr

GLYPHOSATE

In addition to the review that is presented below, a comprehensive review available from USDA Forest Service provides information that incorporates more recent studies and data. The US Forest Service risk assessment report is available at: http://www.fs.fed.us/foresthealth/pesticide/risk.shtml

Review conducted by MDAR and MassDEP for use in Sensitive Areas of Rights-of-Way in Massachusetts

Common Trade Name(s): Roundup, Glyphosate VMF Round Up Pro, Rodeo, Accord, Accord Concentrate,

Chemical Name: N—(phosphonomethyl)glycine—isopropylamine salt
CAS No.: 1071-83-6

GENERAL INFORMATION
Glyphosate, n-phosphonomethyl glycine, is a systemic, broad spectrum herbicide effective against most plant species, including deep rooted perennial species, annual and biennial species of grasses, sedges, and broadleafed weeds. The major pathway for uptake in plants is through the foliage, however, some root uptake may occur. The presence of surfactants and humidity increases the rate of absorption of glyphosate by plants (15).

Foliarly applied glyphosate is readily absorbed and translocated from treated areas to untreated shoot regions. The mechanism of herbicidal action for glyphosate is believed to be inhibition of amino acid biosynthesis resulting in a reduction of protein synthesis and inhibition of growth (10, 15, 101).

Glyphosate is generally formulated as the isopropylamine salt in aqueous solution (122). Of the three products containing glyphosate considered here, Roundup is sold with a surfactant and Rodeo and Accord are mixed with surfactants prior to use (15). Glyphosate has been reviewed by US Forest Service (15), FAO (122), and EPA 00W (51).

ENVIRONMENTAL FATE

Mobility
Glyphosate is relatively immobile in most soil environments as a result of its strong adsorption to soil particles. Adsorption to soil particles and organic matter begins almost immediately after application. Binding occurs with particular rapidity to clays and organic matter (l5). Clays and organic matter saturated with iron and aluminum (such as in the Northeast) tend to absorb more glyphosate than those saturated with sodium or calcium. The soil phosphate level is the main determinant of the amount of glyphosate adsorbed to soil particles. Soils which are low in phosphates will adsorb higher levels of glyphosate (14, 15).

Glyphosate is classified as immobile by the Helling and Turner classification system. In soil column leaching studies using aged (1 month) Glyphosate, leaching of glyphosate was said to be insignificant after 0.5 inches of water per day for 45 days (14).

Persistence

It has been reported that glyphosate dissipates relatively rapidly when applied to most soils (14). However, studies indicate that the soil half-life is variable and dependent upon soil factors. The half-life of glyphosate in greenhouse studies when applied to silty clay loam, silt loam, and sandy loam at rates of 4 and 8 ppm was 3, 27 and 130 days respectively, independent of application rate (14). An average half-life of 2 months has been reported in field studies for 11 soils (15).

Glyphosate is mainly degraded biologically by soil micro-organisms and has a minimal effect on soil microflora (15). In the soil environment, glyphosate is resistant to chemical degradation such as hydrolysis and is stable to sunlight (15). The primary metabolite of glyphosate is aminomethyl phosphonic acid (AMPA) which has a slower degradation rate than glyphosate (15). The persistence of AMPA is reported to be longer than glyphosate, possibly due to tighter binding to soil (14). No data are available on the toxicity of this compound.

Glyphosate degradation by microorganisms has been widely tested in a variety of field and laboratory studies. Soil characteristics used in these studies have included organic contents, soil types and pHs similar to those that occur in Massachusetts (117).

Glyphosate degradation rates vary considerably across a wide variety of soil types. The rate of degradation is correlated with microbial activity of the soils and does not appear to be largely dependent on soil pH or organic content (117). While degradation rates are likely temperature dependent, most reviews of studies do not report or discuss the dependence of degradation rate on temperature. Mueller et al. (1981 cited in 117) noted that glyphosate degraded in Finnish agricultural soils (loam and fine silt soils) over the winter months; a fact which indicates that degradation would likely take place in similar soils in the cool Massachusetts climate. Glyphosate halflives for laboratory experiments on sandy loam and loamy sand, which are common in Massachusetts, range up to 175 days (117). The generalizations noted for the body of available results are sufficiently robust to incorporate conditions and results applicable to glyphosate use in Massachusetts.

TOXICITY REVIEW

Acute (Mammalian)

Glyphosate has reported oral LD5Os of 4,320 and 5,600 mg/kg in male and female rats (15,4). The oral LD5Os of the two major glyphosate products Rodeo and Roundup are 5,000 and 5,400 mg/kg in the rat (15).

A dermal LD5O of 7,940 mg/kg has been determined in rabbits (15,4). There are reports of mild dermal irritation in rabbits (6), moderate eye irritation in rabbits (7), and possible phototoxicity in humans (9). The product involved in the phototoxicity study was Tumbleweed marketed by Murphys Limited UK (9). Maibach (1986) investigated the irritant and the photo irritant responses in individuals exposed to Roundup (41% glyphosate, water, and surfactant); Pinesol liquid, Johnson Baby Shampoo, and Ivory Liquid dishwashing detergent. The conclusion drawn was that glyphosate has less irritant potential than the Pinesol or the Ivory dishwashing liquid (120).

Metabolism

Elimination of glyphosate is rapid and very little of the material is metabolized (6,106).

Subchronic/Chronic Studies (Mammalian)

In subchronic tests, glyphosate was administered in the diet to dogs and rats at 200, 600, and 2,000 ppm for 90 days. A variety of toxicological endpoints were evaluated with no significant abnormalities reported (15,10).

In other subchronic tests, rats received 0, 1,000, 5,000, or 20,000 ppm (57, 286, 1143 mg/kg) in the diet for 3 months. The no observable adverse effect level (NOAEL) was 20,000 ppm (1,143 mg/kg) (115). In the one year oral dog study, dogs received 20, 100, and 500 mg/kg/day. The no observable effect level (NOEL) was 500 mg/kg (116).

Oncogenicity Studies
Several chronic carcinogenicity studies have been reported for glyphosate including an 18 month, mouse study; and a two year rat study. In the rat study, the animals received 0, 30, 100 or 300 ppm in their diet for 2 years. EPA has determined that the doses in the rat study do not reach the maximum tolerated dose (112) and replacement studies are underway with a high dose of 20,000 ppm (123). The mice received 1000, 5000 or 30,000 ppm for 18 months in their diets. These studies were non-positive (112,109). There was a non-statistically significant increase in a rare renal tumor (renal tubular adenoma (benign) in male mice (109). The rat chronic study needs to be redone with a high dose to fill a partial data gap (112). The EPA weight of evidence classification would be D: not classified (51).

Mutagenicity Testing
Glyphosate has been tested in many short term mutagenicity tests. These include 7 bacterial (including Salmonella typhimurim and B. subtilis) and 1 yeast strain Sacchomyces cerevisiae as well as a mouse dominant lethal test and sister chromatid exchange. The microbial tests were negative up to 2,000 mg/plate (15), as were the mouse dominant lethal and the Chinese hamster ovary cell tests. EPA considers the mutagenicity requirements for glyphosate to be complete in the Guidance for the Registration of Pesticide Products containing glyphosate (112).

The developmental studies that have been done using glyphosate include teratogenicity studies in the rat and rabbit, three generation reproduction studies in the rat, and a reproduction study in the deer mouse. (15)

Rats were exposed to levels of up to 3,500 mg/kg/d in one rat teratology study. There were no teratogenic effects at 3,500 mg/kg/d and the fetotoxicity NOEL was 1,000 mg/kg/d. In the rabbit study a fetotoxicity NOEL was determined at 175 mg/kg/d and no teratogenic effects were observed at 10 or 30 mg/kg/d in one study and 350 mg/kg/d in the other study (15). No effects were observed in the deer mouse collected from conifer forest sprayed at 2 lbs active ingredient per acre (15).

Tolerances & Guidelines
EPA has established tolerances for glyphosate residues in at least 75 agricultural products ranging from 0.1 ppm (most vegetables) to 200 ppm for animal feed commodities such as alfalfa (8).

U.S. EPA Office of Drinking Water has released draft Health Advisories for Glyphosate of 17.50 mg/L (ten day) and 0.70 mg/L (Lifetime)(51).

Avian
Two types of avian toxicity studies have been done with glyphosate: ingestion in adults and exposure of the eggs. The species used in the ingestion studies were the mallard duck, bobwhite quail, and the adult hen (chickens). The 8 day feeding LC5Os in the mallard and bobwhite are both greater than 4,640 ppm. In the hen study, 1,250 mg/kg was administered twice daily for 3 days resulting in a total dose of 15,000 mg/kg. No behavioral or microscopic changes were observed (15).

Invertebrates
A variety of invertebrates (mostly arthropods) and microorganisms from freshwater, marine, and terrestrial ecosystems have been studied for acute toxic effects of technical glyphosate as well as formulated Roundup. The increased toxicity of Roundup compared with technical glyphosate in some studies indicates that it is the surfactant (MONO 818) in Roundup that is the primary toxic agent (117). Acute toxicity information may be summarized as follows:

Glyphosate (technical): Acute toxicity ranges from a 48 hr EC5O for midge larvae of 55 mg/L to a 96 hr TL5O for the fiddler crab of 934 mg/L (15).

Roundup: Acute toxicity ranges from a 48 hr EC5O for Daphnia of 3 mg/L to a 95 hr LC5O for crayfish of 1000 mg/L (15).

Among the insects tested, the LD50 for honeybees was 100 mg/bee 48 hours after either ingestion, or topical application of technical glyphosate and Roundup. This level of experimental exposure is considerably in excess of exposure levels that would occur during normal field applications (15).

Aquatic Species (Fish) Technical glyphosate and the formulation Roundup have been tested on various fish species. Roundup is more toxic than glyphosate, and it is the surfactant that is considered to be the primary toxic agent in Roundup:

Glyphosate (technical):
Acute 96 hr LC5Os range from 24 mg/L for bluegill (Dynamic test) to 168 mg/L for the harlequin fish (15).

Roundup: Acute lethal toxicity values range from a 96 hr LC5O for the fathead minnow of 2.3 mg/L to a 96 hr TL5O for rainbow trout of 48 mg/L (15).

Tests with Roundup show that the egg stage is the least sensitive fish life stage. The toxicity increases as the fish enter the sac fry and early swim up stages.

Higher test temperatures increased the toxicity of Roundup to fish, as did higher pH (up to pH 7.5). Above pH 7.5, no change in toxicity is observed.

Glyphosate alone is considered to be only slightly acutely toxic to fish species (LC5Os greater than 10 mg/L), whereas Roundup is considered to be toxic to some species of fish, having LC5Os generally lower than 10 mg/L (15,118).

SUMMARY
Glyphosate when used as recommended by the manufacturer, is unlikely to enter watercourses through run-off or leaching following terrestrial application (117). Toxic levels are therefore unlikely to occur in water bodies with normal application rates and practices (118).

Glyphosate has oral LD5Os of 4,320 and 5,600 in male and female rats respectively. The elimination is rapid and very little of it is metabolized. The NOAEL in rats was 20,000 ppm and 500 mg/kg/d in dogs. No teratogenic effect was observed at doses up to 3,500 mg/kg/d and the fetotoxicity NOELS were 1,000 mg/kg/d in the rat and 175 mg/kg/d in the rabbit.

The evidence of oncogenicity in animals is judged as insufficient at this time to permit classification of the carcinogenic potential of glyphosate. The compound is not mutagenic.

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THE COMMONWEALTH OF MASSACHUSETTS
EXECUTIVE OFFICE OF ENERGY AND ENVIRONMENTAL AFFAIRS
Department of Agricultural Resources
251 Causeway Street, Suite 500, Boston, MA 02114
617-626-1700 fax: 617-626-1850 www.mass.gov/agr

IMAZAPYR

In addition to the review that is presented below, a comprehensive review available from USDA Forest Service provides information that incorporates more recent studies and data. The US Forest Service risk assessment report is available at: http://www.fs.fed.us/foresthealth/pesticide/risk.shtml

Review conducted by MDAR and MassDEP for use in Sensitive Areas of Rights-of-Way in Massachusetts

Common Trade Name(s): Arsenal

Chemical Name: Imazapyr!
2-(4-isopropyl-4-methyl--5-oxy-2-imidazolin-2-yl)
nicotinic acid with isopropyl amine (2)

CAS No.: 81510-83-0

GENERAL INFORMATION

Imazapyr is effective against and provides residual control of a wide variety of annual and perennial weeds, deciduous trees, vines and brambles in non—cropland situations. It also provides residual control and may be applied either pre or postemergence. Postemergence is the preferred method especially for the control of perennial species. Imazapyr is readily absorbed by the foliage and from soil by the root systems. Imazapyr kills plants by inhibiting the production of an enzyme, required in the biosynthesis of certain amino acids, which is unique to plants (10, 100).

ENVIRONMENTAL FATE

Mobility

There are few studies which have investigated the mobility of Imazapyr in soil, but available reports indicate that Imazapyr does not leach and is strongly absorbed to soil (100). Imazapyr has a high water solubility (1 — 1.5%) which could generally indicate a high leaching potential, but as with other organic acids Imazapyr is much less mobile than would normally be expected (100). No soil partition coefficients have been reported, but they may be expected to be quite high (100).

One field study investigated Imazapyr mobility in a sandy loam soil (0.9% organic matter, 8.0% clay; 38.8% silt). Imazapyr did not leach below the 18—21 inch layer after 634 days and 49.6 inches of rain. The levels found below the 12 inch layer were just above the 5 ppb detection limit. In addition, this study investigated the off—target mobility of Imazapyr and found no residues further than 3 inches from the sprayed area after 1 year (102).

Although low levels of Imazapyr did move to the 18 to 21 inch layer this was only after nearly 2 years and fifty inches of rain. This indicates that imazapyr is relatively non-mobile and does not leach through the soil profile. Imazapyr remains near the soil surface and heavy precipitation may cause some off target movement from surface erosion of treated soils.

Persistence

The main route of Imazapyr degradation is photolysis. In a study of photodegradation in water, the half—life of Imazapyr was calculated as 3.7, 5.3 and 2.5 days in distilled water, pH 5 and pH 9 buffers respectively (101). A soil photolysis study for Arsenal on sandy loam calculated a half—life of 149 days (101).

Studies have investigated the persistence of Imazapyr in soil under aerobic and anaerobic conditions. The half-life of Imazapyr in soil has been reported as varying from 3 months to 2 years (100). A laboratory study found the half-life to be 17 months (101). Detectable residues were found in a field study in all soil layers to 21 inches at 634 days (102). Vegetation was sprayed with radio-labelled Imazapyr at a rate of 1 lb. a.i./acre. The soil was a sandy loam (0.9% organic matter) which received 49.6 inches of rain during 634 days. The highest level of radioactivity (0.234 ppm Imazapyr) was found in the top 3 inches of soil at 231 days after application and there were detectable levels in the 9-12 inch layer. The concentrations in the top layer increased steadily from day 4 to 231 when they reached their maximum (0.234 ppm) and then declined. At day 634 the level in the top layer (0-3 inch) was 0.104 ppm (102). These data indicate that Imazapyr is persistent in soil and, most importantly, that Imazapyr is translocated within plants from the plant shoots back to the roots and released back into soil. Very little of the Imazapyr actually reached the soil during application. The soil residues may be due to the decay of plant material containing Imazapyr in the soil (102).

