

# **Yearly Operational Plan (YOP)**

**Town of Franklin**

**2012**

**Prepared By:**

Town of Franklin  
Department of Public Works  
257 Fisher Street  
Franklin, MA 02038

Comprehensive Environmental Inc.  
225 Cedar Hill Street  
Marlborough, MA 01752  
800.725.2550

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## **Program Purpose**

The purpose of 333 CMR 11.00, Rights of Way Management, is to promote the implementation of integrated pest management techniques and to establish standards, requirements, and procedures necessary to minimize the risk of unreasonable adverse effects on human health and the environment associated with the use of herbicides to maintain streets, road, sidewalks and paths. These regulations establish procedures that guarantee ample opportunity for public and municipal agency review and input on the right-of-way maintenance plans.

A yearly operational plan (YOP) must be submitted to the Department of Agricultural Resources every year herbicides are intended for use to maintain rights-of-way. The YOP provides a detailed program for vegetation management for the year. A five year Vegetation Management Plan (VMP) was approved by the Department and is available for review at the Franklin Department of Public Works, Board of Health, Conservation Commission, and Town Administrator. The VMP was approved in 2007 and is in effect through 2011.

Upon receipt of this YOP, the Department publishes a notice in the *Environmental Monitor*. The Town must provide a copy of the proposed YOP and *Environmental Monitor* notice to the Board of Health, Conservation Commission, and the Town Administrator for the Town of Franklin, in which the proposed herbicide treatment is proposed. The Department allows a 45-day comment period on the proposed YOP beginning with the publication of the notice and receipt of the YOP and *Environmental Monitor* notice by the Town.

Public notification of herbicide application to the streets is made at least 21 days in advance of the treatment by a separate notice. Notice is made to the Department of Agricultural Resources, Town Administrator, Public Water Supplier, Board of Health, and the Conservation Commission in the Town of Franklin.

Any comments on this YOP should be made to the person designated herein as the person supervising the YOP or the person performing the treatment.

This Yearly Operational Plan, approved by the Massachusetts Department of Agricultural Resources pursuant to Rights-of-Way Management Regulations (333 CMR 11.00), has been adopted by the following roadway vegetation management program in the Town of Franklin. The undersigned hereby acknowledges that the conditions of the Yearly Operational Plan will be adopted and complied with.

Municipality: Town of Franklin

Name: Mr. Robert Cantoreggi

Office: DPW Director

Address: 257 Fisher Street, Franklin, MA 02038

Telephone / Fax: Ph: (508) 520-4910 Fax: (508) 520-4903

Email: [rcantoreggi@franklin.ma.us](mailto:rcantoreggi@franklin.ma.us)

Signature: \_\_\_\_\_

Date: \_\_\_\_\_

Wetland Determination: Negative Determination issued by the Franklin Conservation Commission on February 15, 2007

## Individual Supervising YOP

Name and Title: Mr. Carlos Rebelo  
Department: Park & Grounds Superintendent  
Address: 257 Fisher Street, Franklin, MA 02038  
Telephone: (508) 520-4910  
Signature: \_\_\_\_\_

## Municipal Department Performing Herbicide Treatment

A licensed herbicide applicator under contract to the Town of Franklin Department of Public Works will perform the herbicide treatment. Applicators are certified by the Massachusetts Department of Agricultural Resources in the applicator category:

Certified Applicator:

License Number:

Company or Department:

Address:

**To Be  
Determine Via  
Public Bid**

Telephone Number:

Email:

The following information is provided as details of the YOP of the Town of Franklin in accordance with the requirements of 333 CMR 11.06 (2):

### Herbicides Proposed

The herbicides proposed for use in calendar year 2011 are:

Herbicide & EPA Reg:	Accord Concentrate or Rodeo (62719-324) Round-Up Pro (524-475)
Active Ingredient:	Glyphosate
Registrant:	Dow AgroSciences
Application Rate:	Accord Concentrate – 2-5% solution Rodeo – 2-5% solution Round-Up Pro – 2-5% solution

Herbicide:	Oust Extra
Active Ingredients:	Sulfometuron Methyl, Metsulfuron Methyl
Registrant:	DuPont
EPA Reg. #	352-622
Application Rate:	2 2/3 ounces to 3 ounces per acre.

Complete information on these products are attached, including the Material Safety Data Sheets (MSDS). The herbicide fact sheet for the above listed herbicides are attached to and made part of this YOP.

## **Herbicide Application Techniques and Alternative Control Procedures**

The herbicide(s) will be applied in accordance with the instructions in the attached manufacturer's information. Alternative control procedures, applicable at the designated "No Spray Zones" will consist of hand cutting, mowing, or selective trimming (mechanical). Other alternative controls will include routine street sweeping along with crack and road repairs.

Low volume foliar treatments will be made using ready to use squirt bottles or hand pump backpacks. High volume foliar application may include a truck-mounted hydraulic sprayer. In both cases, the herbicide solution is applied to lightly wet the target plant/target area. These techniques have few limitations with the exception being reduced effectiveness on tall, high-density target vegetation and will not be used on vegetation over 12 feet in height.

Cut stump treatments will generally be performed to trees greater than 12' tall and resprout. Cut stump treatments consist of mechanical cutting of target species using chain saws immediately followed by herbicide treatment applied with a squirt bottle, a hand pump sprayer, or painted on the freshly cut surface of the stump. The herbicide is limited to freshly cut surface of the remaining stump.

All equipment used for vegetation management programs must be maintained in good working condition, and should be of adequate design and ability to produce the professional quality of work that the Town requires. Because the Town recognizes the vast variety and performance of herbicide application equipment, dictating how that equipment should be calibrated to deliver precise amounts of herbicide to effectively control a host of vegetation conditions is literally impossible. Therefore, the Town insists that the contractor provide the most appropriate application equipment, calibrated to effectively and legally control target vegetation.

Both the Contractor and the Town are responsible to insure that vegetation management activities are conducted in a professional, safe, efficient manner, with special attention directed towards minimal environmental impact. The contractor is qualified, licensed and certified to apply herbicides. "Qualified" means those personnel who have been trained to recognize and identify target and non-target vegetation and are knowledgeable in the safe and proper use of both mechanical and chemical vegetation management techniques. All personnel applying herbicides in Massachusetts must be licensed in the

Commonwealth and must work under the on-site supervision of a certified applicator. All contract personnel will also follow all Label instructions regarding Personal Protective Equipment (PPE).

The Town will rely on the independent contractor listed in the YOP for vegetation management applications and requires, in a contractual agreement, that contractors comply with all applicable federal and state laws and regulations. These include, but are not limited to, applicable OSHA, FIFRA and DOT regulations, 333 CMR 1-15.00, Rights-of-Way Management, Chapter 132B, Chapter 85 of the Acts of 2000 and 321 CMR 10.00 as managed by NHESP.

Herbicides will only be applied in a safe and judicious manner, in compliance with all-applicable State and Federal pesticide regulations.

Applicators will at all times exercise good judgment and common sense during herbicide treatment activities, and will immediately cease operations if adverse conditions or other circumstances warrant.

Herbicides will NOT be applied during the following adverse weather conditions:

- A. During high wind velocity, per 333 CMR 11.03
- B. Foliar applications during periods of dense fog, or moderate to heavy rainfall
- C. Foliar applications of volatile herbicides during periods of high temperatures (90 plus degrees Fahrenheit) and low humidity
- D. Cut Stump applications when deep snow (i.e. 6" plus or ice frozen on stem or stump) prevents adequate coverage of target plants to facilitate acceptable control

The contractors or a representative of the Town must complete daily vegetation management reports that include:

- A. Date, name and address of vegetation management contractor(s)
- B. Identification of site or work area
- C. List of crew members
- D. Type of equipment and hours used, both mechanical and chemical
- E. Method of application and description of target vegetation
- F. Amount, concentration, product name of herbicide(s), adjuvants, and dilutants (EPA registration numbers must be on file)
- G. Weather conditions
- H. Notation of any unusual conditions or incidents, including public inquiries
- I. Recording and/or verification of sensitive areas on ROW maps

A Daily Vegetation Management Form is included in the Appendix

## **Target Vegetation**

The target vegetation for this YOP will include hazard, detrimental and nuisance vegetation.

Vegetation management crews will exercise care to insure that low-growing desirable vegetation and other non-target organisms are not unreasonably affected by the application of herbicides.

#### Hazard Vegetation

Hazard vegetation represents vegetation that may: obscure sightlines, obscure signs, obscure vehicular movement, block fire hydrants, windfall hazards, and winter shading (increase in use of deicing). This may include woody vegetation along the edges of roadways.

#### Detrimental Vegetation

Detrimental vegetation includes grasses and woody plants that are destructive or compromise the function of infrastructure including: cracks along the roadway, pavement/bridge joints, medians/traffic islands, and drainage structures/drainageways.

#### Nuisance Vegetation

This category includes nuisance vegetation that could cause problems to the general public, employees or contractors. Target vegetation in this category is primarily Poison Ivy and other nuisance vegetation within 10 feet of the edge of pavement, bridge abutments, drainage structures and other areas accessible by the public and/or requiring maintenance.

### **Description of Methods Used to Flag or Otherwise Designate Sensitive Areas**

Sensitive areas as defined by 333 CMR 11.04 are ‘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.’ The Sensitive Areas Restriction Table at the end of this document defines specific sensitive areas and associated buffer zones and treatment restrictions such as limited-spray and no-spray zones.

The attached map identifies ‘Sensitive Areas Not Readily Identifiable in the Field’. With this map and the assistance of the Conservation Commission Agent, sensitive areas will be identified and marked along the ROW prior to any herbicide application. Field methods will include flagging and/or roadway marking (via paint) of start and stop areas.

### **Procedures and Locations for Handling, Mixing and Loading of Herbicide Concentrates**

The herbicide will be mixed in the controlled environment at the Department of Public Works Garage located at 257 Fisher Street, Franklin, MA.

Although it is expected that all the mixed herbicide will be used, any remaining will be stored at the DPW Garage in accordance with manufacturer’s instructions. The absorbent product “Speedi-Dri” will be available for use at the locations of application. If there is a leak in the hose, the pump will be immediately shutoff. Equipment used will be washed at the DPW Garage

Herbicides will be handled and applied only in accordance with the label instructions. Contractors will strictly adhere to all mandated safety precautions directed towards the public, the applicator and the environment.

## **Remedial Plan to Address Spills and Related Accidents**

All mixing and loading of herbicides will be conducted at the DPW Garage where the herbicides are stored. Only the amount of herbicide necessary to carry out the vegetation control, based on monitoring results, will be mixed to ensure that there will be no waste and minimize potential problems. The vehicles carrying out the spray operations will be equipped with a bag of absorbent, activated charcoal, leak-proof containers, a broom and a shovel in case of minor spills. A clipboard log of the herbicides on the vehicle will be kept on the vehicle. Herbicide labels and fact sheets will be carried on-site by the applicator.

As soon as any spill is observed, immediate action will be taken to contain the spill and protect the spill area. The cause of the spill must be identified and secured. Spill containment will be accomplished by covering the spill with absorptive clay or other absorptive material or, for large spills, building clay or soil dikes to impede spill progress. Until completely remediated, the spill area will be protected by the placement of barriers and by the delineation of the spill area by crew members. If a fire is involved, care will be taken to avoid breathing fumes from any burning chemicals.

Minor spills will be remedied by soaking up the spill with adsorption clay or other adsorptive material and placing it in leak proof containers, removed from the site and disposed of properly. Dry herbicides, such as granulars, will be swept up or shoveled up directly in leak proof containers for proper disposal. All contaminated soil will be placed in leak proof containers, removed from the site and disposed of properly. Activated charcoal will be incorporated into the soil at the spill location per label instructions. Any minor spill will be reported to the Pesticide Bureau.

Major spills will be handled in a similar manner as minor spills, except in cases where the spill cannot be contained and/or removed by the crew. In this case the MassDEP Incident Response Unit and the Pesticide Bureau must be contacted.

Emergency first responders (including but not limited to fire and police) will be immediately notified of a major spill and/or any size incident deemed a possible risk to public health, safety and the environment.

MassDEP will be contacted when there is a spill of a regulated quantity, regardless of major or minor spill status and in accordance with 310 CMR 40.0000 Massachusetts Contingency Plan.

## **Emergency Contacts**

In the event of a spill, information on safety precautions and clean up procedures may be gathered from the following sources:

- Herbicide label
- Herbicide MSDS sheet

- Herbicide Manufacturer
  - DOW (800) 992-5994
  - Dupont (800) 441-3637
  - Monsanto (314) 697-4000
  - NuFarm (877) 325-1840
- Massachusetts Pesticide Bureau Main # (617) 626-1720  
Michael McClean (617) 626-1781
- Massachusetts Department of Environmental Protection  
Emergency Response (888) 304-1133
- Department of Public Health  
Environmental Toxicology Program (617) 624-5757
- Massachusetts Poison Control Center  
24-Hour Hotline (800) 222-1222
- Town of Franklin Public Works Department 508-520-4916
- Town of Franklin Fire Department 508-528-2323 or 911
- Town of Franklin Police Department 508-528-1212 or 911
- Chem-Trec 800-424-9300
- National Pesticide Information Center 800-858-7378
- National Animal Poison Control Center 888-426-4435

## Sensitive Area Restrictions

333 CMR 11.04

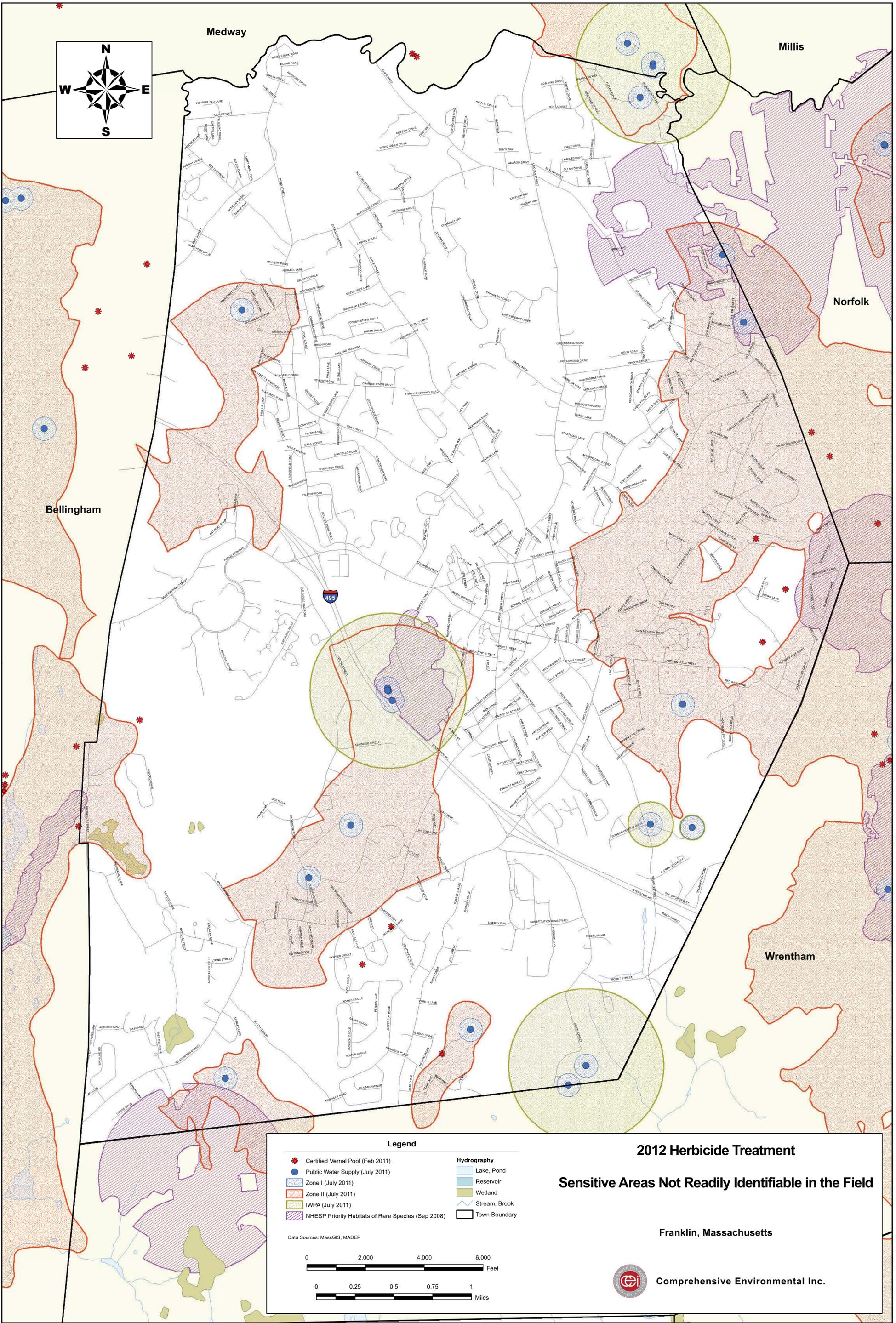
### CONTROL STRATEGIES FOR SENSITIVE AREAS

Sensitive Area	Minimum Buffer Zone (feet)	Control Method	Time Restriction Code
Public Ground Water Supplies	400'	Mechanical Only	None
Primary Recharge Area	Designated buffer zone or 1/2 mile radius	Mechanical, Recommended Herbicides*	1
Public Surface Water Supplies (Class A & Class B)	100'	Mechanical Only	None
	100'-400'	Recommended Herbicides	1
Tributary to Class A Water Source, within 400' upstream of water source	100'	Mechanical Only	None
	100'-400'	Recommended Herbicides	1
Tributary to Class A Water Source, greater than 400' upstream of water source	10'	Mechanical Only	None
	10'-200'	Recommended Herbicides	1
Class B Drinking Water Intake, within 400' upstream of intake	100'	Mechanical Only	None
	100'-200'	Recommended Herbicides	1
Private Drinking Water Supplies	50'	Mechanical Only	None
	50'-100'	Recommended Herbicides	2
Surface Waters	10'	Mechanical Only	None
	10'-100'	Recommended Herbicides	2
Rivers	10' from mean annual high water line	Mechanical Only	None
	10'-200'	Recommended Herbicides	2
Wetlands	100' (treatment in wetlands permitted up to 10' of standing water)* <sup>+</sup>	Low-pressure Foliar, CST, Basal Recommended Herbicides	1
Habitated Areas	100' (for high-pressure foliar only)	Recommended Herbicides	2
Agricultural Area (Crops, Fruits, Pastures)	100' (for high-pressure foliar only)	Recommended Herbicides	2
Certified Vernal Pools	10'	Mechanical Only	None
Certified Vernal Pool Habitat	10'-outer boundary of habitat	As recommended by NHESP in their permit process, no treatment without written permission	
Priority Habitat	As recommended by NHESP in their permit process, no treatment without written permission		

Restriction Code #1: A minimum of twenty-four months shall elapse between applications

Restriction Code #2: A minimum of twelve months shall elapse between applications

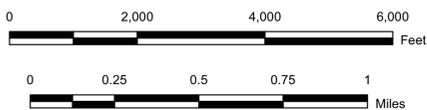
\*Massachusetts recommended herbicides for sensitive sites



**Legend**

- \* Certified Vernal Pool (Feb 2011)
- Public Water Supply (July 2011)
- Zone I (July 2011)
- Zone II (July 2011)
- IWPA (July 2011)
- NHEP Priority Habitats of Rare Species (Sep 2008)
- Lake, Pond
- Reservoir
- Wetland
- Stream, Brook
- Town Boundary

Data Sources: MassGIS, MADEP



**2012 Herbicide Treatment**

**Sensitive Areas Not Readily Identifiable in the Field**

Franklin, Massachusetts



Comprehensive Environmental Inc.

# Daily Vegetation Management Report

## Town of Franklin

Date: \_\_\_\_\_ Weather: \_\_\_\_\_

Applicator Name: \_\_\_\_\_ Address: \_\_\_\_\_

Identification of Site/Work Area: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

List of Crew Members: \_\_\_\_\_

\_\_\_\_\_

Type of Equipment & Hours Used: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Method of Application: \_\_\_\_\_

\_\_\_\_\_

Target Vegetation: \_\_\_\_\_

\_\_\_\_\_

Herbicide Product Name: \_\_\_\_\_

Adjuvants/Dilutants: \_\_\_\_\_

Amount: \_\_\_\_\_ Concentration: \_\_\_\_\_

Unusual Conditions/Incidents: \_\_\_\_\_

\_\_\_\_\_

Public Inquiries: \_\_\_\_\_

\_\_\_\_\_

Recording/Verification of Sensitive Areas: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

# MATERIAL SAFETY DATA SHEET



Emergency Phone: 800-992-5994  
Dow AgroSciences LLC  
Indianapolis, IN 46268

Effective Date: 3/23/04  
Product Code: 84820  
MSDS: 006694

## ACCORD\* CONCENTRATE HERBICIDE

### 1. PRODUCT AND COMPANY IDENTIFICATION:

**PRODUCT:** Accord\* Concentrate Herbicide

#### COMPANY IDENTIFICATION:

Dow AgroSciences LLC  
9330 Zionsville Road  
Indianapolis, IN 46268-1189

### 2. COMPOSITION/INFORMATION ON INGREDIENTS:

Glyphosate IPA: N-(phosphono-methyl) glycine, Isopropylamine Salt	CAS # 038641-94-0	53.8%
Balance, Total		46.2%

### 3. HAZARDOUS IDENTIFICATIONS:

#### EMERGENCY OVERVIEW

Clear, pale yellow liquid. May cause eye irritation. Slightly toxic to aquatic organisms.

**EMERGENCY PHONE NUMBER:** 800-992-5994

### 4. FIRST AID:

**EYE:** Flush eyes thoroughly with water for several minutes. Remove contact lenses after initial 1-2 minutes and continue flushing for several additional minutes. If effects occur, consult a physician, preferably an ophthalmologist.

**SKIN:** Wash skin with plenty of water.

**INGESTION:** No emergency medical treatment necessary.

**INHALATION:** Remove person to fresh air; if effects occur, consult a physician.

**NOTE TO PHYSICIAN:** No specific antidote. Treatment of exposure should be directed at the control of symptoms and the clinical condition of the patient.

### 5. FIRE FIGHTING MEASURES:

**FLASH POINT:** >214°F (>101°C)

**METHOD USED:** Setaflash

#### FLAMMABLE LIMITS:

LFL: Not applicable  
UFL: Not applicable

**EXTINGUISHING MEDIA:** Foam, CO<sub>2</sub>, Dry Chemical

**FIRE AND EXPLOSION HAZARDS:** Foam fire extinguishing system is preferred because uncontrolled water can spread possible contamination. Toxic irritating gases may be formed under fire conditions.

**FIRE-FIGHTING EQUIPMENT:** Use positive-pressure, self-contained breathing apparatus and full protective equipment.

### 6. ACCIDENTAL RELEASE MEASURES:

**ACTION TO TAKE FOR SPILLS:** Absorb small spills with an inert absorbent material such as Hazorb, Zorbball, sand, or dirt. Report large spills to Dow AgroSciences on 800-992-5994.

### 7. HANDLING AND STORAGE:

**PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE:** Keep out of reach of children. Do not swallow. Avoid contact with eyes, skin, and clothing. Avoid breathing vapors and spray mist. Handle concentrate in ventilated area. Wash thoroughly with soap and water after handling and before eating, chewing gum, using tobacco, using the toilet or smoking. Keep away from food, feedstuffs, and water supplies. Store in original container with the lid tightly closed. Store above 10°F (-12°C) to keep from crystallizing.

### 8. EXPOSURE CONTROLS/PERSONAL PROTECTION:

These precautions are suggested for conditions where the potential for exposure exists. Emergency conditions may require additional precautions.

**EXPOSURE GUIDELINES:** None established

**ENGINEERING CONTROLS:** Good general ventilation should be sufficient for most conditions. Local exhaust ventilation may be necessary for some operations.

**RECOMMENDATIONS FOR MANUFACTURING, COMMERCIAL BLENDING, AND PACKAGING WORKERS:**

**EYE/FACE PROTECTION:** Use safety glasses.

**SKIN PROTECTION:** No precautions other than clean body-covering clothing should be needed.

\*Trademark of Dow AgroSciences LLC

# MATERIAL SAFETY DATA SHEET



Emergency Phone: 800-992-5994  
Dow AgroSciences LLC  
Indianapolis, IN 46268

Effective Date: 3/23/04  
Product Code: 84820  
MSDS: 006694

## ACCORD\* CONCENTRATE HERBICIDE

**RESPIRATORY PROTECTION:** For most conditions, no respiratory protection should be needed; however, if discomfort is experienced, use a NIOSH approved air-purifying respirator.

**APPLICATIONS AND ALL OTHER HANDLERS:** Please refer to the product label for personal protective clothing and equipment.

### 9. PHYSICAL AND CHEMICAL PROPERTIES:

**APPEARANCE:** Clear, pale yellow liquid

**DENSITY:** 10.0 - 10.5 lbs/gal

**pH:** 4.8 - 5.0

**ODOR:** None

**SOLUBILITY IN WATER:** Miscible

**SPECIFIC GRAVITY:** 1.21 gm/L

**FREEZING POINT:** -7°F - -10°F (-21°C - -25°C)

### 10. STABILITY AND REACTIVITY:

**STABILITY: (CONDITIONS TO AVOID)** Stable under normal storage conditions.

**INCOMPATIBILITY: (SPECIFIC MATERIALS TO AVOID)** Galvanized or unlined steel (except stainless steel) containers or spray tanks may produce hydrogen gas which may form a highly combustible gas mixture.

**HAZARDOUS DECOMPOSITION PRODUCTS:** None known.

**HAZARDOUS POLYMERIZATION:** Not known to occur.

### 11. TOXICOLOGICAL INFORMATION:

**EYE:** May cause slight temporary eye irritation. Corneal injury is unlikely.

**SKIN:** Essentially non-irritating to skin. Prolonged skin contact is unlikely to result in absorption of harmful amounts. The LD<sub>50</sub> for skin absorption in rabbits is >5000 mg/kg. Did not cause allergic skin reactions when tested in guinea pigs.

**INGESTION:** Very low toxicity if swallowed. Harmful effects not anticipated from swallowing small amounts. The oral LD<sub>50</sub> for rats is >5000 mg/kg.

**INHALATION:** Brief exposure (minutes) is not likely to cause adverse effects. The aerosol LC<sub>50</sub> for rats is >6.37 mg/L for 4 hours.

**SYSTEMIC (OTHER TARGET ORGAN) EFFECTS:** For a similar material, glyphosate, in animals, effects have been reported on the following organ: liver.

**CANCER INFORMATION:** A similar material, glyphosate, did not cause cancer in laboratory animals.

**TERATOLOGY (BIRTH DEFECTS):** For glyphosate IPA, available data are inadequate for evaluation of potential to cause birth defects.

**REPRODUCTIVE EFFECTS:** For glyphosate IPA, available data are inadequate to determine effects on reproduction.

**MUTAGENICITY:** For a similar material, glyphosate, in-vitro and animal genetic toxicity studies were negative.

### 12. ECOLOGICAL INFORMATION:

#### ENVIRONMENTAL DATA:

#### ECOTOXICOLOGY:

Material is practically non-toxic to aquatic organisms on an acute basis (LC<sub>50</sub> or EC<sub>50</sub> is >100 mg/L in most sensitive species tested).

Acute LC<sub>50</sub> for rainbow trout (*Oncorhynchus mykiss*) is >2500 mg/L.

Acute immobilization EC<sub>50</sub> in water flea (*Daphnia magna*) is 918 mg/L.

Material is practically non-toxic to birds on an acute basis (LD<sub>50</sub> is >2000 mg/kg).

Acute oral LD<sub>50</sub> in bobwhite (*Colinus virginianus*) is >2000 mg/kg.

The LC<sub>50</sub> in earthworm *Eisenia foetida* is >1000 mg/kg. Acute contact LD<sub>50</sub> in honey bee (*Apis mellifera*) is >100 µg/bee.

Acute oral LD<sub>50</sub> in honey bee (*Apis mellifera*) is >100 µg/bee.

Growth inhibition EC<sub>50</sub> in green alga (*Selenastrum capricornutum*) is 127 mg/L.

Growth inhibition EC<sub>50</sub> in duckweed (*Lemna sp.*) is 24.4 mg/L.

### 13. DISPOSAL CONSIDERATIONS:

**DISPOSAL METHOD:** 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.

# MATERIAL SAFETY DATA SHEET



Emergency Phone: 800-992-5994  
Dow AgroSciences LLC  
Indianapolis, IN 46268

Effective Date: 3/23/04  
Product Code: 84820  
MSDS: 006694

## ACCORD\* CONCENTRATE HERBICIDE

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 and regulations.

### 14. TRANSPORT INFORMATION:

#### U.S. DEPARTMENT OF TRANSPORTATION (DOT) INFORMATION:

For all package sizes and modes of transportation:  
This material is not regulated for transport.

### 15. REGULATORY INFORMATION:

**NOTICE:** The information herein is presented 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 from one location to another; it is the buyer's responsibility to ensure that its activities comply with federal, state or provincial, and local laws. The following specific information is made for the purpose of complying with numerous federal, state or provincial, and local laws and regulations.

#### U.S. REGULATIONS

**SARA 313 INFORMATION:** To the best of our knowledge, this product contains no chemical subject to SARA Title III Section 313 supplier notification requirements.

**SARA HAZARD CATEGORY:** This product has been reviewed according to the EPA "Hazard Categories" promulgated under Sections 311 and 312 of the Superfund Amendment and Reauthorization Act of 1986 (SARA Title III) and is considered, under applicable definitions, to meet the following categories:

Not to have met any hazard category

**TOXIC SUBSTANCES CONTROL ACT (TSCA):** All ingredients are on the TSCA inventory or are not required to be listed on the TSCA inventory.

**STATE RIGHT-TO-KNOW:** This product is not known to contain any substances subject to the disclosure requirements of

New Jersey  
Pennsylvania

**OSHA HAZARD COMMUNICATION STANDARD:** This product is a "Hazardous Chemical" as defined by the OSHA Hazard Communication Standard, 29 CFR 1910.1200.

**COMPREHENSIVE ENVIRONMENTAL RESPONSE COMPENSATION AND LIABILITY ACT (CERCLA, or SUPERFUND):** To the best of our knowledge, this product contains no chemical subject to reporting under CERCLA.

**NATIONAL FIRE PROTECTION ASSOCIATION (NFPA) RATINGS:**

<u>CATEGORY</u>	<u>RATING</u>
Health	1
Flammability	1
Reactivity	0

### 16. OTHER INFORMATION:

**MSDS STATUS:** Revised Sections: 3,4,11,12,13,14 & 15  
Reference: DR-0361-8028  
Replaces MSDS Dated: 1/12/00  
Document Code: D03-145-002  
Replaces Document Code: D03-145-001

The Information Herein Is Given In Good Faith, But No Warranty, Express Or Implied, Is Made. Consult Dow AgroSciences For Further Information.

# MATERIAL SAFETY DATA SHEET



Emergency Phone: 800-992-5994  
Dow AgroSciences LLC  
Indianapolis, IN 46268

## RODEO\* HERBICIDE

Effective Date: 3/23/04  
Product Code: 84825  
MSDS: 006694

### 1. PRODUCT AND COMPANY IDENTIFICATION:

**PRODUCT:** Rodeo\* Herbicide

#### COMPANY IDENTIFICATION:

Dow AgroSciences LLC  
9330 Zionsville Road  
Indianapolis, IN 46268-1189

### 2. COMPOSITION/INFORMATION ON INGREDIENTS:

Glyphosate IPA: N-(phosphono-methyl) glycine, Isopropylamine Salt	CAS # 038641-94-0	53.8%
Balance, Total		46.2%

### 3. HAZARDOUS IDENTIFICATIONS:

#### EMERGENCY OVERVIEW

Clear, pale yellow liquid. May cause eye irritation. Slightly toxic to aquatic organisms.

**EMERGENCY PHONE NUMBER:** 800-992-5994

### 4. FIRST AID:

**EYE:** Flush eyes thoroughly with water for several minutes. Remove contact lenses after initial 1-2 minutes and continue flushing for several additional minutes. If effects occur, consult a physician, preferably an ophthalmologist.