TOXICITY REVIEW

Acute (Mammalian)

The acute oral LD5O in both male and female rats was greater than 5000 mg/kg using technical Imazapyr. The acute dermal LD5O in male and female rabbits was greater than 2000 mg/kg. The compound was irritating to the rabbit eye but recovery was noted 7 days after application of 100 mg of the test substance. It was classified as mildly irritating to the rabbit skin following application of 0.5 grams of the material on abraded or intact skin (103).

Arsenal product formulation was tested in a similar battery of tests. The rat oral LD5O value was greater than 5000 mg/kg and the rabbit dermal LD5O was greater than 2148 mg/kg. The irritation was observed following installation of 0.5 ml of the test substance in the skin study and 0.1 ml in the eye study (104).

Technical Imazapyr was administered to rats as an aerosol for four hours at a concentration of 5.1 mg/L. There were ten rats per sex and the animals were observed for 14 days after treatment before they were sacrificed. Slight nasal discharge was seen in all rats on day one but disappeared on day two (105).

The inhalation LC5O is greater than 5.0 mg/L for both the formulation and the technical product (105,106). Technical Imazapyr was applied dermally at the following dosages: 0, 100, 200 and 400 mg/kg/day (109). Arsenal was used at 0, 25, 50 and 100% of the formulated solution in sterile saline. Each dose group consisted of 10 male and 10 female rabbits and the test substance was applied to either intact or abraded skin and occluded for 6 hours each day.

The result of the dermal studies with Imazapyr as well as Arsenal were non remarkable with regard to body weights, food consumption, hematology, serum chemistry, clinical observations, necropsy observations and histopathology. It was noted that Arsenal, undiluted, was locally irritating (109).

Subchronic and Chronic Studies (Mammalian)

In the subchronic tests a NOEL for systemic toxicity with dermal administration in rabbits was 400 mg/kg/d (2,109). After dietary administration for 13 weeks in the rat, there was no effect at 10,000 ppm (571. mg/kg/d) which was the highest dose tested (141).

A bioassay is currently underway to evaluate the potential oncogenicity of technical Imazapyr. Groups of 65 rats per sex per dose group have received 0, 1000, 5000 or 10,000 ppm in the diet. Hematology, clinical chemistry and urinalysis tests were conducted at 3, 6 and 12 months and will also be done at 18 months and at study termination. At the 12 month sacrifice the only effect noted was a slight increase in mean food consumption in all treated female groups. Most of the increases were statistically significant, but they did not always exhibit a dose response. The oncogenicity test is due to be submitted to the EPA in the spring of 1989 (115).

Oncogenicity Studies

Chronic bioassays as discussed in the subchronic/chronic section are underway.

Mutagenicity Testing

Five different bacterial strains of Salmonella typhimurium (TA1535, TA98, TAlOO, TA1537, and TA1538) and one of Escherichia coli (WP-2 uvrA-) were used to evaluate the mutagenicity of Imazapyr. It is unclear whether the compound used was technical or formulated Imazapyr. Dose levels up to 5000 micrograms/plate were used and each strain was evaluated both in the presence or absence of PCB—induced rat liver 5—9 microsomes. Negative results were noted in all assays. The six tester strains were designed to detect either base-pair substitutions or frameshift mutations (113).

Developmental Studies (Mammalian)

Two teratology studies have been done and both of these studies evaluated technical Imazapyr. One study used rats as the test species and the other utilized rabbits (111,112).

Pregnant rats received dosages of 0, 100, 300 or 1000 mg/kg/d of Imazapyr during days 6—15 of gestation. There were 22 rats in the control group and 24, 23 and 22 in the low, mid and high dose groups. All doses were administered orally by gavage. Salivation was noted only during the dosing period in 6 of the 22 females in the highest dose group (1000 mg/kg). No other adverse observations were noted in the treated dams (111). Fetal body weight and crown-rump length data for the treated groups were comparable to controls. Fetal development (external, skeletal and visceral) “revealed no aberrant structural changes which appeared to be the result of the exposure to Imazapyr” (111). The NOEL for maternal toxicity was 300 mg/kg and the NOEL for teratogenicity and fetoxicity was 1000 mg/kg (116).

Four groups of 18 pregnant rabbits were exposed on days 6-18 of gestation to doses of 0, 25, 100, 400 mg/kg/d Imazapyr. There was no statistically significant difference between control and treated groups at any dose (112).

Avian

Acute oral LD5Os of Imazapyr in bobwhite quail and mallard duck were 2150 mg/kg. The 8 day dietary LC5O in the bobwhite quail and mallard duck were greater than 5000 ppm (101).

Invertebrates

The dermal honey bee LD5O for Imazapyr is greater than 100 mg/bee (101). The LD5O (48 hr) was greater than 100 mg/L for the water flea (100).

Aquatic

The LC50s of Imazapyr in the rainbow trout, bluegill sunfish and channel catfish were greater than 100 mg/L (101).

SUMMARY

Imazapyr is a relatively immobile herbicide in the soil profile even when used in sandy and low organic content soils. It is also persistent in soils. The low mobility and persistence may result in off-target movement of Imazapyr from surface erosion of treated soils.

The atypical soil—plant flux characteristics of Imazapyr and delayed maximum soil concentrations indicate that repeated annual applications may result in build—up of Imazapyr in soil. Consequently, an interval is required to allow for the degradation of soil residues before a repeated application is made.

The oral LD5O of Imazapyr in rats is greater than 5000 mg/kg and the derrnal LD5O is greater than 2000 mg/kg in rabbits. The oncogenicity bioassay is currently underway and the only effect reported in the interim study was an increase in food consumption in the treated females. No mutagenic effects were observed.

The acute oral LD5Os of Imazapyr and the Arsenal formulation are greater than 5000 mg/kg. In the subchronic 13 week rat study there was no effect observed at the highest dose tested 10,000 ppm. The oncogenicity study is currently underway.

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THE COMMONWEALTH OF MASSACHUSETTS
EXECUTIVE OFFICE OF ENERGY AND ENVIRONMENTAL AFFAIRS
Department of Agricultural Resources
251 Causeway Street, Suite 500, Boston, MA 02114
617-626-1700 fax: 617-626-1850 www.mass.gov/agr

METSULFURON METHYL

In addition to the review that is presented below, a comprehensive review available from USDA Forest Service provides information that incorporates more recent studies and data. The US Forest Service risk assessment report is available at: http://www.fs.fed.us/foresthealth/pesticide/risk.shtml

Review conducted by MDAR and MassDEP for use in Sensitive Areas of Rights-of-Way in Massachusetts

Common Trade Names: Escort, Escort XP (2)

Chemical Name: Methyl 2 E[C[(4-Methoxy—6-methyl-l,3,5-Triazifl—
2-yl) aminolcarbonyl] amino] sulfonyl.]benzoate] (9)

CAS NO.: 74223-64-6

GENERAL INFORMATION

Metsulfuron methyl is a sulfonyl urea herbicide initially registered by E.I. DuPont in 1986. It is a foliar herbicide registered for use on wheat and barley and non-cropland sites such as Right of Way (9).

ENVIRONMENTAL FATE

Mobility

Metsulfuron methyl is a relatively new herbicide. The studies reviewed here have been provided by the registrant, EI DuPont.

The soil water partition coefficients (Kd) of Metsulfuron Methyl have been determined in four different soils: Cecil sand, Flanagan silt loam, Fallsington silt loam, and keyport silt loam. The Kd values range from 0.36 for Cecil sand to 1.40 for Flanagan silt loam, and Kom values ranged from 29 for Fallsington silt loam to 120 for Cecil sand (100). The values for Kd and Kom indicate that metsulfuron methyl is not adsorbed well to soil and that the organic content of the soil is not the only adsorption component. The silt and clay contents appear to influence adsorption, but there are probably other factors also involved.

The previous study also determined the Rf values for soil. Thin layer chromatography was performed on four soils for metsulfuron methyl. The Rf values ranged from 0.64 to 1.00; only one value was less than 0.90 (100). This result confirms the validity of the Kd values, indicating that metsulfuron methyl is mobiie and that the organic matter content of the Soil is a significant component of adsorption.

Metsulfuron methyl was applied to tops of 12 inch columns [containing four different soils], and eluted with 20 inches of water in 20 hours. Following the percolation of the total volume of water, 106% of the metsulfuron

methyl was eluted from the Fallsington sandy loam, 96% from the Flanagan silt loam, 81% for Keyport silt loam and 93% for Myakka sand (100). The breakthrough volumes for the Fallsington, Flangan, Keyport and Myakka soils were 6.5, 4.5, 6.9 and 5.8 inches of water respectively (101).

Metsulfuron methyl is relatively mobile in most soils, but will be retained longer in soils with higher percentages of organic matter.

Persistence

There are two studies which have reviewed the persistence of metsulfuron methyl in the soil. One study was conducted in the southern United States and the second was in the northern United States and Canada. The results of the studies indicate a somewhat contradictory picture of the persistence of metsulfuron methyl.

The soil half-lives in Delaware, North Carolina, Mississippi and Florida were 1 week, 4 weeks, 3 weeks and 1 week respectively following an application in mid to late summer (102). The results are varied and indicate that either climatic or soil factors determine the persistence. The climate is sufficiently similar to be able to discount that as a factor. However, both of the locations where the shortest half-lives were observed had the highest organic matter content in the soils. Furthermore, the half—lives correspond with the organic matter content.

The half—lives following spring applications were 4 and 56 weeks for two sites in Colorado, 6 weeks in North Dakota and 28 weeks in Idaho (103). In contrast to the southern United States study there does not appear to be any correlation with climatic or soil characteristics. There appears to be a slightly shorter half—life in acidic soils in the same location.

Metsulfuron methyl was also applied in the fall and the half-lives determined in two sites in Colorado, North Dakota and Idaho. These half—lives were 8 weeks, 12 weeks, 42 weeks and 28 weeks respectively. As was expected there were longer half—lives following fall applications in North Dakota (6 weeks vs. 42 weeks) however, in Idaho there was no change at all, which is unexpected.

In Canada following spring applications the reported half-lives were 10 weeks, 4 weeks, 4 weeks and 6 weeks for Alberta, 2 locations in Saskatchewan and Manitoba (103). One would expect longer half lives in Northern locations due to the effects of temperature on degradation rates. The results from Canada are generally shorter than those in the U.S. locations, which is unexpected.

Therefore, the half-life of Metsulfuron methyl in the soil is variable and dependent on the location. It is shorter when applied in the spring but appears independent of other environmental factors in most locations.

TOXICITY REVIEW

Acute (Mammalian)

The toxicology database for Metsulfuron methyl has been reviewed and accepted by the EPA (9). DuPont supplied excerpts from their monograph on Ally herbicide (112). Summaries of studies were supplied by DuPont for subchronic, chronic and reproductive studies.

Technical metsulfuron methyl has been tested in two acute oral LD50 studies in Crl:CD Rats. In the first study the LD5O was greater than 5,000 mg/kg and in the second it was greater than 25,000 mg/kg (the maximum feasible dose) (112). Clinical signs included salivation, chromodacryorrhea, stained face, stained perineal area and weight loss (112).

In a 10—dose subacute study using male rats, a single repeated dose of 3,400 mg/kg/day for 10 days over a 2 week period was administered. This was followed by a two week recovery period. No deaths occurred and slight weight loss was the only clinical sign observed. In addition, no gross or microscopic changes were observed (112). The dermal LD50 is greater than 2,000 mg/kg in male and female rabbits (112). Technical metsulfuron methyl caused mild erythema as a 40% solution in guinea pigs. There was no reaction observed at the 4% concentration. No response occurred when treated animals were challenged (112).

In rabbits, moderate areas of slight corneal clouding and severe to moderate conjunctivitis were observed in both washed and unwashed eyes following treatment with technical metsulfuron methyl. The unwashed eyes were

normal in 3 days and the washed eyes in 14 days (112).

Metabolism
Elimination of metsulfuron methyl in the rat is rapid, with 91% of a radioactive dose excreted over 96 hours (9). The routes of elimination were not specified within the report.

Subchronic/Chronic (Mammalian)
Ninety day feeding studies have been done with metsulfuron methyl in rats and mice. The rat study was done in conjunction with a one generation reproduction study (see Developmental Study Section). In this study rats received 0, 100, 1000, or 7500 ppm (0, 5.7, 57, 428 mg/kg/d) (a) in their diets. Effects observed at the high dose were: a decrease in body weight and an increase in total serum protein in the females, and a decrease in liver weight and a decrease in cytoplasmic clearing of hepatocytes in the males the NOEL in this study was 1000 ppm (104).

The 90 day mouse study was done in conjunction with the 18 month mouse study. Groups of 90 mice per sex per dose received 0, 5, 25, 500, 2500 or 5000 ppm (0, 0.66, 3.3, 66.6, 333.3, 666.6 mg/kg/d) in their diets. Clinical evaluations were made at 1, 2, 3, 6, 12 and 18 months. Ten animals per group were sacrificed at the 90 day time point for pathological evaluation. The 2500 ppm group was sacrificed at 12 months. Sporadic effects were observed on the body weight, food consumption, and organ weights. These were not dose related, resulting in a NOEL of 5000 ppm in diet for mice (111).

In the twenty-one day dermal rabbit study, the intact skin of male and female New Zealand White Rabbits received doses of 0, 125, 500 and 2,000 mg/kg for 6 hrs/day for 21 days. Clinical signs observed were sporadic weight loss and diarrhea in a few rabbits. These effects were not dose related. Non dose related histological effects were observed in male rabbits. This effect was characterized as mild testicular atrophy occurring sporadically at all doses (112, 108).

Feeding studies in dogs have been done with purebred beagles. The animals received metsulfuron methyl in diets at dose levels of 0, 50, 500 and 5000 ppm (0, 0.2, 2, 20 mg/kg/d) for one year. There was a decrease in food consumption in the high dose males. There was a decrease in serum lactate dehydrogenase in all groups of both sexes at two or more doses these values were within the historical controls. The NOEL was 500 ppm in the males and 5000 ppm in females (112).

In a chronic feeding study in rats, the animals received metsulfuron methyl at doses of 0, 5, 25, 500, 2500 or 5000 ppm (0, 0.28, 1.4, 28.6, 143 or 286 mg/kg/d. Interim sacrifices were done at 13 and 52 weeks (105).

At the 13 week sacrifice there was a decrease in body weight in the 2500 and 5000 ppm groups; there was a decrease in absolute liver weight at 2500 and 5000 ppm males. There was a decrease in the relative liver weights in the 2500 and 5000 ppm females.

(a) In these discussions the assumptions made for estimated conversion of ppm (diet) to mg/kg/D were:
Species Body weight (kg) Intake (kg)
Rat 0.35 0.020 Mouse 0.03 0.004 Dog 10 0.4
When data were presented as ppm, the dose was estimated in mg/kg and is presented in parenthesis.