**SKIN:** Wash skin with plenty of water.

**INGESTION:** No emergency medical treatment necessary.

**INHALATION:** Remove person to fresh air; if effects occur, consult a physician.

**NOTE TO PHYSICIAN:** No specific antidote. Treatment of exposure should be directed at the control of symptoms and the clinical condition of the patient.

### 5. FIRE FIGHTING MEASURES:

**FLASH POINT:** >214°F (>101°C)

**METHOD USED:** Setaflash

#### FLAMMABLE LIMITS:

LFL: Not applicable  
UFL: Not applicable

**EXTINGUISHING MEDIA:** Foam, CO<sub>2</sub>, Dry Chemical

**FIRE AND EXPLOSION HAZARDS:** Foam fire extinguishing system is preferred because uncontrolled water can spread possible contamination. Toxic irritating gases may be formed under fire conditions.

**FIRE-FIGHTING EQUIPMENT:** Use positive-pressure, self-contained breathing apparatus and full protective equipment.

### 6. ACCIDENTAL RELEASE MEASURES:

**ACTION TO TAKE FOR SPILLS:** Absorb small spills with an inert absorbent material such as Hazorb, Zorb, sand, or dirt. Report large spills to Dow AgroSciences on 800-992-5994.

### 7. HANDLING AND STORAGE:

**PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE:** Keep out of reach of children. Do not swallow. Avoid contact with eyes, skin, and clothing. Avoid breathing vapors and spray mist. Handle concentrate in ventilated area. Wash thoroughly with soap and water after handling and before eating, chewing gum, using tobacco, using the toilet or smoking. Keep away from food, feedstuffs, and water supplies. Store in original container with the lid tightly closed. Store above 10°F (-12°C) to keep from crystallizing.

### 8. EXPOSURE CONTROLS/PERSONAL PROTECTION:

These precautions are suggested for conditions where the potential for exposure exists. Emergency conditions may require additional precautions.

**EXPOSURE GUIDELINES:** None established

**ENGINEERING CONTROLS:** Good general ventilation should be sufficient for most conditions. Local exhaust ventilation may be necessary for some operations.

#### RECOMMENDATIONS FOR MANUFACTURING, COMMERCIAL BLENDING, AND PACKAGING WORKERS:

**EYE/FACE PROTECTION:** Use safety glasses.

**SKIN PROTECTION:** No precautions other than clean body-covering clothing should be needed.

# MATERIAL SAFETY DATA SHEET



Emergency Phone: 800-992-5994  
Dow AgroSciences LLC  
Indianapolis, IN 46268

## RODEO\* HERBICIDE

Effective Date: 3/23/04  
Product Code: 84825  
MSDS: 006694

**RESPIRATORY PROTECTION:** For most conditions, no respiratory protection should be needed; however, if discomfort is experienced, use a NIOSH approved air-purifying respirator.

**APPLICATIONS AND ALL OTHER HANDLERS:** Please refer to the product label for personal protective clothing and equipment.

### 9. PHYSICAL AND CHEMICAL PROPERTIES:

**APPEARANCE:** Clear, pale yellow liquid

**DENSITY:** 10.0 - 10.5 lbs/gal

**pH:** 4.8 - 5.0

**ODOR:** None

**SOLUBILITY IN WATER:** Miscible

**SPECIFIC GRAVITY:** 1.21 gm/L

**FREEZING POINT:** -7°F - -10°F (-21°C - -25°C)

### 10. STABILITY AND REACTIVITY:

**STABILITY:** (CONDITIONS TO AVOID) Stable under normal storage conditions.

**INCOMPATIBILITY:** (SPECIFIC MATERIALS TO AVOID) Galvanized or unlined steel (except stainless steel) containers or spray tanks may produce hydrogen gas which may form a highly combustible gas mixture.

**HAZARDOUS DECOMPOSITION PRODUCTS:** None known.

**HAZARDOUS POLYMERIZATION:** Not known to occur.

### 11. TOXICOLOGICAL INFORMATION:

**EYE:** May cause slight temporary eye irritation. Corneal injury is unlikely.

**SKIN:** Essentially non-irritating to skin. Prolonged skin contact is unlikely to result in absorption of harmful amounts. The LD<sub>50</sub> for skin absorption in rabbits is >5000 mg/kg. Did not cause allergic skin reactions when tested in guinea pigs.

**INGESTION:** Very low toxicity if swallowed. Harmful effects not anticipated from swallowing small amounts. The oral LD<sub>50</sub> for rats is >5000 mg/kg.

**INHALATION:** Brief exposure (minutes) is not likely to cause adverse effects. The aerosol LC<sub>50</sub> for rats is >6.37 mg/L for 4 hours.

**SYSTEMIC (OTHER TARGET ORGAN) EFFECTS:** For a similar material, glyphosate, in animals, effects have been reported on the following organ: liver.

**CANCER INFORMATION:** A similar material, glyphosate, did not cause cancer in laboratory animals.

**TERATOLOGY (BIRTH DEFECTS):** For glyphosate IPA, available data are inadequate for evaluation of potential to cause birth defects.

**REPRODUCTIVE EFFECTS:** For glyphosate IPA, available data are inadequate to determine effects on reproduction.

**MUTAGENICITY:** For a similar material, glyphosate, in-vitro and animal genetic toxicity studies were negative.

### 12. ECOLOGICAL INFORMATION:

#### ENVIRONMENTAL DATA:

#### ECOTOXICOLOGY:

Material is practically non-toxic to aquatic organisms on an acute basis (LC<sub>50</sub> or EC<sub>50</sub> is >100 mg/L in most sensitive species tested).

Acute LC<sub>50</sub> for rainbow trout (*Oncorhynchus mykiss*) is >2500 mg/L.

Acute immobilization EC<sub>50</sub> in water flea (*Daphnia magna*) is 918 mg/L.

Material is practically non-toxic to birds on an acute basis (LD<sub>50</sub> is >2000 mg/kg).

Acute oral LD<sub>50</sub> in bobwhite (*Colinus virginianus*) is >2000 mg/kg.

The LC<sub>50</sub> in earthworm *Eisenia foetida* is >1000 mg/kg. Acute contact LD<sub>50</sub> in honey bee (*Apis mellifera*) is >100 µg/bee.

Acute oral LD<sub>50</sub> in honey bee (*Apis mellifera*) is >100 µg/bee.

Growth inhibition EC<sub>50</sub> in green alga (*Selenastrum capricornutum*) is 127 mg/L.

Growth inhibition EC<sub>50</sub> in duckweed (*Lemna sp.*) is 24.4 mg/L.

### 13. DISPOSAL CONSIDERATIONS:

**DISPOSAL METHOD:** 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.

# MATERIAL SAFETY DATA SHEET



Emergency Phone: 800-992-5994  
Dow AgroSciences LLC  
Indianapolis, IN 46268

## RODEO\* HERBICIDE

Effective Date: 3/23/04  
Product Code: 84825  
MSDS: 006694

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 and regulations.

### 14. TRANSPORT INFORMATION:

#### U.S. DEPARTMENT OF TRANSPORTATION (DOT) INFORMATION:

For all package sizes and modes of transportation:  
This material is not regulated for transport.

### 15. REGULATORY INFORMATION:

**NOTICE:** The information herein is presented 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 from one location to another; it is the buyer's responsibility to ensure that its activities comply with federal, state or provincial, and local laws. The following specific information is made for the purpose of complying with numerous federal, state or provincial, and local laws and regulations.

#### U.S. REGULATIONS

**SARA 313 INFORMATION:** To the best of our knowledge, this product contains no chemical subject to SARA Title III Section 313 supplier notification requirements.

**SARA HAZARD CATEGORY:** This product has been reviewed according to the EPA "Hazard Categories" promulgated under Sections 311 and 312 of the Superfund Amendment and Reauthorization Act of 1986 (SARA Title III) and is considered, under applicable definitions, to meet the following categories:

Not to have met any hazard category

**TOXIC SUBSTANCES CONTROL ACT (TSCA):** All ingredients are on the TSCA inventory or are not required to be listed on the TSCA inventory.

**STATE RIGHT-TO-KNOW:** This product is not known to contain any substances subject to the disclosure requirements of

New Jersey  
Pennsylvania

**OSHA HAZARD COMMUNICATION STANDARD:** This product is a "Hazardous Chemical" as defined by the OSHA Hazard Communication Standard, 29 CFR 1910.1200.

**COMPREHENSIVE ENVIRONMENTAL RESPONSE COMPENSATION AND LIABILITY ACT (CERCLA, or SUPERFUND):** To the best of our knowledge, this product contains no chemical subject to reporting under CERCLA.

#### NATIONAL FIRE PROTECTION ASSOCIATION (NFPA) RATINGS:

<u>CATEGORY</u>	<u>RATING</u>
Health	1
Flammability	1
Reactivity	0

### 16. OTHER INFORMATION:

**MSDS STATUS:** Revised Sections: 3,4,11,12,13,14 & 15  
Reference: DR-0361-8028  
Replaces MSDS Dated: 1/12/00  
Document Code: D03-148-002  
Replaces Document Code: D03-148-001

The Information Herein Is Given In Good Faith, But No Warranty, Express Or Implied, Is Made. Consult Dow AgroSciences For Further Information.

\*Trademark of Dow AgroSciences LLC

<p style="text-align: center;"><b>MONSANTO COMPANY</b> Safety Data Sheet Commercial Product</p>
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## 1. PRODUCT AND COMPANY IDENTIFICATION

**Product name**

**Roundup PRO® Herbicide**

**EPA Reg. No.**

524-475

**Product use**

Herbicide

**Chemical name**

Not applicable.

**Synonyms**

None.

**Company**

MONSANTO COMPANY, 800 N. Lindbergh Blvd., St. Louis, MO, 63167

Telephone: 800-332-3111, Fax: 314-694-5557

E-mail: safety.datasheet@monsanto.com

**Emergency numbers**

FOR CHEMICAL EMERGENCY, SPILL LEAK, FIRE, EXPOSURE, OR ACCIDENT Call CHEMTREC - Day or Night: 1-800-424-9300 toll free in the continental U.S., Puerto Rico, Canada, or Virgin Islands. For calls originating elsewhere: 703-527-3887 (collect calls accepted).

FOR MEDICAL EMERGENCY - Day or Night: +1 (314) 694-4000 (collect calls accepted).

---

## 2. HAZARDS IDENTIFICATION

**Emergency overview**

**Appearance and odour (colour/form/odour):** Clear - Amber / Liquid / Sweet

CAUTION!

CAUSES EYE IRRITATION

**Potential health effects**

**Likely routes of exposure**

Skin contact, eye contact

**Eye contact, short term**

May cause temporary eye irritation.

**Skin contact, short term**

Not expected to produce significant adverse effects when recommended use instructions are followed.

**Inhalation, short term**

Not expected to produce significant adverse effects when recommended use instructions are followed.

**Single ingestion**

Not expected to produce significant adverse effects when recommended use instructions are followed.

Refer to section 11 for toxicological and section 12 for environmental information.

**OSHA Status**

This product is hazardous according to the OSHA Hazard Communication Standard, 29 CFR 1910.1200.

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## 3. COMPOSITION/INFORMATION ON INGREDIENTS

**Active ingredient**

Isopropylamine salt of N-(phosphonomethyl)glycine; {Isopropylamine salt of glyphosate}

**Composition**

COMPONENT	CAS No.	% by weight (approximate)
Isopropylamine salt of glyphosate	38641-94-0	41
Other ingredients		59

Trade secret composition.

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## 4. FIRST AID MEASURES

Use personal protection recommended in section 8.

**Eye contact**

If in eyes, hold eye open and rinse slowly and gently for 15-20 minutes. Remove contact lenses, if present, after first 5 minutes, then continue rinsing. 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.

**Inhalation**

If inhaled, move person to fresh air. If person is not breathing, call emergency number or ambulance, then give artificial respiration, preferably mouth-to-mouth, if possible. Call a poison control center or doctor for treatment advice.

**Ingestion**

Call poison control center or doctor immediately for treatment advice. Have person sip a glass of water or milk if able to swallow. Do not induce vomiting unless told to do so by the poison center or doctor. Do not give anything by mouth to an unconscious person.

**Advice to doctors**

This product is not an inhibitor of cholinesterase.

**Antidote**

Treatment with atropine and oximes is not indicated.

---

## 5. FIRE-FIGHTING MEASURES

**Flash point**

None.

**Extinguishing media**

Recommended: Water, foam, dry chemical, carbon dioxide (CO<sub>2</sub>)

**Unusual fire and explosion hazards**

Minimise use of water to prevent environmental contamination.  
Environmental precautions: see section 6.

**Hazardous products of combustion**

Carbon monoxide (CO), phosphorus oxides (P<sub>x</sub>O<sub>y</sub>), nitrogen oxides (NO<sub>x</sub>)

**Fire fighting equipment**

Self-contained breathing apparatus.  
Equipment should be thoroughly decontaminated after use.

---

## 6. ACCIDENTAL RELEASE MEASURES

### Personal precautions

Use personal protection recommended in section 8.

### Environmental precautions

#### SMALL QUANTITIES:

Low environmental hazard.

#### LARGE QUANTITIES:

Minimise spread.

Keep out of drains, sewers, ditches and water ways.

### Methods for cleaning up

#### SMALL QUANTITIES:

Flush spill area with water.

#### LARGE QUANTITIES:

Absorb in earth, sand or absorbent material.

Dig up heavily contaminated soil.

Collect in containers for disposal.

Refer to section 7 for types of containers.

Flush residues with small quantities of water.

Minimise use of water to prevent environmental contamination.

Refer to section 13 for disposal of spilled material.

Use handling recommendations in Section 7 and personal protection recommendations in Section 8.

---

## 7. HANDLING AND STORAGE

Good industrial practice in housekeeping and personal hygiene should be followed.

### Handling

Avoid contact with eyes.

When using do not eat, drink or smoke.

Wash hands thoroughly after handling or contact.

Wash contaminated clothing before re-use.

Thoroughly clean equipment after use.

Do not contaminate drains, sewers and water ways when disposing of equipment rinse water.

Refer to section 13 of the safety data sheet for disposal of rinse water.

Emptied containers retain vapour and product residue.

**FOLLOW LABELLED WARNINGS EVEN AFTER CONTAINER IS EMPTIED.**

### Storage

Minimum storage temperature: -15 °C

Maximum storage temperature: 50 °C

Compatible materials for storage: stainless steel, fibreglass, plastic, glass lining

Incompatible materials for storage: galvanised steel, unlined mild steel, see section 10.

Keep out of reach of children.

Keep away from food, drink and animal feed.

Keep only in the original container.

Keep container tightly closed in a cool, well-ventilated place.

Partial crystallization may occur on prolonged storage below the minimum storage temperature.

If frozen, place in warm room and shake frequently to put back into solution.

Minimum shelf life: 5 years.

---

## 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

**Airborne exposure limits**

Components	Exposure Guidelines
Isopropylamine salt of glyphosate	No specific occupational exposure limit has been established.
Other ingredients	No specific occupational exposure limit has been established.

**Engineering controls**

No special requirement when used as recommended.

**Eye protection**

If there is significant potential for contact:  
Wear chemical goggles.

**Skin protection**

If repeated or prolonged contact:  
Wear chemical resistant gloves.  
Applicators and other handlers must wear:  
Wear long sleeved shirt, long pants and shoes with socks.

**Respiratory protection**

No special requirement when used as recommended.

When recommended, consult manufacturer of personal protective equipment for the appropriate type of equipment for a given application.

**9. PHYSICAL AND CHEMICAL PROPERTIES**

These physical data are typical values based on material tested but may vary from sample to sample. Typical values should not be construed as a guaranteed analysis of any specific lot or as specifications for the product.

Colour/colour range:	Clear - Amber
Odour:	Sweet
Form:	Liquid
Physical form changes (melting, boiling, etc.):	
Melting point:	Not applicable.
Boiling point:	No data.
Flash point:	None.
Explosive properties:	No explosive properties
Auto ignition temperature:	452 °C
Specific gravity:	1.169 @ 20 °C / 15.6 °C
Vapour pressure:	25 mmHg 24 °C
Vapour density:	Not applicable.
Evaporation rate:	No data.
Dynamic viscosity:	73.2 mPa·s
Kinematic viscosity:	62.47 cSt @ 20 °C
Density:	1.172 g/cm <sup>3</sup> @ 20 °C
Solubility:	Water: Completely miscible.
pH:	4.4 - 5.0
Partition coefficient:	log Pow: < -3.2 @ 25 °C (glyphosate)

**10. STABILITY AND REACTIVITY**

**Stability**

Stable under normal conditions of handling and storage.

**Oxidizing properties**

No data.

**Materials to avoid/Reactivity**

Reacts with galvanised steel or unlined mild steel to produce hydrogen, a highly flammable gas that could explode.

**Hazardous decomposition**

Thermal decomposition: Hazardous products of combustion: see section 5.

**Self-accelerating decomposition temperature (SADT)**

No data.

---

## 11. TOXICOLOGICAL INFORMATION

This section is intended for use by toxicologists and other health professionals.

Data obtained on product and components are summarized below.

**Acute oral toxicity**

**Rat, LD50:** 5,108 mg/kg body weight

Practically non-toxic.

FIFRA category IV.

**Acute dermal toxicity**

**Rat, LD50 (limit test):** > 5,000 mg/kg body weight

Practically non-toxic.

FIFRA category IV.

No mortality.

**Acute inhalation toxicity**

**Rat, LC50, 4 hours, aerosol:** 2.9 mg/L

Other effects: weight loss, breathing difficulty

Practically non-toxic.

FIFRA category IV.

**Skin irritation**

**Rabbit, 6 animals, OECD 404 test:**

Days to heal: 3

Primary Irritation Index (PII): 0.5/8.0

Essentially non irritating.

FIFRA category IV.

**Eye irritation**

**Rabbit, 6 animals, OECD 405 test:**

Days to heal: 3

Slight irritation.

FIFRA category III.

**Skin sensitization**

**Guinea pig, 3-induction Buehler test:**

Positive incidence: 0 %

**N-(phosphonomethyl)glycine; { glyphosate }**

**Mutagenicity**

**In vitro and in vivo mutagenicity test(s):**

Not mutagenic.

**Repeated dose toxicity**

**Rabbit, dermal, 21 days:**

NOAEL toxicity: > 5,000 mg/kg body weight/day  
Target organs/systems: none  
Other effects: none

**Rat, oral, 3 months:**

NOAEL toxicity: > 20,000 mg/kg diet  
Target organs/systems: none  
Other effects: none

**Chronic effects/carcinogenicity**

**Mouse, oral, 24 months:**

NOAEL toxicity: ~5,000 mg/kg diet  
Target organs/systems: liver  
Other effects: decrease of body weight gain, histopathologic effects  
NOEL tumour: > 30,000 mg/kg diet  
Tumours: none

**Rat, oral, 24 months:**

NOAEL toxicity: ~8,000 mg/kg diet  
Target organs/systems: eyes  
Other effects: decrease of body weight gain, histopathologic effects  
NOEL tumour: > 20,000 mg/kg diet  
Tumours: none

**Toxicity to reproduction/fertility**

**Rat, oral, 2 generations:**

NOAEL toxicity: 10,000 mg/kg diet  
NOAEL reproduction: > 30,000 mg/kg diet  
Target organs/systems in parents: none  
Other effects in parents: decrease of body weight gain  
Target organs/systems in pups: none  
Other effects in pups: decrease of body weight gain  
Effects on offspring only observed with maternal toxicity.

**Developmental toxicity/teratogenicity**

**Rat, oral, 6 - 19 days of gestation:**

NOAEL toxicity: 1,000 mg/kg body weight  
NOAEL development: 1,000 mg/kg body weight  
Other effects in mother animal: decrease of body weight gain, decrease of survival  
Developmental effects: weight loss, post-implantation loss, delayed ossification  
Effects on offspring only observed with maternal toxicity.

**Rabbit, oral, 6 - 27 days of gestation:**

NOAEL toxicity: 175 mg/kg body weight  
NOAEL development: 175 mg/kg body weight  
Target organs/systems in mother animal: none  
Other effects in mother animal: decrease of survival  
Developmental effects: none

---

## 12. ECOLOGICAL INFORMATION

This section is intended for use by ecotoxicologists and other environmental specialists.

**Aquatic toxicity, fish**

**Rainbow trout (*Oncorhynchus mykiss*):**

Acute toxicity, 96 hours, static, LC50: 5.4 mg/L  
Moderately toxic.

**Bluegill sunfish (*Lepomis macrochirus*):**

Acute toxicity, 96 hours, static, LC50: 7.3 mg/L  
Moderately toxic.

**Aquatic toxicity, invertebrates**

**Water flea (*Daphnia magna*):**

Acute toxicity, 48 hours, static, EC50: 11 mg/L  
Slightly toxic.

**Avian toxicity**

**Mallard duck (*Anas platyrhynchos*):**

Dietary toxicity, 5 days, LC50: > 5,620 mg/kg diet  
Practically non-toxic.

**Bobwhite quail (*Colinus virginianus*):**

Dietary toxicity, 5 days, LC50: > 5,620 mg/kg diet  
Practically non-toxic.

**Arthropod toxicity**

**Honey bee (*Apis mellifera*):**

Oral/contact, 48 hours, LD50: > 100 µg/bee  
Practically non-toxic.

**Soil organism toxicity, invertebrates**

**Earthworm (*Eisenia foetida*):**

Acute toxicity, 14 days, LC50: > 1,250 mg/kg soil  
Practically non-toxic.

**Similar formulation**

**Aquatic toxicity, algae/aquatic plants**

**Green algae (*Selenastrum capricornutum*):**

Acute toxicity, 72 hours, static, EbC50 (biomass): 12.4 mg/L  
Slightly toxic.

**Similar formulation**

**Soil organism toxicity, microorganisms**

**Nitrogen and carbon transformation test:**

30 L/ha, 28 days: Less than 25% effect on nitrogen or carbon transformation processes in soil.

**N-(phosphonomethyl)glycine; (glyphosate)**

**Bioaccumulation**

**Bluegill sunfish (*Lepomis macrochirus*):**

Whole fish: BCF: < 1  
No significant bioaccumulation is expected.

**Dissipation**

**Soil, field:**

Half life: 2 - 174 days  
Koc: 884 - 60,000 L/kg  
Adsorbs strongly to soil.

**Water, aerobic:**

Half life: < 7 days

---

## 13. DISPOSAL CONSIDERATIONS

**Product**

Excess product may be disposed of by agricultural use according to label instructions.  
Keep out of drains, sewers, ditches and water ways.  
Recycle if appropriate facilities/equipment available.  
Burn in proper incinerator.  
Follow all local/regional/national/international regulations.

**Container**

See the individual container label for disposal information.  
Emptied containers retain vapour and product residue.

Observe all labelled safeguards until container is cleaned, reconditioned or destroyed.  
Empty packaging completely.  
Triple or pressure rinse empty containers.  
Do NOT contaminate water when disposing of rinse waters.  
Store for collection by approved waste disposal service.  
Ensure packaging cannot be reused.  
Do NOT re-use containers.  
Recycle if appropriate facilities/equipment available.  
Follow all local/regional/national/international regulations.

Use handling recommendations in Section 7 and personal protection recommendations in Section 8.

---

## 14. TRANSPORT INFORMATION

The data provided in this section is for information only. Please apply the appropriate regulations to properly classify your shipment for transportation.

Not hazardous under the applicable DOT, ICAO/IATA, IMO, TDG and Mexican regulations.

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## 15. REGULATORY INFORMATION

### TSCA Inventory

All components are on the US EPA's TSCA Inventory

### OSHA Hazardous Components

Surfactant

### SARA Title III Rules

Section 311/312 Hazard Categories

Immediate

Section 302 Extremely Hazardous Substances

Not applicable.

Section 313 Toxic Chemical(s)

Not applicable.

### CERCLA Reportable quantity

Not applicable.

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## 16. OTHER INFORMATION

The information given here is not necessarily exhaustive but is representative of relevant, reliable data.

Follow all local/regional/national/international regulations.

Please consult supplier if further information is needed.

In this document the British spelling was applied.

|| Significant changes versus previous edition.

	Health	Flammability	Instability	Additional Markings
NFPA	1	1	1	

0 = Minimal hazard, 1 = Slight hazard, 2 = Moderate hazard, 3 = Severe hazard, 4 = Extreme hazard

Full denomination of most frequently used acronyms. BCF (Bioconcentration Factor), BOD (Biochemical Oxygen Demand), COD (Chemical Oxygen Demand), EC50 (50% effect concentration), ED50 (50% effect dose), I.M. (intramuscular), I.P. (intraperitoneal), I.V. (intravenous), Koc (Soil adsorption coefficient), LC50 (50% lethality concentration), LD50 (50% lethality dose), LDLo (Lower limit of lethal dosage), LEL (Lower Explosion Limit), LOAEC (Lowest Observed Adverse Effect Concentration), LOAEL (Lowest Observed Adverse Effect Level), LOEC (Lowest Observed Effect Concentration), LOEL (Lowest Observed Effect Level), MEL (Maximum Exposure limit), MTD (Maximum Tolerated Dose), NOAEC (No Observed Adverse Effect Concentration), NOAEL (No Observed Adverse Effect Level), NOEC (No Observed Effect Concentration), NOEL (No Observed Effect Level), OEL (Occupational Exposure Limit), PEL (Permissible Exposure Limit), PII (Primary

Irritation Index), Pow (Partition coefficient n-octanol/water), S.C. (subcutaneous), STEL (Short-Term Exposure Limit), TLV-C (Threshold Limit Value-Ceiling), TLV-TWA (Threshold Limit Value - Time Weighted Average), UEL (Upper Explosion Limit)

This Material Safety Data Sheet (MSDS) serves different purposes than and DOES NOT REPLACE OR MODIFY THE EPA-APPROVED PRODUCT LABELING (attached to and accompanying the product container). This MSDS 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-approved 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, MONSANTO Company or any of its subsidiaries 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 the purposes prior to use. In no event will MONSANTO Company or any of its subsidiaries 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 TO THE PRODUCT TO WHICH INFORMATION REFERS.

**DuPont™ Oust® Extra Herbicide**

Version 2.0

Revision Date 10/31/2011

Ref. 130000029345

This SDS adheres to the standards and regulatory requirements of the United States and may not meet the regulatory requirements in other countries.

**SECTION 1. PRODUCT AND COMPANY IDENTIFICATION**

Product name : DuPont™ Oust® Extra Herbicide  
Tradename/Synonym : DPX-GJP86  
B11622901  
SULFOMETURON METHYL: Methyl 2-[[[(4,6-dimethyl-2-pyrimidinyl)amino]carbonyl]amino]sulfonyl]benzoate  
METSULFURON METHYL: Methyl 2-[[[(4-methoxy-6-methyl-1,3,5-triazin-2-yl)amino]carbonyl]amino]sulfonyl]benzoate

MSDS Number : 130000029345

Product Use : Herbicide

Manufacturer : DuPont  
1007 Market Street  
Wilmington, DE 19898

Product Information : 1-800-441-7515 (outside the U.S. 1-302-774-1000)  
Medical Emergency : 1-800-441-3637 (outside the U.S. 1-302-774-1139)  
Transport Emergency : CHEMTREC: 1-800-424-9300 (outside the U.S. 1-703-527-3887)

**SECTION 2. HAZARDS IDENTIFICATION**

## Emergency Overview

## CAUTION!

Harmful if absorbed through skin. Causes moderate eye irritation. Avoid contact with skin, eyes and clothing.

## Potential Health Effects

This section includes potential acute adverse effects which could occur if this material is not used according to the label.

Skin : May cause: Irritation with discomfort or rash.

Eyes : May cause: Irritation with discomfort, pain, redness, or visual impairment.

Ingestion

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Sulfometuron methyl : Effects due to ingestion may include: Red blood cell destruction which could produce tiredness, rapid heartbeat, dizziness, pale skin, leg cramps, shortness of breath, jaundice (yellow tinge to skin and eyes)

**Carcinogenicity**

None of the components present in this material at concentrations equal to or greater than 0.1% are listed by IARC, NTP, or OSHA, as a carcinogen.

**SECTION 3. COMPOSITION/INFORMATION ON INGREDIENTS**

Component	CAS-No.	Concentration
Sulfometuron methyl	74222-97-2	56.25 %
Metsulfuron methyl	74223-64-6	15 %
Other Ingredients		28.75 %

**SECTION 4. FIRST AID MEASURES**

- Skin contact : Take off all contaminated clothing immediately. Rinse skin immediately with plenty of water for 15-20 minutes. Call a poison control center or doctor for treatment advice.
- 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 poison control center or doctor for treatment advice.
- Inhalation : No specific intervention is indicated as the compound is not likely to be hazardous. Consult a physician if necessary.
- Ingestion : No specific intervention is indicated as the compound is not likely to be hazardous. Consult a physician if necessary.

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General advice : Have the product container or label with you when calling a poison control center or doctor, or going for treatment. For medical emergencies involving this product, call toll free 1-800-441-3637. See Label for Additional Precautions and Directions for Use.

**SECTION 5. FIREFIGHTING MEASURES**

Flammable Properties  
Lower explosion limit : 0.092 g/l

Fire and Explosion Hazard : Not a fire or explosion hazard.

Suitable extinguishing media : Water spray, Foam, Dry chemical, Carbon dioxide (CO2)

Unsuitable extinguishing media : High volume water jet, (contamination risk)

Firefighting Instructions : Wear full protective clothing and self-contained breathing apparatus. (on small fires) If area is heavily exposed to fire and if conditions permit, let fire burn itself out since water may increase the area contaminated. Cool containers / tanks with water spray. Control Runoff.

**SECTION 6. ACCIDENTAL RELEASE MEASURES**

NOTE: Review FIRE FIGHTING MEASURES and HANDLING (PERSONNEL) sections before proceeding with clean-up. Use appropriate PERSONAL PROTECTIVE EQUIPMENT during clean-up.

Safeguards (Personnel) : Evacuate personnel, thoroughly ventilate area, use self-contained breathing apparatus. Use personal protective equipment.

Spill Cleanup : Dike spill. Sweep up and shovel into suitable containers for disposal. For minor spills, leaks, etc., follow all precautions indicated on the label and clean up immediately.

Accidental Release Measures : Prevent material from entering sewers, waterways, or low areas. Never return spills in original containers for re-use. Dispose of in accordance with local regulations.



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**SECTION 7. HANDLING AND STORAGE**

- Handling (Personnel) : Wash hands thoroughly with soap and water after handling and before eating, drinking, chewing gum, using tobacco, or using the toilet.
- Handling (Physical Aspects) : Keep away from heat and sources of ignition.
- Storage : Store in original container. Store in a cool, dry place. Do not contaminate water, other pesticides, fertilizer, food or feed in storage. Keep out of the reach of children.

**SECTION 8. EXPOSURE CONTROLS/PERSONAL PROTECTION**

- 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.
- Personal protective equipment
  - Skin and body protection : Applicators and other handlers must wear:
    - Long sleeved shirt and long pants
    - Shoes plus socks
    - 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, such as polyvinyl chloride, nitrile rubber, or butyl rubber
      - Shoes plus socks
  - Protective measures : 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.

Exposure Guidelines

Exposure Limit Values			
Sulfometuron methyl			
TLV	(ACGIH)	5 mg/m3	TWA


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AEL \* (DUPONT) 10 mg/m3 8 & 12 hr. TWA Total dust.

Metsulfuron methyl  
AEL \* (DUPONT) 10 mg/m3 8 & 12 hr. TWA

\* AEL is DuPont's Acceptable Exposure Limit. Where governmentally imposed occupational exposure limits which are lower than the AEL are in effect, such limits shall take precedence.

**SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES**

Form : granules  
Color : light brown  
Odor : slight  
pH : 7.2  
Density : 0.67 g/ml  
Water solubility : dispersible

**SECTION 10. STABILITY AND REACTIVITY**

Stability : Stable at normal temperatures and storage conditions.  
Conditions to avoid : None reasonably foreseeable.  
Hazardous decomposition products : Decomposition will not occur.  
Hazardous reactions : Polymerization will not occur.

**SECTION 11. TOXICOLOGICAL INFORMATION**

DuPont™ Oust® Extra Herbicide  
Inhalation 4 h LC50 : > 5.3 mg/l , rat  
Dermal LD50 : > 2,000 mg/kg , rabbit

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Oral LD50	:	> 5,000 mg/kg , rat
Skin irritation	:	slight irritation, rabbit
Eye irritation	:	slight irritation, rabbit
Sensitisation	:	Did not cause sensitization on laboratory animals., guinea pig
Further information	:	Information given is based on data on the components and the toxicology of similar products.
Sulfometuron methyl Repeated dose toxicity	:	<p>The following effects occurred at levels of exposure that significantly exceed those expected under labeled usage conditions.</p> <p>Oral dog</p> <p>Abnormal decrease in number of red blood cells</p> <p>Oral rat</p> <p>Reduced body weight gain</p> <p>Oral mouse</p> <p>Reduced body weight gain</p>
Carcinogenicity	:	Animal testing did not show any carcinogenic effects.
Mutagenicity	:	Animal testing did not show any mutagenic effects. Tests on bacterial or mammalian cell cultures did not show mutagenic effects.
Reproductive toxicity	:	Animal testing showed effects on reproduction at levels equal to or above those causing parental toxicity.
Teratogenicity	:	Animal testing showed effects on embryo-fetal development at levels equal to or above those causing maternal toxicity.


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Metsulfuron methyl		
Repeated dose toxicity	:	The following effects occurred at levels of exposure that significantly exceed those expected under labeled usage conditions.
		Oral rat
		Reduced body weight gain, Organ weight changes, Liver
		Dermal rabbit
		Skin irritation
Carcinogenicity	:	Did not show carcinogenic effects in animal experiments.
Mutagenicity	:	Did not show mutagenic effects in animal experiments.
		Did not cause genetic damage in cultured bacterial cells.
		Genetic damage in cultured mammalian cells was observed in some laboratory tests but not in others.
Reproductive toxicity	:	Animal testing did not show any effects on fertility.
Teratogenicity	:	Animal testing showed no developmental toxicity.

**SECTION 12. ECOLOGICAL INFORMATION**

Aquatic Toxicity		
Sulfometuron methyl		
96 h LC50	:	Oncorhynchus mykiss (rainbow trout) > 148 mg/l
120 h EC50	:	Pseudokirchneriella subcapitata (green algae) 0.0046 mg/l
48 h EC50	:	Daphnia magna (Water flea) > 150 mg/l

Metsulfuron methyl

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96 h LC50 : Oncorhynchus mykiss (rainbow trout) &gt; 150 mg/l

72 h EC50 : Anabaena flos-aquae (cyanobacteria) 0.066 mg/l

14 d EC50 : Lemna minor 0.00036 mg/l

48 h EC50 : Daphnia magna (Water flea) &gt; 120 mg/l

Additional ecological information : 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. See product label for additional application instructions relating to environmental precautions.

**SECTION 13. DISPOSAL CONSIDERATIONS**

Waste Disposal : Do not contaminate water, food or feed by disposal. Wastes resulting from the use of this product must be disposed of on site or at an approved waste disposal facility.

Container Disposal : Container Refilling and Disposal:  
Refer to the product label for instructions.  
Do not transport if this container is damaged or leaking.

In the event of a major spill, fire or other emergency, call 1-800-441-3637 day or night.

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.

**SECTION 14. TRANSPORT INFORMATION**

IATA\_C UN number : 3077


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IMDG	Proper shipping name	: Environmentally hazardous substance, solid, n.o.s. (Sulfometuron methyl, Metsulfuron methyl)
	Class	: 9
	Packing group	: III
	Labelling No.	: 9MI
	UN number	: 3077
	Proper shipping name	: Environmentally hazardous substance, solid, n.o.s. (Sulfometuron methyl, Metsulfuron methyl)
	Class	: 9
	Packing group	: III
	Labelling No.	: 9
	Marine pollutant	: yes (Sulfometuron methyl, Metsulfuron methyl)

Not regulated as a hazardous material by DOT.

**SECTION 15. REGULATORY INFORMATION**

SARA 313 Regulated Chemical(s)	: 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.
EPA Reg. No.	: 352-622 In the United States this product is regulated by the US Environmental Protection Agency (EPA) under the Federal Insecticide, Fungicide and Rodenticide Act (FIFRA). It is a violation of Federal law to use this product in a manner inconsistent with its labeling. Read and follow all label directions. This product is excluded from listing requirements under EPA/TSCA.
California Prop. 65	: Chemicals known to the State of California to cause cancer, birth defects or any other harm: none known

**SECTION 16. OTHER INFORMATION**

NFPA

HMIS



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Health	:	1	1
Flammability	:	1	1
Reactivity/Physical hazard	:	0	0

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® Registered trademark of E.I. du Pont de Nemours and Company

Contact person : DuPont Crop Protection, Wilmington, DE, 19898, Phone: 1-888-638-7668

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.

Significant change from previous version is denoted with a double bar.

# Specimen Label



## Accord® Concentrate

### Herbicide

For control of annual and perennial weeds and woody plants in forests, non-crop sites, and in and around aquatic sites; also for use in wildlife habitat areas, 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(s):	
glyphosate <sup>†</sup> N-(phosphonomethyl)glycine, isopropylamine salt .....	53.8%
Other Ingredients .....	46.2%
Total Ingredients .....	100.0%

<sup>†</sup> Contains 5.4 pounds per gallon glyphosate, isopropylamine salt (4 pounds per gallon glyphosate acid).

EPA Reg. No. 62719-324

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.)

### Precautionary Statements

#### Hazards to Humans and Domestic Animals

##### 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 (Personal Protective Equipment). 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.

**Notice:** Read the entire label. Use only according to label directions. **Before using this product, read Terms and Conditions of Use, Warranty Disclaimer, Inherent Risks of Use, and Limitation of Remedies elsewhere on this label. If terms are unacceptable, return at once unopened.**

In case of emergency endangering health or the environment involving this product, call 1-800-992-5994. If you wish to obtain additional product information, visit our web site at [www.dowagro.com](http://www.dowagro.com).

Agricultural Chemical: Do not ship or store with food, feeds, drugs or clothing.

### 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. See individual container label for repackaging limitations.**

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 Reuse:** 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 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 larger than 5 gallons:

**Container Reuse:** 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.

#### Nonrefillable containers larger than 5 gallons:

**Container Reuse:** 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.

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## General Information

(How this product works)

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This product is a water-soluble liquid, which mixes readily with water and nonionic surfactant to be applied as a foliar spray for the control or destruction of many herbaceous and woody plants. This product is intended for control of annual and perennial weeds and woody plants in forests, pine straw plantations, non-crop sites such as utility rights-of-way, and in and around aquatic sites; also for use in wildlife habitat areas, for perennial grass release, and grass growth suppression and grazed areas on these sites.

The active ingredient in 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, 7 days or more on most perennial weeds, and 30 days or more on most woody plants. Extremely cool or cloudy weather following treatment may slow the activity of this product and delay visual effects of control. Visible effects include 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.

Always use the higher rate of this product and surfactant within the recommended range when vegetation is heavy or dense, when treating dense multi-canopied sites or woody vegetation or difficult-to-control herbaceous or woody plants.

Do not treat weeds, brush or trees under poor growing conditions such as drought stress, disease or insect damage, as reduced control may result. Reduced control of target vegetation may also occur if foliage is heavily covered with dust at the time of treatment.

Reduced control may result when applications are made to woody plants or weeds following site disturbance or plant top growth removal from grazing, mowing, logging or mechanical brush control. For best results, delay treatment of such areas until resprouting and foliar growth has restored the target vegetation to the recommended stage of growth for optimum herbicide exposure and control.

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.

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.

**Note:** The maximum 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 the maximum use rates.

**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, such as 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 of greater than 4.5 but not to exceed 7.5 quarts per acre, no more than 15 percent of the available grazing area may be treated.
  - ▶ For application rates that do not exceed 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.

**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.

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 recommended in this label. Mixing this product with herbicides or other materials not recommended in this label may result in reduced performance.

**ATTENTION: 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.**

## 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.

1. The distance of the outer most 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 should be observed.

The applicator should be familiar with and take into account the information covered in the following **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 Inversion section 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-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 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 backwards, parallel to the airstream 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 may further reduce drift without reducing swath width.

Application-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 2-10 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 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 connected cloud (under low wind conditions) indicates an inversion, while smoke that moves upwards 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).

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## Mixing And Application Instructions

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**Apply these spray solutions in properly maintained and calibrated equipment capable of delivering desired volumes. Hand-gun applications should 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.**

### Mixing

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 water while adding the required amount of this product (see "Directions for Use" and "Weeds Controlled" sections of this label).
2. Near the end of the filling process, add the required surfactant and mix well. Remove hose from tank immediately after filling to avoid siphoning back into the water source.

**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.

During mixing and application, foaming of the spray solution may occur. To prevent or minimize foam, avoid the use of mechanical agitators, place the filling hose below the surface of the spray solution (only during filling), terminate by-pass and return lines at the bottom of the tank, and, if needed, use an approved anti-foam or defoaming agent.

Keep by-pass line on or near bottom of tank to minimize foaming. Screen size in nozzle or line strainers should be no finer than 50 mesh. Carefully select correct nozzle to avoid spraying a fine mist. For best results with conventional ground application equipment, use flat fan nozzles. Check for even distribution of spray droplets.

**IMPORTANT:** When using this product, unless otherwise specified, mix with a surfactant such as a non-ionic 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). Always read and follow the manufacturer's surfactant label recommendations for best results.

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 recommendations.

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.

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### **Application Equipment And Techniques**

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**ATTENTION: AVOID DRIFT. EXTREME CARE MUST BE EXERCISED 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 crops, plants, or other areas on which the 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 a 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.

### **Aerial Equipment**

See the supplemental label for use of this product by air in California.

**For control of weed or brush species listed in this label using aerial application equipment:** For aerial broadcast application, unless otherwise specified, apply the rates of this product and surfactant recommended for broadcast application in a spray volume of 3 to 20 gallons of water per acre. See the "Weeds Controlled" section of this label for labeled annual and herbaceous weeds and woody plants and broadcast rate recommendations. Aerial applications of this product may only be made as specifically recommended in this label. For aerial application of this product in California, refer to Federal supplemental label for this product entitled "For Aerial Application in California Only". In California, aerial application may be made in aquatic sites and noncrop areas, including aquatic sites present in noncrop areas that are part of the intended treatment.

**Forestry and Utility Rights-of-Way Sites:** It is recommended that this product be applied by helicopter only in forestry sites and utility rights-of-way. Apply the rate of this product and surfactant recommended for broadcast sprays in a spray volume of 5 to 30 gallons per acre.

**In California, aerial application may be made only in non-residential, forestry sites or chaparral areas.**

**AVOID DRIFT. Do not apply during 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.

Drift control additives may be used. When a drift control additive is used, read and carefully observe the cautionary statements and all other information appearing in the additive label. The use of a drift control agent for conifer and herbaceous release applications may result in conifer injury and is not recommended.

**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.

## Ground Broadcast Equipment

**For control of weed or brush species listed in this label using conventional boom equipment:** For ground broadcast application, unless otherwise specified, apply the rates of this product and surfactant recommended for broadcast application in a spray volume of 3 to 30 gallons of water per acre. See the "Weeds Controlled" section of this label for labeled annual and herbaceous weeds and woody plants and broadcast rate recommendations. As density of vegetation increases, spray volume should be increased within the recommended 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.

**Forestry and Utility Rights-of-Way Sites:** This product is recommended for broadcast applications using suitable ground equipment in forestry sites, utility sites, and utility rights-of-way. Apply the recommended rates of this product and surfactant in a spray volume of 10 to 60 gallons per acre. 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 the desired volume of spray solution by mixing the amount of this product in water, shown in the following table:

### Spray Solution

Desired Volume	Amount of this product							
	3/4%	1%	1 1/4%	1 1/2%	2%	5%	8%	10%
1 gal	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	12 3/4 fl oz
25 gal	1 1/2 pt	1 qt	1 1/4 qt	1 1/2 qt	2 qt	5 qt	2 gal	2.5 gal
100 gal	3 qt	1 gal	1 1/4 gal	1 1/2 gal	2 gal	5 gal	8 gal	10 gal

2 tablespoons = 1 fluid ounce

For use in knapsack sprayers, it is suggested that the recommended amount of this product be mixed with water in a larger container. Fill the knapsack sprayer with the mixed solution and add the correct amount of surfactant.

## Selective Equipment

This product may be applied through shielded sprayers or wiper application equipment. This equipment may be used to selectively control undesirable vegetation without harming desirable vegetation.

Shielded sprayers direct the herbicide solution onto weeds while shielding desirable vegetation from the spray solution. Any recommended rate or tank mixture of this product may be used employing this equipment.

Wiper applicators physically wipe product directly onto undesirable vegetation. Care should be taken to avoid wiping desirable vegetation. Use a 33 to 100 percent solution of this product, diluted in water for wiper applications. Use a 33 percent solution for wick or gravity feed systems. Higher concentrations may be used in pressurized systems that are capable of handling thicker solutions. Addition of a nonionic

**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 in this label.

Applications should be made on a spray-to-wet basis. Spray coverage should be uniform and complete. 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 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.

surfactant at a rate of 10 percent by volume of total herbicide solution is recommended.

## 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," "General Information" and "Mixing and Application Instructions" for labeled uses and specific application instructions.

**Broadcast Application Rates:** For weeds less than 6 inches tall, use 1 1/2 pints of this product per acre plus a surfactant such as a non-ionic surfactant containing 80% or greater active ingredient. If weeds are greater than 6 inches tall, use 2 1/2 pints of this product per acre plus a non-ionic surfactant containing 80% or greater active ingredient..

**Hand-Held, High-Volume Application Rates:** Use a 3/4 percent solution of this product in water plus a surfactant such as a non-ionic surfactant containing 80% or greater active ingredient. Apply to foliage of vegetation to be controlled.

**When applied as directed, this product plus a surfactant such as a non-ionic surfactant containing 80% or greater active ingredient will control the following annual weeds:**

<b>Common Name</b>	<b>Scientific Name</b>
Balsamapple †	<i>Momordica charantia</i>
Barley	<i>Hordeum vulgare</i>
Barnyardgrass	<i>Echinochloa crus-galli</i>
Bassia, fivehook	<i>Bassia hyssopifolia</i>
Bluegrass, annual	<i>Poa annua</i>
Bluegrass, bulbous	<i>Poa bulbosa</i>
Brome	<i>Bromus spp.</i>
Buttercup	<i>Ranunculus spp.</i>
Cheat	<i>Bromus secalinus</i>
Chickweed, mouseear	<i>Cerastium vulgatum</i>
Cocklebur	<i>Xanthium strumarium</i>
Corn, volunteer	<i>Zea mays</i>
Crabgrass	<i>Digitaria spp.</i>
Dwarfdandelion	<i>Krigia cespitosa</i>
Falseflax, smallseed	<i>Camelina microcarpa</i>
Fiddleneck	<i>Amsinckia spp.</i>
Flaxleaf fleabane	<i>Conyza bonariensis</i>
Fleabane	<i>Erigeron spp.</i>
Foxtail	<i>Setaria spp.</i>
Foxtail, Carolina	<i>Alopecurus carolinianus</i>
Groundsel, common	<i>Senecio vulgaris</i>
Horseweed/Marestail	<i>Conyza canadensis</i>
Kochia	<i>Kochia scoparia</i>
Lambsquarters, common	<i>Chenopodium album</i>
Lettuce, prickly	<i>Lactuca serriola</i>
Morningglory	<i>Ipomoea spp.</i>
Mustard, blue	<i>Chorispora tenella</i>
Mustard, tansy	<i>Descurainia pinnata</i>
Mustard, tumble	<i>Sisymbrium altissimum</i>
Mustard, wild	<i>Sinapis arvensis</i>
Oats, wild	<i>Avena fatua</i>
Panicum	<i>Panicum spp.</i>
Pennycress, field	<i>Thlaspi arvense</i>
Pigweed, redroot	<i>Amaranthus retroflexus</i>
Pigweed, smooth	<i>Amaranthus hybridus</i>
Ragweed, common	<i>Ambrosia artemisiifolia</i>
Ragweed, giant	<i>Ambrosia trifida</i>
Rocket, London	<i>Sisymbrium irio</i>
Rye	<i>Secale cereale</i>
Ryegrass, Italian ††	<i>Lolium multiflorum</i>
Sandbur, field	<i>Cenchrus spp.</i>
Shattercane	<i>Sorghum bicolor</i>
Shepherd's-purse	<i>Capsella bursa-pastoris</i>
Signalgrass, broadleaf	<i>Brachiaria platyphylla</i>
Smartweed, Pennsylvania	<i>Polygonum pennsylvanicum</i>
Sowthistle, annual	<i>Sonchus oleraceus</i>
Spanishneedles ††	<i>Bidens bipinnata</i>
Stinkgrass	<i>Eragrostis cilianensis</i>
Sunflower	<i>Helianthus annuus</i>
Thistle, Russian	<i>Salsola kali</i>
Spurry, umbrella	<i>Holosteum umbellatum</i>
Velvetleaf	<i>Abutilon theophrasti</i>

<b>Common Name</b>	<b>Scientific Name</b>
Wheat	<i>Triticum aestivum</i>
Witchgrass	<i>Panicum capillare</i>

† Apply with hand-held equipment only.  
 †† Apply 3 pints of this product per acre.

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 to control most vigorously growing perennial weeds. Unless otherwise directed, apply when target plants are actively growing and most have reached early head or early bud stage of growth. Unless otherwise directed, allow at least 7 days after application before disturbing vegetation.

**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.

**Specific Weed Control Recommendations:** For perennial weeds, apply the recommended rate plus a surfactant such as a non-ionic surfactant containing 80% or greater active ingredient.. Use of this product without surfactant will result in reduced herbicide performance. Refer to the "Mixing and Application Instructions" section of this label and the surfactant manufacturer label for more information. .

**When applied as directed, this product plus a surfactant such as a non-ionic surfactant containing 80% or greater active ingredient will control the following perennial weeds:** (Numbers in parentheses "(-)" following common name of a listed weed species refer to "Specific Perennial Weed Control Recommendations" for that weed which follow the species listing.)

<b>Common Name</b>	<b>Scientific Name</b>
Alfalfa (31)	<i>Medicago sativa</i>
Alligatorweed † (1)	<i>Alternanthera philoxeroides</i>
Anise/Fennel (31)	<i>Foeniculum vulgare</i>
Artichoke, Jerusalem (31)	<i>Helianthus tuberosus</i>
Bahiagrass (31)	<i>Paspalum notatum</i>
Bermudagrass (2)	<i>Cynodon dactylon</i>
Bindweed, field (3)	<i>Convolvulus arvensis</i>
Bluegrass, Kentucky (12)	<i>Poa pratensis</i>
Blueweed, Texas (3)	<i>Helianthus ciliaris</i>
Brackenfern (4)	<i>Pteridium spp.</i>
Bromegrass, smooth (12)	<i>Bromus inermis</i>
Canarygrass, reed (12)	<i>Phalaris arundinacea</i>
Cattail (5)	<i>Typha spp.</i>
Clover, red (31)	<i>Trifolium pratense</i>
Clover, white (31)	<i>Trifolium repens</i>
Cogongrass (6)	<i>Imperata cylindrica</i>
Cordgrass (7)	<i>Spartina spp.</i>
Cutgrass, giant † (8)	<i>Zizaniopsis miliacea</i>
Dallisgrass (31)	<i>Paspalum dilatatum</i>
Dandelion (31)	<i>Taraxacum officinale</i>
Dock, curly (31)	<i>Rumex crispus</i>
Dogbane, hemp (9)	<i>Apocynum cannabinum</i>
Fescue (31)	<i>Festuca spp.</i>
Fescue, tall (10)	<i>Festuca arundinacea</i>
Guineagrass (11)	<i>Panicum maximum</i>
Hemlock, poison (31)	<i>Conium maculatum</i>

Common Name	Scientific Name
Horsenettle (31)	<i>Solanum carolinense</i>
Horseradish (9)	<i>Armoracia rusticana</i>
Ice Plant (22)	<i>Mesembryanthemum crystallinum</i>
Johnsongrass (12)	<i>Sorghum halepense</i>
Kikuyugrass (21)	<i>Pennisetum clandestinum</i>
Knapweed (9)	<i>Centaurea repens</i>
Lantana (13)	<i>Lantana camara</i>
Lespedeza, common (31)	<i>Lespedeza striata</i>
Lespedeza, sericea (31)	<i>Lespedeza cuneata</i>
Loosestrife, purple (14)	<i>Lythrum salicaria</i>
Lotus, American (15)	<i>Nelumbo lutea</i>
Maidencane (16)	<i>Panicum hematomon</i>
Milkweed (17)	<i>Asclepias spp.</i>
Muhly, wirestem (21)	<i>Muhlenbergia frondosa</i>
Mullein, common (31)	<i>Verbascum thapsus</i>
Napiergrass (31)	<i>Pennisetum purpureum</i>
Nightshade, silverleaf (3)	<i>Solanum elaeagnifolium</i>
Nutsedge, purple (18)	<i>Cyperus rotundus</i>
Nutsedge, yellow (18)	<i>Cyperus esculentus</i>
Orchardgrass (12)	<i>Dactylis glomerata</i>
Pampasgrass (19)	<i>Cortaderia jubata</i>
Paragrass (16)	<i>Brachiaria mutica</i>
Phragmites <sup>†</sup> (20)	<i>Phragmites spp.</i>
Quackgrass (21)	<i>Agropyron repens</i>
Reed, giant (22)	<i>Arundo donax</i>
Ryegrass, perennial (12)	<i>Lolium perenne</i>
Smartweed, swamp (31)	<i>Polygonum coccineum</i>
Spatterdock (23)	<i>Nuphar luteum</i>
Starthistle, yellow (31)	<i>Centaurea solstitialis</i>
Sweet potato, wild <sup>†</sup> (24)	<i>Ipomoea pandurata</i>
Thistle, artichoke (25)	<i>Cynara cardunculus</i>
Thistle, Canada (25)	<i>Cirsium arvense</i>
Timothy (12)	<i>Phleum pratense</i>
Torpedograss <sup>†</sup> (26)	<i>Panicum repens</i>
Tules, common (27)	<i>Scirpus acutus</i>
Vaseygrass (31)	<i>Paspalum urvillei</i>
Velvetgrass (31)	<i>Holcus spp.</i>
Waterhyacinth (28)	<i>Eichornia crassipes</i>
Waterlettuce (29)	<i>Pistia stratiotes</i>
Waterprimrose (30)	<i>Ludwigia spp.</i>
Wheatgrass, western (12)	<i>Agropyron smithii</i>

<sup>†</sup> Partial control.

<sup>††</sup> Partial control in southeastern states. See "Specific Weed Control Recommendations" below.

#### Specific Perennial Weed Control Recommendations:

1. **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.
2. **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.

3. **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.
4. **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.
5. **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.
6. **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.
7. **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.
8. **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.
9. **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.
10. **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.
11. **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.
12. **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.

13. **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.
14. **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.
15. **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.
16. **Maldenecane / 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.
17. **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.
18. **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.
19. **Pampasgrass:** Apply a 1 1/2 percent solution of this product with hand-held equipment when plants are actively growing.
20. **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.
21. **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.
22. **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.
23. **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.
24. **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.
25. **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.
26. **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.
27. **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.
28. **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.
29. **Waterlettuce:** For control, apply a 3/4 to 1 percent solution of this product with 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.
30. **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.
31. **Other perennial weeds listed above:** Apply 4 1/2 to 7 1/2 pints of this product per acre as a broadcast spray or apply as a 3/4 to 1 1/2 percent solution with hand-held equipment.

### Woody Brush and Trees

**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.

#### Application Rates and Timing

When 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 wood brush and tree species listed in this section of this label. Use the higher rate of application for dense stands and larger woody brush and trees.

**Specific Brush or Tree Control Recommendations:** Numbers in parentheses "(-)" following the common name of a listed brush or tree species refer to "Specific Brush or Tree Control Recommendations" which follow the species listing. See this section for specific application rates and timing for listed species.

For woody brush and trees, apply the recommended rate plus a surfactant such as a non-ionic surfactant containing 80% or greater active ingredient. Use of this product without surfactant will result in reduced herbicide performance. Refer to the "Mixing and Application Instructions" section of this label and the surfactant manufacturer label for more information. Make applications 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.

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 treatments.

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.

See the "Directions for Use" and "Mixing and Application Instructions" sections in this label for labeled use and specific application instructions. **When applied as directed, this product plus a surfactant such as a non-ionic surfactant containing 80% or greater active ingredient will control the following woody brush plants and trees:** (Numbers in parentheses "-" following common name of a listed brush or tree species refer to "Specific Brush or Tree Control Recommendations" for that species which follow the species listing.)

<b>Common Name</b>	<b>Scientific Name</b>
Alder (1)	<i>Alnus spp.</i>
Ash <sup>†</sup> (20)	<i>Fraxinus spp.</i>
Aspen, quaking (2)	<i>Populus tremuloides</i>
Bearclover, Bearmat (20)	<i>Chamaebatia foliolosa</i>
Birch (3)	<i>Betula spp.</i>
Blackberry (1)	<i>Rubus spp.</i>
Broom, French (4)	<i>Cytisus monspessulanus</i>
Broom, Scotch (4)	<i>Cytisus scoparius</i>
Buckwheat, California <sup>†</sup> (5)	<i>Eriogonum fasciculatum</i>
Cascara <sup>†</sup> (20)	<i>Rhamnus purshiana</i>
Catsclaw <sup>†</sup> (6)	<i>Acacia greggi</i>
Ceanothus (20)	<i>Ceanothus spp.</i>
Chamise (17)	<i>Adenostoma fasciculatum</i>
Cherry, bitter (7)	<i>Prunus emarginata</i>
Cherry, black (7)	<i>Prunus serotina</i>
Cherry, pin (7)	<i>Prunus pensylvanica</i>
Coyote brush (8)	<i>Baccharis consanguinea</i>
Creepers, Virginia <sup>†</sup> (20)	<i>Parthenocissus quinquefolia</i>
Dewberry (1)	<i>Rubus trivialis</i>
Dogwood (9)	<i>Cornus spp.</i>
Elderberry (3)	<i>Sambucus spp.</i>
Elm <sup>†</sup> (20)	<i>Ulmus spp.</i>
Eucalyptus, bluegum (10)	<i>Eucalyptus globulus</i>
Hasardia <sup>†</sup> (5)	<i>Haplopappus squamosus</i>
Hawthorn (2)	<i>Crataegus spp.</i>
Hazel (3)	<i>Corylus spp.</i>
Hickory (9)	<i>Carya spp.</i>
Holly, Florida (11) (Brazilian peppertree)	<i>Schinus terebinthifolius</i>

<b>Common Name</b>	<b>Scientific Name</b>
Honeysuckle (1)	<i>Lonicera spp.</i>
Hornbeam, American (20)	<i>Carpinus caroliniana</i>
Kudzu (12)	<i>Pueraria lobata</i>
Locust, black <sup>†</sup> (20)	<i>Robinia pseudoacacia</i>
Manzanita (20)	<i>Arctostaphylos spp.</i>
Maple, red <sup>†</sup> (13)	<i>Acer rubrum</i>
Maple, sugar (14)	<i>Acer saccharum</i>
Maple, vine <sup>†</sup> (20)	<i>Acer circinatum</i>
Monkey flower <sup>†</sup> (5)	<i>Mimulus guttatus</i>
Oak, black <sup>†</sup> (20)	<i>Quercus velutina</i>
Oak, northern pin (14)	<i>Quercus palustris</i>
Oak, post (1)	<i>Quercus stellata</i>
Oak, red (14)	<i>Quercus rubra</i>
Oak, southern red (7)	<i>Quercus falcata</i>
Oak, white <sup>†</sup> (20)	<i>Quercus alba</i>
Persimmon <sup>†</sup> (20)	<i>Diospyros spp.</i>
Poison-ivy (15)	<i>Rhus radicans</i>
Poison-oak (15)	<i>Rhus toxicodendron</i>
Poplar, yellow <sup>†</sup> (20)	<i>Liriodendron tulipifera</i>
Prunus (7)	<i>Prunus spp.</i>
Raspberry (1)	<i>Rubus spp.</i>
Redbud, eastern (20)	<i>Cercis canadensis</i>
Rose, multiflora (16)	<i>Rosa multiflora</i>
Russian-olive (20)	<i>Elaeagnus angustifolia</i>
Sage: black (17), white	<i>Salvia spp.</i>
Sagebrush, California (17)	<i>Artemisia californica</i>
Salmonberry (3)	<i>Rubus spectabilis</i>
Salt cedar <sup>†</sup> (9)	<i>Tamarix spp.</i>
Saltbush, sea myrtle (18)	<i>Baccharis halimifolia</i>
Sassafras (20)	<i>Sassafras albidum</i>
Sourwood <sup>†</sup> (20)	<i>Oxydendrum arboreum</i>
Sumac, poison <sup>†</sup> (20)	<i>Rhus vernix</i>
Sumac, smooth <sup>†</sup> (20)	<i>Rhus glabra</i>
Sumac, winged <sup>†</sup> (20)	<i>Rhus copallina</i>
Sweetgum (7)	<i>Liquidambar styraciflua</i>
Swordfern <sup>†</sup> (20)	<i>Polystichum munitum</i>
Tallowtree, Chinese (17)	<i>Sapium sebiferum</i>
Thimbleberry (3)	<i>Rubus parviflorus</i>
Tobacco, tree <sup>†</sup> (5)	<i>Nicotiana glauca</i>
Trumpet creeper (2)	<i>Campsis radicans</i>
Waxmyrtle, southern <sup>†</sup> (11)	<i>Myrica cerifera</i>
Willow (19)	<i>Salix spp.</i>

<sup>†</sup>Partial control (See below for control or partial control instructions.)

**Specific Brush or Tree Control Recommendations:**

- 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 / Trumpet creeper:** 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 / Broom, 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.

6. **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.
7. **Cherry, bitter / Cherry, black / Cherry, pin / Oak, southern red / Sweetgum / 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.
8. **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.
9. **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.
10. **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.
11. **Holly, Florida / Waxmyrtle, southern:** For partial control, apply this product as a 1 1/2 percent solution with hand-held equipment.
12. **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.
13. **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.
14. **Maple, sugar / Oak: northern pin / Oak, 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.
15. **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.
16. **Rose, multiflora:** For control, apply 3 pints of this product per acre as a broadcast spray or as a 3/4 percent solution with hand-held equipment. Treatments should be made prior to leaf deterioration by leaf-feeding insects.
17. **Sage, black / Sagebrush, California / Chamise / Tallowtree, Chinese:** For control of these species, apply a 3/4 percent solution of this product as a foliar spray with hand-held equipment. Thorough coverage of foliage is necessary for best results.
18. **Saltbush, sea myrtle:** For control, apply this product as a 1 percent solution with hand-held equipment.
19. **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.
20. **Other woody brush and trees listed above:** 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.

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### **Aquatic and other Noncrop Sites**

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Apply this product as directed and under conditions described to control or partially control weeds and woody plants listed in the "Weeds Controlled" section in industrial, recreational and public areas or other similar aquatic or terrestrial sites on this label.

### **Noncrop Sites**

**This product may be used to control the listed weeds in and around aquatic sites and on noncrop sites such as :**

Airports  
 Golf Courses  
 Habitat Restoration & Management Areas  
 Highways & Roadsides  
 Industrial Plant Sites  
 Lumberyards  
 Parking Areas  
 Parks  
 Petroleum Tank Farms  
 Pipeline, Power, Telephone & Utility Rights-of-Way  
 Pumping Installations  
 Railroads  
 Schools  
 Storage Areas  
 Similar Sites

### **Aquatic Sites**

**This product may be applied to emerged weeds in all bodies of fresh and brackish water which may be flowing, nonflowing 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.**

**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 to public water. Permits may be required to treat such water.
- **NOTE:** 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 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. 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.

### Forestry Sites and Utility Rights-of-Way

In forest and utility sites, this product is recommended for the control or partial control of woody brush, trees, and annual and perennial herbaceous weeds. This product is also recommended for use in preparing or establishing wildlife openings within these sites, in pine straw plantations for maintaining logging roads, and for side trimming along utility rights-of-way.