Findings at the 52 week sacrifice included increase in kidney weight (2500 ppm males) and increased absolute brain weights (at doses of 25, 500, 2500 and 5000 ppm) in males and at doses of 2,500 and 5000 ppm in females. There was an increase in absolute heart weight at 2500 ppm in males and at 2500 and 5000 ppm in females. The absolute organ weights were back to normal at termination. Relative brain weights of the 2500 and 5000 ppm groups were increased (105)

Oncogenicity Studies
There were no gross or histopathological changes observed in mice receiving up to 5000 ppm metsulfuron methyl in their diets (112. 111). Similar results were obtained in the 104 week rat study; there were no histopathological changes observed which were attributable to metsulfuron methyl (105, 112). EPA concludes that there were no

oncogenic effects in rats or mice at the highest dose tested; 5000 ppm in both cases (9).

Mutagenicity Testing

Metsulfuron methyl was negative in the unscheduled DNA synthesis assay; in vivo bone marrow cytogenic assay in rats (doses were 500, 1,000, and 5,000 mglkg bw); CHO/HGPRT Assay; Salmonella typhimurium reverse mutation assay four strains with and without S9 metabolic activation; and also in the in vivo mouse micronucleus assay at doses of 166, 500, 1666, 3000 and 5000 mg/kg (112). 'T¶e only positive mutagenicity assay was in the in vitro assay for chromosome aberrations in Chinese Hamster Ovary at high doses (greater than 2.63 mM, 1.0 mg/mL)). In this assay no increases in structural aberrations were observed at 0.13 or 1.32 mM(0.05 or 0.5 mg/mL) (112).

Developmental Studies

Several studies have been done to investigate the effects of Metsulfuron methyl on reproduction and development in rats and rabbits.

Pregnant Cr1: COBS CD(SD) BR rats received metsulfuron methyl at doses of 0, 40, 250 or 1000 mg/kg by the oral route on days 5 to 14 of gestation. There were 25 rats per group. Maternal toxicity was observed at doses of 250 and 1000 mg/kg/d. The maternal toxicity NOEL was 40 mg/kg/d. There was no evidence of "teratogenic" response or embryo fetal toxicity (112).

In the rabbit study, New Zealand white rabbits received 0, 25, 100, 300 or 700 mg/kg/d on days 6 to 18 gestation. There was a dose related increase in maternal deaths; 1, 2 and 12 deaths at doses of 100, 300 and 700 mg/kg respectively. The maternal toxicity NOEL was 25 mg/kg/d and there was no evidence of teratogenic or embryolethal effects observed in this study (112).

Several multigenerational studies have been done with Metsulfuron methyl. A four litter reproduction study was done concurrently with the chronic bioassay. Rats from each treatment were separated from the main study and bred. The doses were 0, 5, 25, 500, 2500, and 5000 ppm (0, 0.28, 1.4, 28.6, 143 and 286 mg/kg/d). There was a dose dependent decrease in body weight in the parental (P1) generation at doses of 25 ppm and greater in males and females. This effect was not present in dams during gestation or lactation (106).

Overall fertility in the P1 and filial (Fl) matings was low in both control and treated groups with no apparent cause. There was a decrease in pup size in the Fla but not the Flb, F2a, or F2b litters. The gestation index was 100% for all groups in both filial generations with the exception of F2a when it was 90%. On the basis of the lower body weights and lower growth rates, the NOEL was 25 ppm for this study (106).

In a 90 day, 2 generation 4 litter protocol, rats received 0, 25, 500 or 5000 ppm (0, 1.4, 28.6, 286 mg/kg/d) Metsulfuron methyl in their diets for 90 days prior to mating. In this protocol the parental generation was bred twice first to produce the Fla and then the FiB. The FiB rats were then fed the appropridte diet for 90 days (after weaning). There was a decrease in litter size in the 5000 ppm group in the F2a generation, but not in any other generation. The NOEL for this study was 500 ppm (107).

In a 90 day feeding, one generation rat study, 16 male and 16 female rats received 0, 100, 1000 or 7500 ppm in their diet prior to mating. There were no differences observed in reproduction and lactation performance or litter survival among groups. There was an overall low fertility in the control and treated groups. This result made the effects of metsulfuron methyl on fertility difficult to assess from this study (104).

Tolerances and Guidelines

Tolerances have been set for metsulfuron methyl in barley wheat (from 0.05 to 20 ppm, depending on the commodity) and in meat and meat byproducts (0.1 ppm). The tolerance in milk is 0.05 ppm (8, 9). The acceptable daily intake is 0.0125 mg/kg/d based on a one year dog NOEL of 1.25 mg/kg/d using a safety factor of 100 (9).

Avian

Metsulfuron methyl has been tested in two species of birds, the mallard duck and the bobwhite quail. The acute oral LD5O is greater than 2150 mg/kg in the duck. Two, 8 day dietary studies have been done. The 8 day LC5O is greater than 5620 ppm in both the duck and the quail (9).

Invertebrates

The 48 hour LC5O for Daphnia is greater than 150 ppm and the acute toxicity in the honeybee is greater than 25 mg/bee (9).

Aquatic

Metsulfuron methyl has acute LC5O of greater than 150 ppm in both the rainbow trout and the bluegill sunfish (9).

Summary

Metsulfuron methyl has a moderate to high mobility in the soil profile and is relatively persistent in the environment, especially when applied in the fall. These factors would be of concern under most circumstances. However, metsulfuron methyl is applied at very low rates (3-4 ozs./A) and therefore the amounts which reach the soil are quite low. Consequently, Metsulfuron methyl should not impact groundwater as a result of leaching or migrate from the target area. Metsulfuron methyl has low toxicity (EPA Toxicity Category III) for acute dermal exposure and primary eye irritation and is category IV for all other acute exposures. The chronic studies indicate no oncogenicity response and the systemic NOEL's are 500 ppm in rats and 5000 ppm in mice. There was no evidence of teratological effects in the rat or the rabbit at the highest dose tested in both species. While there was evidence of maternal toxicity at 40 mg/kg/d in the rat and 100 mg/kg/d in the rabbits.

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THE COMMONWEALTH OF MASSACHUSETTS
EXECUTIVE OFFICE OF ENERGY AND ENVIRONMENTAL AFFAIRS
Department of Agricultural Resources
251 Causeway Street, Suite 500, Boston, MA 02114
617-626-1700 fax: 617-626-1850 www.mass.gov/agr

TRICLOPYR

In addition to the review that is presented below, a comprehensive review available from USDA Forest Service provides information that incorporates more recent studies and data. The US Forest Service risk assessment report is available at: http://www.fs.fed.us/foresthealth/pesticide/risk.shtml

Review conducted by MDAR and MassDEP for use in Sensitive Areas of Rights-of-Way in Massachusetts

Common Trade Name(s): Garlon 3A, Garlon 4

Chemical Name: Triclopyr [(3 ,5,6-Trichloro-2-pyridinyl) oxy] acetic acid

CAS No: 55335—06—3

GENERAL INFORMATION

Triclopyr is a picolinic acid derivative and is marketed as Garlon 3A the triethylamine (TEA) salt (CAS #057213-69-1) and Garlon 4 the butoxyethyl ester ***(CAS#*** 008008-20-6).

Triclopyr is effective against a wide variety of woody plants as a foliar spray, basal spray and when applied to cut surfaces. Triclopyr is absorbed by both plant leaves and roots and is readily translocated throughout the plant. It produces an auxin-type response in growing plants in that it appears to interfere with normal growth processes. Thus, maximal plant response occurs when applications are made soon after full leaf development and when there is sufficient soil moisture for plant growth.

ENVIRONMENTAL FATE

Mobility

Most laboratory and field studies indicate that Triclopyr is a relatively mobile herbicide under most conditions. Soil organic carbon partition coefficients K(oc) were determined for the TEA salt in 12 soils which ranged from 0.081% to 21.7% organic carbon. The K(oc) values range from 12 to 78 (14), indicating that Triclopyr should be mobile in most soils. In the same study the K(oc) values of trichloropyridinol, the major metabolite, were reported to range from 114 to 156 in three soils which were not identified. This indicates that trichloropyridinol is less mobile than Triclopyr and should have moderate mobility in soil(14).

In a laboratory study using sandy loam soil with a low organic matter content (0.62%), 75-80% of the applied Triclopyr leached through a 12 inch soil column between days 11 and 15. Water was applied at the rate of 0.5 inches/day for 45 days. The major degradation product, tricloropyridinol required 13 inches of applied water to elute, nearly twice as much (7.5 inches) as Triclopyr(14).

In a field study, Garlon 3A was applied at the rate of 3 gallons/ acre (9 lbs/acre) to six soils ranging from clays to loamy sands in six states. Rainfall was reported to be normal, but not given. Small amounts of Triclopyr and its metabolites were found in the 6—12 inch and 12-18 inch layers of soil 28 to 56 days after application (14,15). Although an application rate of 9 lbs per acre is rather high, the presence of Triclopyr at those depths should be noted especially since there is a correlation with the previous laboratory studies.

In other studies, Triclopyr exhibited significantly lower mobility than had been previously reported. In a field study conducted in Massachusetts, Triclopyr was applied to sandy loam soil at a rate of 0.6 lb/acre. Rainfall was reported as normal, but not given. Triclopyr was never detected below the top ten inch layer of soil at any time during the three month study (100). As part of the same study, Triclopyr was applied to soil columns containing the same soil as in the field study at the rate of 0.6 and 6.0 lbs/acre. Simulated rainfall was applied to the soil columns at a rate of 1 inch per week for a total of 5 inches. Triclopyr was not detected below the top 4 inch layer of soil (100). These results indicate lower mobility than previously reported, but they may reflect the short persistence of Triclopyr in soil rather than its mobility through the soil profile.

Persistence

Soil

Microbial degradation is the primary mechanism by which Triclopyr is degraded in soils to two metabolites (15). Degradation under anaerobic conditions (i.e. saturated soils) is reported to be 5 to 8 times slower than under aerobic conditions (14). Triclopyr in soils is not thought to be degraded to any appreciable extent by chemical hydrolysis and, due to its low volatility, is not thought to volatilize from soil to any great extent (15).

A review by TRW states that Triclopyr "is not considered to be a persistent compound in soils" (95). Studies indicate that under certain conditions the half-life of Triclopyr can be relatively short. The Dow Chemical Company has reported a half-life of 10 days in silty clay loam (96). In a small West Virginia watershed the half-life was estimated as between 14 and 16 days (15). Triclopyr was applied aerially at the rate of 10 lbs/acre, but much of the Triclopyr was intercepted by foliage. Average Triclopyr residues in soil from the treated area of this study, measured on the day of the treatment, were non—detectable in densely wooded areas, 4.4 ppm in lightly wooded areas, and 18 ppm in open areas (15). In a Massachusetts field study, the half—life of Triclopyr was reported as 10 days after the applications of 0.6 and 6.0 lbs/acre Triclopyr to non-target vegetation (100).

Most other studies suggest a much longer persistence for Triclopyr in soil. In a laboratory study, Dow reported a half-life of 46 days for Triclopyr in loam. The loam was maintained in the laboratory at **95 deg** F with moisture at field capacity for the duration of the study (96). A **95 deg** soil temperature and moisture at field capacity are both quite high and indicate that the persistence at less than ideal conditions would be longer. Dow also reports the average half-life of Triclopyr in soil to be 30 days (101). An average half-life of 46 days is reported in the Herbicide Handbook (10) and by Ghassemi et al. (95). In addition, other investigators have reported a half—life in soil of "less than 50 days" at temperatures between 25-35 deg C, and between 79 and 156 days at 15deg C (14). In a field study conducted in Sweden, Garlon 3A was applied at the rate of 2 lbs (a.i.)/acre to eight different forest soils. Residues of Triclopyr persisted for 1 to 2 years, and in some cases in excess of 2 years, at levels approximately 10 percent or less of initial soil residue levels (15). It must be noted that soil temperature levels never exceeded 14deg C (57 deg F) and these temperatures are not favorable to microbial degradation (15). These low maximum temperatures are not typical of year round Massachusetts temperatures, but indicate the increased persistence that may occur when applications are made in the fall and are followed by cold weather.

The variable half-lives reported for Triclopyr indicate that soil half-life may be dependent on the soil and climatic conditions. As in most situations of microbial degradation; cold and, dry or saturated soils decrease the decomposition rate, while warm moist soils increase it.

Aquatic

The fate of the butoxyethyl ester of Triclopyr (TBEE) in water is summarized in Figure 1. This diagram shows the major degradation pathways for the ester in water, but does not include processes such as sediment and particulate adsorption. The fate of the ester in water has also been simulated with a modelling technique by McCall et al., 1988 (115). A recent study by Woodburn (116) with the triethylamine salt of Triclopyr experimentally applied to a lake in Florida also provides useful comparative data on the persistence of Triclopyr degradation products. The degradation path is believed to be TBEE to Triclopyr acid to 3,5,6—trichloro-2-pyridinol (TCP) to non-halogenated organic acids.

TBEE degrades quite rapidly in water to Triclopyr acid. Laboratory studies indicate that photolysis is the principal degradation pathway with hydrolysis also contributing (117, 118). Several studies indicate that the half-life of the ester in water can range from 1.5—2 days as a result of photolysis (117, 119). Hydrolysis half—lives are dependent upon water pH and temperature and range from 0.06 d to 208 d in natural waters. They decrease with increasing temperature and increasing pH. Acidic conditions increase the persistence of the ester substantially. The 208 d half—life was observed in natural unbuffered water at pH 5 and 15^{o}C. Waters with this pH level occur in Massachusetts. One laboratory study has produced contradictory results where the ester was stable to hydrolysis, and little photodegradation of the ester occurred over 9 months (120). This study however was performed with buffered, sterile water. Modelling results for the dissipation of the ester indicate that decay should be fairly rapid with a half-life of 12-18 hours (115).

The acid is short-lived in the aquatic environment with reported half—lives of from 2.1 hours at the water's surface in summer at **40deg** N latitude to 14 hr at 1m water depth in winter (117). The principal decay product of the acid is 3,5,6-trichloro-2-pyridinol (TCP), a transient metabolite in water with half—lives ranging from minutes to one day (121). TCP rapidly degrades into nonhalagenated, low molecular weight organic acids (116,121), with phototransformation playing a larger role than hydrolysis in this process.

Salomon et al. (118) demonstrated a half—life of 3.8-4.3 days at l6-17 deg C for the ester to TCP step in an Ontario Lake. Woodburn (116) added Triclopyr salt to a Florida lake and determined a half—life of 0.5—3.6 d at 300 C for the salt to organic acid step. The time scales of both of these studies are in general agreement with the other data on the time course of breakdown for the ester (or salt) to organic acids. With the exceptions of the Hamaker (120) study and a slow breakdown at pH 5, most studies indicate that TBEE in water is degraded relatively rapidly.

TOXICITY REVIEW

Acute (Mammalian)

The Triclopyr toxicity database has been reviewed in several places including the GEIR on the Control of Vegetation on Utility and Railroad Rights-of-Way in Massachusetts (14), Herbicide Handbook Weed Science Society of America (10), and by the U.S. Forest Service (15). Several Dow Publications review the Triclopyr information (101) and Garlon products (102 and 103).