In forestry sites, this product is recommended for use in site preparation prior to planting any tree species, including Christmas trees and silvicultural nursery sites.

In utility sites, this product is recommended for use along electrical power, pipeline, and telephone rights-of-way, and in other utility sites associated with these rights-of-way, such as substations.

#### Application Rates <sup>†</sup>:

Method of Application	Application Rate	Spray Volume (gal/acre)
<b>Broadcast</b>		
Aerial	1.5 to 7.5 qt/acre	5 to 30
Ground	1.5 to 7.5 qt/acre	10 to 60
<b>Spray-to-Wet</b>		
Handgun, Backpack Mistblower	0.75 to 2% by volume	spray-to-wet
<b>Low Volume Directed Spray <sup>††</sup></b>		
Handgun, Backpack Mistblower	5% to 10% by volume	partial coverage

<sup>†</sup> Where repeat applications are necessary, do not exceed 8.0 quarts per acre per year.

<sup>††</sup> 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.

In forestry site preparation and utility rights-of-way applications, this product requires use with a surfactant such as a non-ionic surfactant containing greater than 80 percent active ingredient. Use of this product without surfactant will result in reduced herbicide performance. Refer to the "Mixing and Application Instructions" section of this label and the surfactant manufacturer label for more information.

Use higher rates of this product within the recommended rate ranges 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 recommended rate range to control of perennial herbaceous weeds from emergence up to the appearance of seedheads, flowers or berries appear. Use lower rates within the recommended 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 Mixtures

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 on the mixture. Any recommended 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. For side trimming treatments in utility rights-of-way, tank mixtures with Arsenal 2WSL herbicide are not recommended. For side trimming treatments, it is recommended that this product be used alone as recommended, or as a tank mix with Garlon.

Product	Broadcast Rate	Use Sites
Arsenal Applicators Concentrate	2 to 16 fl oz/acre	Forestry site preparation
Oust	1 to 4 oz/acre	Forestry site preparation, utility sites
Garlon 3A <sup>†</sup>	1 to 4 qt/acre	Forestry site preparation, utility sites
Garlon 4	1 to 4 qt/acre	Forestry site preparation, utility sites
Arsenal 2WSL	2 to 32 fl oz/acre	Utility sites
	<b>Spray-to-Wet Rates</b>	
Arsenal Applicators Concentrate	1/32% to 1/2% by volume	Forestry site preparation
Arsenal 2WSL	1/32% to 1/2% by volume	Utility sites
	<b>Low Volume Directed Spray Rates</b>	
Arsenal Applicators Concentrate	1/8% to 1/2% by volume	Forestry site preparation
Arsenal 2WSL	1/8% to 1/2% by volume	Utility sites

<sup>†</sup> Ensure that Garlon 3A is thoroughly mixed with water before adding this product. Agitation is required while mixing this product with Garlon 3A to avoid compatibility problems.

For control of herbaceous weeds, use the lower recommended tank mixture rates. For control of dense stands or difficult-to-control woody brush and trees, use the higher recommended rates.

## Forestry Conifer and Hardwood Release

### Directed Sprays and Selective Equipment

This product may be applied as a directed spray or by using selective equipment in forestry conifer and hardwood sites, including Christmas tree plantations and silvicultural nurseries. This product requires use with a surfactant. 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. Refer to the "Mixing and Application Instructions" section of this label and the surfactant manufacturer label for more information.

**Tank Mixing:** In hardwood plantations, tank mixtures with Oust may be used. In pine plantations, tank mixtures with Garlon 4 or Arsenal AC may be used. Comply with all site restrictions, forestry species limitations, and precautions on the tank mix product labels.

Avoid contact of spray drift, mist or drips with foliage, green bark or non-woody surface roots of desirable plant species. See "Application Equipment and Techniques" section of this label for specific recommendations and precautions.

**Spray-to-Wet Applications:** Use a 2 percent spray solution to control undesirable woody brush and trees. To control herbaceous weeds, use a 1 to 2 percent spray solution.

**Low Volume Directed Spray Applications:** Use a 5 to 10 percent spray solution. Coverage should be uniform with at least 50 percent of the foliage contacted. Coverage of the top one-half of the unwanted vegetation is important.

**Broadcast Applications:** For equipment calibrated for broadcast applications, use 1 1/2 to 7 1/2 quarts of this product per acre. Apply in 10 to 60 gallons of clean water per acre. Shielded application equipment may be used to avoid contact of the spray solution with desirable plants. Shields should be adjusted to prevent spray contact with the foliage of green bark of desirable vegetation.

**Wiper Application Equipment:** See the "Selective Equipment" section of this label for equipment and application rate recommendations.

### Broadcast Application

**Note:** Except where specifically recommended below, make broadcast applications of this product only where conifers have been established for more than one year.

**Broadcast application must be made after formation of final conifer resting buds in the fall or prior to initial bud swelling in the spring.**

Injury may occur to conifers treated for release, especially where spray patterns overlap or the higher rates are applied. Damage can be accentuated if applications are made when conifers are actively growing, or are under stress from drought, flood water, improper planting, insects, animal damage or diseases.

This product requires use with a surfactant. Use a surfactant that is labeled/recommended for use in over-the-top release applications. Use of this product without a surfactant will result in reduced herbicide performance. Refer to the "Mixing and Application Instructions" section of this label and the surfactant manufacturer label for more information.

For release of the following conifer species outside the Southeastern United States:

Douglas fir (*Pseudotsuga menziesii*)  
Fir (*Abies* species)  
Hemlock <sup>†</sup> (*Tsuga* species)  
Pines <sup>†</sup> (*Pinus* species)  
Redwood, California <sup>††</sup> (*Sequoia* species)

<sup>†</sup> Includes all species except loblolly pine, longleaf pine, shortleaf pine or slash pine.

<sup>††</sup> Use of a surfactant is not recommended for release of hemlock species or California redwood. In mixed conifer stands, injury to these species may result if a surfactant is used.

**Application Rate for Conifer Release:** Apply 3/4 to 1 1/2 quarts per acre as a broadcast spray. In Maine and New Hampshire, up to 2 1/4 quarts per acre of this product may be used for the control and suppression of difficult-to-control hardwood species.

To release Douglas fir, and pine and spruce species at the end of the first growing season (except in California), apply 3/4 to 1 1/8 quarts per acre of this product. Make sure that all conifers are well hardened off.

**Note:** For release of Douglas fir with this product or recommended tank mixtures, a nonionic surfactant recommended for over-the-top foliar spray may be used. To avoid possible conifer injury, nonionic surfactants may be used at 2 fluid ounces per acre at elevations above 1500 feet, or 1 fluid ounce per acre in the coastal range or at elevations below 1500 feet. Use of surfactant rates exceeding those listed above may result in unacceptable conifer injury and are not recommended. Make sure that the nonionic surfactant has been adequately tested for safety to Douglas fir before use.

**Tank Mixtures with Oust:** To release jack pine, white pine and white spruce, apply 3/4 to 1 1/2 quarts of this product with 1 to 3 ounces (1 to 1 1/2 ounces for white pine) of Oust per acre. Make applications to actively growing weeds as a broadcast spray over the top of established conifers. Applications at these rates should be made after formation of conifer resting buds in the late summer or fall.

**Tank Mixtures with Arsenal Applicators Concentrate:** This product may be tank mixed with Arsenal Applicators Concentrate for release of Douglas fir. Tank mix 3/4 to 1 1/8 quarts of this product with 2 to 6 fluid ounces of Arsenal Applicators Concentrate per acre. For release of balsam fir and red spruce, apply a mixture of 1 1/2 quarts of this product with 1 to 2 1/2 fluid ounces of Arsenal Applicators Concentrate per acre.

In Maine and New Hampshire 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, up to 2 1/4 quarts per acre of this product may be tank mixed with 1 to 2 1/2 fluid ounces per acre of Arsenal Applicators Concentrate herbicide and applied as a broadcast spray.

**Tank mixtures with Arsenal Applicators Concentrate and Oust or Oust XP Herbicides:** 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 weed densities, tough-to-control brush and where maples make up a large component of the undesirable trees up to 2 1/4 quarts per acre of this product may be tank mixed with 1 to 2.5 fluid ounces per acre of Arsenal Applicators Concentrate and 1 to 3 oz of Oust or Oust XP herbicides and applied as a broadcast spray.

**For release of the following conifer species in the Southeastern United States:**

**Loblolly pine** (*Pinus taeda*)  
**Eastern white pine** (*Pinus strobus*)  
**Shortleaf pine** (*Pinus echinata*)  
**Slash pine** (*Pinus elliottii*)  
**Virginia pine** (*Pinus virginiana*)  
**Longleaf pine** (*Pinus palustris*)

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 recommended tank mixture.

**Tank Mixtures with Arsenal Applicators Concentrate:** For conifer release, apply 3/4 to 1 1/2 quarts of this product with 2 to 16 fluid ounces 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 recommended rates for dense tough-to-control wood brush and trees.

Read and observe label claims, cautionary statements and all information on the labels of each product used in these tank mixtures. Use according to the most restrictive precautionary statements for each product in the mixture.

### Herbaceous Release

When applied as directed, this product plus listed residual herbicides provides 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.

**Tank Mixtures with Oust:** To release loblolly pines, tank mix 12 to 18 fluid ounces of this product with 2 to 4 ounces of Oust per acre.

To release slash pines, tank mix 9 to 12 fluid ounces of this product with 2 to 4 ounces of Oust per acre.

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 per acre of this product may be tank mixed with 1 to 3 oz of Oust herbicide or Oust XP herbicide to control grass, herbaceous weeds and woody brush, and applied as a broadcast spray.

For tank mixtures with Oust use a surfactant that is labeled recommended for use in over-the-top herbaceous release applications. Use of this product without a surfactant will result in reduced herbicide performance. Refer to the "Mixing and Application Instructions" section of this label and the surfactant manufacturer label for more information.

Weed control may be reduced if water volumes exceed 25 gallons per acre for these treatments.

**Tank Mixture with Atrazine:** To release Douglas fir, apply 3/4 quart of this product with 4 pounds a.i. of atrazine per acre. 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 mixture.

Always read and follow the manufacturer's label for all herbicides and surfactants used.

### 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.

Consult local public water control authorities before applying this product in and around public water. Permits may be required to treat in such areas.

There is no restriction on the use of treated water for irrigation, recreation or domestic purposes.

**Note:** 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 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 application. 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. 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. The maximum application rate of 3 3/4 quarts per acre must not be exceeded in a single over-water broadcast application except as follows, where any recommended 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.

### Wildlife Habitat Restoration and Management Areas

This product is recommended 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 should be exercised to keep spray off of desirable plants.

**Wildlife Food Plots:** This product may be used as a 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 reinfest 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 "Weed Controlled" section in this label for recommended 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 freshly cut surface immediately after cutting.** Delay in applying this product may result in reduced performance. For best results, trees should be cut 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:

<b>Common Name</b>	<b>Scientific Name</b>
Alder	<i>Alnus spp.</i>
Coyote brush †	<i>Baccharis consanguinea</i>
Dogwood †	<i>Cornus spp.</i>
Eucalyptus	<i>Eucalyptus spp.</i>
Hickory †	<i>Carya spp.</i>
Madrone	<i>Arbutus menziesii</i>
Maple †	<i>Acer spp.</i>
Oak	<i>Quercus spp.</i>
Poplar †	<i>Populus spp.</i>
Reed, giant	<i>Arundo donax</i>
Salt cedar	<i>Tamarix spp.</i>
Sweet gum †	<i>Liquidambar styraciflua</i>
Sycamore †	<i>Platanus occidentalis</i>
Tan oak	<i>Lithocarpus densiflorus</i>
Willow	<i>Salix spp.</i>

† This product is not approved for this use on these species in the state of California.

## 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, applications should be made during periods of active growth and full leaf expansion.

**This treatment will control the following woody species:**

<b>Common Name</b>	<b>Scientific Name</b>
Oak	<i>Quercus spp.</i>
Poplar	<i>Populus spp.</i>
Sweet gum	<i>Liquidambar styraciflua</i>
Sycamore	<i>Platanus occidentalis</i>

**This treatment will suppress the following woody species:**

<b>Common Name</b>	<b>Scientific Name</b>
Black gum †	<i>Nyssa sylvatica</i>
Dogwood	<i>Cornus spp.</i>
Hickory	<i>Carya spp.</i>
Maple, red	<i>Acer rubrum</i>

† This product is not approved for this use on this species in the state of California.

## 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 recommendations for control or suppression of winter annuals and tall fescue are listed below.

Apply the recommended rates of this product in 10 to 25 gallons of water per acre plus a surfactant such as a non-ionic surfactant containing 80% or greater active ingredient.. Use of this product without surfactant will result in reduced herbicide performance. Refer to the "Mixing and Application Instructions" section of this label and the surfactant manufacturer label for more information.

### Weeds Controlled or Suppressed †

**Note:** C = Controlled; S = Suppressed

Weed Species	Rate (Fluid Ounces Per Acre)					
	6	9	12	18	24	48
<b>Barley, little</b> <i>Hordeum pusillum</i>	S	C	C	C	C	C
<b>Bedstraw, catchweed</b> <i>Galium aparine</i>	S	C	C	C	C	C
<b>Bluegrass, annual</b> <i>Poa annua</i>	S	C	C	C	C	C
<b>Chervil</b> <i>Chaerophyllum tainturieri</i>	S	C	C	C	C	C
<b>Chickweed, common</b> <i>Stellaria media</i>	S	C	C	C	C	
<b>Clover, crimson</b> <i>Trifolium incarnatum</i>	•	S	S	C	C	C
<b>Clover, large hop</b> <i>Trifolium campestre</i>	•	S	S	C	C	C
<b>Speedwell, corn</b> <i>Veronica arvensis</i>	S	C	C	C	C	C
<b>Fescue, tall</b> <i>Festuca arundinacea</i>	•	•	•	•	S	S
<b>Geranium, Carolina</b> <i>Geranium carolinianum</i>	•	•	S	S	C	C
<b>Henbit</b> <i>Lamium amplexicaule</i>	•	S	C	C	C	C
<b>Ryegrass, Italian</b> <i>Lolium multiflorum</i>	•	•	S	C	C	C
<b>Vetch, common</b> <i>Vicia sativa</i>	•	•	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 a surfactant such as a non-ionic surfactant containing 80% or greater active ingredient.. Use of this product without surfactant will result in reduced herbicide performance. Refer to the "Mixing and Application Instructions" section of this label and the surfactant manufacturer label for more information. 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

† Johnsongrass is controlled at the higher rate.

†† Suppression at the higher rate only.

Use only on well-established bermudagrass. Bermudagrass injury may result from the treatment but regrowth will occur under moist conditions. Repeat applications in the same season are not recommended, 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 in 10 to 25 gallons of water per acre, plus a surfactant such as a non-ionic surfactant containing 80% or greater active ingredient. Use of this product without surfactant will result in reduced herbicide performance. Refer to the "Mixing and Application Instructions" section of this label and the surfactant manufacturer label for more information.

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 water per acre plus a surfactant such as a non-ionic surfactant containing 80% or greater active ingredient. Use of this product without surfactant will result in reduced herbicide performance. Refer to the "Mixing and Application Instructions" section of this label and the surfactant manufacturer label for more information. Applications should be made 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.

### **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, use by the buyer or any other user constitutes acceptance of the terms under Warranty Disclaimer, Inherent Risks of Use and Limitations of Remedies.

### **Warranty Disclaimer**

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. Dow AgroSciences 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 Dow AgroSciences or the seller. To the fullest extent permitted by law, all such risks shall be assumed by buyer.

### **Limitation of Remedies**

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.

Dow AgroSciences shall not be liable for losses or damages resulting from handling or use of this product unless Dow AgroSciences is promptly notified of such loss or damage in writing. To the fullest extent permitted by law, in no case shall Dow AgroSciences be liable for consequential or incidental damages or losses.

The terms of the Warranty Disclaimer above and this 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 this Limitation of Remedies in any manner.

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**Produced for**  
**Dow AgroSciences LLC**  
**9330 Zionsville Road**  
**Indianapolis, IN 46268**

Label Code: D02-145-004  
Replaces Label: D02-145-003  
LOES Number: 010-00111

EPA-accepted 07/13/06

### **Revisions:**

1. Updated Storage and Disposal

# Specimen Label



# Rodeo®

## Herbicide

For control of annual and perennial weeds and woody plants in forests, non-crop sites, and in and around aquatic sites; also for use in wildlife habitat areas, 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(s):	
glyphosate <sup>†</sup> N-(phosphonomethyl)glycine, isopropylamine salt .....	53.8%
Other Ingredients .....	46.2%
Total Ingredients .....	100.0%

<sup>†</sup> Contains 5.4 pounds per gallon glyphosate, isopropylamine salt (4 pounds per gallon glyphosate acid).

EPA Reg. No. 62719-324

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.)

### Precautionary Statements

#### Hazards to Humans and Domestic Animals

##### 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 (Personal Protective Equipment). 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.

**Notice:** Read the entire label. Use only according to label directions. **Before using this product, read Terms and Conditions of Use, Warranty Disclaimer, Inherent Risks of Use, and Limitation of Remedies elsewhere on this label. If terms are unacceptable, return at once unopened.**

In case of emergency endangering health or the environment involving this product, call 1-800-992-5994. If you wish to obtain additional product information, visit our web site at [www.dowagro.com](http://www.dowagro.com).

Agricultural Chemical: Do not ship or store with food, feeds, drugs or clothing.

### 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. See individual container label for repackaging limitations.**

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 Reuse:** 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 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 larger than 5 gallons:

**Container Reuse:** 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.

#### Nonrefillable containers larger than 5 gallons:

**Container Reuse:** 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.

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## General Information

### (How this product works)

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This product is a water-soluble liquid, which mixes readily with water and nonionic surfactant to be applied as a foliar spray for the control or destruction of many herbaceous and woody plants. This product is intended for control of annual and perennial weeds and woody plants in forests, pine straw plantations, non-crop sites such as utility rights-of-way, and in and around aquatic sites; also for use in wildlife habitat areas, for perennial grass release, and grass growth suppression and grazed areas on these sites.

The active ingredient in 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, 7 days or more on most perennial weeds, and 30 days or more on most woody plants. Extremely cool or cloudy weather following treatment may slow the activity of this product and delay visual effects of control. Visible effects include 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.

Always use the higher rate of this product and surfactant within the recommended range when vegetation is heavy or dense, when treating dense multi-canopied sites or woody vegetation or difficult-to-control herbaceous or woody plants.

Do not treat weeds, brush or trees under poor growing conditions such as drought stress, disease or insect damage, as reduced control may result. Reduced control of target vegetation may also occur if foliage is heavily covered with dust at the time of treatment.

Reduced control may result when applications are made to woody plants or weeds following site disturbance or plant top growth removal from grazing, mowing, logging or mechanical brush control. For best results, delay treatment of such areas until resprouting and foliar growth has restored the target vegetation to the recommended stage of growth for optimum herbicide exposure and control.

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.

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.

**Note:** The maximum 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 the maximum use rates.

**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, such as 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 of greater than 4.5 but not to exceed 7.5 quarts per acre, no more than 15 percent of the available grazing area may be treated.
  - ▶ For application rates that do not exceed 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.

**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.

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 recommended in this label. Mixing this product with herbicides or other materials not recommended in this label may result in reduced performance.

**ATTENTION: 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.**

## 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.

1. The distance of the outer most 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 should be observed.

The applicator should be familiar with and take into account the information covered in the following **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 Inversion section of this label).

**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-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 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 backwards, parallel to the airstream 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 may further reduce drift without reducing swath width.

Application-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 2-10 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 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 connected cloud (under low wind conditions) indicates an inversion, while smoke that moves upwards 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).

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## Mixing And Application Instructions

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**Apply these spray solutions in properly maintained and calibrated equipment capable of delivering desired volumes. Hand-gun applications should 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.**

### Mixing

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 water while adding the required amount of this product (see "Directions for Use" and "Weeds Controlled" sections of this label).
2. Near the end of the filling process, add the required surfactant and mix well. Remove hose from tank immediately after filling to avoid siphoning back into the water source.

**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.

During mixing and application, foaming of the spray solution may occur. To prevent or minimize foam, avoid the use of mechanical agitators, place the filling hose below the surface of the spray solution (only during filling), terminate by-pass and return lines at the bottom of the tank, and, if needed, use an approved anti-foam or defoaming agent.

Keep by-pass line on or near bottom of tank to minimize foaming. Screen size in nozzle or line strainers should be no finer than 50 mesh. Carefully select correct nozzle to avoid spraying a fine mist. For best results with conventional ground application equipment, use flat fan nozzles. Check for even distribution of spray droplets.

**IMPORTANT:** When using this product, unless otherwise specified, mix with a surfactant such as a non-ionic 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). Always read and follow the manufacturer's surfactant label recommendations for best results.

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 recommendations.

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.

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### Application Equipment And Techniques

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**ATTENTION: AVOID DRIFT. EXTREME CARE MUST BE EXERCISED 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 crops, plants, or other areas on which the 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 a 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.

### Aerial Equipment

**For aerial application of this product in California, refer to Federal supplemental label for this product entitled "For Aerial Application in California Only".** In California, aerial application may be made in aquatic sites and noncrop areas, including aquatic sites present in noncrop areas that are part of the intended treatment.

**For control of weed or brush species listed in this label using aerial application equipment:** For aerial broadcast application, unless otherwise specified, apply the rates of this product and surfactant recommended for broadcast application in a spray volume of 3 to 20 gallons of water per acre. See the "Weeds Controlled" section of this label for labeled annual and herbaceous weeds and woody plants and broadcast rate recommendations. Aerial applications of this product may only be made as specifically recommended in this label.

**AVOID DRIFT. Do not apply during 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.

Drift control additives may be used. When a drift control additive is used, read and carefully observe the cautionary statements and all other information appearing in the additive label. The use of a drift control agent for conifer and herbaceous release applications may result in conifer injury and is not recommended.

**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.

### Ground Broadcast Equipment

**For control of weed or brush species listed in this label using conventional boom equipment:** For ground broadcast application, unless otherwise specified, apply the rates of this product and surfactant recommended for broadcast application in a spray volume of 3 to 30 gallons of water per acre. See the "Weeds Controlled" section of this label for labeled annual and herbaceous weeds and woody plants and broadcast rate recommendations. As density of vegetation increases, spray volume should be increased within the recommended 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.

**Forestry and Utility Rights-of-Way Sites:** This product is recommended for broadcast applications using suitable ground equipment in forestry sites, utility sites, and utility rights-of-way. Apply the recommended rates of this product and surfactant in a spray volume of 10 to 60 gallons per acre. 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:**

**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 in this label.

Applications should be made on a spray-to-wet basis. Spray coverage should be uniform and complete. 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 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.

Prepare the desired volume of spray solution by mixing the amount of this product in water, shown in the following table:

**Spray Solution**

Desired Volume	Amount of this product							
	3/4%	1%	1 1/4%	1 1/2%	2%	5%	8%	10%
1 gal	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	12 3/4 fl oz
25 gal	1 1/2 pt	1 qt	1 1/4 qt	1 1/2 qt	2 qt	5 qt	2 gal	2.5 gal
100 gal	3 qt	1 gal	1 1/4 gal	1 1/2 gal	2 gal	5 gal	8 gal	10 gal

2 tablespoons = 1 fluid ounce

For use in knapsack sprayers, it is suggested that the recommended amount of this product be mixed with water in a larger container. Fill the knapsack sprayer with the mixed solution and add the correct amount of surfactant.

**Selective Equipment**

This product may be applied through shielded sprayers or wiper application equipment. This equipment may be used to selectively control undesirable vegetation without harming desirable vegetation.

Shielded sprayers direct the herbicide solution onto weeds while shielding desirable vegetation from the spray solution. Any recommended rate or tank mixture of this product may be used employing this equipment.

Wiper applicators physically wipe product directly onto undesirable vegetation. Care should be taken to avoid wiping desirable vegetation. Use a 33 to 100 percent solution of this product, diluted in water for wiper applications. Use a 33 percent solution for wick or gravity feed systems. Higher concentrations may be used in pressurized systems that are capable of handling thicker solutions. Addition of a nonionic surfactant at a rate of 10 percent by volume of total herbicide solution is recommended.

**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," "General Information" and "Mixing and Application Instructions" for labeled uses and specific application instructions.

**Broadcast Application Rates:** For weeds less than 6 inches tall, use 1 1/2 pints of this product per acre plus a surfactant such as a non-ionic surfactant containing 80% or greater active ingredient. If weeds are greater than 6 inches tall, use 2 1/2 pints of this product per acre plus a non-ionic surfactant containing 80% or greater active ingredient..

**Hand-Held, High-Volume Application Rates:** Use a 3/4 percent solution of this product in water plus a surfactant such as a non-ionic surfactant containing 80% or greater active ingredient. Apply to foliage of vegetation to be controlled.

When applied as directed, this product plus a surfactant such as a non-ionic surfactant containing 80% or greater active ingredient will control the following annual weeds:

Common Name	Scientific Name
Balsamapple †	<i>Momordica charantia</i>
Barley	<i>Hordeum vulgare</i>
Barnyardgrass	<i>Echinochloa crus-galli</i>
Bassia, fivehook	<i>Bassia hyssopifolia</i>
Bluegrass, annual	<i>Poa annua</i>
Bluegrass, bulbous	<i>Poa bulbosa</i>
Brome	<i>Bromus spp.</i>
Buttercup	<i>Ranunculus spp.</i>
Cheat	<i>Bromus secalinus</i>
Chickweed, mouseear	<i>Cerastium vulgatum</i>
Cocklebur	<i>Xanthium strumarium</i>
Corn, volunteer	<i>Zea mays</i>
Crabgrass	<i>Digitaria spp.</i>
Dwarfandelion	<i>Krigia cespitosa</i>
Falseflax, smallseed	<i>Camelina microcarpa</i>
Fiddleneck	<i>Amsinckia spp.</i>
Flaxleaf fleabane	<i>Conyza bonariensis</i>
Fleabane	<i>Erigeron spp.</i>
Foxtail	<i>Setaria spp.</i>
Foxtail, Carolina	<i>Alopecurus carolinianus</i>
Groundsel, common	<i>Senecio vulgaris</i>
Horseweed/Marestail	<i>Conyza canadensis</i>
Kochia	<i>Kochia scoparia</i>
Lambsquarters, common	<i>Chenopodium album</i>
Lettuce, prickly	<i>Lactuca scariola</i>
Morningglory	<i>Ipomoea spp.</i>
Mustard, blue	<i>Chorispura tenella</i>
Mustard, tansy	<i>Descurainia pinnata</i>
Mustard, tumble	<i>Sisymbrium altissimum</i>
Mustard, wild	<i>Sinapis arvensis</i>
Oats, wild	<i>Avena fatua</i>
Panicum	<i>Panicum spp.</i>
Pennycress, field	<i>Thlaspi arvense</i>
Pigweed, redroot	<i>Amaranthus retroflexus</i>
Pigweed, smooth	<i>Amaranthus hybridus</i>
Ragweed, common	<i>Ambrosia artemisiifolia</i>
Ragweed, giant	<i>Ambrosia trifida</i>
Rocket, London	<i>Sisymbrium irio</i>
Rye	<i>Secale cereale</i>
Ryegrass, Italian ††	<i>Lolium multiflorum</i>
Sandbur, field	<i>Cenchrus spp.</i>
Shattercane	<i>Sorghum bicolor</i>
Shepherd's-purse	<i>Capsella bursa-pastoris</i>
Signalgrass, broadleaf	<i>Brachiaria platyphylla</i>
Smartweed, Pennsylvania	<i>Polygonum pennsylvanicum</i>
Sowthistle, annual	<i>Sonchus oleraceus</i>
Spanishneedles ††	<i>Bidens bipinnata</i>
Stinkgrass	<i>Eragrostis cilianensis</i>
Sunflower	<i>Helianthus annuus</i>
Thistle, Russian	<i>Salsola kali</i>
Spurry, umbrella	<i>Holosteum umbellatum</i>
Velvetleaf	<i>Abutilon theophrasti</i>
Wheat	<i>Triticum aestivum</i>
Witchgrass	<i>Panicum capillare</i>

† Apply with hand-held equipment only.

†† Apply 3 pints of this product per acre.

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 to control most vigorously growing perennial weeds. Unless otherwise directed, apply when target plants are actively growing and most have reached early head or early bud stage of growth. Unless otherwise directed, allow at least 7 days after application before disturbing vegetation.

**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.

**Specific Weed Control Recommendations:** For perennial weeds, apply the recommended rate plus a surfactant such as a non-ionic surfactant containing 80% or greater active ingredient. Use of this product without surfactant will result in reduced herbicide performance. Refer to the "Mixing and Application Instructions" section of this label and the surfactant manufacturer label for more information.

**When applied as directed, this product plus a surfactant such as a non-ionic surfactant containing 80% or greater active ingredient will control the following perennial weeds:** (Numbers in parentheses "(-)" following common name of a listed weed species refer to "Specific Perennial Weed Control Recommendations" for that weed which follow the species listing.)

Common Name	Scientific Name
Alfalfa (31)	<i>Medicago sativa</i>
Alligatorweed † (1)	<i>Alternanthera philoxeroides</i>
Anise/Fennel (31)	<i>Foeniculum vulgare</i>
Artichoke, Jerusalem (31)	<i>Helianthus tuberosus</i>
Bahiagrass (31)	<i>Paspalum notatum</i>
Bermudagrass (2)	<i>Cynodon dactylon</i>
Bindweed, field (3)	<i>Convolvulus arvensis</i>
Bluegrass, Kentucky (12)	<i>Poa pratensis</i>
Blueweed, Texas (3)	<i>Helianthus ciliaris</i>
Brackenfern (4)	<i>Pteridium spp.</i>
Bromegrass, smooth (12)	<i>Bromus inermis</i>
Canarygrass, reed (12)	<i>Phalaris arundinacea</i>
Cattail (5)	<i>Typha spp.</i>
Clover, red (31)	<i>Trifolium pratense</i>
Clover, white (31)	<i>Trifolium repens</i>
Cogongrass (6)	<i>Imperata cylindrica</i>
Cordgrass (7)	<i>Spartina spp.</i>
Cutgrass, giant † (8)	<i>Zizaniopsis miliacea</i>
Dallisgrass (31)	<i>Paspalum dilatatum</i>
Dandelion (31)	<i>Taraxacum officinale</i>
Dock, curly (31)	<i>Rumex crispus</i>
Dogbane, hemp (9)	<i>Apocynum cannabinum</i>
Fescue (31)	<i>Festuca spp.</i>
Fescue, tall (10)	<i>Festuca arundinacea</i>
Guineagrass (11)	<i>Panicum maximum</i>
Hemlock, poison (31)	<i>Conium maculatum</i>
Horsenettle (31)	<i>Solanum carolinense</i>
Horseradish (9)	<i>Armoracia rusticana</i>
Ice Plant (22)	<i>Mesembryanthemum crystallinum</i>
Johnsongrass (12)	<i>Sorghum halepense</i>
Kikuyugrass (21)	<i>Pennisetum clandestinum</i>

**Common Name**

Knapweed (9)  
 Lantana (13)  
 Lespedeza, common (31)  
 Lespedeza, sericea (31)  
 Loosestrife, purple (14)  
 Lotus, American (15)  
 Maidencane (16)  
 Milkweed (17)  
 Muhly, wirestem (21)  
 Mullein, common (31)  
 Napiergrass (31)  
 Nightshade, silverleaf (3)  
 Nutsedge, purple (18)  
 Nutsedge, yellow (18)  
 Orchardgrass (12)  
 Pampasgrass (19)  
 Paragrass (16)  
 Phragmites<sup>††</sup> (20)  
 Quackgrass (21)  
 Reed, giant (22)  
 Ryegrass, perennial (12)  
 Smartweed, swamp (31)  
 Spatterdock (23)  
 Starthistle, yellow (31)  
 Sweet potato, wild<sup>†</sup> (24)  
 Thistle, artichoke (25)  
 Thistle, Canada (25)  
 Timothy (12)  
 Torpedograss<sup>†</sup> (26)  
 Tules, common (27)  
 Vaseygrass (31)  
 Velvetgrass (31)  
 Waterhyacinth (28)  
 Waterlettuce (29)  
 Waterprimrose (30)  
 Wheatgrass, western (12)

**Scientific Name**

*Centaurea repens*  
*Lantana camara*  
*Lespedeza striata*  
*Lespedeza cuneata*  
*Lythrum salicaria*  
*Nelumbo lutea*  
*Panicum hematomon*  
*Asclepias spp.*  
*Muhlenbergia frondosa*  
*Verbascum thapsus*  
*Pennisetum purpureum*  
*Solanum elaeagnifolium*  
*Cyperus rotundus*  
*Cyperus esculentus*  
*Dactylis glomerata*  
*Cortaderia jubata*  
*Brachiaria mutica*  
*Phragmites spp.*  
*Agropyron repens*  
*Arundo donax*  
*Lolium perenne*  
*Polygonum coccineum*  
*Nuphar luteum*  
*Centaurea solstitialis*  
*Ipomoea pandurata*  
*Cynara cardunculus*  
*Cirsium arvense*  
*Phleum pratense*  
*Panicum repens*  
*Scirpus acutus*  
*Paspalum urvillei*  
*Holcus spp.*  
*Eichornia crassipes*  
*Pistia stratiotes*  
*Ludwigia spp.*  
*Agropyron smithii*

<sup>†</sup> Partial control.

<sup>††</sup> Partial control in southeastern states. See "Specific Weed Control Recommendations" below.

**Specific Perennial Weed Control Recommendations:**

- 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.

15. **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.
16. **Maldencane / 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.
17. **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.
18. **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.
19. **Pampasgrass:** Apply a 1 1/2 percent solution of this product with hand-held equipment when plants are actively growing.
20. **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.
21. **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.
22. **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.
23. **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.
24. **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.
25. **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.
26. **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.
27. **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.
28. **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.
29. **Waterlettuce:** For control, apply a 3/4 to 1 percent solution of this product with 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.
30. **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.
31. **Other perennial weeds listed above:** Apply 4 1/2 to 7 1/2 pints of this product per acre as a broadcast spray or apply as a 3/4 to 1 1/2 percent solution with hand-held equipment.

### Woody Brush and Trees

**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.

#### Application Rates and Timing

When 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 wood brush and tree species listed in this section of this label. Use the higher rate of application for dense stands and larger woody brush and trees.

**Specific Brush or Tree Control Recommendations:** Numbers in parentheses "(-)" following the common name of a listed brush or tree species refer to "Specific Brush or Tree Control Recommendations" which follow the species listing. See this section for specific application rates and timing for listed species.

For woody brush and trees, apply the recommended rate plus a surfactant such as a non-ionic surfactant containing 80% or greater active ingredient. Use of this product without surfactant will result in reduced herbicide performance. Refer to the "Mixing and Application Instructions" section of this label and the surfactant manufacturer label for more information. Make applications 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.

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 treatments.

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.

See the "Directions for Use" and "Mixing and Application Instructions" sections in this label for labeled use and specific application instructions. **When applied as directed, this product plus a surfactant such as a non-ionic surfactant containing 80% or greater active ingredient will control the following woody brush plants and trees:** (Numbers in parentheses "-" following common name of a listed brush or tree species refer to "Specific Brush or Tree Control Recommendations" for that species which follow the species listing.)

<b>Common Name</b>	<b>Scientific Name</b>
Alder (1)	<i>Alnus spp.</i>
Ash †(20)	<i>Fraxinus spp.</i>
Aspen, quaking (2)	<i>Populus tremuloides</i>
Bearclover, Bearmat (20)	<i>Chamaebatia foliolosa</i>
Birch (3)	<i>Betula spp.</i>
Blackberry (1)	<i>Rubus spp.</i>
Broom, French (4)	<i>Cytisus monspessulanus</i>
Broom, Scotch (4)	<i>Cytisus scoparius</i>
Buckwheat, California † (5)	<i>Eriogonum fasciculatum</i>
Cascara †(20)	<i>Rhamnus purshiana</i>
Catsclaw †(6)	<i>Acacia greggi</i>
Ceanothus (20)	<i>Adenostoma fasciculatum</i>
Chamise (17)	<i>Prunus emarginata</i>
Cherry, bitter (7)	<i>Prunus serotina</i>
Cherry, black (7)	<i>Prunus pensylvanica</i>
Cherry, pin (7)	<i>Baccharis consanguinea</i>
Coyote brush (8)	<i>Parthenocissus quinquefolia</i>
Creepers, Virginia †(20)	<i>Rubus trivialis</i>
Dewberry (1)	<i>Cornus spp.</i>
Dogwood (9)	<i>Sambucus spp.</i>
Elderberry (3)	<i>Ulmus spp.</i>
Elm †(20)	<i>Eucalyptus globulus</i>
Eucalyptus, bluegum (10)	<i>Haplopappus squamosus</i>
Hasardia †(5)	<i>Crataegus spp.</i>
Hawthorn (2)	<i>Corylus spp.</i>
Hazel (3)	<i>Carya spp.</i>
Hickory (9)	<i>Schinus terebinthifolius</i>
Holly, Florida (11) (Brazilian peppertree)	
Honeysuckle (1)	<i>Lonicera spp.</i>
Hornbeam, American (20)	<i>Carpinus caroliniana</i>
Kudzu (12)	<i>Pueraria lobata</i>
Locust, black †(20)	<i>Robinia pseudoacacia</i>
Manzanita (20)	<i>Arctostaphylos spp.</i>
Maple, red †(13)	<i>Acer rubrum</i>
Maple, sugar (14)	<i>Acer saccharum</i>
Maple, vine †(20)	<i>Acer circinatum</i>
Monkey flower †(5)	<i>Mimulus guttatus</i>
Oak, black †(20)	<i>Quercus velutina</i>
Oak, northern pin (14)	<i>Quercus palustris</i>
Oak, post (1)	<i>Quercus stellata</i>

<b>Common Name</b>	<b>Scientific Name</b>
Oak, red (14)	<i>Quercus rubra</i>
Oak, southern red (7)	<i>Quercus falcata</i>
Oak, white †(20)	<i>Quercus alba</i>
Persimmon †(20)	<i>Diospyros spp.</i>
Poison-ivy (15)	<i>Rhus radicans</i>
Poison-oak (15)	<i>Rhus toxicodendron</i>
Poplar, yellow †(20)	<i>Liriodendron tulipifera</i>
Prunus (7)	<i>Prunus spp.</i>
Raspberry (1)	<i>Rubus spp.</i>
Redbud, eastern (20)	<i>Cercis canadensis</i>
Rose, multiflora (16)	<i>Rosa multiflora</i>
Russian-olive (20)	<i>Elaeagnus angustifolia</i>
Sage: black (17), white	<i>Salvia spp.</i>
Sagebrush, California (17)	<i>Artemisia californica</i>
Salmonberry (3)	<i>Rubus spectabilis</i>
Salt cedar †(9)	<i>Tamarix spp.</i>
Saltbush, sea myrtle (18)	<i>Baccharis halimifolia</i>
Sassafras (20)	<i>Sassafras albidum</i>
Sourwood †(20)	<i>Oxydendrum arboreum</i>
Sumac, poison †(20)	<i>Rhus vernix</i>
Sumac, smooth †(20)	<i>Rhus glabra</i>
Sumac, winged †(20)	<i>Rhus copallina</i>
Sweetgum (7)	<i>Liquidambar styraciflua</i>
Swordfern †(20)	<i>Polystichum munitum</i>
Tallowtree, Chinese (17)	<i>Sapium sebiferum</i>
Thimbleberry (3)	<i>Rubus parviflorus</i>
Tobacco, tree †(5)	<i>Nicotiana glauca</i>
Trumpet creeper (2)	<i>Campsis radicans</i>
Waxmyrtle, southern †(11)	<i>Myrica cerifera</i>
Willow (19)	<i>Salix spp.</i>

† Partial control (See below for control or partial control instructions.)

**Specific Brush or Tree Control Recommendations:**

- 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 / Trumpet creeper:** 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 / Broom, 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 / Cherry, black / Cherry, pin / Oak, southern red / Sweetgum / 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.

9. **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.
10. **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-foot tall. Ensure complete coverage. Apply when plants are actively growing. Avoid application to drought-stressed plants.
11. **Holly, Florida / Waxmyrtle, southern:** For partial control, apply this product as a 1 1/2 percent solution with hand-held equipment.
12. **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.
13. **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.
14. **Maple, sugar / Oak: northern pin / Oak, 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.
15. **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.
16. **Rose, multiflora:** For control, apply 3 pints of this product per acre as a broadcast spray or as a 3/4 percent solution with hand-held equipment. Treatments should be made prior to leaf deterioration by leaf-feeding insects.
17. **Sage, black / Sagebrush, California / Chamise / Tallowtree, Chinese:** For control of these species, apply a 3/4 percent solution of this product as a foliar spray with hand-held equipment. Thorough coverage of foliage is necessary for best results.
18. **Saltbush, sea myrtle:** For control, apply this product as a 1 percent solution with hand-held equipment.
19. **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.
20. **Other woody brush and trees listed above:** 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.

### Aquatic and other Noncrop Sites

Apply this product as directed and under conditions described to control or partially control weeds and woody plants listed in the "Weeds Controlled" section in industrial, recreational and public areas or other similar aquatic or terrestrial sites on this label.

#### Noncrop Sites

**This product may be used to control the listed weeds in and around aquatic sites and on noncrop sites such as :**

Airports  
 Golf Courses  
 Habitat Restoration & Management Areas  
 Highways & Roadsides  
 Industrial Plant Sites  
 Lumberyards  
 Parking Areas  
 Parks  
 Petroleum Tank Farms

Pipeline, Power, Telephone & Utility Rights-of-Way  
 Pumping Installations  
 Railroads  
 Schools  
 Storage Areas  
 Similar Sites

#### Aquatic Sites

**This product may be applied to emerged weeds in all bodies of fresh and brackish water which may be flowing, nonflowing 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.**

**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 to public water. Permits may be required to treat such water.
- **NOTE:** 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 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. 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.

### Forestry Sites and Utility Rights-of-Way

In forest and utility sites, this product is recommended for the control or partial control of woody brush, trees, and annual and perennial herbaceous weeds. This product is also recommended for use in preparing or establishing wildlife openings within these sites, in pine straw plantations for maintaining logging roads, and for side trimming along utility rights-of-way.

In forestry sites, this product is recommended for use in site preparation prior to planting any tree species, including Christmas trees and silvicultural nursery sites.

In utility sites, this product is recommended for use along electrical power, pipeline, and telephone rights-of-way, and in other utility sites associated with these rights-of-way, such as substations.

#### Application Rates <sup>1</sup>:

Method of Application	Application Rate	Spray Volume (gal/acre)
<b>Broadcast</b>		
Aerial	1.5 to 7.5 qt/acre	5 to 30
Ground	1.5 to 7.5 qt/acre	10 to 60
<b>Spray-to-Wet</b>		
Handgun, Backpack Mistblower	0.75 to 2% by volume	spray-to-wet
<b>Low Volume Directed Spray <sup>11</sup></b>		
Handgun, Backpack Mistblower	5% to 10% by volume	partial coverage

<sup>1</sup>Where repeat applications are necessary, do not exceed 8.0 quarts per acre per year.

<sup>11</sup>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.

In forestry site preparation and utility rights-of-way applications, this product requires use with a surfactant such as a non-ionic surfactant containing greater than 80 percent active ingredient. Use of this product without surfactant will result in reduced herbicide performance. Refer to the "Mixing and Application Instructions" section of this label and the surfactant manufacturer label for more information.

Use higher rates of this product within the recommended rate ranges 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 recommended rate range to control of perennial herbaceous weeds from emergence up to the appearance of seedheads, flowers or berries appear. Use lower rates within the recommended 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 Mixtures

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 on the mixture. Any recommended 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. For side trimming treatments in utility rights-of-way, tank mixtures with Arsenal 2WSL herbicide are not recommended. For side trimming treatments, it is recommended that this product be used alone as recommended, or as a tank mix with Garlon.

Product	Broadcast Rate	Use Sites
Arsenal Applicators Concentrate	2 to 16 fl oz/acre	Forestry site preparation
Oust	1 to 4 oz/acre	Forestry site preparation, utility sites
Garlon 3A <sup>†</sup>	1 to 4 qt/acre	Forestry site preparation, utility sites
Garlon 4	1 to 4 qt/acre	Forestry site preparation, utility sites
Arsenal 2WSL	2 to 32 fl oz/acre	Utility sites
	<b>Spray-to-Wet Rates</b>	
Arsenal Applicators Concentrate	1/32% to 1/2% by volume	Forestry site preparation
Arsenal 2WSL	1/32% to 1/2% by volume	Utility sites
	<b>Low Volume Directed Spray Rates</b>	
Arsenal Applicators Concentrate	1/8% to 1/2% by volume	Forestry site preparation
Arsenal 2WSL	1/8% to 1/2% by volume	Utility sites

<sup>†</sup>Ensure that Garlon 3A is thoroughly mixed with water before adding this product. Agitation is required while mixing this product with Garlon 3A to avoid compatibility problems.

For control of herbaceous weeds, use the lower recommended tank mixture rates. For control of dense stands or difficult-to-control woody brush and trees, use the higher recommended rates.

### Forestry Conifer and Hardwood Release

#### Directed Sprays and Selective Equipment

This product may be applied as a directed spray or by using selective equipment in forestry conifer and hardwood sites, including Christmas tree plantations and silvicultural nurseries. This product requires use with a surfactant. 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. Refer to the "Mixing and Application Instructions" section of this label and the surfactant manufacturer label for more information.

**Tank Mixing:** In hardwood plantations, tank mixtures with Oust may be used. In pine plantations, tank mixtures with Garlon 4 or Arsenal AC may be used. Comply with all site restrictions, forestry species limitations, and precautions on the tank mix product labels.

Avoid contact of spray drift, mist or drips with foliage, green bark or non-woody surface roots of desirable plant species. See "Application Equipment and Techniques" section of this label for specific recommendations and precautions.

**Spray-to-Wet Applications:** Use a 2 percent spray solution to control undesirable woody brush and trees. To control herbaceous weeds, use a 1 to 2 percent spray solution.

**Low Volume Directed Spray Applications:** Use a 5 to 10 percent spray solution. Coverage should be uniform with at least 50 percent of the foliage contacted. Coverage of the top one-half of the unwanted vegetation is important.

**Broadcast Applications:** For equipment calibrated for broadcast applications, use 1 1/2 to 7 1/2 quarts of this product per acre. Apply in 10 to 60 gallons of clean water per acre. Shielded application equipment may be used to avoid contact of the spray solution with desirable plants. Shields should be adjusted to prevent spray contact with the foliage of green bark of desirable vegetation.

**Wiper Application Equipment:** See the "Selective Equipment" section of this label for equipment and application rate recommendations.

### Broadcast Application

**Note:** Except where specifically recommended below, make broadcast applications of this product only where conifers have been established for more than one year.

**Broadcast application must be made after formation of final conifer resting buds in the fall or prior to initial bud swelling in the spring.**

Injury may occur to conifers treated for release, especially where spray patterns overlap or the higher rates are applied. Damage can be accentuated if applications are made when conifers are actively growing, or are under stress from drought, flood water, improper planting, insects, animal damage or diseases.

This product requires use with a surfactant. Use a surfactant that is labeled/recommended for use in over-the-top release applications. Use of this product without a surfactant will result in reduced herbicide performance. Refer to the "Mixing and Application Instructions" section of this label and the surfactant manufacturer label for more information.

**For release of the following conifer species outside the Southeastern United States:**

**Douglas fir** (*Pseudotsuga menziesii*)

**Fir** (*Abies* species)

**Hemlock**<sup>††</sup> (*Tsuga* species)

**Pines**<sup>†</sup> (*Pinus* species)

**Redwood, California**<sup>††</sup> (*Sequoia* species)

<sup>†</sup> Includes all species except loblolly pine, longleaf pine, shortleaf pine or slash pine.

<sup>††</sup> Use of a surfactant is not recommended for release of hemlock species or California redwood. In mixed conifer stands, injury to these species may result if a surfactant is used.

**Application Rate for Conifer Release:** Apply 3/4 to 1 1/2 quarts per acre as a broadcast spray. In Maine and New Hampshire, up to 2 1/4 quarts per acre of this product may be used for the control and suppression of difficult-to-control hardwood species.

To release Douglas fir, and pine and spruce species at the end of the first growing season (except in California), apply 3/4 to 1 1/8 quarts per acre of this product. Make sure that all conifers are well hardened off.

**Note:** For release of Douglas fir with this product or recommended tank mixtures, a nonionic surfactant recommended for over-the-top foliar spray may be used. To avoid possible conifer injury, nonionic surfactants may be used at 2 fluid ounces per acre at elevations above 1500 feet, or 1 fluid ounce per acre in the coastal range or at elevations below 1500 feet. Use of surfactant rates exceeding those listed above may result in unacceptable conifer injury and are not recommended. Make sure that the nonionic surfactant has been adequately tested for safety to Douglas fir before use.

**Tank Mixtures with Oust:** To release jack pine, white pine and white spruce, apply 3/4 to 1 1/2 quarts of this product with 1 to 3 ounces (1 to 1 1/2 ounces for white pine) of Oust per acre. Make applications to actively growing weeds as a broadcast spray over the top of established conifers. Applications at these rates should be made after formation of conifer resting buds in the late summer or fall.

**Tank Mixtures with Arsenal Applicators Concentrate:** This product may be tank mixed with Arsenal Applicators Concentrate for release of Douglas fir. Tank mix 3/4 to 1 1/8 quarts of this product with 2 to 6 fluid ounces of Arsenal Applicators Concentrate per acre. For release of balsam fir and red spruce, apply a mixture of 1 1/2 quarts of this product with 1 to 2 1/2 fluid ounces of Arsenal Applicators Concentrate per acre.

In Maine and New Hampshire 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, up to 2 1/4 quarts per acre of this product may be tank mixed with 1 to 2 1/2 fluid ounces per acre of Arsenal Applicators Concentrate herbicide and applied as a broadcast spray.

**Tank mixtures with Arsenal Applicators Concentrate and Oust or Oust XP Herbicides:** 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 weed densities, tough-to-control brush and where maples make up a large component of the undesirable trees up to 2 1/4 quarts per acre of this product may be tank mixed with 1 to 2.5 fluid ounces per acre of Arsenal Applicators Concentrate and 1 to 3 oz of Oust or Oust XP herbicides and applied as a broadcast spray.

**For release of the following conifer species in the Southeastern United States:**

**Loblolly pine** (*Pinus taeda*)

**Eastern white pine** (*Pinus strobus*)

**Shortleaf pine** (*Pinus echinata*)

**Slash pine** (*Pinus elliotii*)

**Virginia pine** (*Pinus virginiana*)

**Longleaf pine** (*Pinus palustris*)

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 recommended tank mixture.

**Tank Mixtures with Arsenal Applicators Concentrate:** For conifer release, apply 3/4 to 1 1/2 quarts of this product with 2 to 16 fluid ounces 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 recommended rates for dense tough-to-control wood brush and trees.

Read and observe label claims, cautionary statements and all information on the labels of each product used in these tank mixtures. Use according to the most restrictive precautionary statements for each product in the mixture.

### Herbaceous Release

When applied as directed, this product plus listed residual herbicides provides 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.

**Tank Mixtures with Oust:** To release loblolly pines, tank mix 12 to 18 fluid ounces of this product with 2 to 4 ounces of Oust per acre.

To release slash pines, tank mix 9 to 12 fluid ounces of this product with 2 to 4 ounces of Oust per acre.

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 per acre of this product may be tank mixed with 1 to 3 oz of Oust herbicide or Oust XP herbicide to control grass, herbaceous weeds and woody brush, and applied as a broadcast spray.

For tank mixtures with Oust use a surfactant that is labeled/ recommended for use in over-the-top herbaceous release applications. Use of this product without a surfactant will result in reduced herbicide performance. Refer to the "Mixing and Application Instructions" section of this label and the surfactant manufacturer label for more information.

Weed control may be reduced if water volumes exceed 25 gallons per acre for these treatments.

**Tank Mixture with Atrazine:** To release Douglas fir, apply 3/4 quart of this product with 4 pounds a.i. of atrazine per acre. 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 mixture.

Always read and follow the manufacturer's label for all herbicides and surfactants used.

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### Wetland Sites

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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.

Consult local public water control authorities before applying this product in and around public water. Permits may be required to treat in such areas.

There is no restriction on the use of treated water for irrigation, recreation or domestic purposes.

**Note:** 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 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 application. 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. 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. The maximum application rate of 3 3/4 quarts per acre must not be exceeded in a single over-water broadcast application except as follows, where any recommended 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.

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### Wildlife Habitat Restoration and Management Areas

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This product is recommended 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 should be exercised to keep spray off of desirable plants.

**Wildlife Food Plots:** This product may be used as a 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 reinfest 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 "Weed Controlled" section in this label for recommended 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 freshly cut surface immediately after cutting.** Delay in applying this product may result in reduced performance. For best results, trees should be cut 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	<i>Alnus spp.</i>
Coyote brush †	<i>Baccharis consanguinea</i>
Dogwood †	<i>Cornus spp.</i>
Eucalyptus	<i>Eucalyptus spp.</i>
Hickory †	<i>Carya spp.</i>
Madrone	<i>Arbutus menziesii</i>
Maple †	<i>Acer spp.</i>
Oak	<i>Quercus spp.</i>
Poplar †	<i>Populus spp.</i>
Reed, giant	<i>Arundo donax</i>
Salt cedar	<i>Tamarix spp.</i>
Sweet gum †	<i>Liquidambar styraciflua</i>
Sycamore †	<i>Platanus occidentalis</i>
Tan oak	<i>Lithocarpus densiflorus</i>
Willow	<i>Salix spp.</i>

† This product is not approved for this use on these species in the state of California.

## 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, applications should be made during periods of active growth and full leaf expansion.

**This treatment will control the following woody species:**

Common Name	Scientific Name
Oak	<i>Quercus spp.</i>
Poplar	<i>Populus spp.</i>
Sweet gum	<i>Liquidambar styraciflua</i>
Sycamore	<i>Platanus occidentalis</i>

**This treatment will suppress the following woody species:**

Common Name	Scientific Name
Black gum †	<i>Nyssa sylvatica</i>
Dogwood	<i>Cornus spp.</i>
Hickory	<i>Carya spp.</i>
Maple, red	<i>Acer rubrum</i>

†This product is not approved for this use on this species in the state of California.

## 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 recommendations for control or suppression of winter annuals and tall fescue are listed below.

Apply the recommended rates of this product in 10 to 25 gallons of water per acre plus a surfactant such as a non-ionic surfactant containing 80% or greater active ingredient.. Use of this product without surfactant will result in reduced herbicide performance. Refer to the "Mixing and Application Instructions" section of this label and the surfactant manufacturer label for more information.

### Weeds Controlled or Suppressed <sup>†</sup>

**Note:** C = Controlled; S = Suppressed

Weed Species	Rate (Fluid Ounces Per Acre)					
	6	9	12	18	24	48
<b>Barley, little</b> <i>Hordeum pusillum</i>	S	C	C	C	C	C
<b>Bedstraw, catchweed</b> <i>Galium aparine</i>	S	C	C	C	C	C
<b>Bluegrass, annual</b> <i>Poa annua</i>	S	C	C	C	C	C
<b>Chervil</b> <i>Chaerophyllum tainturieri</i>	S	C	C	C	C	C
<b>Chickweed, common</b> <i>Stellaria media</i>	S	C	C	C	C	
<b>Clover, crimson</b> <i>Trifolium incarnatum</i>	•	S	S	C	C	C
<b>Clover, large hop</b> <i>Trifolium campestre</i>	•	S	S	C	C	C
<b>Speedwell, corn</b> <i>Veronica arvensis</i>	S	C	C	C	C	C
<b>Fescue, tall</b> <i>Festuca arundinacea</i>	•	•	•	•	S	S
<b>Geranium, Carolina</b> <i>Geranium carolinianum</i>	•	•	S	S	C	C
<b>Henbit</b> <i>Lamium amplexicaule</i>	•	S	C	C	C	C
<b>Ryegrass, Italian</b> <i>Lolium multiflorum</i>	•	•	S	C	C	C
<b>Vetch, common</b> <i>Vicia sativa</i>	•	•	S	C	C	C

<sup>†</sup>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 a surfactant such as a non-ionic surfactant containing 80% or greater active ingredient.. Use of this product without surfactant will result in reduced herbicide performance. Refer to the "Mixing and Application Instructions" section of this label and the surfactant manufacturer label for more information. 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	Trumpet creeper ††
Fescue (tall)	Vaseygrass

† Johnsongrass is controlled at the higher rate.

†† Suppression at the higher rate only.

Use only on well-established bermudagrass. Bermudagrass injury may result from the treatment but regrowth will occur under moist conditions. Repeat applications in the same season are not recommended, since severe injury may result.

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### **Bahiagrass Seedhead and Vegetative Suppression**

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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 in 10 to 25 gallons of water per acre, plus a surfactant such as a non-ionic surfactant containing 80% or greater active ingredient. Use of this product without surfactant will result in reduced herbicide performance. Refer to the "Mixing and Application Instructions" section of this label and the surfactant manufacturer label for more information.

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.

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### **Annual Grass Growth Suppression**

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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 water per acre plus a surfactant such as a non-ionic surfactant containing 80% or greater active ingredient. Use of this product without surfactant will result in reduced herbicide performance. Refer to the "Mixing and Application Instructions" section of this label and the surfactant manufacturer label for more information. Applications should be made 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.

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### **Terms and Conditions of Use**

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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, 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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### **Warranty Disclaimer**

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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. 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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### **Inherent Risks of Use**

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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 fullest extent permitted by law, all such risks shall be assumed by buyer.

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### **Limitation of Remedies**

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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.

Dow AgroSciences shall not be liable for losses or damages resulting from handling or use of this product unless Dow AgroSciences is promptly notified of such loss or damage in writing. To the fullest extent permitted by law, in no case shall Dow AgroSciences be liable for consequential or incidental damages or losses.

The terms of the Warranty Disclaimer above and this 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 this Limitation of Remedies in any manner.

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**Produced for**  
**Dow AgroSciences LLC**  
**9330 Zionsville Road**  
**Indianapolis, IN 46268**

Label Code: D02-148-005  
Replaces Label: D02-148-004  
LOES Number: 010-01471

EPA-accepted 07/13/06

#### **Revisions:**

1. Updated Storage and Disposal

## ATTENTION:

This specimen label is provided for general information only.

- This pesticide product may not yet be available or approved for sale or use in your area.
- It is your responsibility to follow all Federal, state and local laws and regulations regarding the use of pesticides.
- Before using any pesticide, be sure the intended use is approved in your state or locality.
- Your state or locality may require additional precautions and instructions for use of this product that are not included here.
- Monsanto does not guarantee the completeness or accuracy of this specimen label. The information found in this label may differ from the information found on the product label. You must have the EPA approved labeling with you at the time of use and must read and follow all label directions.
- You should not base any use of a similar product on the precautions, instructions for use or other information you find here.
- Always follow the precautions and instructions for use on the label of the pesticide you are using.

2113613-48



The complete broad-spectrum postemergence professional herbicide for industrial, turf and ornamental weed control.

## Complete Directions for Use

AVOID CONTACT OF HERBICIDE WITH FOLIAGE, STEMS, EXPOSED NON-WOODY ROOTS OR FRUIT OF CROPS, DESIRABLE PLANTS AND TREES, BECAUSE SEVERE INJURY OR DESTRUCTION IS LIKELY TO RESULT.

EPA Reg. No. 524-475

2010-1

GROUP 9 HERBICIDE

Read the entire label before using this product.

Use only according to label instructions.

Not all products listed on this label are registered for use in California. Check the registration status of each product in California before using.

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.

THIS IS AN END-USE PRODUCT. MONSANTO DOES NOT INTEND AND HAS NOT REGISTERED IT FOR REFORMULATION. SEE INDIVIDUAL CONTAINER LABEL FOR REPACKAGING LIMITATIONS.

## 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 per liter or 4 pounds per U.S. gallon of the active ingredient glyphosate, in the form of its isopropylamine salt. Equivalent to 356 grams per liter or 3 pounds per U.S. gallon of the acid, glyphosate.

This product is protected by U.S. Patent Nos. 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

FOR PRODUCT INFORMATION OR ASSISTANCE IN USING THIS PRODUCT,  
CALL TOLL-FREE,  
1-800-332-3111.

IN CASE OF AN EMERGENCY INVOLVING THIS PRODUCT, OR FOR  
MEDICAL ASSISTANCE, CALL COLLECT, DAY OR NIGHT,  
(314)-694-4000.

## 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: Call a poison control center or doctor for treatment advice.

IF IN EYES	<ul style="list-style-type: none"><li>• Hold eye open and rinse slowly and gently with water for 15 - 20 minutes.</li><li>• Remove contact lenses if present after the first 5 minutes then continue rinsing eye.</li></ul>
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- Have the product container or label with you when calling a poison control center or doctor, or going for treatment.
- You may also contact (314) 694-4000, 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 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 Personal Protective Equipment (PPE). If there are no such instructions for washables, 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.

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.

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 an emergency, such as spill or equipment breakdown.

### 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 washwaters.

## 3.3 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 Monsanto Supplemental Labeling. Supplemental labeling may be found on the [www.cdms.net](http://www.cdms.net) or [www.greenbook.net](http://www.greenbook.net) websites or obtained by contacting your Authorized Monsanto Retailer or Monsanto Company 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 regulations.

### 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 greater than 14 mils in thickness composed of materials such as butyl rubber, natural rubber, neoprene rubber, or nitrile rubber, 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 (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.

**PESTICIDE DISPOSAL:** To avoid wastes, use all material in this container, including rinsate, by application in accordance with 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 procedures.

[FOR RIGID PLASTIC 2.5 GAL CONTAINERS OR OTHERS  $\leq$  5 GAL]

**CONTAINER 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.

**CONTAINER HANDLING:** 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.

Once cleaned, some plastic pesticide containers can be taken to a container collection site or picked up for recycling. To find the nearest site, contact your chemical dealer or Monsanto at 1-800-768-6387. If recycling is not available, puncture and dispose of in a sanitary landfill.

[FOR RIGID PLASTIC 30 GAL CONTAINERS OR OTHERS > 5 GAL]

**CONTAINER 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.

**CONTAINER HANDLING:** 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 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 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.

Once cleaned, some plastic pesticide containers can be taken to a container collection site or picked up for recycling. To find the nearest site, contact your chemical dealer or Monsanto at 1-800-768-6387. If recycling is not available, puncture and dispose of in a sanitary landfill.

## 5.0 PRODUCT INFORMATION

**Product Description:** This product is a postemergence, systemic herbicide with no soil residual activity. It gives broad-spectrum control of many annual weeds, perennial weeds, woody brush and trees. It is formulated as a water-soluble liquid containing surfactant and no additional surfactant is needed.

**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, which 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 may not be visible for 7 days or more. Extremely cool or cloudy weather following treatment may slow activity of this product and delay development of visual symptoms.

**Mode of Action in Plants:** 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.

**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 this product off of the foliage and a repeat application may be required for adequate control.

**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 this herbicide and will continue to grow.

**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 precautionary statements for each product in the mixture.

When this label identifies a tank mixture with a single generic active ingredient such as diuron, 2,4-D or dicamba, the user is responsible for ensuring that the mixture product's label allows the specific application.

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 listed in this label. Mixing this product with herbicides or other materials not on this label may result in reduced performance.

**Annual Maximum Use Rate:** 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 allowed 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 as tank mixtures, 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. The combined total of all treatments must not exceed 10.6 quarts of this product per acre per year. See the "INGREDIENTS" section of this label for necessary product information.

### ATTENTION

AVOID CONTACT OF HERBICIDE WITH FOLIAGE, STEMS, EXPOSED NON-WOODY ROOTS OR FRUIT OF CROPS, DESIRABLE PLANTS AND TREES, BECAUSE 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 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) that 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 have other unintended consequences.