The oral LD5O for Triclopyr in rats is 729 mg/kg in males and 630 mg/kg in females (15, 101). The rat oral LD5O for combined sexes has been reported as 713 mg/kg (10, 14). Rabbits and guinea pigs are more susceptible to oral administration of Triclopyr with LDSOs of 550 and 310 mg/kg respectively (14, 15, 10). The Garlon products have oral LD5Os of greater than 2000 mg/kg (10, 14, 15, 101, 103, 103).

The dermal LD5Os are greater than 2000 mg/kg in rabbits (Triclopyr), and greater than 3980 mg/kg in rabbits for Garlon 4 and Garlon 3A (101, 102, 103)

The effects of Triclopyr on the eye are dependent on the chemical derivative involved: the butoxyethyl ester found in Garlon 4 is essentially non—irritating (102, 15, 14, and 101), while the triethylamine salt is not only an irritant but can cause serious injury (101, 14, 15). These eye injuries include conjunctival irritation, moderate internal redness and moderate to severe corneal damage which may be permanent (14). An inhalation study showed that 100% of the test rats survived a 1 hour exposure to 3 to 20 dilutions of Garlon 3A in air. Transitory nasal irritation to rats was noted after a 4 hour exposure to Garlon 4 aerosol (14).

Metabolism

Two studies, one dermal and one oral have been done in humans to determine pharmacokinetic and metabolic profiles. Five mg/kg acid equivalent (ae) was applied to the forearm of 5 volunteers in the dermal study. One point five eight percent to 1.11% of the applied dose was absorbed and the percutaneous absorption half -life was 16.8 hours (108). In the oral study, 6 volunteers received 0.1 or 0.5 mg/kg Triclopyr (acid equivalent) in apple juice. The excretion half—life is 5 hours and 80% of the dose is recovered as unchanged Triclopyr in the urine (109). The 20% which was unaccounted for could be attributed to one of several explanations including incomplete collections of urine, incomplete absorption of material or metabolism to an unknown metabolite.

Subchronic/Chronic Studies (Mammalian)

Long—term bioassays have been done using Triclopyr in rats (107) and mice (106). Summaries of these studies, provided by Dow Chemical Company have been reviewed for this discussion.

Fischer 344 rats received 5, 20, 50 or 250 mg/kg/d in a preliminary 13 week study. There was a decrease in body weight gain at 50 and 250 mg/kg/d and kidney effects were observed in both sexes at doses of 20 mg/kg or greater (107). In the full two year study, the doses were 0, 3, 12 and 36 mg/kg/d. The dose related effects in the males were increased body weight at 12 and 36 mg/kg/d, and in females there was an increase in pigmentation in the proximal tubules at 3, 12 and 36 mg/kg/d. Neither the weight increase in the males nor the increased pigmentation in the females were accompanied by morphological, histological or functional changes. The NOAEL for males and females was reported to be 3 mg/kg/d (107).

In the mouse bioassay, ICR mice received Triclopyr in their diets for twenty-two months. The doses were 0, 50, 250, 1250 ppm (0, 5, 55, 28.6 and 143 mg/kg/d in males and 0, 5.09, 26.5 and 135 mg/kg/d in females). The range finding study included doses of 0, 200, 400, 800, 1600 or 3200 ppm. At the high dose there were decreases in body weight, anemia, changes in urine, increase in cholesterol levels and multiple changes in liver functions. Some of the liver changes were also observed in the 1600 and 800 ppm groups. There were decreases in body weights, changes in kidney and urine (at various doses and points in time) and liver effects at the 1250 ppm dose. At 250 ppm there were mild kidney effects and the NOEL was reported as 50 ppm (5.55 and 5.09 mg/kg/d for males and females respectively) (106).

In subchronic studies, the 90 day dietary NOELs were 30 mg/kg/d and 20 mg/kg/d for rats and mice, respectively. Dogs were more sensitive to dietary administration of Triclopyr, with kidney effects (decrease in excretion) at 2.5 mg/kg/d (14, 101). Dogs refused to eat food that would result in doses of 30 and 100 mg/kg (104). In a one year study, dogs received doses of 0. 0.5, 2.5 or 5.0 mg/kg/d. Minimal kidney effects were observed at 2.5 and 5.0 mg/kg/d. These findings were considered non—adverse by Dow making the NOAEL 5.0 mg/kg/d and the NOEL 0.5 mg/kg/d (105).

Two monkey studies were done to investigate kidney effects in primates. In one study, the monkeys received 0, 10, 20 or 30 mg/kg/d in diet for 28 days. There was no effect on urinary excretion or other responses observed (101, 104). In a second study, 4 monkeys received Triclopyr at 5 mg/kg/d for 28 days, the dose was then increased to 20 mg/kg/d for 102 days. The effects observed in this study were stool softening and diarrhea (104).

Oncocrenicitv Studies

There have been two chronic bioassays done for Triclopyr. Rats received 0, 3, 12 or 36 mg/kg/d and mice received 0, 50, 250 or 1250 ppm (0, 5.55, 28.6, 143 mg/kg/d for males and 0, 5.09, 26.5 and 135 mg/kg/d for females). The only positive result was an increase in combined incidence of mammary adenomas and adenocarcinomas in the female rats at the high dose. There was no evidence of multiple tumors and the effect was not dose related (107, 106).

Mutagenicitv Testing

Triclopyr has been tested for mutagenicity in a variety of test systems and found to be weakly positive in one, the dominant lethal study in rats. Triclopyr was non-mutagenic in bacterial assay systems, cytogenic assays, and mouse dominant lethal studies (15).

Developmental Studies

The teratology of Triclopyr was investigated using the rabbit model. Doses in the range finding study were 0, 25, 50, 100 and 200 mg/kg. There was 50% and 71% mortality in the 100 and 200 mg/kg groups respectively. The doses used in the full study were 0, 10, 25 and 75 mg/kg/d for days 6 to 18 of gestation. There were 16 rabbits per dose group. One dam in the 25 mg/kg/d group aborted and one dam in the 75 mg/kg/d group died. In the 25 mg/kg group one fetus had hyperplasia of the aortic arch with pulmonary arterial semilunar valve stenosis. Another fetus had a missing gall bladder. There was a statistically significant but non-dose related increase in resorptions at 10 mg/kg/d. This increase was within historical control variability. The developmental NOEL was reported as 75 mg/kg/d with a slight increase in maternal mortality
(110)

Tolerances and Other Guidelines

Tolerances are set for Triclopyr on 5 raw agricultural commodities:
grasses, forage (500 ppm); grasses, forage, hay (500 ppm); milk (0.01 ppm); meat, fat and meat by products (except liver and kidney) of cattle, goats, hogs, horses, and sheep (0.05 ppm); and liver and kidney of cattle, goats, hogs, horses, and sheep (0.5) ppm (8).

The Dow internal guideline for inhalation exposure to Triclopyr is 10 milligrams/cubic meter (102, 103).

Avian

The toxic effects of Triclopyr on birds have been investigated in a small number of studies conducted by the Dow Chemical Company. For mallard ducks, acute oral LCSOs are reported at 1,698 mg/kg for unformulated Triclopyr, 3,176 mg/kg for Garlon 3A, and 4,640 mg/kg for Garlon 4. Eight day subchronic oral LC5Os are reported as follows for the various triclopyr formulations:

Triclopyr	
	mallard duck LC50 = 5,000 ppm
	bobwhite quail LC50 = 2,935 ppm
	Japanese quail LC50 = 3,278 ppm
Garlon 3A	mallard duck LC50=10,000 ppm
	bobwhite quail LC50=11,622 ppm
Garlon 4	mallar d duck LC50=l0,000 ppm
	bobwhite quail LC50=9,026 ppm

Source: (15)

The data summarized above indicate low acute and subchronic toxicity to the bird species tested. No field studies on the toxic effects of Triclopyr or its formulations in birds have been reported (15).

Invertebrates

Very little data were available on the invertebrate and microorganism toxicity of Triclopyr. The data reported are primarily for the triethylamine salt (Garlon 3A) and were generated by the Dow Chemical Company.

The data indicate low acute lethal toxicity* to organisms tested, with a 96 hr LC5O of 895 ppm in shrimp, 96 hr LC5O greater than 1000 ppm in crabs, and 48 hr LC5Os ranging between 56 and 87 ppm in oysters (15). The 48 hr LC5O for Daphnia is reported as 1,170 ppm (15). After 72 hours of incubation with 500 ppm of Triclopyr, no apparent effects on growth were observed in six soil microorganisms when compared to a control (15).

No information was obtained on the invertebrate toxicity of Garlon 4, the butoxyethyl ester of Triclopyr.

Aquatic

The available information on Triclopyr toxicity to fish indicate a wide response of fish to the two formulations of Triclopyr and to unformulated Triclopyr. The butoxyethyl ester of Triclopyr (Garlon 4) is "highly toxic to fish", based upon the Clarke et al. criteria. The 96 hour LC5O values for rainbow trout and bluegill sunfish are 0.74 and 0.87 ppm respectively (15). The corresponding value for juvenile Coho salmon is 1.3 ppm (122).

The triethylamine salt formulation (Garlon 3A) is "slightly toxic" to fish with 96 hour LC5Os of 552 and 891 ppm for rainbow trout and bluegills respectively. The corresponding values for unformulated Triclopyr are 117 ppm for rainbow trout and 148 ppm for bluegill. Both fish species were less sensitive to Garlon 3A than to the active ingredient (15).

No fish toxicity data are available for 3,5,6—trichloro—2—pyridinol (TCP), the intermediate breakdown product from the Triclopyr acid to the non—halogenated organic acid end product.

Dow Chemical Company reports that in natural soil and aquatic environments, both amine and ester formulations rapidly convert (photodegrade) to Triclopyr acid, which in turn is neutralized to a salt at normal environment pH (5.5-6.5)(15). No information is provided with any of the fish toxicity data on the actual form of Triclopyr present in the test water. The persistence data summarized in a previous section and the simulation results of McCall et al. (115), however provide a description of the probable fate of Triclopyr in the toxicity test tanks. The majority of the fish mortalities during the toxicity tests with bluegill sunfish and rainbow trout exposed to the ester occurred during the first 24 hours of the test: a pattern consistent with the change of the toxic ester form to less toxic breakdown products during this period (124).

EXPOSURE ASSESSMENT

For the exposure assessment, we have chosen to analyze the fate of the butoxyethyl ester form of Triclopyr (Garlon 4) in water because of its reported high aquatic toxicity in laboratory studies. Garlon 4 would be applied basally at an average application rate of 0.5 pints per acre for the proposed utility program.

In aquatic organisms, LC5Os greater than 10 ppm are considered to be indicative of only slight toxicity and LC5Os less than 1 ppm are considered to reflect high acute toxicity (Clarke et al., 1970 as referenced in [15]).

Since Garlon 4 contains 61.6% of the active ingredient, this application could distribute 37 mg Triclopyr BEE/m^2. The requested maximum application rate is 2 pints per acre.

Two aquatic exposure scenarios have been constructed to evaluate the potential contamination of non-target surface waters with Garlon 4 from a typical land application. The first, most extreme, and very unlikely scenario is for the case of a static stream traversing a treated acre with a percentage of all of the herbicide applied to the acre running into the water. The second represents a more shallow, static stream or standing water body of much less volume with runoff from a portion of the bordering land.

SCENARIO (1)

ASSUMPTIONS:

Application rate = 0.5 pint/acre
0.47 L/pint
61.6% active ingredient
20% of herbicide applied to acre runs off
density of applied herbicide = 1.0 g/ml

RUNOFF:

0.20 x 0.5 pt/acre x 0.47 L/pt x 0.616 = 0.03 L/acre

RECEIVING WATER:

Static stream crossing a treated acre

Dimension: 0.3 x 1.22 x 64 m = 23.4 **in**^{3} (volume)

DILUTION:

0.03L into 23.4 m = 1.3 mL/m^3

1.3 mL/m^3 x 1 m^3 /10^3 L = 1.3 x 10 mL/L

1.3 x l0^{-3} mL/L x 1 g/ml x l0^3 mg/g = 1.3 mg TBEE/L

SCENARIO (2)

ASSUMPTIONS:

Application Rate = 0.5 pt/acre
0.47 L/pt
61.6% active ingredient **2**

20% of herbicide applied to 3m^2 runs off
density of applied herbicide = 1.0 g/ml

RUNOFF:

0.2 x 0.5 pt/acre x 0.47 L/pt x 0.616 x 2.47
x 10^{-4} acre/m^2 x 10 mL/L x 3 m^2 = 0.02 mL

RECEIVING WATER:

Static stream,

Dimensions: 0.15 x 1 x 5 m = 0.75 m^3 (volume)

DILUTION:

0.02 mL into 0.75 m3 = 0.03 mL/m^3

0.03 mL/ m^3 x 10^{-3} m /L x 10^3 mg/g x 1 g/ml = <u>0.03 mg/L</u>

The calculations presented above illustrate that the probable immediate post—runoff concentrations of TBEE in static water bodies will be in the sub-parts per million range. At maximum application rates (2 pts/acre), these concentrations would range from about 0.1 to 5.2 mg/L. The concentrations for the worst exposure scenario (#1) are greater than (7x) the 96 hour LC5O concentrations for freshwater fish; those

for the other scenario are almost an order of magnitude less. The no effect level for TBEE with juvenile Coho salmon is ≤1.0 mg/L (122). Therefore, under the worst exposure scenario with the maximum application rate of herbicide, the 96 hour LC5O could be exceeded. Under other, less extreme conditions at average application rates, predicted concentrations of the active ingredient would be substantially less than the reported no effect level in Coho salmon. The persistence characteristics of TBEE are such that the ester form of Triclopyr would not likely persist in surface waters for longer than a couple of days, except in those waters in Massachusetts which are acidic where the ester may persist for up to several months. It is also very unlikely that rainbow trout would be impacted at application rates of 0.5 pts/acre based on the reasonable scenario (#2) which predicts water concentrations of Garlon 4 less than toxic concentrations.

The following factors would also tend to reduce the exposure concentrations that fish would experience: flowing waters would provide greater dilution than assumed for static conditions; the Massachusetts Right-of-Way Management Act mandates an application setback of 10 feet from standing or flowing waters or from wetlands (33 CMR 1l.04:(l) and (4) (a)); and actual runoff of the applied herbicide would probably be less than used for these sample calculations. Scenario 1 represents an extremely unlikely event where 20% of all the herbicide applied to an acre runs off into a small water course. The conditions which would foster this type of runoff across setbacks (i.e. heavy rains) would tend to turn static stream systems into flowing water courses and hence increase dilution.

The application rate used in the previous non—target species assessment (June 23, 1990) was 0.5 pints per acre applied basally. The utilities involved in managing rights-of-way and the manufacturer of Garlon 4 have since indicated that the required application rate may range as high as 2-3 quarts of Garlon 4 per acre for effective control of vegetation. The following addition to the exposure assessment examines the resultant changes in the predicted exposure concentrations that might occur in freshwater fish habitats when Garlon 4 is applied at the 2-3 quarts /acre rate.