## 5.1 Weed Resistance Management

GROUP	9	HERBICIDE
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Glyphosate, the active ingredient in this product, is a Group 9 herbicide based on the mode of action classification system of the Weed Science Society of America. Any weed population may contain plants naturally resistant to Group 9 herbicides. Weed species resistant to Group 9 herbicides may be effectively managed utilizing another herbicide from a different Group or using other cultural or mechanical practices.

To minimize the occurrence of glyphosate-resistant biotypes observe the following weed management instructions:

- Scout your application site before and after herbicide applications.
- Control weeds early when they are relatively small.
- Incorporate other herbicides and cultural or mechanical practices as part of your weed control system where appropriate.
- Utilize the labeled rate for the most difficult weed in the site. Avoid tank mixtures with other herbicides that reduce this product's efficacy (through antagonism) or tank mixtures which encourage rates of this product below the label rates.
- Control weed escapes and prevent weeds from setting seeds.
- Clean equipment before moving from site to site to minimize spread of weed seed.
- Use new commercial seed as free of weed seed as possible.
- Report any incidence of repeated non-performance of this product on a particular weed to your Monsanto representative, local retailer, or county extension agent.

## 5.2 Management Instructions for Glyphosate-Resistant Weed Biotypes

**NOTE:** Appropriate testing is critical in order to confirm weed resistance to glyphosate. Contact your Monsanto representative to determine if resistance has been confirmed to any particular weed biotype in your area. Control instructions for biotypes confirmed as resistant to glyphosate are made available on separately published supplemental labeling or Fact Sheets for this product and may be obtained from your local retailer or Monsanto representative.

Follow good weed management practices to avoid the spread of confirmed resistant biotypes.

- If a naturally occurring resistant biotype is present at your site, this product may 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 may also be used as appropriate.
- Scout treated sites after herbicide applications and control escapes of resistant biotypes before they set seed.
- Thoroughly clean equipment before leaving sites known to contain resistant biotypes.

## 6.0 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, OR USE OF VISIBLY MUDDY WATER OR WATER FROM PONDS AND DITCHES THAT IS NOT CLEAR.

### 6.1 Mixing with Water

This product mixes readily with water. Mix spray solutions of this product as follows: Begin filling the mixing tank or spray tank with the required amount of clean 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.

## 6.2 Tank Mixing Procedure

When tank mixing, read and carefully observe label directions, cautionary statements and all information on the labels of all products used. Add the tank-mix product to the tank as directed by the label. Maintain agitation and add the specified amount of this product.

Maintain good agitation at all times until the contents of the tank are sprayed. If the spray mixture is allowed to settle, thorough agitation may be 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 for additional precautions.

## 6.3 Mixing for Hand-Held Sprayers

Prepare the desired volume of spray solution by mixing the amount of this product as indicated in the following table with water:

### Spray Solution

Desired Volume	Amount of Roundup PRO Herbicide					
	1/2%	1%	1-1/2%	2%	5%	10%
1 Gal	2/3 oz	1-1/3 oz	2 oz	2-2/3 oz	6-1/2 oz	13 oz
25 Gal	1 pt	1 qt	1-1/2 qt	2 qt	5 qt	10 qt
100 Gal	2 qt	1 gal	1-1/2 gal	2 gal	5 gal	10 gal

2 tablespoons = 1 fluid ounce

For use in backpack, knapsack or pump-up sprayers, mix the appropriate amount of this product with water in a larger container and then fill the sprayer with the mixed solution.

## 6.4 Colorants or Dyes

Colorants or marking dyes may be added to spray solutions of this product, however they may reduce product performance at lower rates or dilution. Use colorants or dyes according to the manufacturer's instructions.

## 7.0 APPLICATION EQUIPMENT AND TECHNIQUES

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

APPLY THESE SPRAY SOLUTIONS IN PROPERLY MAINTAINED AND CALIBRATED EQUIPMENT CAPABLE OF DELIVERING DESIRED VOLUMES.

### 7.1 Aerial Equipment

DO NOT APPLY THIS PRODUCT USING AERIAL SPRAY EQUIPMENT EXCEPT UNDER CONDITIONS SPECIFIED IN THIS LABEL or in separately published Monsanto Supplemental Labeling.

Use the specified rates of this herbicide in 3 to 25 gallons of water per acre. When used according to label directions, this product will give control or partial control of herbaceous weeds, woody brush and trees listed in the "WEEDS CONTROLLED" section of this label.

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. Drift control additives may be used. When a drift control additive is used, read and carefully observe the cautionary statements and all other information appearing on the additive label.

FOR AERIAL APPLICATION IN CALIFORNIA, REFER TO THE FEDERAL SUPPLEMENTAL LABEL FOR AERIAL APPLICATIONS IN THAT STATE FOR SPECIFIC INSTRUCTIONS, RESTRICTIONS AND REQUIREMENTS.

Avoid direct application to any body of water.

Ensure uniform application. To avoid streaked, uneven or overlapped application, use appropriate marking devices.

**Aircraft Maintenance:** PROLONGED EXPOSURE OF THIS PRODUCT TO UNCOATED STEEL SURFACES MAY RESULT IN CORROSION AND POSSIBLE FAILURE OF THE PART. The maintenance of an organic coating (paint) which meets aerospace specification MIL-C-38413 may prevent corrosion. To prevent corrosion of exposed parts, thoroughly wash aircraft after each day of spraying to remove residues of this product accumulated during spraying or from spills. Landing gear is most susceptible.

### 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.

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

#### AERIAL SPRAY DRIFT MANAGEMENT

The following drift management requirements must be followed to avoid off-target drift movement from aerial applications to agricultural field crops.

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 downwards more than 45 degrees. Observe state regulations if they are more stringent.

#### 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 Inversion" 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:** 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 provides uniform coverage
- **Nozzle orientation:** Orienting nozzles so that the spray is released backwards, parallel to the airstream, 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 may further reduce drift without reducing swath width.
- **Application Height:** Do not make applications 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 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. Increase swath distance with increasing drift potential (higher wind speed, 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 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 needs to be familiar with local wind patterns and how they affect drift.

#### Temperature and Humidity

When making applications in low relative humidity, adjust 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 make applications 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, movement of smoke produced by a ground source or an aircraft smoke generator can also identify temperature inversions. 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 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).

## 7.2 Ground Broadcast Equipment

Use the labeled 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, increase spray volume within the labeled 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.

## 7.3 Backpack or Hand-Held Equipment

Apply to foliage of vegetation to be controlled on a spray-to-wet basis; do not spray to the point of runoff. Spray coverage should be uniform and complete. Use coarse sprays only.

## 7.4 Selective Equipment

This product may be diluted with water and applied through recirculating spray systems, shielded applicators, hooded sprayers, wiper applicators or sponge bars, to listed weeds growing in any non-crop site specified on this label.

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.

**AVOID CONTACT OF HERBICIDE WITH DESIRABLE VEGETATION.** Contact of this product with desirable vegetation may result in unwanted plant damage or destruction.

Adjust application equipment used above desired vegetation 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 is likely to result in discoloration, stunting or destruction.

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

#### 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. **EXTREME CARE MUST BE EXERCISED TO AVOID CONTACT OF HERBICIDE WITH DESIRABLE VEGETATION.**

#### 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. 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 (2) 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 applicators 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.

**For Rope or Sponge Wick Applicators:** Use solutions ranging from 33 to 75 percent of this product in water.

**For Panel Applicators and Pressure-Feed Systems:** Use solutions ranging from 33 to 100 percent of this product in water.

When applied as directed, this product **CONTROLS** the following weeds:

Corn, volunteer	Sicklepod
Panicum, Texas	Spanishneedles
Rye, common	Starbur, bristly
Shattercane	

When applied as directed, this product **SUPPRESSES** the following weeds:

Beggarweed, Florida	Ragweed, common
Bermudagrass	Ragweed, giant
Dogbane, hemp	Smutgrass
Oogtannel	Sunflower
Guineagrass	Thistle, Canada
Johnsongrass	Thistle, musk
Milkweed	Vaseygrass
Nightshade, silverleaf	Velvetleaf
Pigweed, redroot	

## 7.5 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 undiluted concentrate of other products when using injection systems unless specifically instructed.

## 7.6 CDA Equipment

The rate of this product applied per acre by controlled droplet application (COA) equipment must not be less than the amount specified in this label when applied by conventional broadcast equipment. For vehicle-mounted CDA equipment, apply in 2 to 15 gallons of water per acre.

COA 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 is likely to result.

## 8.0 SITE AND USE INSTRUCTIONS

Unless otherwise specified, applications may be made to control any weeds listed in the "WEEDS CONTROLLED" section of this label. Refer also to the "Selective Equipment" section.

### 8.1 Cut Stumps

Cut stump treatments may be made on any site listed on this label. This product will control 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, make applications during periods of active growth and full leaf expansion.

Alder	Saltcedar
Eucalyptus	Sweetgum
Madrone	Tan oak
Oak	Willow
Reed, giant	

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. Adjacent trees having a similar age, height and spacing may signal shared roots. Whether grafted or shared, injury is likely to occur to non-treated stems/trees when one or more trees sharing common roots are treated.

### 8.2 Forestry Site Preparation

Use this product for the control or partial control of woody brush, trees and herbaceous weeds in forestry or in preparing or establishing wildlife openings within these sites and maintaining logging roads.

This product can also be used for site preparation prior to planting any tree species, including Christmas trees, eucalyptus, hybrid tree cultivars and silvicultural nursery sites.

Refer to the "WEEDS CONTROLLED" and "Woody Brush and Trees" sections of this label for specific application rates and instructions.

Use higher rates of this product within the specified 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. Increase rates within the specified range for control of perennial herbaceous weeds any time after emergence and before seedheads, flowers or berries appear.

Use the lower rates of this product within the specified range for control of annual herbaceous weeds and actively growing perennial herbaceous weeds after seedheads, flowers or berries appear. Apply to the foliage of actively growing annual herbaceous weeds any time after emergence.

This product has no herbicidal or residual activity in the soil. Where repeat applications are necessary, do not exceed 10.6 quarts of this product per acre per year.

Unless otherwise directed, do not apply this product as an over-the-top broadcast spray for forestry conifer or hardwood release.

#### TANK MIXTURES

Tank mixtures of this product may be used to increase the spectrum of vegetation controlled. This product may be tank-mixed with the following products provided that the specific product is registered for use on the target site. Refer to these product labels for approved sites and application rates. 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 precautionary statements for each product in the mixture.

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 labeled rate of this product may be used in a tank mix with the following products for forestry site preparation.

Arsenal Applicators Concentrate	Garlon 3A
Chopper	Garlon 4
Escort	Oust
Escort XP	Oust XP

## 8.3 Non-crop Areas and Industrial Sites

Use in areas such as airports, apartment complexes, Christmas tree farms, commercial sites, Conservation Reserve Program (CRP) areas, ditch banks, dry ditches, dry canals, fencerows, golf courses, greenhouses, industrial sites, landscape areas, lumber yards, manufacturing sites, municipal sites, natural areas, office complexes, ornamentals, parks, parking areas, pastures, petroleum tank farms and pumping installations, plant nurseries, public areas, railroads, rangeland, recreational areas, residential areas, rights-of-way, roadsides, schools, sod or turf seed farms, sports complexes, storage areas, substations, turfgrass areas, utility sites, warehouse areas, and wildlife management areas

#### Weed Control, Trim-and-Edge, Bare Ground

This product may be used in non-crop 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 non-crop 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.

Repeated applications of this product may be used, as weeds emerge, to maintain bare ground.

TANK MIXTURES: This product may be tank-mixed with the following products provided that the specific product is registered for use on the target site. Refer to these product labels for approved sites and application rates. 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 precautionary statements for each product in the mixture.

User is responsible for ensuring that the mixture product's label allows the specific applications when tank mixing with a single generic active ingredient listed below.

Arsenal	Landmark II MP
atrazine	Dust
Barricade 65WG	Oust XP
Certainty®	Outrider®
Crossbow L	pendimethalin
dicamba*	Plateau
diuron	Poast
Endurance	Ronstar 50WP
Escort	simazine
Escort XP	Surflan AS
Gallery 75DF	Surflan WDG
Garlon 3A	Telar DF
Garlon 4	Transline
Goat 2XL	Velpar DF
Krovar I DF	Velpar L
Landmark II	2,4-D

\*This product plus dicamba tank mixtures may not be applied by air in California.

When applied as a tank mixture for bare ground, this product provides control of the emerged annual weeds and control or partial control of emerged perennial weeds, woody brush and trees.

For control or partial control of the following perennial weeds, apply 1 to 2 quarts of this product plus 2 to 4 ounces of Oust or Oust XP per acre.

Bahiagrass	Dock, curly	Poorjoe
Bermudagrass	Dogfennel	Quackgrass
Broomsedge	Fescue, tall	Vaseygrass
Dallisgrass	Johnsongrass	Vervain, blue

#### Chemical Mowing - Perennials

This product will suppress perennial grasses listed in this section to serve as a substitute for mowing. Use 8 fluid ounces of this product per acre when treating tall fescue, fine fescue, orchardgrass, quackgrass or reed canarygrass covers. Use 6 fluid ounces of this product per acre when treating Kentucky bluegrass. Apply treatments in 10 to 40 gallons of spray solution per acre.

Use only in areas where some temporary injury or discoloration of perennial grasses can be tolerated.

#### Chemical Mowing - Annuals

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 4 to 5 fluid ounces of this product in 10 to 40 gallons of spray solution per acre. Make applications 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.

#### Bromus Species and Medusahead in Pastures and Rangelands

**Bromus species.** This product may be used to treat downy brome (*Bromus tectorum*), Japanese brome (*Bromus japonicus*), soft chess (*Bromus mollis*) and cheatgrass (*Bromus secalinus*) found in industrial, rangeland and pasture sites. Apply 8 to 16 fluid ounces of this product per acre on a broadcast basis.

For best results, coincide treatment with early seedhead emergence of the most mature plants. Delaying the application until this growth stage will maximize the emergence of other weedy grass flushes. Apply to the same site each year until seed banks are depleted and the desirable perennial grasses can become reestablished on the site.

**Medusahead.** To treat medusahead, apply 16 fluid ounces of this product per acre as soon as plants are actively growing, and prior to the 4-leaf stage. Applications may be made in the fall or spring.

Applications to brome and medusahead may be made using ground or aerial equipment. Aerial applications for these uses may be made using fixed wing or helicopter equipment. For aerial applications, apply in 2 to 10 gallons of water per acre. For applications using ground equipment, apply in 10 to 20 gallons of water per acre. When applied as directed in this label, there are no grazing restrictions.

#### Dormant Turfgrass

This product may be used to control or suppress many winter annual weeds and tall fescue for effective release of dormant bermudagrass and bahiagrass turf. Treat only when turf is dormant and prior to spring greenup.

Apply 8 to 64 fluid ounces of this product per acre. Apply the labeled rates in 10 to 40 gallons of water per acre. Use only in areas where bermudagrass or bahiagrass are desirable ground covers and where some temporary injury or discoloration can be tolerated.

Treatments in excess of 16 fluid ounces per acre may result in injury or delayed greenup in highly maintained areas, such as golf courses and lawns. DO NOT apply tank mixtures of this product plus Oust or Oust XP in highly maintained turfgrass areas. For further uses, refer to the "Roadsides" section of this label, which gives rates for dormant bermudagrass and bahiagrass treatments.

#### Actively Growing Bermudagrass

This product may be used to control or partially control many annual and perennial weeds for effective release of actively growing bermudagrass. DO NOT apply more than 16 fluid ounces of this product per acre in highly maintained turfgrass areas. DO NOT apply tank mixtures of this product plus Oust or Oust XP in highly maintained turfgrass areas. For further uses, refer to the "Roadsides" section of this label, which gives rates for actively growing bermudagrass treatments. Use only in areas where some temporary injury or discoloration can be tolerated.

#### 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. 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 the best control. 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 spray.

Desirable turfgrasses may be planted 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.

**PRECAUTIONS; RESTRICTIONS:** Do not disturb soil or underground plant parts before treatment. Delay tillage or renovation techniques such as vertical mowing, coring or slicing for 7 days after application to allow translocation into underground plant parts.

If application rates total 3 quarts per acre or less, no waiting period between treatment 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.

## 8.4 Habitat Management

#### Habitat Restoration and Management

This product may be used to control exotic and other undesirable vegetation in habitat management and natural areas, including rangeland and wildlife refuges. 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. Spot treatments can be made to selectively remove unwanted plants for habitat management and enhancement.

#### Wildlife Food Plots

This product may be used as a site preparation treatment 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 to allow translocation into underground plant parts.

## 8.5 Injection and Frill (Woody Brush and Trees)

This product may be used to control woody brush and trees by injection or frill applications. Apply this product using suitable equipment that must penetrate into the living tissue. Apply the equivalent of 1/25 fluid ounce (1 mL) of this product per each 2 to 3 inches of trunk diameter at breast height (DBH). This is best achieved by applying a 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. Avoid application techniques that allow runoff to occur from frilled or cut areas in species that exude sap freely. In species such as this, make the frill or cuts at an oblique angle to produce a cupping effect and use a 100 percent concentration of this product. For best results, apply during periods of active growth and after full leaf expansion. This product will control many species, some of which are listed below.

<b>Control</b>	<b>Partial Control</b>
Ogwood	Black gum
Oak	Hickory
Poplar	Maple, red
Sweetgum	
Sycamore	

## 8.6 Hollow Stem Injection

This product may be applied through hand-held injection devices that deliver the specified amounts of this product into targeted hollow-stem plants growing in any non-crop site specified on this label. For control of the following hollow-stem plants, follow the use instructions below.

#### Castorbean (*Ricinus communis*)

Inject 5 mL per plant of this product into the lower portion of the main stem.

#### Hemlock, Poison (*Conium maculatum*)

Inject one leaf cane per plant 10 to 12 inches above root crown with 6 mL of a 5% v/v solution of this product.

#### Hogweed, Giant (*Heracleum mantegazzianum*)

Inject one leaf cane per plant 12 inches above root crown with 6 mL of a 5% v/v solution of this product.

#### Horsetail, Field (*Equisetum arvense*)

Inject one segment above the root crown with 0.6 mL per stem of this product. Use a small syringe that calibrates to this rate.

#### Knotweed, Bohemian (*Polygonum bohemicum*)

Inject 6 mL per stem of this product between second and third internode.

#### Knotweed, Giant (*Polygonum sechalinense*)

Inject 6 mL per stem of this product between second and third internode.

#### Knotweed, Japanese (*Polygonum cuspidatum*)

Inject 6 mL per stem of this product between second and third internode.

#### Reed, Giant (*Arundo donax*)

Inject 8 mL per stem of this product between second and third internode.

#### Thistle, Canada (*Cirsium arvense*)

Cut 8 to 9 of the tallest plants at bud stage in a clump with clippers. Use a cavity needle that is pushed into the stem center and then slowly removed as 0.6 mL per stem of this product is injected into the stem.

**NOTE:** Based on the maximum annual use rate of glyphosate for these non-crop sites, the combined total for all treatments must not exceed 10.6 quarts of this product per acre. At 6 mL per stem, 10.6 quarts should treat approximately 1700 stems.

## 8.7 Ornamentals, Plant Nurseries, and Christmas Trees

#### Post-Directed, Trim-and-Edge

This product may be used as a post-directed spray 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 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. THIS PRODUCT IS NOT FOR USE AS AN OVER-THE-TOP BROADCAST SPRAY IN ORNAMENTALS AND CHRISTMAS TREES. Care must be exercised 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.

#### Wiper Applications

This product may be used through wick or other suitable wiper applicators to control or partially control undesirable vegetation around established eucalyptus or poplar trees. See the "Selective Equipment" section of this label for further information about the proper use of wiper applicators.

#### 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.

## 8.8 Parks, Recreational and Residential Areas

This product may be used in parks, recreational and residential areas. It may be applied with any application equipment described in this label. This product may be used to trim-and-edge around trees, fences, and paths, around buildings, sidewalks, and other objects in these areas. This product may be used for spot treatment of unwanted vegetation. This product may be used 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.

All of the instructions in the "Non-crop Areas and Industrial Sites" section apply to park and recreational areas.

## 8.9 Railroads

The instructions in the "Non-crop Areas and Industrial Sites" section may be used on railroads.

### Bare Ground, Ballast and Shoulders, Crossings, and Spot Treatment

This product may be used to maintain bare ground on railroad ballast and shoulders. Repeat applications of this product may be used, as weeds emerge, to maintain bare ground. This product may be used to control tall-growing weeds to improve line-of-sight at railroad crossings and reduce the need for mowing along rights-of-way. For crossing applications, up to 80 gallons of spray solution per acre may be used.

**TANK MIXTURES:** This product may be tank-mixed with the following products for ballast, shoulder, spot, bare ground and crossing treatments provided that the specific product is registered for use on such sites. Refer to these product labels for approved non-crop sites and application rates. 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 precautionary statements for each product in the mixture.

User is responsible for ensuring that the mixture product's label allows the specific applications when tank mixing with a single generic active ingredient listed below:

Arsenal	Hyvar X	simazine
atrazine	Hyvar XL	Spike 80 DF
dicamba*	Krovar I DF	Telar DF
Escort	Oust	Transline
Escort XP	Oust XP	Velpar DF
Garlon 3A	Outrider	Velpar L
Garlon 4	Sahara DG	2,4-D

\*This product plus dicamba tank mixtures may not be applied by air in California

### Brush Control

This product may be used to control woody brush and trees on railroad rights-of-way. Apply 4 to 10 quarts of this product per acre as a broadcast spray, using boom-type or boomless nozzles. Up to 80 gallons of spray solution per acre may be used. Apply a 3/4 to 2 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. This product may be mixed with the following products for enhanced control of woody brush and trees:

Arsenal	Krenite	Vanquish
Escort	Telar DF	Velpar DF
Escort XP	Tordon K	Velpar L
Garlon 3A	Tordon 22K	
Garlon 4	Transline	

### Bermudagrass Release

This product may be used to control or partially control many annual and perennial weeds for effective release of actively growing bermudagrass. Apply 1 to 3 pints of this product in up to 80 gallons of spray solution per acre. Use the lower rate when treating annual weeds below 6 inches in height (or runner length). Use the higher rate as weeds increase in size or as they approach flower or seedhead formation. These rates will also provide partial control of the following perennial species:

Bahiagrass	Johnsongrass
Bluestem, silver	Trumpetcreeper
Fescue, tall	Vaseygrass

This product may be tank-mixed with Oust or Oust XP. If tank-mixed, use no more than 1 to 3 pints of this product with 1 to 2 ounces of Oust or Oust XP per acre. Use the lower rates of each product to control annual weeds less than 6 inches in height (or runner length) that are listed in this label and the Oust or Oust XP label. Use the higher rates as annual weeds increase in size and approach the flower or seedhead stages. These rates will also provide partial control of the following perennial weeds:

Bahiagrass	Fescue, tall
Blackberry	Johnsongrass
Bluestem, silver	Poorjoe
Broomsedge	Raspberry
Dallisgrass	Trumpetcreeper
Dewberry	Vaseygrass
Dock, curly	Vervain, blue
Dogfennel	

Use only on well-established bermudagrass. Bermudagrass injury may result from the treatment, but regrowth will occur under moist conditions. Repeat applications in the same season may cause severe injury.

## 8.10 Roadsides

The instructions in the "Non-crop Areas and Industrial Sites" section may apply to roadsides.

### Shoulder Treatments

This product may be used on road shoulders. It may be applied with boom sprayers, shielded boom sprayers, high-volume off-center nozzles, hand-held equipment, and similar equipment.

### Guardrails and Other Obstacles to Mowing

This product may be used to control weeds growing under guardrails and around signposts and immovable other objects along the roadsides.

### Spot Treatment

This product may be used as a spot treatment to control unwanted vegetation growing along roadsides.

**TANK MIXTURES.** This product may be tank-mixed with the following products for shoulder, guardrail, spot and bare ground treatments provided that the specific product is registered for use on such sites. Refer to these product labels for approved non-crop sites and application rates. Read and carefully observe the cautionary statement and all other information appearing on the labels of all herbicides used. Use according to the most restrictive precautionary statements for each product in the mixture.

User is responsible for ensuring that the mixture product's label allows the specific applications when tank mixing with a single generic active ingredient listed below.

atrazine	Landmark MP	Poast
Crossbow L	Landmark II MP	Ronstar 50 WSP
dicamba*	Landmark XP	Sahara DF
diuron	Oust	Surflan AS
Endurance	Oust XP	Surflan WOG
Escort	Outrider	Telar DF
Escort XP	pendimethalin	Velpar DF
Gallery 75DF	Plateau	Velpar L
Krovar I DF	Plateau DG	2,4-D

\*This product plus dicamba tank mixtures may not be applied by air in California.

See the "Non-crop Areas and Industrial Sites" section of this label for tank mixing instructions.

### Release of Bermudagrass or Bahiagrass

#### Dormant Applications

This product may be used to control or partially control many winter annual weeds and tall fescue for effective release of dormant bermudagrass or bahiagrass. Treat only when turf is dormant and prior to spring greenup. This product may also be tank-mixed with Oust or Oust XP for residual control. Tank mixtures of this product with Oust or Oust XP may delay greenup.

For best results on winter annuals, treat when plants 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 at or beyond the 4- to 6-leaf stage.

Apply 8 to 64 fluid ounces of this product in a tank mixture with 0.75 to 1.33 ounces of Outrider herbicide per acre. Read and follow all label directions for Outrider herbicide.

Apply 8 to 64 fluid ounces of this product per acre alone or in a tank mixture with 0.25 to 1 ounce per acre of Oust or Oust XP. Apply the labeled rates in 10 to 40 gallons of water per acre. Use only in areas where bermudagrass or bahiagrass are desirable ground covers and where some temporary injury or discoloration can be tolerated. To avoid delays in greenup and minimize injury, add no more than 1 ounce of Oust or Oust XP per acre on bermudagrass and no more than 1/2 ounce of Oust or Oust XP per acre on bahiagrass and avoid treatments when these grasses are in a semi-dormant condition.

#### Actively Growing Bermudagrass

This product may be used to control or partially control many annual and perennial weeds for effective release of actively growing bermudagrass. Apply 1 to 3 pints of this product in 10 to 40 gallons of spray solution per acre. Use the lower rate when treating annual weeds below 6 inches in height (or runner length). Use the higher rate as weeds increase in size or as they approach flower or seedhead formation. These rates will also provide partial control of the following perennial species:

Bahiagrass	Johnsongrass
Bluestem, silver	Trumpetcreeper
Fescue, tall	Vaseygrass

This product may be tank-mixed with Oust or Oust XP. If tank-mixed, use no more than 1 to 2 pints of this product with 1 to 2 ounces of Oust or Oust XP per acre. Use the lower rates of each product to control annual weeds less than 6 inches in height (or runner length) that are listed in this label and the Oust or Oust XP label. Use the higher rates as annual weeds increase in size and approach the flower or seedhead stages. These rates will also provide partial control of the following perennial weeds:

Bahiagrass	Fescue, tall
Bluestem, silver	Johnsongrass
Broomsedge	Poorjoe
Dallisgrass	Trumpet creeper
Dock, curly	Vaseygrass
Dogfennel	Vervain, blue

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 may cause severe injury.

#### 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. Apply 1 to 2 weeks after full greenup 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.

This product may be used for control or partial control of Johnsongrass and other weeds listed on the Outrider herbicide label in actively growing bahiagrass. Apply 6.25 ounces of this product with 0.75 to 2.0 ounces of Outrider herbicide per acre. Use only on well-established bahiagrass.

A tank mixture of this product plus Oust or Oust XP may be used. Apply 6 fluid ounces of this product plus 0.5 to 1.0 ounce of Oust or Oust XP per acre 1 to 2 weeks following an initial spring mowing. Make only one application per year.

## 8.11 Utility Sites

Use this product along electrical power, pipeline and telephone rights-of-way, and in other sites associated with these rights-of-way, such as substations, roadsides, railroads or similar rights-of-way that run in conjunction with utilities.

This product may be used in utility sites and substations for bare ground, trim-and-edge around objects, 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 a utility site to ornamentals, flowers, turfgrass (sod or seed), or beginning construction projects.

This product can be used in preparing or establishing wildlife openings within these sites, maintaining access roads and for side trimming along utility rights-of-way.

**TANK MIXTURES:** Tank mixtures of this product may be used to increase the spectrum of control for herbaceous weeds, woody brush and trees. This product may be tank-mixed with the following products. Refer to these products' labels for approved non-crop sites and application rates. 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 precautionary statements for each product in the mixture.

User is responsible for ensuring that the mixture product's label allows the specific applications when tank mixing with a single generic active ingredient listed below

Arsenal	Krenite	Surtlan AS
atrazine	Krovar 1 DF	Surtlan WDG
dicamba <sup>1</sup>	Oust	Telar DF
diuron	Oust XP	Transline
Endurance	Outrider	Vanquish
Escort	pendimethalin	Velpar DF
Escort XP	Plateau	Velpar L
Garlon 3A*	Sahara OG	2,4-D
Garlon 4 <sup>2</sup>	simazine	

<sup>1</sup> This product plus dicamba tank mixtures may not be applied by air in California.

<sup>2</sup> For side trimming treatments, this product can be used alone or in tank mixture with Garlon 4.

\*Ensure that Garlon 3A is thoroughly mixed with water according to label directions before adding this product. Have spray mixture agitating at the time this product is added to avoid spray compatibility problems.

#### Bare Ground and Trim-and-Edge

This product may be used in utility sites and substations for bare ground, trim-and-edge around objects, 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 a utility site to ornamentals, flowers, turfgrass (sod or seed), or beginning construction projects.

Repeated applications of this product may be used, as weeds emerge, to maintain bare ground.

This product may be tank-mixed with the following products. Refer to these products' labels for approved non-crop sites and application rates.

Arsenal	Plateau
Banvel	Princep OF
Barricade 65WG	Princep Liquid
diuron	Ronstar 50WP
Endurance	Sahara
Escort	simazine
Garlon 3A	Surtlan

## 9.0 WEEDS CONTROLLED

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 (noncultivated) area.

Reduced results may occur when treating weeds heavily covered with dust. For weeds that have been mowed, grazed or cut, allow regrowth to occur prior to treatment.

For low volume directed spray applications, use a 5 to 10 percent solution of this product for control or partial control of annual weeds, perennial weeds, or woody brush and trees. Spray coverage should be uniform with at least 50 percent of the foliage contacted. Coverage of the top one-half of the plant is important for best results. 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 resprouts.

Refer to the following label sections for rates to control annual and perennial weeds and woody brush and trees. For difficult to control annual or perennial weeds and woody brush and trees, where plants are growing under stressed conditions, or where infestations are dense, this product may be used at 5 to 10 quarts per acre for enhanced results.

## 9.1 Annual Weeds

Use 1 quart per acre if weeds are less than 6 inches in height or runner length and 1.5 quarts to 4 quarts per acre if weeds are over 6 inches in height or runner length or when weeds are growing under stressed conditions. Use the higher rate for tough-to-control species regardless of the weed size at application. Treat tough-to-control weeds early when they are relatively small. This product may be tank-mixed provided that the specific tank-mix product is registered for use on the target site. Refer to these product labels for approved sites and application rates.

For spray-to-wet applications, apply a 1/2 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 for smaller weeds growing under stressed conditions, use a 1 to 2 percent solution. Use the higher rate for tough-to-control species or for weeds over 24 inches tall.