The change in the application rate will result in the following differences in predicted exposure concentrations from those originally predicted for 0.5 pts/acre:

2 at/acre x 2pt/ qt = x 8 0.5 pt/acre

3at/acre x 2pt/qt = x 12 0.5 pt/acre

Application rates will therefore be 8-12 times greater than for the 0.5 pts/acre case. The probable concentrations in water after runoff as previously predicted were 1.3 (Scenario 1) and 0.03 mg/L (Scenario 2) ing butoxyethyl ester of Triclopyr / L. These concentrations would therefore range from 0.24 — 15.6 ing/L for application rates between two and six quarts.

These predicted concentrations encompass and substantially exceed the reported LCSO concentrations for fish (in range of 0.7 - 1.3 mg/L and the NOEL of 1 mg/L for juvenile Coho salmon. The more realistic exposure scenario (#2) predicts exposure concentrations of the same order of magnitude as the LC5O values.

Given that the higher application rates required for vegetation control in some areas have the potential to produce potentially lethal concentrations of the butoxyethyl ester of Triclopyr to fish in water as a result of runoff, a setback greater than the mandated 10 feet from standing or flowing waters (333 CMR 11.04: (1) and (4) (a)) will provide an additional level of protection when application rates exceed 0.5 pts/acre.

SUMMARY

Triclopyr exhibits moderate mobility in most of the soils tested. Soils with higher organic carbon content would be expected to retard the mobility of Triclopyr. Trichloropyridinol, the major breakdown product, is less mobile than Triclopyr.

Microbial degradation is the primary mechanism by which Triclopyr is degraded in soils. Degradation rates are variable and appear to be dependent on the soil and climatic conditions. In Massachusetts conditions, Triclopyr can be expected to have moderate persistence when applied in warm weather (late spring —early fall), and slightly longer persistence in colder weather.713 mg/kg. Rabbits and guinea pigs have oral LDSOs of 550 and 310 mg/kg respectively. The target organ for Triclopyr is in the liver. The only positive result in the oncogenicity studies was an increase in the combined incidence of mammary adenomas and adenocarcinoinas in the female rats at the high dose. Mutagenicity tests were negative. The developmental NOEL was reported as 75 mg/kg/d with a slight increase in maternal mortality. Using EPA's carcinogen classification scheme, Triclopyr may be considered a group C carcinogen (possible human carcinogen: limited animal evidence).

RECOMMENDATION

The herbicide Garlon 4, containing the butoxyethyl ester of Triclopyr (EPA Reg. No. 464-554), is recommended for use in sensitive areas only at application rates of 0.5 pt/acre pursuant to 333 CMR 11.00. Applications at rates up to three quarts per acre are permitted with a setback of 50 feet from standing or flowing waters suitable for fish habitat. The set back restriction may be waived upon demonstration to both the Departments of Food and Agriculture and Environmental Protection that runoff concentrations from applications of Garlon 4 with setbacks less than 50 feet do not pose a threat to fish.

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Summary of Aminopyralid Toxicity and Fate for Application to Sensitive Areas of Rights-of-Way

The following summary addresses use of the herbicide aminopyralid in Sensitive Areas of Rights-of-Way in Massachusetts. The review was jointly conducted by the Massachusetts Department of Environmental Protection (MassDEP) Office of Research and Standards (ORS) and the Massachusetts Department of Agricultural Resources (DAR) in accordance with the cooperative agreement issued between the two agencies in 1987 and updated in 2011 pursuant to the provisions of Section 4(1)(E) of 333 CMR 11.00 Rights-of-Way Management Regulations.

The conclusions summarized in this memo are based upon several sources of information, including a comprehensive review of this herbicide by the USDA Forest Service (Durkin 2007), scientific documents contained in the US Environmental Protection Agency (EPA) docket of information for aminopyralid to support pesticide registration decisions and the results of literature searches for recent pertinent studies on this chemical. As aminopyralid is a relatively new product, very little primary information was found in the literature that was pertinent to the scope of this review and therefore the review was primarily based on information provided by the secondary summary documents described above. The purpose of this review is to ascertain the suitability of this product for use within sensitive areas of rights-of-way, based upon consideration of available information on the potential toxicity of the active ingredient aminopyralid as well as its fate and transport in the environment.

Aminopyralid (2-pyridine carboxylic acid, 4-amino-3,6-dichloro-2-pyridine carboxylic acid) is a pyridine carboxylic acid herbicide manufactured by Dow AgroSciences LLC (DAS) for use in controlling annual and perennial broadleaf weeds. At the time of this active ingredient review, two end-use products containing aminopyralid were requested: Milestone (EPA Reg. No. 62719-519) and OpenSight (EPA Reg. No. 62719-597). Additional details on the evaluation of the products can be found in separate review documents.[1]

Aminopyralid is structurally similar to other pyridine carboxylic acid herbicides that preceded it in development, including clopyralid, picloram and triclopyr. Technical grade picloram and clopyralid contain the carcinogen hexachlorobenzene as well as other carcinogenic chlorinated benzenes as impurities that are byproducts of their synthesis process. According to DAS, the manufacturing process for aminopyralid does not produce these byproducts (John Jachetta, DAS product manager for aminopyralid as cited in Durkin, 2007). EPA has labeled aminopyralid a “reduced risk pesticide” that has a favorable human health toxicity profile when compared to the registered alternatives, because it has a lower application rate, which should alleviate the need for repeat applications and thus result in a lower overall amount used.

Similar to other pyridine carboxylic acids, aminopyralid is a synthetic analogue of an auxin, a plant hormone that regulates development, growth and other plant functions. Though the specific mode of action of these compounds is not fully known, they produce effects on the plant including alterations in

[1] Product review of Milestone Herbicide; Product Review of Opensight Herbicide

cell wall elasticity and gene expression, and non-productive tissue growth that results in leaf curl and disruption of the plant phloem, interfering with transport of nutrients and causing death in days to weeks.

Summary of fate and transport:

Aminopyralid is generally very persistent in the environment. Under favorable light conditions, it can rapidly photodegrade in shallow, clear water (though not in murky deeper water), with a half-life of 0.6 days. It photodegrades slowly in soil, with a half-life of about 72.2 days. It is stable to microbial degradation in sediment and water systems. In aerobic soils, it is metabolized at a moderate rate depending on the type of soil, with a half-life range of about 31.5 days to 193 days in eight soils[2]. It is expected to be stable in anaerobic soils (USEPA, 2014).

Under environmental conditions and pH, 99.9% of aminopyralid will dissociate to its anionic form, which contributes to its high solubility, lack of volatility and very low adsorption to soils. As a result, aminopyralid partitions to water and is expected to have high mobility in most soils. The major route of dissipation of aminopyralid from soil is through runoff and leaching.

Once aminopyralid enters surface water, any residue that is not subject to photolysis will persist and be mobile in aquatic environments. Aquatic field dissipation studies in treated ponds showed half-lives in the range of 10.8 to 14.6 days. Any part of aminopyralid applied to terrestrial vegetation that reaches the soil has a high potential to run off into surface water or leach into the soil profile and groundwater. Once aminopyralid reaches anaerobic depths in soil, degradation will dramatically slow and only its high mobility will determine the rate at which it will contaminate groundwater. Field dissipation in bare ground studies showed dissipation half-lives in the range of 9 to 54 days and leaching depths in the range of 6 to 36 inches. The potential for groundwater contamination with aminopyralid is expected to be higher in areas with shallow groundwater (because there is less depth to travel before reaching groundwater) or when rain occurs soon after application. Additional information on the expected concentrations in surface water and groundwater following the terrestrial applications in rights-of-way is available in the companion document to this review.

[2] Recent assessments by USEPA (2014) and the European Union (EFSA, 2013) provide updated information for aerobic soil metabolism and soil binding parameter values of aminopyralid. USEPA (2014) considered the data from eight soils. The soil half-life values ranged from 31 to 193 days, with an average of 103.7 days. The soil-water partitioning constant (K_D) values ranged from 0.03 to 0.29 mL/g for soils with pH values of 6.1 to 7.8; K_D values of acid soils were in the range of 0.15 to 0.72 mL/g. The K_{OC} values for soils with near-neutral pH values were in the range of 1.05 to 7.54 mL/g and for acidic soils the values were in the range of 19.95 to 24.3 mL/g. In general, K_{OC}-values increase with decreasing pH. USEPA (2014) indicated that these data on soil half-life and soil binding (soil-water distribution coefficient data) are acceptable for use in exposure modeling and risk assessment.
In addition to the USEPA assessment, aquatic exposure modeling conducted as part of a European risk assessment (EFSA, 2013) was reviewed to provide additional data and information. The model input value for soil half-life geometric mean of 54.8 days was lower than the values used in the SERA risk assessment (Durkin, 2007) and the values used by USEPA. The model input value for soil binding parameter (mean $K_{F,OC}$ of 6.64 mL/g) was within the range of values used in the other modeling efforts reviewed above.

The only potentially major degradation products of aminopyralid are formed during aqueous photolysis and include two small amino acid analogs, i.e., malonamic acid and oxamic acid, along with four unidentified acid amides of 2-3 carbons in length. EPA concluded that neither of the two identified compounds would be of concern as they are expected to be readily metabolized following uptake and/or rapidly excreted without any significant biological effects. In addition, none of these compounds are expected to be produced to any great extent as aqueous photolysis only occurs up to the depth that sunlight penetrates a water body. Only carbon dioxide and some non-extractable residues were found in amounts over 10% of the applied study residue in all other laboratory degradation studies of aminopyralid, at maximums of 76.2% in aerobic soil metabolism and 15% in aerobic aquatic metabolism.

Summary of Toxicity and Risk Assessment:

Available toxicity information reviewed by the secondary sources cited above all indicate that aminopyralid at environmentally relevant concentrations has low potential toxicity to humans, as well as terrestrial animals and aquatic organisms. This finding is consistent with its mode of action, which is specific to plant biology. A number of systemic mammalian studies as well as aquatic ecotoxicity studies indicate that exposure concentrations of aminopyralid associated with herbicide applications are well below concentrations of concern for these receptors.

In terms of mammalian effects, the weight of evidence indicates that aminopyralid does not produce significant systemic effects. The effects most often seen following exposure to aminopyralid are on the gastrointestinal tract after oral exposure, with cecal effects in rats and stomach effects in dogs and rabbits. In rats, the typical effect is cecal enlargement. Given that cecal enlargement is typically seen with poorly absorbed osmotically active compounds, this effect is categorized by a number of investigators as an adaptive change and/or not toxicologically significant. The significance of cecal effects to humans, which only have a vestigial trace of this organ, is also unclear. The USDA Forest Service considers the effects on the gastrointestinal system as portal of entry effects. The differences in effects are attributed to differences in species anatomy and methods of exposure (i.e., gavage vs. dietary). Another somewhat notable effect in mammals includes the results of an acute oral toxicity study in rats in which bilateral cloudiness and lacrimation of eyes was seen in all rats after one day but not on subsequent days. Cloudiness of eyes is an unusual effect that has not been seen in any other aminopyralid study. The significance of these findings is unclear. Finally, in one developmental study, incoordination in several adult female rabbits was noted but this effect was rapidly reversible.

EPA developed a chronic Reference Dose (RfD) of 0.5 mg a.e.[3]/kg/day for aminopyralid for the general population derived based on a No Observed Adverse Effect Level (NOAEL) of 50 mg a.e./kg/day from a 24-month feeding study in rats. The endpoint, increase in cecal weights at 500 mg a.e./kg/day, may have very little relevance to potential effects in humans. However, the RfD is based on the most sensitive effect for the most sensitive species from the available database for aminopyralid. EPA also derived a Human Health Benchmark for Pesticide (HHBP) concentration of 3500 ug/L (ppb) from this chronic RfD

[3] Because aminopyralid dissociates from its acid form to its anionic form in the environment, aminopyralid application rates and concentrations are reported as "acid equivalents" (a.e.), instead of "active ingredients" (a.i.) because the acid part of the active ingredient salt is the herbicidally active component.

based upon a 70 kg adult who drinks 2 L/day of water and incorporating a Relative Source Contribution (RSC) factor of 20%.

For short-term/intermediate exposures, EPA developed an acute RfD of 1.0 mg a.e./kg/day derived based on a NOAEL of 104 mg a.e./kg/day from a developmental gavage study in rabbits in which decreased maternal food consumption and body weight as well as spontaneous abortion (in one rabbit) and decreased fetal weights were seen at higher doses.

A comparison of predicted short and long-term exposure to aminopyralid following application indicates that exposures are substantially below the above acute and chronic criteria.

Though the potential for aminopyralid to contaminate groundwater is high due to aminopyralid's high solubility and prolonged half-life in soil, both EPA and the U.S. Forest Service concluded that predicted short and long-term concentrations of aminopyralid in groundwater are substantially below concentrations of health concern for people using groundwater as a source of drinking water.

In terms of ecological effects, it appears that birds are more sensitive to aminopyralid administered through gavage than dietary exposure. A series of ecological benchmark toxicity concentrations were developed by both EPA and the US Forest Service for various terrestrial and aquatic wildlife. Though there were some differences in some of these values between the two agencies, the evaluations conducted by both agencies point to the same conclusion, that there is no indication from the available data that aminopyralid will adversely affect mammals, birds, fish, aquatic and terrestrial invertebrates, terrestrial microorganisms and amphibians.

A couple of ecological data gaps remain in the data submitted by the manufacturer of this compound to the U.S. Environmental Protection Agency (USEPA). These include a cyanobacteria growth study, an early life stage study in fathead minnows and an invertebrate lifecycle study in mysid shrimp. Additional information on data that are needed to address uncertainties in risk assessments is available in documents that were issued with the Registration Review of aminopyralid. The Registration Review of aminopyralid was initiated in 2013 and is scheduled to be completed in 2020. Information and notices related to this review will be available in the docket (USEPA, 2013).

An additional quantitative comparison of modeled concentrations of aminopyralid in surface water and groundwater following land application in rights-of-way areas was done by DAR to available ecological and human health benchmarks. This analysis indicated that projected water concentrations resulting from application of aminopyralid are well below concentrations of concern for ecological receptors in surface water as well as for humans who use these waters as sources of drinking water. For additional details on this evaluation as well as on the modeling conducted, please see the companion document to this review, entitled "Exposure Assessment of Aminopyralid in Surface and Ground Water: Review of Modeling Input Parameter, Refined Modeling and Comparison with Benchmarks."

Plants:

Aminopyralid's auxinic mode of action renders it toxic to all terrestrial (dicot) broadleaf plants. It is generally not toxic to terrestrial (monocot) grasses. While aquatic macrophytes have been shown to be more sensitive to aminopyralid than aquatic organisms, this herbicide is generally not toxic to aquatic macrophytes and algae.

Given that aminopyralid has an auxinic mode of action that can affect all terrestrial broadleaf plants, the potential impact to non-target broadleaf plants, particularly plants that are endangered species, is seen as the greatest concern for this herbicide. In addition, effects on non-target plants that might not be endangered species but which might serve as a food source for endangered animal species would be of concern.