#### WEED SPECIES

Anoda, spurred	Itchgrass*
Barley*	Johnsongrass, seedling
Barnyardgrass*	Junglerice
Bassia, fivehook	Knotweed
Bittercress*	Kochia
Black nightshade*	Lamb's-quarters*
Bluegrass, annual*	Little barley*
Bluegrass, bulbous*	London rocket*
Brome, downy*	Mayweed
Brome, Japanese*	Medusahead*
Browntop panicum*	Morningglory
Buttercup*	( <i>Ipomoea</i> spp.)
Carolina foxtail*	Mustard, blue*
Carolina geranium	Mustard, tansy*
Castorbean	Mustard, tumble*
Cheatgrass*	Mustard, wild*
Cheeseweed	Oats
( <i>Malva parviflora</i> )	Pigweed*
Chervil*	Plains/Tickseed coreopsis*
Chickweed*	Prickly lettuce*
Cocklebur*	Puncturevine
Copperleaf, hophornbeam	Purslane, common
Corn*	Ragweed, common*
Corn speedwell*	Ragweed, giant
Crabgrass*	Red rice
Dwarf dandelion*	Russian thistle
Eastorn mannagrass*	Rye*
Eclipta*	Ryegrass*
Fall panicum*	Sandbur, field*
Falsedandelion*	Shattercane*
Falseflax, smallseed*	Shepherd's-purse*
Fiddleneck	Sicklepod
Field pennycress*	Signalgrass, broadleaf*
Filaree	Smartweed, ladythumb*
Feabane, annual*	Smartweed, Pennsylvania*
Feabane, hairy	Sowthistle, annual
( <i>Coryza bonariensis</i> )*	Spanishneedles
Feabane, rough*	Speedwell, purslane*
Florida pusley	Sprangletop*
Foxtail*	Spurge, annual
Goatgrass, jointed*	Spurge, prostrate*
Goosegrass	Spurge, spotted*
Grain sorghum (milo)*	Spurry, umbrella*
Groundsel, common*	Starthistle, yellow
Hemp sesbania	Stinkgrass*
Henbit	Sunflower*
Horseweed/Marestail	Teaweed/Prickly sida
( <i>Coryza canadensis</i> )	Texas panicum*

## WEED SPECIES

Velvetleaf	Wild oats*
Virginia copperleaf	Witchgrass*
Virginia pepperweed*	Woolly cupgrass*
Wheat*	Yellow rocket

\*When using field broadcast equipment (aerial applications or boom sprayers using flat-fan nozzles) these species will be controlled or partially controlled using 1 pint of this product per acre. Applications must be made using 3 to 10 gallons of carrier volume per acre. Use nozzles that ensure thorough coverage of foliage and treat when weeds are in an early growth stage.

## 9.2 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). For non-flowering plants, best results are obtained when the plants reach a mature stage of growth. In many situations, treatments are required prior to these growth stages. Under these conditions, use the higher application rate within the specified range. Use a 2 percent solution on tough-to-control perennials such as bermudagrass, dock, field bindweed, hemp dogbane, milkweed and Canada thistle.

Ensure thorough coverage when using spray-to-wet treatments using hand-held equipment. When using hand-held equipment for low volume directed spot treatments, apply a 5 to 10 percent solution of this product.

Allow 7 or more days after application before tillage.

Weed Species	Rate (QT/A)	Hand-Held % Solution
Alfalfa*	1	2
Alligatorweed*	4	1.5
Anise (fennel)	2 - 4	1 - 2
Bahiagrass	3 - 5	2
Beachgrass, European ( <i>Ammophila arenaria</i> )	--	5
Bentgrass*	1.5	2
Bermudagrass	5	2
Bermudagrass, water (knotgrass)	1.5	2
Bindweed, field	4 - 5	2
Bluegrass, Kentucky	?	2
Blueweed, Texas	4 - 5	2
Brackenfern	3 - 4	1 - 1.5
Bromegrass, smooth	2	2
Bursage, woolly-leaf	--	2
Canarygrass, reed	2 - 3	2
Cattail	3 - 5	2
Clover, red, white	3 - 5	2
Cogongrass	3 - 5	2
Dallisgrass	3 - 5	2
Dandelion	3 - 5	2
Dock, curly	3 - 5	?
Dogbane, hemp	4	2
Fescue (except tall)	3 - 5	2
Fescue, tall	1 - 3	2
German ivy	2 - 4	1 - 2
Guinea grass	3	1
Horsenettle	3 - 5	2
Horseradish	4	2
Iceland	2	1.5 - 2
Jerusalem artichoke	3 - 5	2
Johnsongrass	2 - 3	1
Kikuyugrass	2 - 3	2
Knapweed	4	2
Lantana	--	1 - 1.25
Lespedeza	3 - 5	2
Milkweed, common	3	2
Muhly, wirestem	2	2
Mullein, common	3 - 5	2
Napiergrass	3 - 5	2
Nightshade, silverleaf	2	2
Nutsedge, purple, yellow	3	1 - 2
Orchardgrass	2	2
Pampasgrass	3 - 5	1.5 - 2
Paragrass	3 - 5	2
Pepperweed, perennial	4	2
Phragmites*	3 - 5	1 - 2
Poison hemlock	2 - 4	1 - 2

Weed Species	Rate (QT/A)	Hand-Held % Solution
Quackgrass	2 - 3	2
Redvine*	2	2
Reed, giant	4 - 5	2
Ryegrass, perennial	2 - 3	1
Smartweed, swamp	3 - 5	2
Spurge, leafy*	--	2
Sweet potato, wild*	--	2
Thistle, artichoke	2 - 3	1 - 2
Thistle, Canada	2 - 3	2
Timothy	2 - 3	2
Torpedograss*	4 - 5	2
Trumpet creeper*	2 - 3	2
Vaseygrass	3 - 5	2
Velvetgrass	3 - 5	2
Wheatgrass, western	2 - 3	2

\*Partial control

## 9.3 Woody Brush and Trees

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.

Ensure thorough coverage when using spray-to-wet treatments using hand-held equipment. When using hand-held equipment for low volume directed-spray spot treatments, apply a 5 to 10 percent solution of this product.

Symptoms may not appear prior to frost or senescence with tall treatments.

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.

Weed Species	Broadcast Rate (QT/A)	Hand-Held Spray-to-Wet % 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
Catsclaw*	--	1 - 1.5
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
Deerweed	2 - 5	1
Dogwood*	2 - 5	1 - 2
Elderberry	2	1
Elm*	2 - 5	1 - 2
Eucalyptus	--	2
Gorse*	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
Kudzu	4	2
Lucust, black*	2 - 4	1 - 2
Madrone resprouts*	--	2
Manzanita*	2 - 5	1 - 2
Maple, red	2 - 4	1 - 1.5
Maple, sugar	--	1 - 1.5
Monkey flower*	2 - 4	1 - 2

Weed Species	Broadcast Rate (QT/A)	Hand-Held Spray-to-Wet % Solution
Oak; black, white*	2 - 4	1 - 2
Oak, post	3 - 4	1 - 1.5
Oak; northern, pin	2 - 4	1 - 1.5
Oak, Scrub*	2 - 4	1 - 1.5
Oak; southern red	2 - 3	1 - 1.5
Peppertree, Brazilian (Florida holy)*	2 - 5	1 - 2
Persimmon*	2 - 5	1 - 2
Pine	2 - 5	1 - 2
Poison ivy	4 - 5	2
Poison oak	4 - 5	2
Poplar, yellow*	2 - 5	1 - 2
Redbud, eastern	2 - 5	1 - 2
Rose, multiflora	2	1
Russian olive*	2 - 5	1 - 2
Sage, black	2 - 4	1
Sage, white*	2 - 4	1 - 2
Sage brush, California	2 - 4	1
Salmonberry	2	1
Saltcedar*	2 - 5	1 - 2
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 resprouts*	—	2
Thimbleberry	2	1
Tobacco, tree*	2 - 4	1 - 2
Toyon*	—	2
Trumpet creeper	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
Yerba Santa*	—	2

\*Partial control

## 10.0 LIMIT OF WARRANTY AND LIABILITY

Monsanto Company warrants that this product conforms to the chemical description on the label and is reasonably fit for the purposes set forth in the Complete Directions for Use label booklet ("Directions") when used in accordance with those Directions under the conditions described therein. 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 promptly notify this Company of any claims whether based in contract, negligence, strict liability, other tort or otherwise.

To the fullest extent permitted by law, buyer and all users are responsible for all loss 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, 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, application in any manner not explicitly set forth in 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.

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 PERMITTED BY 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.

Roundup PRO, Certainty, Outrider, and Monsanto and Vine Design are registered trademarks of Monsanto Technology LLC.

All other trademarks are the property of their respective owners.

This product is protected by U.S. Patent Nos. 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).

EPA Reg. No. 524-475

In case of an emergency involving this product,  
or for medical assistance,  
Call Collect, day or night, (314) 694-4000.

Packed For:  
MONSANTO COMPANY  
800 N. LINDBERGH BLVD.  
ST. LOUIS, MISSOURI, 63167 U.S.A.  
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012810



## ATENCIÓN:

Esta etiqueta de muestra se entrega únicamente para información general.

- Este producto pesticida puede no estar todavía disponible o aprobado para la venta o utilización en su localidad.
- Usted tiene la responsabilidad de cumplir todas las leyes federales, estatales y locales, así como todas las reglamentaciones relativas a la utilización de pesticidas.
- Antes de utilizar un pesticida, asegúrese de que esté aprobado en su estado o localidad.
- Su estado o localidad puede exigir precauciones adicionales e instrucciones para la utilización de este producto que no están incluidas aquí.
- Monsanto no garantiza el lo completo ni la certeza de esta etiqueta de la espécimen. La información encontrada en esta etiqueta puede diferir de la información encontrada en la etiqueta del producto. Usted debe tener consigo la etiqueta aprobada por la agencia EPA cuando utilice el producto y debe leer y respetar todas las instrucciones en la etiqueta.
- No debe basarse sobre las precauciones, las instrucciones de utilización y cualquier otra información en esta etiqueta para utilizar algún otro producto similar.
- Siempre siga las precauciones y las instrucciones para el uso en la etiqueta del pesticida que usted utiliza.



El herbicida profesional completo de postemergencia y de amplia efectividad, para el control de malezas en zonas industriales, céspedes y ornamentales.

### Instrucciones completas para el uso

EVITE EL CONTACTO DEL HERBICIDA CON EL FOLLAJE, TALLOS, RAICES NO LEÑOSAS EXPUESTAS O FRUTOS EXPUESTOS DE LAS COSECHAS, PLANTAS Y ARBOLES DESEABLES. EN CASO CONTRARIO ES PROBABLE QUE SUFRAN GRAVES DAÑOS O SEAN DESTRUIDOS TOTALMENTE.

Registro en la EPA Nº 524-475

2010-1

GRUPO	9	HERBICIDA
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Antes de usar este producto, lea la etiqueta en su totalidad.

Uselo solamente de acuerdo con las instrucciones de la etiqueta.

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.

Antes de comprar o usar el producto, lea "LÍMITES EN LA GARANTÍA Y EN LA RESPONSABILIDAD" en la última sección de la etiqueta. Si las condiciones son inaceptables para usted, devuelva el producto inmediatamente sin abrir el recipiente.

ESTE ES UN PRODUCTO PARA USARSE TAL Y COMO ESTA PREPARADO. MONSANTO NO LO HA DISEÑADO NI LO HA REGISTRADO PARA QUE SEA REFORMULADO. VEA LA ETIQUETA DEL ENVASE INDIVIDUAL PARA ENTERARSE DE LAS LIMITACIONES DE REEMPAQUE.

## 1.0 INGREDIENTES

### INGREDIENTE ACTIVO:

*Glifosato, N-(fosfonometil)glicina, en forma de su sal de isopropilamina .....	41.0%
DTROS INGREDIENTES (incluyendo surfactante): .....	59.0%
	100.0%

\*Contiene 480 gramos por litro o 4 libras por galón del ingrediente activo glifosato, en forma de su sal de isopropilamina. Equivalente a 356 gramos por litro o 3 libras por galón del ácido, glifosato.

Este producto está protegido por la patente de los Estados Unidos Nos. 5,683,958; 5,703,015; 6,063,733; 6,121,199; 6,121,200. No se han otorgado licencias bajo ninguna patente que no sea de los Estados Unidos.

## 2.0 TELEFONOS IMPORTANTES

PARA INFORMACION SOBRE EL PRODUCTO O AYUDA PARA UTILIZAR ESTE PRODUCTO, LLAME GRATIS AL, 1-800-332-3111.

EN CASO DE QUE SE PRESENTE UNA EMERGENCIA RELACIONADA CON ESTE PRODUCTO, O PARA OBTENER AYUDA MEDICA, LLAME POR COBRAR A CUALQUIER HORA DEL DIA O DE LA NOCHE, AL TELEFONO, (314)-694-4000.

## 3.0 ADVERTENCIAS

### 3.1 Riesgos para seres humanos y animales domésticos

Manténgase fuera del alcance de los niños.

## ¡PRECAUCION!

IRRITA LOS OJOS.

Evite el contacto con los ojos y con la ropa.

PRIMEROS AUXILIOS: Llame al centro de envenenamientos o a un médico para que le indique el tratamiento.

SI ENTRA EN CONTACTO CON LOS OJOS	• Mantenga abiertos los ojos y enjuague lenta y cuidadosamente con agua durante 15 a 20 minutos • Si usa lentes de contacto, quítelos después de los primeros 5 minutos, y continúe enjuagando los ojos.
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• Tenga a mano el envase o la etiqueta del producto cuando llame al centro de envenenamientos o al médico, o cuando vaya a procurarse tratamiento.

• También puede llamar por cobrar al teléfono (314) 694-4000, las 24 horas, para obtener información sobre el tratamiento médico de urgencia.

• Este producto está identificado como herbicida Roundup PRO®, Registro de la EPA Nº 524-475.

ANIMALES DOMESTICOS: Este producto se considera relativamente no tóxico para los perros y otros animales domésticos; sin embargo, la ingestión de este producto o de grandes cantidades de vegetación recientemente tratada puede resultar en una irritación gastrointestinal temporal (vómito, diarrea, cólico, etc.). Si se observan dichos síntomas, dé al animal suficiente cantidad de líquidos para evitar la deshidratación. Si los síntomas continúan por más de 24 horas, llame al veterinario.

### Equipo de protección personal (PPE)

Las personas que aplican o manejan este producto deben usar: camisas de manga larga, así como pantalones largos, zapatos y calcetín. Siga las instrucciones del fabricante para limpiar y mantener el equipo de protección personal (PPE). En caso de no tener dichas instrucciones para las piezas lavables, use detergente y agua muy caliente. Mantenga y lave el equipo de protección personal separado de la otra ropa.

Deséchela la ropa y otros materiales absorbentes que se hayan empapado o se encuentren muy contaminados con el concentrado de este producto. No los vuelva a utilizar.

En los casos en los cuales el personal encargado de manejar el producto lo hace en ambientes cerrados, cabinas cerradas o aviones, de manera tal que se cumplan los requisitos indicados en "Worker Protection Standard (WPS) for agricultural pesticides" (Normas para la Protección de los Trabajadores que trabajan con pesticidas usados en la agricultura) (40 CFR 170.240 (d) (4-6)), los requisitos para el equipo de protección personal del trabajador pueden ser reducidos o modificados de acuerdo a lo que se especifica en las normas WPS.

IMPORTANTE: Cuando se emplean equipos de protección personal reducidos debido a que se utiliza un sistema cerrado, el personal que manipula el producto debe recibir todos los equipos de protección especificados arriba para "las personas que aplican este producto y otras personas que lo manipulan" y tener tales equipos inmediatamente a su disposición para emplear en caso de emergencia, como un derrame o un desperfecto del equipo.

#### Recomendaciones de seguridad para el usuario

El usuario debe:

- Lavarse las manos antes de comer, beber, mascar goma, usar labaco o de usar el servicio higiénico.
- Quitarse la ropa inmediatamente en caso de que el pesticida entre dentro de ésta. Luego debe lavarse muy bien y ponerse ropa limpia.

## 3.2 Riesgos al medio ambiente

No aplique directamente al agua, en áreas donde el agua superficial esté presente o en áreas donde haya mareas altas y bajas por debajo del nivel medio de mareas altas. No contamine el agua cuando deseché el agua con la cual lavó el equipo.

## 3.3 Riesgos de orden físico o químico

Para mezclar, almacenar y aplicar la solución de este producto, se deben usar solamente recipientes de acero inoxidable, aluminio, fibra de vidrio, plástico o recipientes de acero recubiertos internamente con plástico.

**NO MEZCLE, ALMACENE O APLIQUE ESTE PRODUCTO O SUS SOLUCIONES PARA ROCIAR EN RECIPIENTES O TANQUES ROCIADORES DE ACERO GALVANIZADO O DE ACERO NO RECUBIERTO (EXCEPTO SI ES ACERO INOXIDABLE)** Este producto o la solución para rociar reaccionan con el material de dichos recipientes y tanques, lo cual produce hidrógeno, que puede formar una mezcla de gases altamente combustibles. Si esta mezcla de gases entra en contacto con llamas, chispas, el soplete de un soldador, un cigarrillo encendido o cualquier otra fuente de encendido, puede inflamarse o explotar y causar heridas graves a personas.

### INSTRUCCIONES PARA EL USO

El uso de este producto de cualquier manera que sea inconsistente con las instrucciones dadas en la etiqueta es una violación de las leyes federales. Este producto puede ser empleado de acuerdo con las Instrucciones de uso en la etiqueta o según las Etiquetas Complementarias de Monsanto que se publican por separado. Las Etiquetas Complementarias pueden encontrarse en las páginas web [cdms.net](http://cdms.net) o [greenbook.net](http://greenbook.net) o bien, solicítelas al vendedor minorista de Monsanto autorizado o el representante de la compañía Monsanto.

No aplique este producto de alguna manera que entre en contacto con los trabajadores u otras personas, ya sea directamente o por medio de alguna corriente de aire. Solamente las personas que los manipulen y que usen equipo protector 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 el uso en la agricultura

Use este producto siguiendo estrictamente las instrucciones de la etiqueta y de acuerdo con "Worker Protection Standard", 40 CFR sección 170. Estas normas contienen los requisitos para proteger a los trabajadores agrícolas en haciendas, bosques, viveros e invernaderos, así como a aquellos trabajadores que manejan pesticidas usados en la agricultura. Las normas contienen los requisitos para entrenar, descontaminar, para dar aviso y para asistencia de emergencia. También contienen instrucciones específicas y excepciones que tienen que ver con el contenido de esta etiqueta en lo relacionado con el equipo para la protección personal (PPE) e intervalos de entrada restringida. Los requisitos mencionados en esta sección se aplican únicamente a los usos de este producto que están regulados por las Normas para la Protección de los Trabajadores (WPS).

No entre ni permita la entrada de personal al área tratada durante el intervalo de entrada restringida (REI) de 4 horas.

El equipo de protección personal (PPE) permitido por el Estándar de Protección al Trabajador (WPS) necesario para una entrada prematura a lugares tratados y que implique el contacto con cualquier cosa que haya sido tratada como plantas, suelo o agua, es: overoles/monos, guantes resistentes a los productos químicos de más de 14 mil de espesor, fabricados con materiales como caucho (plástico) butílico, caucho natural, neopreno o caucho nitrilo, zapatos y calcetines.

#### Requisitos para usos no agrícolas

Los requisitos en esta sección son para los usos de este producto que NO están cubiertos por WPS (40 CFR Sección 170) para el uso de pesticidas en la agricultura. Las regulaciones del WPS se aplican cuando el producto se usa para obtener productos agrícolas en haciendas, bosques, viveros e invernaderos.

Mantenga a las personas y a los animales domésticos fuera del área tratada hasta que la solución rociada se haya secado.

## 4.0 ALMACENAMIENTO Y DESECHO

Son fundamentales el almacenamiento y la eliminación adecuados de los pesticidas para evitar la exposición de las personas y el medio ambiente como consecuencia de fuga y derrames del producto, excedentes o desechos y actos de vandalismo. No permita que este producto contamine el agua, los alimentos de las personas y animales o las semillas por medio del almacenamiento y la eliminación.

**ALMACENAMIENTO DE PESTICIDAS:** 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 bien cerrado para evitar derramamientos y contaminación.

**ENVASE DE PESTICIDA:** Para evitar desperdicio, use todo el material contenido en este envase, incluyendo los residuos del enjuague, aplicándolo según las indicaciones de la etiqueta. Si no es posible evitar el desperdicio, ofrezca el producto restante a una planta de eliminación de desechos o a un programa de eliminación de pesticidas. Estos programas suelen ser manejados por gobiernos estatales o locales o por la industria. Todos los desechos deben seguir los procedimientos federales, estatales y locales aplicables.

**[PARA ENVASES DE PLÁSTICO RÍGIDO DE 2.5 GALONES U OTROS ENVASES DE MENOS DE 5 GALONES]**

**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.

**MANIPULACIÓN DEL ENVASE:** 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. 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. Sostenga el envase en posición invertida sobre el equipo de aplicación o el tanque mezclador o recoja los residuos del 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. Drene durante 10 segundos después de que el flujo comience a gotear.

Una vez limpios, algunos envases de pesticida de plástico pueden llevarse a un centro de acopio de envases o ser recogidos para su reciclaje. Para encontrar el centro más cercano, póngase en contacto con su distribuidor de productos químicos o con Monsanto en el 1-800-768-6387. Si no es posible reciclar el envase, perforélo y deséchelo en un relleno sanitario.

**[PARA ENVASES DE PLÁSTICO RÍGIDO DE 30 GALONES U OTROS ENVASES DE MÁS DE 5 GALONES]**

**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.

**MANIPULACIÓN DEL ENVASE:** 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. Llene el envase con agua hasta un 1/4 de su capacidad. Vuelva a colocar la tapa y ajústela bien. Incline el envase sobre la parte lateral y hágalo rodar hacia atrás y hacia adelante durante 30 segundos, asegurándose de que dé al menos un giro completo. Apoye el envase sobre uno de los extremos e inclínelo hacia atrás y hacia adelante varias veces. Invierta el envase apoyándolo sobre el otro extremo y repita el procedimiento. 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. 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. Sostenga el envase en posición invertida sobre el equipo de aplicación o el tanque mezclador o recoja los residuos del 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. Drene durante 10 segundos después de que el flujo comience a gotear.

Una vez limpios, algunos envases de pesticida de plástico pueden llevarse a un centro de acopio de envases o ser recogidos para su reciclaje. Para encontrar el centro más cercano, póngase en contacto con su distribuidor de productos químicos o con Monsanto en el 1-800-768-6387. Si no es posible reciclar el envase, perforélo y deséchelo en un relleno sanitario.

## 5.0 INFORMACIÓN DE LA PRODUCCIÓN

**Descripción del producto:** Este producto es un herbicida sistémico de aplicación post-emergencia foliar, sin actividad residual en el suelo. Controla un amplio espectro de malezas anuales, malezas perennes, matorrales leñosos y árboles. Es un líquido soluble en agua y contiene surfactante por lo que no es necesario usar surfactante adicional.

**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 incluyen que la planta se marchite y se vuelva amarilla en forma gradual, hasta que la parte exterior de ésta se tome completamente color café; mientras tanto, las partes de la planta que están bajo tierra se deterioran completamente. Los efectos visibles en la mayor parte de las malezas anuales se pueden apreciar entre los 2 ó 4 días después de la aplicación, pero en la mayoría de las malezas perennes, los efectos no se ven hasta después de 7 días o más. El frío extremo o el cielo muy nublado después de la aplicación pueden retardar la actividad del producto y hacer que el efecto visual se retarde.

**Modo de acción en las plantas:** El ingrediente activo de este producto inhibe una enzima hallada sólo en las plantas y microorganismos que es esencial para la formación de aminoácidos específicos.

**Prácticas culturales:** Se podrá observar una reducción en el efecto si 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.

**Resistencia a la lluvia:** La lluvia torrencial poco después de la aplicación lavará el producto del follaje y se requerirá una nueva aplicación para obtener un control adecuado.

**No tiene actividad residual sobre el suelo:** Las malezas deben haber emergido en el momento de la aplicación para poder ser controladas por este producto. Las malezas que germinen de semillas después de la aplicación no serán controladas. Las plantas no emergidas con rizomas o raíces subterráneas de malezas perennes no conectadas no se verán afectadas por el herbicida y continuarán creciendo.

**Mezclas de tanque:** Este producto no proporciona control residual de malezas. Para lograr un control residual subsiguiente, utilice un herbicida que esté aprobado en la etiqueta. Lea y siga cuidadosamente todas las precauciones indicadas y toda la información que aparezca en las etiquetas de los herbicidas que use. Use los según las instrucciones más restrictivas de la etiqueta de cada producto usado en la mezcla.

Cuando esta etiqueta indique una mezcla de tanque con un ingrediente activo genérico como diuron, 2,4-D o dicamba, el usuario será responsable de asegurarse de que la etiqueta del producto de mezcla permita la aplicación específica.

El comprador y todos los usuarios son responsables por todas las pérdidas o daños que resulten del uso o manejo de las mezclas de este producto con herbicidas u otros materiales que no estén expresamente recomendados en esta etiqueta. La mezcla de este producto con herbicidas u otros materiales que no estén recomendados en esta etiqueta puede reducir la eficacia de este producto.

**Cantidades de aplicación máximas:** Las cantidades de aplicación o uso máximas especificadas en esta etiqueta están expresadas en unidades de volumen (onzas fluidas o cuartos de galón) de este producto por acre. No obstante, las dosis máximas de aplicación permitidas corresponden al uso de este producto en combinación con otros herbicidas que contienen glifosato como principio activo, tanto si son aplicados como mezclas de tanque o por separado, en función de las libras totales de glifosato (libras de ácido equivalente) por acre. Si se aplica más de un producto que contiene glifosato al mismo sitio dentro del mismo año, debe asegurarse de que el uso total de glifosato (libras de ácido equivalente) no exceda el máximo permitida. El total combinado de todos los tratamientos no debe exceder 1D.6 cuartos de galón de este producto (1D.6 libras de ácido glifosato) por acre por año. Vea en la sección "INGREDIENTES" de esta etiqueta información importante sobre el producto.

### ATENCIÓN

EVITE EL CONTACTO DEL HERBICIDA CON EL FOLLAJE, TALLOS, RAICES NO LEÑOSAS EXPUESTAS O FRUTOS EXPUESTOS DE LAS COSECHAS, PLANTAS Y ARBOLES DESEABLES EN CASO CONTRARIO ES PROBABLE QUE SUFRAN GRAVES DAÑOS O SEAN DESTRUIDOS TOTALMENTE.

EVITE EL ACARREO. CUANDO EL PRODUCTO SE APLIQUE, SE DEBE TENER MUCHO CUIDADO PARA PREVENIR EL DAÑO A PLANTAS Y CULTIVOS DESEABLES.

No permita que la solución del herbicida se nebulice, gotee, sea acarreada o salpique sobre la vegetación deseable. Una cantidad pequeña puede ser suficiente para causar daños graves o destruir las cosechas, plantas u otras áreas que no se desea tratar. La probabilidad de que ocurran daños por el uso de este producto aumenta cuando hay muchas ráfagas de viento, a medida que aumenta la velocidad del viento, cuando la velocidad del viento cambia constantemente o cuando existen otras condiciones meteorológicas que favorecen la dispersión del rociado. Cuando se esté aplicando el producto con un rociador, evite la combinación de presiones y tipos de boquilla que puedan dar como resultado salpicaduras o partículas finas (niebla), que tienen muchas probabilidades de que el producto sea acarreado. EVITE LA APLICACIÓN A ALTA VELOCIDAD O PRESIÓN EXCESIVAS.

**NOTA:** El uso de este producto de cualquier manera contraria a las indicaciones contenidas en esta etiqueta, puede resultar en lesiones a personas, animales o cosechas o pueden ocurrir otras consecuencias no deseadas

## 5.1 Control de malezas resistentes

GRUPO	9	HERBICIDA
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El glifosato, ingrediente activo en este producto, es un herbicida del grupo 9 basado en el sistema de clasificación de efecto de Weed Science Society de los Estados Unidos. Todas las poblaciones de malezas pueden contener plantas naturalmente resistentes a los herbicidas del grupo 9. Las especies de malezas resistentes a los herbicidas del grupo 9 pueden tratarse con buenos resultados utilizando otro herbicida de un grupo diferente o adoptando otras prácticas de cultivo o mecánicas.

Para reducir al mínimo la incidencia de biotipos resistentes al glifosato, respete las siguientes recomendaciones generales con respecto a la gestión de malezas:

- Haga un reconocimiento del sitio de la aplicación antes y después de haber aplicado herbicida.
- Controle las malezas cuanto antes, cuando sean todavía relativamente pequeñas
- Donde sea apropiado, incorpore otros herbicidas y prácticas de cultivo o mecánicas como parte del sistema de control de malezas.
- Utilice la cantidad indicada en la etiqueta para las malezas más difíciles de controlar en el sitio. Evite las mezclas de tanque con otros herbicidas que reduzcan la eficacia de este producto (por antagonismo) o las recomendaciones de mezclas de tanque que alientan la utilización de cantidades de este producto inferiores a las indicadas en la etiqueta.
- Controle las malezas omitidas e impida que echen semilla.
- Limpie los equipos antes de trasladarse de un sitio a otro para reducir al mínimo la propagación de semillas de malezas.
- Utilice semillas comerciales nuevas tan libres de semillas de malezas como sea posible.
- Informe todo incidente de falta de rendimiento reiterado de este producto en una maleza determinada al representante de Monsanto, vendedor minorista de su localidad o agente de extensión del condado.

## 5.2 Instrucciones de administración para biotipos de malezas resistentes al glifosato

**NOTA:** Es fundamental realizar una prueba apropiada para confirmar la resistencia de la maleza al glifosato. Comuníquese con su representante de Monsanto para determinar si se confirmó la resistencia a algún biotipo de maleza determinada en su región. Las recomendaciones de control para biotipos confirmados como resistentes al glifosato se dan a conocer con la publicación de etiquetas o fichas técnicas complementarias para este producto y puede solicitarlas al vendedor minorista o a su representante de Monsanto.

Siga las prácticas correctas de gestión de malezas para evitar la propagación de biotipos resistentes confirmados.

- Si en su zona existe naturalmente un biotipo resistente, para lograr su control puede mezclar este producto en un tanque o aplicarlo secuencialmente con un herbicida apropiadamente etiquetado con efecto diferente.
- También se pueden utilizar prácticas de control de cultivo y mecánicas según corresponda.
- Haga un reconocimiento de los lugares tratados después de las aplicaciones de herbicida y controle las omisiones de biotipos resistentes antes de que echen semilla.
- Limpie minuciosamente los equipos antes de abandonar los lugares que se sabe que contienen biotipos resistentes.

## 6.0 MEZCLA

Limpie las piezas del rociador inmediatamente después de su utilización lavándolas bien con agua.

**NOTA:** PUEDE OCURRIR UNA DISMINUCIÓN DE LOS RESULTADOS SI SE UTILIZA AGUA QUE CONTIENGA TIERRA, TAL COMO AGUA CON BARRO VISIBLE O AGUA DE CHARCOS O ACEQUIAS QUE NO ESTE CLARA.

## 6.1 Mezcla con agua

Este producto se mezcla fácilmente con agua. La solución para rociar se debe mezclar de la siguiente manera: ponga la cantidad correcta de agua limpia en el tanque en el cual se va a preparar la mezcla. Agregue la cantidad necesaria de este producto cuando ya está cerca de completarse el llenado con agua y mezcle bien. Tenga cuidado de que el líquido no regrese al recipiente original. Use dispositivos aprobados para evitar que el líquido regrese al recipiente original cuando así lo exijan las reglamentaciones estatales o locales. Es posible que durante la mezcla y rociado, la solución produzca espuma. Para evitar o minimizar la formación de espuma, evite el uso de agitadores mecánicos, cierre las tuberías de derivación y de retorno en el fondo del tanque, y si es necesario, use compuestos aprobados para evitar la formación de espuma o para eliminar la espuma ya formada.

## 6.2 Procedimiento para mezclas de tanque

Cuando haga mezclas de tanque, lea y siga cuidadosamente las instrucciones de la etiqueta, las precauciones y toda la información contenida en las etiquetas de todos los productos utilizados. Agregue el producto al tanque según las instrucciones de la etiqueta. Agite continuamente y agregue la cantidad recomendada de este producto.

Agite continuamente hasta usar totalmente 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 con el rociado.

A fin de reducir la formación de espuma, mantenga las tuberías de retorno lo más cerca del fondo del tanque. El tamaño del cernidor en la boquilla o de los cerridores en las tuberías no debe ser menor al número 50.

Siempre determine previamente la compatibilidad de la mezcla de este producto, que viene en tanque rotulado, con agua como vehículo mezclando cantidades pequeñas proporcionales con anticipación. Asegúrese de que el producto específico de mezcla de tanque esté registrado para aplicar en el sitio deseado.