An important consideration with this compound is that aminopyralid ingested by animals in grasses and other vegetation is excreted largely unchanged. As has been found with two of its predecessor compounds, (i.e., clopyralid, and picloram), use of manure from domesticated animals (that have ingested aminopyralid-treated grasses and vegetation) as compost in gardens can have detrimental effects to sensitive broadleaf plants, including plants in the nightshade family such as potatoes, tomatoes, and legumes. The aminopyralid product label warns that manure from animals that have grazed on aminopyralid-treated vegetation within the previous three days should not be used on land used for growing susceptible broadleaf plants. The three-day warning refers to the time it takes for consumed vegetation containing aminopyralid residues to pass through grazing animals. While this warning does not directly apply to application of aminopyralid on rangeland, it should be considered in scenarios where there is the potential for range vegetation to enter the garden compost stream.

Conclusions/Recommendations:

The information contained in the secondary documents from both EPA and the US Forest Service that were reviewed for this evaluation consistently present the same profile and conclusions on the toxicity, fate and transport of this herbicide. No conflicting information was identified in the literature. In addition, supplemental modeling conducted by DAR for this review consistently point to the same conclusions as those reached by EPA, the US Forest Service and others. Modeled concentrations of aminopyralid in environmental media following application as specified in product labels are well below toxicity levels of concern for humans, as well as terrestrial and aquatic wildlife.

Sensitive non-target plant species have been identified as the organisms of concern. Given that herbicides are designed to control plants, this is not surprising. This information, coupled with the fact that aminopyralid is very mobile and persistent in the environment strongly suggests that application of aminopyralid should be targeted as much as possible to avoid impacts on non-target plants. Measures that minimize drift should be used in applying this product. In addition, as with any application, a preliminary field survey should be conducted prior to application to identify any plants on the endangered species list and/or any other plant species that are important to that ecosystem.

Based upon the available database for aminopyralid, use of this herbicide in sensitive areas of rights-of-ways should be acceptable if it is applied in a manner that is consistent with the product label, the above recommendations and the Massachusetts Sensitive Areas of Rights-of-Way Regulations.

Reference:

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USEPA, 2014. Registration Review; Preliminary problem formulation for environmental fate, ecological risk, endangered species, and human health drinking water exposure assessments for aminopyralid. USEPA, Environmental Fate and Effects Division. February 12, 2014. Accessed at: http://www.regulations.gov/#!documentDetail;D=EPA-HQ-OPP-2013-0749-0011.

Exposure Assessment of Aminopyralid in Surface and Ground Water: Review of Modeling Input Parameter, Refined Modeling and Comparison with Benchmarks

1. Introduction

Aquatic exposure modeling has been used to estimate aminopyralid residue concentrations in surface water and ground water to support human health and ecological risk assessments. The USDA Forest Service document, "Aminopyralid-Human Health and Ecological Risk Assessment-FINAL REPORT", prepared by Syracuse Environmental Research Associates, Inc. (SERA) (Durkin 2007) describes the modeling that was used to estimate the concentrations of aminopyralid that may occur in surface and ground water. The risk assessment also reviews environmental fate input parameters and summarizes results from other modeling efforts conducted by USEPA and DOW AgroSciences (DAS).

The present document reviews these modeling data and also provides the results of additional modeling conducted by DAR, utilizing more recent modeling information and environmental fate input parameters, to complement and refine existing modeling results. All of these modeled concentrations in surface and ground water were assessed by comparing them to benchmark toxicity values for aquatic life and human health established by USEPA.

2. Review of Modeling Data in SERA Risk Assessment

The SERA risk assessment (Durkin 2007) notes that modeling results are sensitive to the input parameter value for soil half-life. The range of input values for aerobic soil metabolism half-life used in the various modeling efforts is related to the limitations and uncertainty in the data that were available for this parameter at the time modeling was conducted. SERA used a slightly higher value for half-life time of 343 days compared to 310.5 days by USEPA. The value used by USEPA was based on a single study result of 103.5 days. USEPA multiplied that half-life value by 3 to account for the uncertainty associated with using only a single study result.

SERA notes that the soil binding parameter (i.e., soil-water partitioning coefficients K_{OC} and K_D) is variable and not closely related to organic carbon content of the soil. Model input values for this parameter used in GLEAMS modeling were refined by using specific values associated with the type of soil. Values used for K_{OC} ranged from 0.87 in clay to 8.91 mL/g in loam; K_D values ranged from 0.39 in sand to 0.63 mL/g in clay. The parameter values used in modeling by USEPA was K_D of 0.03 mL/g and DOW AgroSciences used a K_{OC} value of 0.81mL/g.

The input parameter values used in the modeling described in SERA were considered to be the most conservative and resulted in the highest estimates for concentrations in surface water. The modeling results for selected scenarios that are most representative for Massachusetts are

included in Table 1 for comparison with other modeling results. The SERA report notes that the central estimate for surface water exposure based on GLEAMS modeling is similar to the value estimated by USEPA based on the PRZM/EXAMS modeling. The GLEAMS modeling data were the basis for the concentrations used in the SERA risk assessment.

SERA did not conduct modeling of concentrations in groundwater, but considered groundwater modeling results from USEPA and DAS (see also Table 2). The drinking water exposure assessment described by SERA is based on modeling results for surface water. As noted in SERA, modeling results for concentrations in surface water are higher than modeling results in groundwater.

3. Recent Information Related to Environmental Fate Characteristics and Model Input Values

As noted in the section above, the model input values for soil half-life and soil binding were found to be important parameters in modeling of aquatic exposure. Recent assessments by USEPA (2014A) and the European Union (EFSA, 2013) provide updated information for these properties of aminopyralid.

USEPA (2014A) considered the data from eight soils. The soil half-life values ranged from 31 to 193 days, with an average of 103.7 days. The K_D values ranged from 0.03 to 0.29 mL/g for soils with pH values of 6.1 to 7.8; K_D values of acid soils were in the range of 0.15 to 0.72 mL/g. The K_{OC} values for soils with near-neutral pH values were in the range of 1.05 to 7.54 mL/g and for acidic soils the values were in the range of 19.95 to 24.3 mL/g. In general, K_{OC} values increase with decreasing pH. USEPA (2014A) indicated that these data on soil half-life and soil binding (soil-water distribution coefficient data) are acceptable for use in exposure modeling and risk assessment.

In addition to the USEPA assessment, aquatic exposure modeling conducted as part of a European risk assessment (EFSA, 2013) was reviewed to provide additional data and information. The model input value for soil half-life geometric mean of 54.8 days was lower than the values used in the SERA risk assessment and the values used by USEPA. The model input value for soil binding parameter (mean K_{FOC} of 6.64 mL/g) was within the range of values used in the other modeling efforts reviewed above. The EFSA modeling results are included in Table 1.

Consideration of the data from the recent USEPA and EFSA assessments indicates that the input parameter values used in the GLEAMS modeling described in the SERA risk assessment were conservative values. In the refined modeling described below, DAR considered the recent information with the selection of input parameter values.

4. Additional Aquatic Exposure Modeling

For the purpose of this review, DAR conducted additional modeling using updated input parameter values to complement the existing data with refined exposure modeling results. The modeling conducted by DAR was done with recently released EPA water exposure models (see Appendix 1 and 2.

The model input parameter values for soil half-life and soil binding were based on the environmental fate information and data provided in the recent assessment by USEPA (2014A). The average value for soil half-life of 103.5 day and the lowest value for soil binding parameter K_D of 0.03 mL/g were used for model input. The application rate was the maximum labeled rate of 0.11 lbs of aminopyralid per acre. For surface water modeling, the watershed scenarios modeled were the EPA standard pond, the EPA index reservoir and a custom small pond scenario. Further details on model input can be found in Appendix 1.

The results of DAR modeling are presented below and compared with the modeling data summarized in the SERA risk assessment (Durkin, 2007) and EFSA (2013).

4.1. Surface Water Modeling

Additional modeling of surface water concentrations was conducted to complement the existing modeling data that were generated with EPA standard scenarios using modeling data that are more representative for Massachusetts ROW. The model scenario that was developed for surface water exposure assessment of herbicide components in ROW areas (Wijnja, 2010), was used in the modeling here with the latest version of the EPA surface water exposure model (see Appendix 1). The latest version of the EPA surface water exposure model also allows the modeling of a custom watershed scenario. For the purpose of this assessment, DAR developed a custom small pond scenario. More detailed information on the model input and modeling results can be found in Appendix 1.

The modeled surface water concentrations are summarized and compared with other modeling results in Table 1. To facilitate comparison of modeling results, results from other modeling were scaled, if necessary, to the value representative of an application rate of 0.11 lbs/acre.

The modeling results generated with the MA-specific ROW scenario by DAR show the highest concentrations for the custom small pond scenario. These higher concentrations are attributed to the smaller dimensions of the watershed, including a shallower pond, compared to the EPA standard pond and reservoir.

Comparison of the most conservative refined modeling results (ROW scenario and custom small pond) with the concentrations used in the SERA risk assessment indicate that the results are similar to the central values used in SERA risk assessment.

The results for the MA-specific ROW scenario with standard pond and index reservoir watersheds are lower than the concentration generated by EPA modeling for the same type of watersheds. This is likely the result of difference in the land use scenarios (ROW versus range land or a generic scenario) and weather input data. The results for the ROW scenario and custom small pond watershed resulted in higher concentrations compared to the EPA standard pond and EPA Index Reservoir water bodies.

Table 1. Modeling results for surface water concentrations of aminopyralid. The results are representative of an application rate of 0.11 lbs/acre.

Agency/Org.	Model/Scenario	Concentration (µg/L or ppb)		Source/Notes
		Peak	Longer-term	
DAR	MA ROW scenario with:			
	SWCC, EPA Standard Pond	0.612	0.477	Appendix 1A
	SWCC, EPA Index Reservoir	1.93	1.45	Appendix 1B
	SWCC, Custom Small Pond	12.1	3.32	Appendix 1C
SERA				Durkin, 2007:
	GLEAMS Standard, Pond	3.34 - 14.3	2.21 - 7.76	Table 6; 50 inch rainfall and rate of 0.11 lbs/acre
	GLEAMS-Driver, Pond	8.8 - 34.1	4.4 – 19.8	Table 9, 10; average rainfall and for rate of 0.11 lbs/acre
EPA				Durkin, 2007:
	PRZM/EXAMS, Reservoir	10.01	1.936	Table 11, rate of 0.11 lbs/acre
	GENEEC, EPA Standard Pond	6.38	5.39	″
DOW				Durkin, 2007:
	GENEEC	6.16	3.96	Table 11; rate of 0.11 lbs/acre
				″
SERA	Conc. used for Risk Assess.			Durkin, 2007:
	Central	11	4.4	Table 12, rate of 0.11 lbs/acre
	Lower	0.23	0.11	″
	Upper	66.0	28.6	″
EFSA				EFSA, 2013: Annex A
	FOCUS Step 1	20.4	20.1	Screening-level Assessment
	FOCUS Step 3	0.052	0.049	Late Spring Application, Pond D4 Scenario
	FOCUS Step 3	0.332	0.042	Late Spring Application, Stream Scenario D4

DAR modeling with ROW-scenario also evaluated the sensitivity of the results for the input value of the soil aerobic metabolism half-life. The model results did not change significantly for simulations with a soil aerobic metabolism half-life of 310.5 d compared to 103.5 d (Table 1 in Appendices 1A, 1B and 1C). The 310.5 d value was used in earlier modeling by EPA (see Section 2); the value of 103.5 d was more recently recommended for use in risk assessment (see Section 3).

Modeling data generated by the European EFSA agency show screening-level assessment concentrations that are higher than the DAR custom pond values, but concentrations for specific scenarios are lower than modeling results for all other scenarios included in Table 1.

4.2. Groundwater modeling results

Additional groundwater modeling was conducted with EPA models SCIGROW and PRZM-GW (Water Models | Pesticides | US EPA: http://www.epa.gov/pesticide-science-and-assessing-pesticide-risks/about-water-exposure-models-used-pesticide).

SCI-GROW (Screening Concentration in Groundwater) as a screening-level tool to estimate drinking water exposure concentrations in groundwater resulting from pesticide use. As a screening tool, SCI-GROW provides conservative estimates of pesticides in groundwater. It is a generic model that provides peak estimates of compound concentrations in groundwater based on a given application rate, number of applications, and standard environmental fate parameters of soil aerobic half-life and soil binding constant.

The PRZM-GW (Pesticide Root Zone Model – Ground Water) model has the capability to consider variability in leaching potential of different soils, weather (including rainfall), cumulative yearly applications or depth to aquifer. The conceptual model is based on a rural drinking water well beneath an agricultural field (a high pesticide use area), which draws water from an unconfined, high water-table aquifer. Processes included in the conceptual model that influence pesticide transport through the soil profile include water flow, chemical specific dissipation and transportation parameters (i.e., degradation and sorption), and crop specific factors, including transpiration, pesticide interception and management practices.

Six different scenarios were developed for the PRZM-GW model. The modeling for the review presented here used was based on the Delmarva Sweet Corn - Evesboro Loamy Sand scenario. Delmarva Peninsula sweet corn scenario is one of the six PRZM-GW standard scenarios that fall within regions where groundwater is highly susceptible to nitrate contamination. The six scenarios are expected to provide reasonable upper bound estimates for pesticide concentrations for vulnerable groundwater sources (USEPA, 2015).

The Delmarva Corn scenario most closely represents the Virginia Coastal Plain spatially and characteristically. In the Delmarva Corn scenario, the vadose zone ends and the aquifer begins 9 meters (29.5 feet) below the land surface. It has been reported that 26 of 29 Virginia Coastal Plain counties have at least one domestic well with a depth to the bottom of the well screen of 30 feet or less. Using this example, it follows that modeling with PRZM-GW provides estimated drinking water concentrations (EDWCs) that represent a subset of a broadly distributed population relying on shallow, private drinking water wells.

The scenario characteristics for vegetation were adjusted to be representative of ROW vegetation. Weather input data were representative for Eastern Massachusetts. This model simulation can be considered to be representative of behavior at a vulnerable site given the loamy sand soil profile and the absence of a buffer zone around the well.

Details on the SCI-GROW and PRZM-GW modeling can be found in Appendices 2A and 2B. The modeling results are summarized in Table 2 and compared with the other ground water modeling data.

Table 2. Comparison of groundwater modeling results for concentrations of aminopyralid for maximum application rate of 0.11 lbs/acre.

Agency/Org.	Model/Scenario	Concentration (µg/L or ppb)		Source/Notes
		Peak	Longer-term	
DAR	SCIGROW	5.17		Appendix 2A ; K_{OC}:1.05; soil half-life: 103.5 d
	PRZM-GW	12.6	10.5	Appendix 2B; K_{OC}:1.05; soil half-life: 103.5 d
EPA				Durkin, 2007: Table 11
	SCI-GROW	0.627		Application rate of 0.11 lbs/acre; K_{OC}: 1.05; soil half-life: 38.7 d
DOW				Durkin, 2007:
	SCI-GROW	1.65		Table 11, for application rate of 0.11 lbs/A; K_{OC} of 7.1 and soil half-life of 88.6 d
	SCI-GROW	0.121		Rate: 0.11 lbs/acre; K_{OC} of 7.1; soil half-life of 30 d
				″
EFSA				EFSA, 2013: Annex A
	FOCUS PEARL	0.116		Annual application of 0.053 lbs ai/acre; field dissipation half-life of 14.1 d; K_{foC}: 5.14 mL/g

Modeling results from DAR show the highest concentrations due to the use of conservative values for soil adsorption constant and soil half-life input parameters. These input values are the most recent values that EPA recommends for use in risk assessment (see section 3).

It should be noted that the soil defined in the Delmarva Sweet Corn - Evesboro Loamy Sand scenario represents a sandy soil profile with relatively low organic matter content. Such a soil profile is considered to favor leaching of substances into the profile. In the model scenario, the soil is definedto have low organic matter (highest is 0.52 % organic carbon in top layers and 0.1 – 0.20 % in deeper soil layers). Percentage of sand in the soil layers is greater than 90 % and clay content is between 2 and 5%. These soil particle size distributions are similar to values for sandy soils that occur in southeastern Massachusetts and Cape Cod. For example, the Carver soils are sandy soils with clay content of 1 to 5 % and organic matter content in the ranges of 0.1 – 1.0 %. (Soil Survey for Barnstable County: http://nesoil.com/barnstable/index.htm).

4.3. Groundwater Monitoring Data

The ground water modeling results can further be evaluated by considering results from monitoring studies. At the time of this review, two studies were located that were publicly available (online) that included aminopyralid as a target analyte.

A groundwater monitoring study conducted in Wyoming by the US Geological Survey (USGS) included aminopyralid as a target analyte. Aminopyralid was not detected (Eddy-Miller et al., 2013).

In a monitoring study in the Bitterroot Valley, MT, aminopyralid was detected at a level of 0.1 µg/L in one of 46 samples from 23 wells (Schmidt and Mulder, 2009).

USGS pesticide use data indicate that there was substantial use of this herbicide in both Montana and Wyoming (Fig. 1).

These monitoring study results show low detection frequencies of aminopyralid in areas where this herbicide was used. When detected, the level was much lower than the ground water modeling data presented in section 4.2.

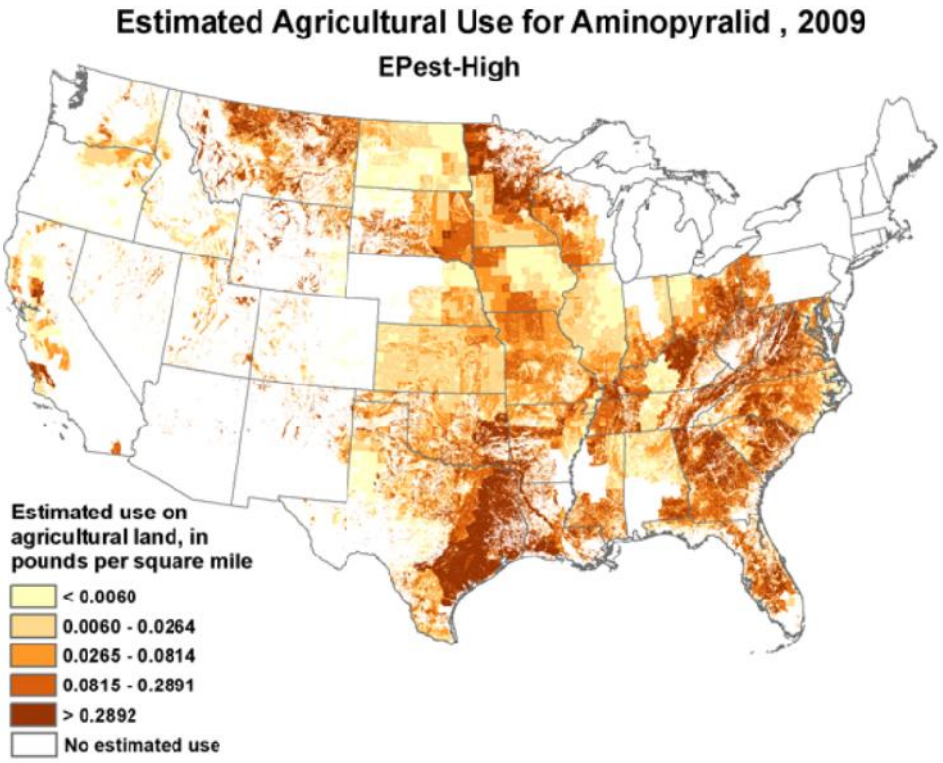

Figure 1 Estimated Agricultural use of Aminopyralid in the US during 2009. Accessed at: USGS NAWQA: The Pesticide National Synthesis Project

5. Comparison of Modeled Concentrations with Aquatic Life and Human Health Benchmarks

EPA developed benchmarks that can assist with the assessment of monitoring and modeling data. Surface water modeling data were compared with aquatic life bench mark to assess the potential for ecological effects in aquatic systems.

Comparison of modeled surface water concentrations with Aquatic Life Benchmarks for Aminopyralid (Table 3) can be helpful to assess risk to aquatic life (USEPA, 2014B). Comparison of the modeled concentrations in Table 1 (DAR data for peak 0.612 – 12.1 µg/L and chronic 0.477 to 3.32 µg/L) with the benchmarks in Table 3 shows levels well below benchmark values. This comparison indicates minimal risk to aquatic life.

Table 3. Aquatic life benchmarks for aminopyralid

Species	Acute (µg/L or ppb)	Chronic (µg/L or ppb)
Fish	>5,000	1360
Invertebrates	>49,300	10200
Non-vascular plants	18,000	
Vascular plants	>88,000	

Comparison of the modeled concentrations with human health benchmark values for aminopyralid can further assist with assessment of potential for human health effects.

The chronic or life-time human health benchmark (HHBM) value for aminopyralid is 3500 ppb (US EPA, 2014C). An acute HHBM value has not been established. The EPA risk assessment notes that aminopyralid is of low acute toxicity and therefore no acute reference dose was identified for any population.

Comparison of the modeled aminopyralid concentrations in groundwater and the HHBM indicates that there is no concern for effects on human health from drinking water containing residues of aminopyralid following application per label specifications..

6. References

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Appendix 1A: Summary of Water Modeling of Aminopyralid and the USEPA Standard Pond

Estimated Environmental Concentrations for aminopyralid are presented in Table 1 for the USEPA standard pond with the RightOfWay_MA_PAX field scenario. A graphical presentation of the year-to-year peaks is presented in Figure 1. These values were generated with the Surface Water Concentration Calculator (SWCC Version 1.106) (Water Models | Pesticides | US EPA)[1]. The SWCC model estimates pesticide concentrations in water bodies that result from pesticide applications to land. The SWCC is designed to simulate the environmental concentration of a pesticide in the water column and sediment and is used for regulatory purposes by the USEPA Office of Pesticide Programs (OPP). The SWCC uses PRZM version 5.0+ (PRZM5) and the Variable Volume Water Body Model (VVWM), replacing the older PE5 shell (last updated November 2006), which used PRZM3 and EXAMS.

Critical input values for the model are summarized in Tables 2 and 3. This model estimates that about 1.1% of aminopyralid applied to the field eventually reaches the water body. The main mechanism of transport from the field to the water body is by runoff (53.3% of the total transport) followed by spray drift (46.7%).

In the water body, pesticide dissipates with an effective water column half-life of 68.2 days. (This value does not include dissipation by transport to the benthic region; it includes only processes that result in removal of pesticide from the complete system.) The main source of dissipation in the water column is photolysis (effective average half-life = 71 days) followed by metabolism (1744.3 days) and volatilization (1.866018E+10 days).

In the benthic region, pesticide dissipation is negligible (1744.3 days). The main source of dissipation in the benthic region is metabolism (effective average half-life = 1744.3 days). The vast majority of the pesticide in the benthic region (92.5%) is in the pore water rather than sorbed to sediment.

Table 1. Estimated Environmental Concentrations (ppb) for aminopyralid.

	Soil half-life 103.5 d	Soil half-life 310.5 d
Peak (1-in-10 yr)	0.610	0.612
4-day Avg (1-in-10 yr)	0.596	0.598
21-day Avg (1-in-10 yr)	0.552	0.553
60-day Avg (1-in-10 yr)	0.476	0.477

[1] USEPA Water Models Pesticides: http://www.epa.gov/pesticide-science-and-assessing-pesticide-risks/about-water-exposure-models-used-pesticide

365-day Avg (1-in-10 yr)	0.145	0.146
Entire Simulation Mean	0.726E-01	0.727E-01

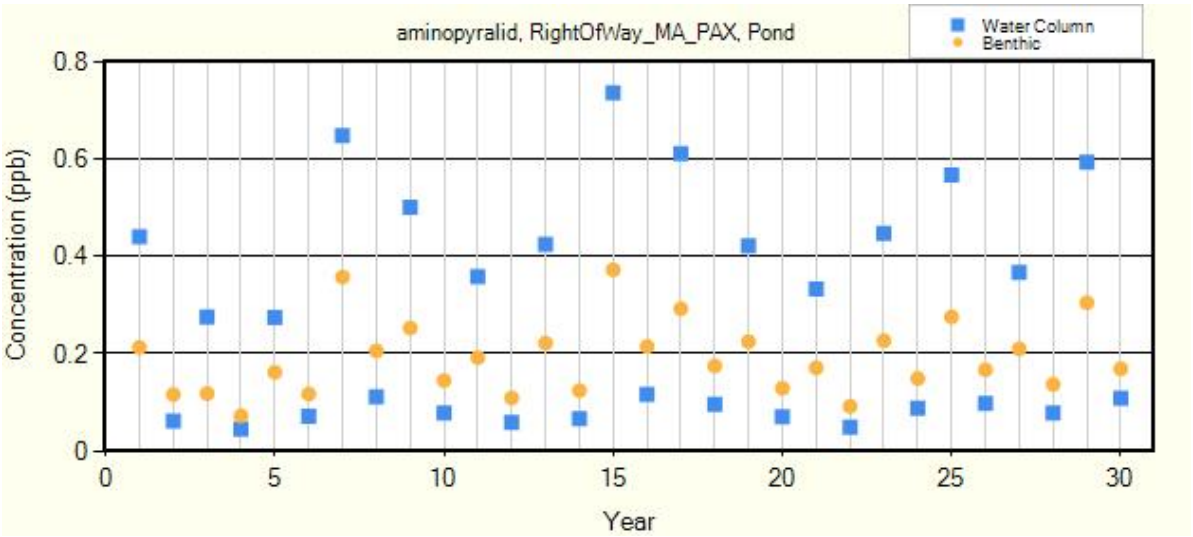
Table 2. Summary of Model Inputs for aminopyralid.

Scenario	RightOfWay_MA_PAX
Cropped Area Fraction	1
K_D (ml/g)	0.03
Water Half-Life (days) @ 20 °C	1073.6
Benthic Half-Life (days) @ 20 °C	1073.6
Photolysis Half-Life (days) @ 42 °Lat	0.6
Hydrolysis Half-Life (days)	0
Soil Half-Life (days) @ 20 °C	103.5
Foliar Half-Life (days)	
Molecular Wt	207
Vapor Pressure (torr)	7.4e-11
Solubility (mg/l)	2480

Table 3. Application Schedule for aminopyralid (every two years)

Date (Mon/Day)	Type	Amount (kg/ha)	Eff.	Drift
07/01	Foliar	0.11	0.95	0.05

Figure 1. Yearly Peak Concentrations


aminopyralid, RightOfWay_MA_PAX, Pond
Water Column
Benthic
Concentration (ppb)
0.8
0.6
0.4
0.2
0
0
5
10
15
20
25
30
Year

Appendix 1B: Summary of Water Modeling of aminopyralid and the USEPA Standard Reservoir

Estimated Environmental Concentrations for aminopyralid are presented in Table 1 for the USEPA standard reservoir with the RightOfWay_MA_PAX field scenario. A graphical presentation of the year-to-year peaks is presented in Figure 1. These values were generated with the Surface Water Concentration Calculator (SWCC Version 1.106). Critical input values for the model are summarized in Tables 2 and 3.

This model estimates that about 0.72% of aminopyralid applied to the field eventually reaches the water body. The main mechanism of transport from the field to the water body is by runoff (78.9% of the total transport) followed by spray drift (21.1%).

In the water body, pesticide dissipates with an effective water column half-life of 53.4 days. (This value does not include dissipation by transport to the benthic region; it includes only processes that result in removal of pesticide from the complete system.) The main source of dissipation in the water column is photolysis (effective average half-life = 97.3 days) followed by washout (126.8 days), metabolism (1744.3 days), and volatilization (2.556444E+10 days).

In the benthic region, pesticide dissipation is negligible (1744.3 days). The main source of dissipation in the benthic region is metabolism (effective average half-life = 1744.3 days). The vast majority of the pesticide in the benthic region (92.5%) is in the pore water rather than adsorbed to sediment.

Table 1. Estimated Environmental Concentrations (ppb) for aminopyralid.

	Soil Half-life 103.5 d	Soil Half-life 310.5 d
Peak (1-in-10 yr)	1.11	1.11
4-day Avg (1-in-10 yr)	1.08	1.08
21-day Avg (1-in-10 yr)	0.985	0.989
60-day Avg (1-in-10 yr)	0.792	0.794
365-day Avg (1-in-10 yr)	0.223	0.224
Entire Simulation Mean	0.938E-01	0.941E-01

Table 2. Summary of Model Inputs for aminopyralid.

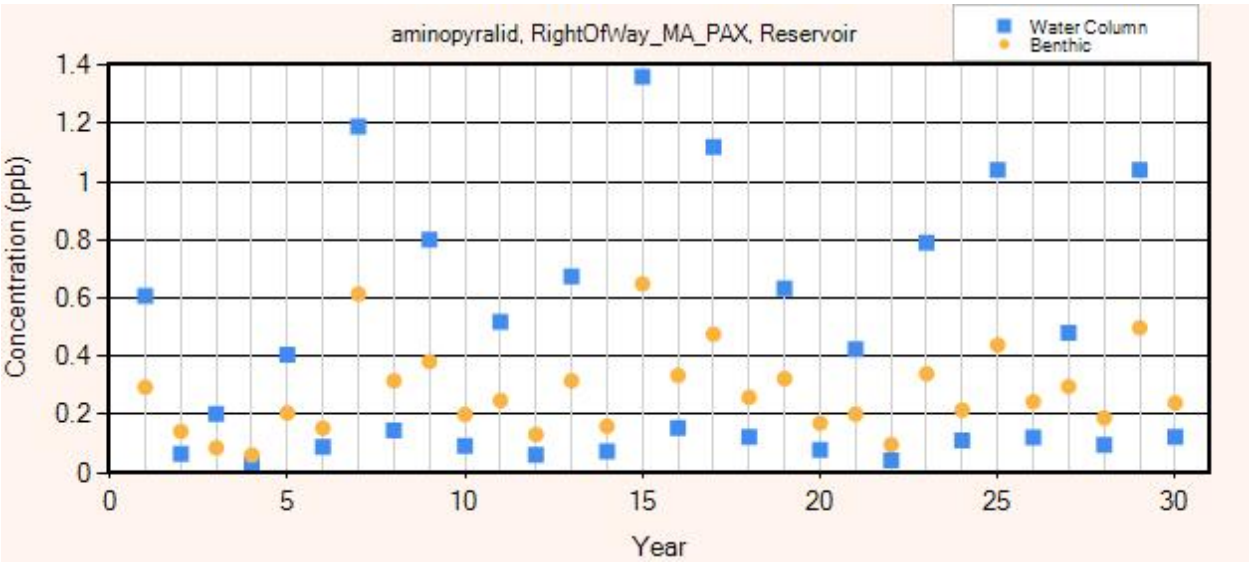
Scenario	RightOfWay_MA_PAX
Cropped Area Fraction	1.0
K_D (ml/g)	0.03

Water Half-Life (days) @ 20 °C	1073.6
Benthic Half-Life (days) @ 20 °C	1073.6
Photolysis Half-Life (days) @ 42 °Lat	0.6
Hydrolysis Half-Life (days)	0
Soil Half-Life (days) @ 20 °C	103.5
Foliar Half-Life (days)	
Molecular Wt	207
Vapor Pressure (torr)	7.4e-11
Solubility (mg/l)	2480

Table 3. Application Schedule for aminopyralid (every two years)

Date (Mon/Day)	Type	Amount (kg/ha)	Eff.	Drift
07/01	Foliar	0.11	0.95	0.05

Figure 1. Yearly Peak Concentrations



Appendix 1C: Summary of Water Modeling of aminopyralid in a Custom Small Pond Scenario

Estimated Environmental Concentrations for aminopyralid are presented in Table 1 for the custom small pond with the RightOfWay_MA_PAX field scenario. A graphical presentation of the year-to-year peaks is presented in Figure 1. These values were generated with the Surface Water Concentration Calculator (SWCC Version 1.106). Critical input values for the model are summarized in Tables 2 and 3.

The custom watershed characteristics were made to be more representative of a ROW scenario by considering a smaller catchment area-to-pond area/volume; it was adapted from the TOXSWA scenario: http://www.pesticidemodels.eu/toxswa/eu-registration . The depth of the pond was chosen to be 0.33 m initial depth and 0.67 m maximum depth. The applications occurred every two years.

This model estimates that about 0.62% of aminopyralid applied to the field eventually reaches the water body. The main mechanism of transport from the field to the water body is by runoff (96.8% of the total transport) followed by spray drift (3.24%).

In the water body, pesticide dissipates with an effective water column half-life of 11.6 days. (This value does not include dissipation by transport to the benthic region; it includes only processes that result in removal of pesticide from the complete system.) The main source of dissipation in the water column is photolysis (effective average half-life = 11.7 days) followed by metabolism (1744.3 days) and volatilization (3.078929E+09 days).

In the benthic region, pesticide dissipation is negligible (1744.3 days). The main source of dissipation in the benthic region is metabolism (effective average half-life = 1744.3 days). The vast majority of the pesticide in the benthic region (92.5%) is in the pore water rather than sorbed to sediment.

Table 1. Estimated Environmental Concentrations (ppb) for aminopyralid.

	Soil Half-life 103.5 d	Soil Half-life 310.5 d
Peak (1-in-10 yr)	12.2	12.3
4-day Avg (1-in-10 yr)	10.6	10.7
21-day Avg (1-in-10 yr)	6.63	6.66
60-day Avg (1-in-10 yr)	3.46	3.47
365-day Avg (1-in-10 yr)	0.598	0.600
Entire Simulation Mean	0.218	0.219

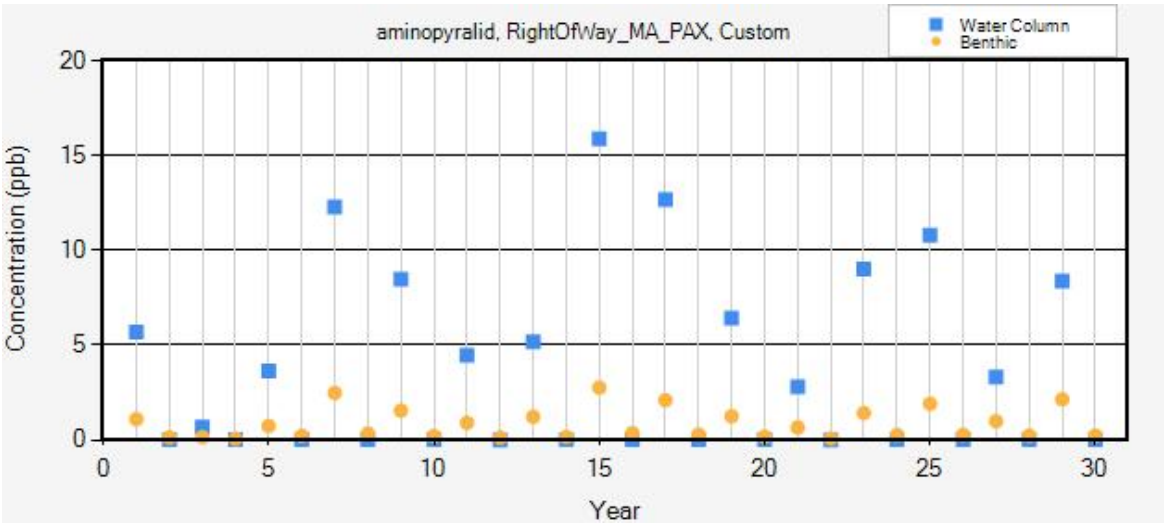
Table 2. Summary of Model Inputs for aminopyralid.

Scenario	RightOfWay_MA_PAX
Cropped Area Fraction	1.0
K_d (ml/g)	0.03
Water Half-Life (days) @ 20 °C	1073.6
Benthic Half-Life (days) @ 20 °C	1073.6
Photolysis Half-Life (days) @ 42 °Lat	0.6
Hydrolysis Half-Life (days)	0
Soil Half-Life (days) @ 20 °C	103.5
Foliar Half-Life (days)	
Molecular Wt	207
Vapor Pressure (torr)	7.4e-11
Solubility (mg/l)	2480

Table 3. Application Schedule for aminopyralid (every two years)

Date (Mon/Day)	Type	Amount (kg/ha)	Eff.	Drift
07/01	Foliar	0.11	0.99	0.01

Figure 1. Yearly Peak Concentrations



Appendix 2A: Groundwater Modeling with SCIGROW

SCI-GROW (Screening Concentration in Groundwater) is a screening-level tool to estimate drinking water exposure concentrations in groundwater resulting from pesticide use. As a screening tool, SCI-GROW provides conservative estimates of pesticides in groundwater. It is a generic model that provides peak estimates of compound concentrations in groundwater based on a given application rate, number of applications, and standard environmental fate parameters of soil aerobic half-life and soil binding constant. SCI-GROW is an empirical model based on a linear best fit through 13 single-application groundwater studies. These studies were typically two to three year studies. SCI-GROW is a screening level risk assessment tool that has been used to evaluate the effect of pesticide use on groundwater. More information on the SCI-GROW model is available at EPA website for water models: Water Models | Pesticides | US EPA [2]

Model input and output is given below.

```
SCIGROW

                    VERSION 2.3
          ENVIRONMENTAL FATE AND EFFECTS DIVISION
               OFFICE OF PESTICIDE PROGRAMS
           U.S. ENVIRONMENTAL PROTECTION AGENCY
                      SCREENING MODEL
              FOR AQUATIC PESTICIDE EXPOSURE


 SciGrow version 2.3
 chemical:Aminopyralid
 time is  2/20/2015  12: 4:28
 ---------------------------------------------------------------------
  Application      Number of       Total Use    Koc      Soil Aerobic
  rate (lb/acre)  applications   (lb/acre/yr)  (ml/g)   metabolism (days)
 ---------------------------------------------------------------------
      0.110           1.0           0.110      1.05E+00      103.5
 ---------------------------------------------------------------------
 groundwater screening cond (ppb) =   5.17E+00
 *********************************************************************
```

[2] USEPA Water Models: http://www.epa.gov/pesticide-science-and-assessing-pesticide-risks/about-water-exposure-models-used-pesticide

Appendix 2B: Groundwater Modeling with PRZM-GW model

Analysis for Aminopyralid and the DELMARVA Sweet Corn - Evesboro Loamy Sand Scenario in the PRZM-GW model system

PRZM-GW (Pesticide Root Zone Model – Ground Water) was developed as the harmonized tool for assessing pesticide concentrations in groundwater. This model has the capability to consider variability in leaching potential of different soils, weather (including rainfall), cumulative yearly applications or depth to aquifer. The conceptual model is based on a rural drinking water well beneath an agricultural field (a high pesticide use area), which draws water from an unconfined, high water-table aquifer. Processes included in the conceptual model that influence pesticide transport through the soil profile include water flow, chemical specific dissipation and transportation parameters (i.e., degradation and sorption), and crop specific factors, including transpiration, pesticide interception and management practices.

Six different scenarios were developed for the PRZM-GW model. The modeling for the review presented here was based on the Delmarva Sweet Corn - Evesboro Loamy Sand scenario. Delmarva Peninsula sweet corn scenario is one of the six PRZM-GW standard scenarios that fall within regions where groundwater is highly susceptible to nitrate contamination. The six scenarios are expected to provide reasonable upper bound estimates for pesticide concentrations for vulnerable groundwater sources (USEPA, 2015)[3].

The Delmarva Corn scenario most closely represents the Virginia Coastal Plain spatially and characteristically. In the Delmarva Corn scenario, the vadose zone ends and the aquifer begins 9 meters (29.5 feet) below the land surface. It has been reported that 26 of 29 Virginia Coastal Plain counties have at least one domestic well with a depth to the bottom of the well screen of 30 feet or less. Using this example, it follows that modeling with PRZM-GW provides estimated drinking water concentrations (EDWCs) that represent a subset of a broadly distributed population relying on shallow, private drinking water wells.

Weather data were representative of Eastern Massachusetts and scenario characteristics for vegetation were adjusted to be representative of ROW vegetation. Vegetation height, root zone depth were set at values that were used in ROW model scenario used of surface water modeling (Wijnja, 2010). Model simulation can be considered to be representative of behavior at a

[3] USEPA, 2015.Implementation of the Pesticide Root Zone Model Groundwater (PRZM-GW) for Use in EPA's Pesticide Exposure Assessments. USEPA, Office of Pesticide Program, Environmental Fate and Effects Division (EFED), September 8, 2015. Accessed at: http://www.epa.gov/sites/production/files/2015-11/documents/attachment_1_-_implementation_report_of_przm-gw_final.pdf

vulnerable site given the loamy sand soil profile and the absence of a buffer zone around the well.

Estimated groundwater concentrations and breakthrough times for aminopyralid are presented in Table 1 for the DELMARVA sweet corn - Evesboro loamy sand groundwater scenario. A graphical presentation of the daily concentrations in the aquifer is presented in Figure 1. These values were generated with the PRZM-GW (Version 1.07). Critical input values for the model are summarized in Tables 2 and 3.

Table 1. Groundwater Results for aminopyralid and the DELMARVA sweet corn - Evesboro loamy sand Scenario for ROW in Massachusetts

	Soil half-life 103.5 d	Soil half-life 310.5 d
Peak Concentration (ppb)	12.6	19.6
Post-Breakthrough Mean Concentration (ppb)	10.5	15.8
Entire Simulation Mean Concentration (ppb)	7.52	11.3
Average Breakthrough Time (days)	3013.025	3013.025
Throughputs	3.63754	3.63754

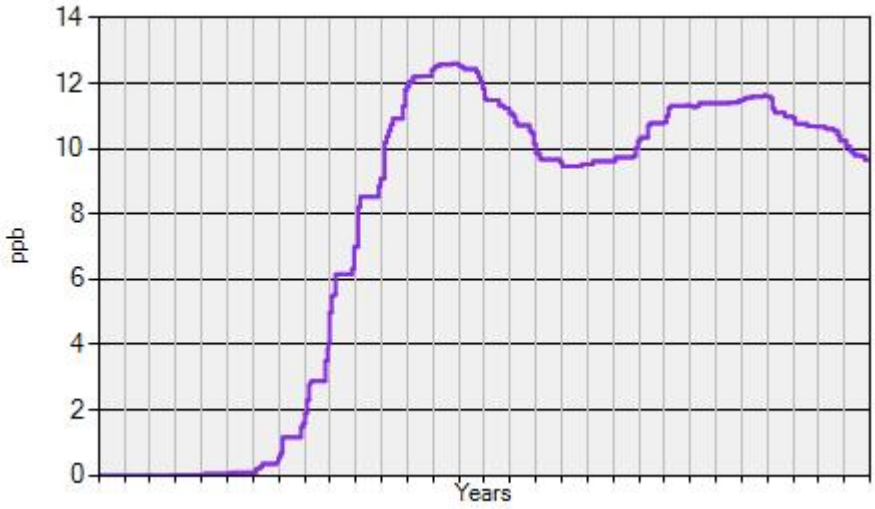
Table 2. Chemical Properties for Groundwater Modeling of aminopyralid.

Koc (ml/g)	1.05
Surface Soil Half Life (days)	103.5 (310.5)
Hydrolysis Half Life (days)	0
Diffusion Coefficint Air (cm2/day)	0.0
Henry's Constant	0.0
Enthalpy (kcal/mol)	0.0

Table 3. Pesticide application scheme used for aminopyralid. This application scheme was applied once every 2 years of the simulation.

Application Date (Month/Day)	Application Method	Application Rate (kg/ha)
07/01	Above canopy application	0.11

Figure 1. Aquifer Breakthrough Curve for aminopyralid and the DELMARVA Sweet Corn - Evesboro Loamy Sand Scenario. Groundwater depth is 10 m and application of 0.11 lbs/acre occur every 2 years. Results shown are for simulation with soil half-life of 103.5 d.



APPENDIX 10

NATIONAL GRID ENVIRONMENTAL POLICY

Environmental Operations Policy

"It is essential to me as CEO that we operate in an environmentally responsible way because we know it's the right thing to do – for society, the environment and our business.

Everyone at National Grid has a role to play in proactively supporting the environment in the way we work. We do this by continually improving the way we monitor environmental risks, respond to incidents and use resulting learning to evolve our environmental performance."

John Pettigrew, Chief Executive

For details on the minimum performance requirements for National Grid employees to meet this policy, see our Responsible Business Charter and Standard, and the detailed version of this policy on grid:home.

Date: 31 March 2024. Version 1.1

At National Grid, we take our responsibilities for sustainable environmental operations seriously. We will, as a minimum, meet our legal and voluntary obligations while aspiring to world-class performance in our environmental operations.

Scope

This policy applies to anyone who is employed by or carries out work on behalf of any National Grid business.

Through this policy, we shall

- Fulfil all our compliance obligations on sustainable environmental operations, both legal and voluntary.
- Deliver continual improvement in our environmental performance and Environmental Management Systems.
- Commit to prevent pollution and contamination by managing all lifecycle stages of our business operations, sites, and assets.
- Use a lifecycle approach to identify our environmental aspects, risks and opportunities and establish appropriate targets and plans to address them.
- Protect nature in line with the commitment made in our Responsible Business Charter.
- Use resources responsibly.
- Identify and prioritise, where possible, the opportunities to use alternatives to hazardous materials.
- Manage waste by adopting the principles of waste hierarchy and where possible, work towards embedding the circular economy in our operations.
- Continue to influence our supply chain to operate in environmentally responsible ways.
- Ensure all our employees have the training, skills, knowledge, and resources necessary to meet our environmental commitments.

nationalgrid