Vea la sección "Mezclas de tanque" para las precauciones adicionales.

## 6.3 Mezcla para rociadores de mano

Prepare la cantidad deseada de la solución para rociar, mezclando las proporciones de este producto con agua, según se muestra en la siguiente tabla:

### Solución para rociar

Volumen deseado	Cantidad de Roundup PRO herbicida					
	1/2%	1%	1-1/2%	2%	5%	10%
1 Gal	2/3 oz	1-1/3 oz	2 oz	2-2/3 oz	6-1/2 oz	13 oz
25 Gal	1 pt	1 qt	1-1/2 qt	2 qt	5 qt	10 qt
100 Gal	2 qt	1 gal	1-1/2 gal	2 gal	5 gal	10 gal

2 cucharadas = 1 onza fluida

Cuando se usen rociadores tipo mochila, o para bombeo, mezcle la cantidad apropiada de este producto con agua en un envase más grande y luego llene el rociador con la solución mezclada.

## 6.4 Colorantes o tinturas

Se pueden agregar colorantes o tinturas a las soluciones de este producto para pulverización; sin embargo, es posible que reduzcan su rendimiento si se utilizan menores proporciones o si lo diluye. Para usar los colorantes y tinturas siga las instrucciones del fabricante.

## 7.0 EQUIPOS Y TECNICAS PARA LA APLICACION

No use ningún sistema de irrigación para aplicar este producto.

APLIQUE ESTAS SOLUCIONES PARA ROCIAR UTILIZANDO EQUIPOS DEBIDAMENTE MANTENIDOS Y CALIBRADOS QUE SEAN CAPACES DE ROCIAR EL VOLUMEN DESEADO

### 7.1 Equipo aéreo

NO APLIQUE ESTE PRODUCTO CON EQUIPOS AEREOS EXCEPTO BAJO LAS CONDICIONES QUE SE ESPECIFICAN EN ESTE LIBRETO o según las Etiquetas Complementarias de Monsanto que se publican por separado.

Use las dosis recomendadas de este herbicida en 3 a 25 galones de agua por acre. Cuando se usa de acuerdo a las instrucciones de la etiqueta, este producto proporciona el control o el control parcial de malezas herbáceas, matorrales leñosos y árboles que se indican en la sección "MALEZAS CONTROLADAS" de esta etiqueta.

Es menos probable que los pulverizadores gruesos se dispersen. Por lo tanto, no utilice boquillas, o bien use aquéllas cuya configuración permita rociar con gotas finas. No aplique el producto con las boquillas en ángulo con respecto al aire y no incremente el volumen de pulverización aumentando la presión de la boquilla. Los añadidos de la reducción de la deriva pueden ser utilizados. Cuando utilice un aditivo de reducción de dispersión, lea detenidamente y siga al pie de la letra las advertencias y el resto de la información de la etiqueta del aditivo.

PARA LA APLICACION AEREA EN CALIFORNIA, CONSULTE LA ETIQUETA DE EL SUPLEMENTO FEDERAL PARA APLICACIONES AEREAS EN DICHO ESTADO, PARA CONOCER LAS INSTRUCCIONES, LIMITACIONES Y REQUISITOS ESPECIFICOS.

Evite la aplicación directa sobre agua.

Asegúrese de que la aplicación sea uniforme. A fin de evitar que queden áreas sin tratar, que la aplicación no sea uniforme o que las aplicaciones se traslapen, se deben usar marcadores adecuados.

**Mantenimiento De Avión:** EL CONTACTO PROLONGADO DE ESTE PRODUCTO CON PARTES DE ACERO QUE NO ESTA RECUBIERTO CON ALGUN TIPO DE PROTECCION, PUEDE DAR COMO RESULTADO LA CORROSION Y POSIBLEMENTE QUE LAS PARTES FALLEN. Es posible prevenir la corrosión recubriendo las partes con pintura orgánica, que cumpla con las especificaciones aero-espaciales MIL-C-38413. Al final de cada día de trabajo, para evitar la corrosión de las partes expuestas, lave muy bien el avión a fin de remover los residuos de este producto que se acumulan durante el rociado o por derramamientos. Las partes del tren de aterrizaje son extremadamente susceptibles.

### MANEJO DE LA DERIVA POR ROCIADO

EVITE LA DERIVA. DEBE USARSE EXTREMO CUIDADO EN LA APLICACION DE ESTE PRODUCTO PARA EVITAR DAÑOS A PLANTAS Y CULTIVOS DESEADOS.

No permita que la solución del herbicida empañe, gotee, se derive o salpique sobre la vegetación deseada, ya que mínimas cantidades de este producto pueden causar daños graves o destrucción del cultivo, plantas u otras áreas que no se pretendía tratar.

Es la responsabilidad del aplicador evitar la deriva por rociado en el lugar de aplicación. La interacción de varios factores relacionados con el clima y el equipo determina la posibilidad de deriva por rociado. El aplicador y el cultivador son responsables de considerar todos estos factores al tomar decisiones.

### MANEJO DE LA DERIVA POR ROCIADO AÉREO

Deben seguirse los siguientes requerimientos de manejo de la deriva para evitar el movimiento de ésta fuera de objetivo en aplicaciones aéreas a campos de cultivo agrícola.

1. La distancia del pulverizador más externo en la barra distribuidora no debe exceder 3/4 del largo de la envergadura o rotor.
2. Los pulverizadores deben siempre apuntar hacia atrás, paralelos a la corriente de aire, nunca hacia abajo más de 45 grados. En los estados con reglamentos más estrictos, éstos deben observarse.

### Importancia del tamaño de la gotita

La forma más eficaz de reducir la posibilidad de deriva es la aplicación de gotitas grandes. La mejor estrategia de manejo de la deriva es la aplicación de las gotitas más grandes que provean suficiente cobertura y control. La aplicación de gotitas más grandes reduce la posibilidad de deriva, pero no la evitará si las aplicaciones se realizan inadecuadamente o bajo condiciones ambientales desfavorables (vea las secciones de "Viento", "Temperatura y Humedad", e "Inversión de la Temperatura" en esta etiqueta).

### Control del tamaño de la gotita

- **Volumen:** Use pulverizadores de velocidad de flujo alta para aplicar el mayor volumen de rociado práctico. Los pulverizadores con mayores velocidades de flujo producen gotitas más grandes.
- **Presión:** Use las presiones de rociado más bajas para el pulverizador. La presión más alta reduce el tamaño de la gotita y no mejora la penetración del todo. Cuando sean necesarias velocidades de flujo mayores, use pulverizadores con velocidad de flujo mayor en lugar de aumentar la presión.
- **Número de pulverizadores:** Use el número mínimo de pulverizadores que provean cobertura uniforme.
- **Orientación del pulverizador:** Oriente los pulverizadores de modo que el rocío sea liberado hacia atrás, paralelo a la corriente de aire, produzca gotitas más grandes que en otras orientaciones. Una deflexión significativa de la horizontal reducirá el tamaño de la gotita y aumentará la posibilidad de deriva.
- **Tipo de pulverizador:** Use un tipo de pulverizador que esté diseñado para la aplicación prevista. Con la mayoría de los tipos de pulverizadores, los ángulos de rociado más angostos producen gotitas más grandes. Considere el uso de pulverizadores de deriva baja. Los pulverizadores de flujo sólido orientados hacia atrás producen gotitas más grandes que otros tipos de pulverizador.
- **Largo de la barra distribuidora:** Para algunos tipos de uso, la reducción del largo efectivo de la barra distribuidora a menos de 3/4 de la envergadura o el largo del rotor puede reducir más la deriva sin reducir el ancho de la hilera (pasada).
- **Altura de la aplicación:** Las aplicaciones no deben realizarse a una altura mayor que 10 pies por encima de la copa de las plantas más grandes, a menos que se requiera mayor altura por razones de seguridad del aeroplano. La realización de las aplicaciones a la menor altura que sea segura reduce la exposición de las gotitas a la evaporación y el viento.

### Ajuste de la hilera (pasada)

Cuando se realizan aplicaciones con viento cruzado, la pasada se desplazará hacia abajo. Por ello, en los extremos con o contra el viento del campo, el aplicador debe compensar por este desplazamiento ajustando la vía del aeroplano con el viento hacia arriba. La distancia de ajuste de la hilera debe aumentar, con aumento de la posibilidad de deriva (mayor viento, gotitas más pequeñas, etc.).

### Viento

La posibilidad de deriva es menor con velocidades del viento entre 2 y 10 millas por hora. Sin embargo, muchos factores, incluyendo el tamaño de las gotitas y el tipo de equipo determinan la posibilidad de deriva a una velocidad determinada. Debe evitarse la aplicación menos de 2 millas por hora debido a la dirección variable del viento y la posibilidad alta de inversión. NOTA: El terreno local puede influir en los patrones de viento. Cada aplicador debe conocer los patrones (vientos) locales y cómo éstos afectan la deriva.

## Temperatura y humedad

Cuando se realizan aplicaciones con humedad relativa baja, fije el equipo para que produzca gotitas más grandes para compensar por la evaporación. La evaporación de gotitas es más grave cuando las condiciones son calurosas y secas.

### Inversiones de temperatura

No deben realizarse aplicaciones durante una inversión de temperatura debido a que la posibilidad de deriva es alta. No deben realizarse aplicaciones durante una inversión de temperatura debido a que es alta la posibilidad de deriva. Las inversiones de temperatura restringen la mezcla de aire vertical, lo que causa que pequeñas gotitas suspendidas permanezcan 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; 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 aeroplano. 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 una buena mezcla de aire vertical.

### Áreas sensibles

Este producto sólo se debe aplicar cuando la posibilidad de deriva hacia zonas susceptibles (como 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 (es decir, cuando el viento sople lejos de las áreas susceptibles).

## 7.2 Equipo de aplicación terrestre

Use las proporciones indicadas en la etiqueta de este producto con 3 a 40 galones de agua por acre para rociar a voleo, a menos que se indique de otra manera. A medida que la densidad de las malezas aumenta, el volumen de rocío se debe aumentar también para conseguir una cobertura completa, pero siempre dentro de los límites indicados en la etiqueta. A fin de evitar un rocío muy fino, seleccione la boquilla cuidadosamente. Para obtener mejores resultados con equipo a nivel del terreno, use boquillas tipo abanico plano. Verifique el patrón de rocío para la distribución uniforme de las gotitas.

## 7.3 Equipo de mano o mochila de espalda

Aplique el producto al follaje de la vegetación que se desea controlar de rociado para mojar; no rocíe hasta el punto en que el producto gotee de la vegetación. La cobertura del follaje debe ser completa y uniforme. Use rociadores gruesos solamente.

## 7.4 Equipo especializado

Este producto puede diluido con agua y aplicarse usando rociadores de recirculación, aplicadores con pantalla, rociadores con capucha, aplicadores por frotación o barras de esponja, sobre las malezas mencionadas que crecen en lugares no cultivables especificados en esta etiqueta.

Los rociadores de recirculación dirigen la solución hacia los tipos de malezas que crecen sobre vegetación deseable, mientras que la solución que no ha sido interceptada por las malezas se recoge y se regresa al tanque para volverla a usar.

**EVITE EL CONTACTO DEL HERBICIDA CON LA VEGETACION ATRACTIVA.** El contacto de este producto con vegetación puede dañar o destruir las plantas aún cuando no se lo desee.

Los equipos para la aplicación utilizados por encima de la vegetación deseable deben ser calibrados de tal manera que el rociado o el punto de contacto por frotación más bajo esté por lo menos a 2 pulgadas arriba de la vegetación deseable. Gotas, niebla, espuma o salpicaduras del herbicida en contacto con la vegetación deseable pueden causar con mucha probabilidad descoloración, atrofia o destrucción.

Se obtienen mejores resultados cuando una mayor cantidad de la maleza entra en contacto con el herbicida. Las malezas que no entran en contacto con la solución herbicida no serán afectadas. Esto puede ocurrir en lugares donde las malezas están muy concentradas, cuando la infestación es grave o donde la altura de las malezas es variada, lo que no permite que todas sean tocadas por el herbicida. En estos casos puede hacerse necesario repetir el tratamiento.

### Aplicadores con pantalla y con capucha

Los rociadores con pantalla o con capucha aplican la solución del herbicida directamente sobre las malezas, al mismo tiempo que protegen la vegetación deseable, para que no sea tocada por el herbicida. Use boquillas que aseguren un recubrimiento uniforme en toda el área tratada. En los rociadores con pantalla, mantenga las pantallas debidamente colocadas a fin de proteger la vegetación que no se desee destruir. **SE DEBE TENER MUCHO CUIDADO PARA EVITAR EL CONTACTO DEL HERBICIDA CON LA VEGETACION DESEABLE.**

### Aplicadores por frotación y barras de esponja

Los aplicadores por frotación o de esponja aplican la solución del herbicida frotando las malezas con un material absorbente que contenga la solución del herbicida. El equipo debe ser diseñado, mantenido y operado de manera que la solución del herbicida no haga contacto con la vegetación deseable. Opere este equipo a velocidades inferiores a las 5 millas por hora. En áreas donde la infestación es grave, se puede mejorar la eficacia reduciendo la velocidad, así se asegura que el frotador esté siempre adecuadamente

saturado con la solución del herbicida. Se obtienen mejores resultados si se aplica dos veces en direcciones opuestas.

Evite lugares o goteos sobre la vegetación deseable. Ajuste la altura de los aplicadores a fin de asegurar un contacto adecuado con las malezas. Mantenga limpias las superficies de frotación. Tenga presente que en terrenos inclinados, el herbicida puede migrar causando goteos en la parte baja y el secado de las mechas en la parte superior del aplicador por frotación.

No use aplicadores por frotación cuando las malezas estén mojadas.

Mezcle solamente la cantidad de solución que se usará durante el período de un día, debido a que el uso de sobras de días anteriores puede dar como resultado un efecto menos eficiente. Inmediatamente después de usar este producto, lave bien el aplicador usando bastante agua.

**Para aplicadores de cordón o de mecha de esponja:** Puede emplearse soluciones que oscilan entre 33 y 75 por ciento de este producto en agua.

**Para aplicadores de panel y sistemas de alimentación a presión:** Se pueden usar soluciones que varían del 33 al 100 por ciento de este producto con agua.

Cuando se aplica de acuerdo a las recomendaciones, este producto CONTROLA las siguientes malezas:

Corn, volunteer	Sicklepod
Panicum, Texas	Spanishneedles
Rye, common	Starbur, bristly
Shattercane	

Cuando se aplica de acuerdo a las recomendaciones, este producto SUPRIME las siguientes malezas:

Beggarweed, Florida	Ragweed, common
Bermudagrass	Ragweed, giant
Dogbane, hemp	Smutgrass
Dogfennel	Sunflower
Guineagrass	Thistle, Canada
Johnsongrass	Thistle, musk
Milkweed	Vaseygrass
Nightshade, silverleaf	Velvetleaf
Pigweed, redroot	

## 7.5 Sistemas por inyección

Este producto puede usarse con sistemas de rociado por inyección, ya sean aéreos o a nivel del terreno. Puede usarse como líquido concentrado o diluido antes de la inyección en el chorro de rociado. No mezcle este producto con concentraciones de otros productos sin diluir cuando use los sistemas por inyección salvo que se recomiende específicamente.

## 7.6 Equipo de aplicación por goteo controlado

La proporción de este producto aplicado por acre usando el equipo de aplicación por goteo controlado (GDA) no debe ser menor que la cantidad indicada en esta etiqueta cuando se usa equipo convencional para aplicaciones al voleo. Cuando se usa el equipo aplicador por goteo controlado montado en un vehículo, use de 2 a 15 galones de agua por acre.

Los equipos de goteo controlado producen un rocío que es difícil de ver. Se debe tener especial cuidado para evitar que el rocío o el acarreo entre en contacto con el follaje o cualquier otra parte verde de la vegetación que no se quiere tratar, ya que en caso contrario, es probable que éste sea dañada o destruida.

## 8.0 SITIO E INSTRUCCIONES DE USO

A menos que se especifique lo contrario, pueden hacerse aplicaciones para controlar las malezas indicadas en la sección "MALEZAS CONTROLADAS" de esta etiqueta. Vea también la sección "Equipo Selectivo".

## 8.1 Troncos cortados

El tratamiento de troncos cortados puede hacerse en cualquier área indicada en esta etiqueta. Este producto controla muchas especies de matorrales leñosos y árboles, algunos de los cuales se mencionan a continuación. Aplique este producto usando equipo adecuado para garantizar la cobertura completa del cambium. Corte los árboles o sus brotes cerca de la superficie del suelo. Aplique una solución de este producto del 50 al 100 por ciento a la superficie recién cortada, **inmediatamente después** del corte. Oemarar la aplicación puede reducir la eficacia del producto. Para obtener mejores resultados, la aplicación deberá hacerse durante los períodos de crecimiento activo y expansión completa de las hojas. Para obtener mejores resultados, la aplicación deberá hacerse durante los períodos de crecimiento activo y expansión completa de las hojas.

Alder	Saltcedar
Eucalyptus	Sweetgum
Madrone	Tan oak
Oak	Willow
Reed, giant	

**NO HAGA LAS APLICACIONES SOBRE TRONCOS CORTADOS CUANDO LAS RAICES DE LOS MATORRALES LEÑOSOS O ARBOLES DESEABLES PUEEN ESTAR INERTADAS A LAS**

**RAICES DE LOS TRONCOS CORTADOS.** Algunos brotes, tallos o árboles pueden compartir el mismo sistema radicular. Árboles que están contiguos, que tienen la misma edad, altura y separación pueden indicar raíces compartidas. Cuando se trata de uno o más árboles que tienen raíces en común, tanto si están injertados como si comparten el sistema radicular, es probable que se produzca un daño en los brotes/árboles no tratados.

## 8.2 Preparación del lugar para forestación

Se recomienda este producto para controlar o controlar parcialmente malezas leñosas, árboles y malezas herbáceas en forestaciones. También se recomienda para preparar o crear claros para la vida silvestre en estos lugares y para mantener los caminos de las explotaciones forestales.

Se recomienda utilizar este producto para preparar el lugar antes de plantar cualquier especie de árbol, como árboles de Navidad, eucaliptos, cultivos de árboles híbridos y viveros dedicados a la silvicultura.

Consulte en la sección "MALEZAS CONTROLADAS" y "Matorrales leñosos y árboles" de esta etiqueta las proporciones de aplicación específicas e instrucciones.

Utilice proporciones más concentradas de este producto dentro de los márgenes recomendados para controlar o controlar parcialmente malezas leñosas, árboles y malezas herbáceas perennes difíciles de controlar. Para obtener resultados óptimos, aplique este producto a árboles y arbustos leñosos en crecimiento activo después de la expansión completa de las hojas y antes de que éstas adquieran color otoñal y se caigan. Incremente la concentración dentro del margen recomendado para controlar malezas herbáceas perennes en cualquier momento después de la emergencia y antes de que aparezcan inflorescencias, flores o bayas.

Utilice proporciones menos concentradas de este producto dentro del margen recomendado para controlar malezas herbáceas anuales y malezas herbáceas perennes en crecimiento activo después de que aparezcan inflorescencias, flores o bayas. Aplique al follaje de malezas herbáceas anuales en crecimiento activo en cualquier momento después de la emergencia.

Este producto carece de actividad herbicida o residual en la tierra. Si es necesario repetir las aplicaciones, no exceda los 10.6 cuartos de galón (10.03 litros) de este producto por acre por año.

A menos que se indique lo contrario, no rocíe este producto por difusión en la parte superior de coníferas para forestación o árboles de madera dura.

### MEZCLAS DE TANQUE

Se pueden emplear mezclas de tanque con este producto para aumentar el espectro de la vegetación controlada. Este producto se puede mezclar en tanque con los siguientes productos, siempre y cuando el producto específico esté registrado para utilizarse en el lugar objetivo. Consulte en las etiquetas de estos productos los lugares aprobados y las proporciones de aplicación. Lea detenidamente y respete al pie de la letra las advertencias y el resto de la información en las etiquetas de todos los herbicidas que utilice. Use la mezcla conforme a las medidas precautorias más estrictas indicadas para cada producto en la mezcla.

**NOTA:** Para la preparación de sitios de forestación, asegúrese de que el producto para mezclar en tanque esté aprobado antes de plantar las especies deseadas. Respete las restricciones del intervalo de plantación.

Todas las proporciones recomendadas de este producto se pueden utilizar en una mezcla de tanque con los siguientes productos para la preparación de sitios de forestación.

Concentrado para aplicadores	Arsenal	Garlon 3A
Chopper		Garlon 4
Escort		Oust
Escort XP		Oust XP

## 8.3 Áreas no cultivables y áreas industriales

Utilice en lugares como aeropuertos, complejos de apartamentos, campos de árboles de Navidad, zonas comerciales, áreas de programas de conservación de reserva, bordes de acequias, zanjas secas, canales secos, hileras de cercas, canchas de golf, invernaderos, zonas industriales, áreas de paisaje, depósitos de maderas, zonas de fabricación, solares municipales, zonas naturales, complejos de oficinas, cultivos ornamentales, estacionamientos, parques, pasturas, zonas con tanques de petróleo e instalaciones de bombeo, viveros de plantas, áreas públicas, líneas de ferrocarril, praderas, zonas recreativas, zonas residenciales, derechos de paso, bordes de carreteras, escuelas, granjas de tepes o para semillas de césped, complejos deportivos, zonas de almacenamiento, subestaciones, hierba del césped, zonas de servicios públicos, zonas de depósito, y zonas en las que se realiza gestión de vida silvestre.

### Control general de malezas, recortado de bordes y suelo limpio de malezas

Este producto puede utilizarse en áreas no cultivables y de cultivos no alimenticios. Puede aplicarse con cualquiera de los equipos descritos en este librito. Puede usarse para el recortado de bordes alrededor de objetos en áreas no cultivables, para tratamiento localizado de vegetación no deseable y para eliminar las malezas no deseadas que crecen en cuadros de arbustos establecidos y plantaciones ornamentales. Este producto puede usarse antes de plantar un área con plantas ornamentales, flores, césped (tepes o semillas), o antes de colocar asfalto o de comenzar un proyecto de construcción.

Pueden hacerse aplicaciones repetidas de este producto, a medida que emergen las malezas, para mantener el suelo limpio de malezas.

**MEZCLAS DE TANQUE:** Este producto se puede mezclar en tanque con los siguientes productos, siempre y cuando el producto específico esté registrado para utilizarse en el lugar objetivo. Consulte en las etiquetas de estos productos los lugares aprobados y las proporciones de aplicación. Lea detenidamente y respete al pie de la letra las advertencias y el resto de la información en las etiquetas de todos los herbicidas que utilice. Use la mezcla conforme a las medidas precautorias más estrictas indicadas para cada producto en la mezcla.

El usuario tiene la responsabilidad de asegurarse de que en la etiqueta del producto de la mezcla se permiten las aplicaciones específicas cuando se mezcla en un tanque un ingrediente activo genérico detallado abajo.

Arsenal	Landmark II MP
atrazine	Oust
Barncade 65WG	Oust XP
Certainly <sup>®</sup>	Duttrider <sup>®</sup>
Crossbow L	pendimethalin
dicamba*	Plateau
diuron	Poast
Endurance	Ronstar 50WP
Escort	simazine
Escort XP	Surflan AS
Gallery 75DF	Surflan WDG
Garlon 3A	Telar DF
Garlon 4	Transline
Goal 2XL	Velpar DF
Krovar I DF	Velpar L
Landmark II	2,4-D

\*Este producto más las mezclas en tanque de dicamba, no se pueden aplicar por pulverización aérea en California.

Cuando se aplica como mezcla de tanque para mantener el suelo limpio de malezas, este producto proporciona control sobre las malezas anuales emergidas y control o control parcial sobre las malezas perennes emergidas, matorrales leñosos y árboles.

Para controlar o controlar parcialmente las malezas perennes siguientes, aplique 1 a 2 cuartos de galón de este producto más 2 a 4 onzas de Oust o Oust XP por acre.

Bahiagrass	Dock, curly	Poorjoe
Bermudagrass	Dogfennel	Quackgrass
Broomsedge	Fescue, tall	Vaseygrass
Dallisgrass	Johnsongrass	Vervain, blue

### Segeo químico - Plantas perennes

Este producto suprime las hierbas perennes mencionadas en esta sección para servir como sustituto del segeo. Use 8 onzas fluidas de este producto por acre cuando trate tall fescue, fine fescue, orchardgrass, quackgrass o reed canarygrass. Use 6 onzas fluidas de este producto por acre cuando trate Kentucky bluegrass. Aplique el tratamiento en 10 a 40 galones de solución para rociar por acre.

Uselo solamente en áreas en las que puede tolerarse un daño o decoloración temporal de las hierbas perennes.

### Segeo químico - Plantas anuales

Para suprimir el crecimiento de algunas hierbas anuales, tales como el ballico, la cebada silvestre y la avena loca anuales que crecen en céspedes agrestes al borde de las carreteras u otras áreas industriales, aplique de 4 a 5 onzas fluidas de este producto en 10 a 40 galones de solución de rocío por acre. Las aplicaciones se deben realizar cuando las hierbas anuales crezcan activamente y antes de que las semillas se encuentren en la etapa de "boot" del desarrollo. Los tratamientos pueden perjudicar a las hierbas deseadas.

### Especie de Bromus y Medusahead en pasturas y praderas

**Especie Bromus:** Este producto puede ser utilizado para tratar downy brome (*Bromus tectorum*), Japanese brome (*Bromus japonicus*), soft chess (*Bromus mollis*) y cheatgrass (*Bromus setchuensis*) que se encuentran en lugares industriales, pasturas y praderas. Aplique por dilución, 8 a 16 onzas fluidas de este producto por acre.

Para obtener mejores resultados, el tratamiento debe coincidir con la emergencia temprana del epicótilo de las plantas más maduras. Demorar la aplicación hasta esta etapa del desarrollo maximizará la emergencia de otros brotes de malezas de pastos. Las aplicaciones se deben hacer todos los años sobre el mismo lugar hasta que se agoten los bancos de semilla y se puedan restablecer en el lugar los pastos perennes deseados.

**Medusahead (*Taeniatherum caput-medusa*):** Para tratar plantas de medusahead, aplique 16 onzas líquidas fluidas de este producto por acre tan pronto como las plantas estén creciendo activamente y antes de la etapa de las 4 hojas. Las aplicaciones se pueden realizar en otoño o primavera.

Las aplicaciones en las plantas bromus y medusahead se pueden efectuar con equipos terrestres o aéreos. Las aplicaciones aéreas para estos usos se pueden efectuar con equipos de ala fija o helicóptero. En aplicaciones aéreas, aplique este producto en 2 a 10 galones por acre de agua. En aplicaciones con equipo terrestre, aplique en 10 a 20 galones por acre de agua. Cuando se aplica de acuerdo con las instrucciones en esta etiqueta no existen restricciones para utilizar como pastura.

### Césped durmiente

Este producto puede usarse para controlar o suprimir muchas malezas anuales de invierno y tall fescue para el alivio eficaz de céspedes de bermudagrass y bahiagrass durmientes. Trate solamente cuando el césped esté durmiente y antes de reverdecer en la primavera.

Aplique entre 8 y 64 onzas fluidas de este producto por acre. Aplique las proporciones indicadas en la etiqueta en 10 a 40 galones de agua por acre. Utilícelo sólo en áreas donde bermudagrass o bahiagrass sean coberturas de terreno convenientes y donde pueda tolerarse algún daño temporal o descoloración.

Los tratamientos en exceso de 16 onzas fluidas por acre pueden dañar o retrasar el reverdecer en las áreas donde se hace mucho mantenimiento, como campos de golf y jardines. NO APLIQUE mezclas de tanque de este producto más Oust u Oust XP en zonas de pastizales con mucho mantenimiento. Para otras aplicaciones, consulte la sección "Bordes de carreteras" de esta etiqueta, donde se indican las proporciones para tratamientos de bermudagrass y bahiagrass inactivos.

#### Bermudagrass en crecimiento activo

Este producto puede ser usado para controlar total o parcialmente muchas malezas anuales y perennes para el mantenimiento eficaz de bermudagrass que esté creciendo activamente. NO APLIQUE más de 16 onzas líquidas por acre de este producto a en zonas de pastizales con mucho mantenimiento. NO APLIQUE mezclas de tanque de este producto más Oust u Oust XP en zonas de pastizales con mucho mantenimiento. Para otras aplicaciones, consulte la sección "Bordes de carreteras" de esta etiqueta, donde se indican las proporciones para tratamientos de bermudagrass en crecimiento activo. Emplee sólo en los lugares donde se puede tolerar cierto daño o decoloración temporal.

#### Césped Renovación, Producción de semillas o tepes

Este producto controla la mayor parte de la vegetación existente antes de renovar zonas con semilla de pasto para praderas o de establecer pasto para césped cultivado para tepes. Para lograr máximo control de la vegetación existente, demore la siembra para determinar si se produce algún crecimiento de partes de plantas subterráneas que no fueron alcanzadas por el tratamiento. Cuando se necesita reiterar 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. En los casos en que la vegetación existente crece por debajo de pastizales segados controlados, aplique este producto después de omitir una siega regular a fin de dar tiempo a que crezca lo suficiente para interceptar adecuadamente el rociado.

Pueden plantarse los céspedes deseados siguiendo los procedimientos anteriormente mencionados.

Puede utilizarse equipo de mano para el tratamiento en puntos específicos de vegetación no deseada que crezca en el césped existente. Se pueden utilizar equipos de difusión para controlar restos de tepes o de otra vegetación no deseada después de cosechar los tepes.

PRECAUCIONES, RESTRICCIONES: No perturbe la tierra o las partes subterráneas de las plantas antes de realizar el tratamiento. La labranza o las técnicas de renovación como segado vertical, ahuecamiento o rebanado deberían retrasarse por 7 días después de la aplicación para que se produzca el correcto traslado del producto a las partes subterráneas de la planta.

Si las proporciones de aplicación equivalen a 3 cuartos de galón por acre o menos, no se requiere período de espera entre el tratamiento y la utilización como alimento o pastura para el ganado. Si la proporción es mayor a 3 cuartos de galón por acre, retire el ganado doméstico antes de efectuar la aplicación y espere 8 semanas después de haber aplicado para utilizar como pastura o para cosechar.

## 8.4 Manejo de hábitats

#### Restauración y mantenimiento de hábitats

Este producto puede ser usado para controlar la vegetación exótica y otras plantas indeseables en áreas de manejo de hábitats y en áreas naturales, incluyendo hábitats nativos y refugios para la fauna silvestre. Pueden hacerse aplicaciones para permitir la recuperación de las especies de plantas nativas, antes de plantar dichas especies nativas deseables, y para otros requisitos similares de control de la vegetación de amplia efectividad. A fin de eliminar selectivamente ciertas plantas indeseables, se pueden hacer aplicaciones en puntos específicos para controlar y mejorar el hábitat.

#### Sitios donde se siembran alimentos para la fauna silvestre

Este producto puede ser usado para preparar el terreno donde se desea sembrar alimentos para la fauna silvestre. Cualquiera especie de alimento para la fauna silvestre puede ser sembrada después de aplicar este producto, o también se puede permitir que las especies nativas vuelvan a poblar el área. Si hace falta labrar para preparar el terreno antes de sembrar las semillas, espere 7 días después de aplicar este producto antes de arar a fin de permitir la absorción adecuada en las partes de la planta que estén bajo tierra.

## 8.5 Inyección y chorro (matorrales leñosos y árboles)

Los matorrales leñosos y árboles pueden ser controlados aplicando este producto por inyección o chorro. Aplique este producto usando equipo adecuado, que debe ser capaz de penetrar en el tejido vivo. Aplique el equivalente a 1/25 onza fluida (1 ml) de este producto por cada 2 ó 3 pulgadas de diámetro del tronco a la altura del pecho (DBH en inglés). La mejor forma de hacerlo es aplicando una solución del 50 al 100 por ciento, este producto, con un chorro continuo alrededor del árbol o en cortes espaciados uniformemente alrededor del árbol y por debajo del nivel de las ramas. A medida que el diámetro del árbol aumenta, se obtienen mejores resultados con el chorro continuo alrededor del árbol o en cortes espaciados muy cerca entre sí alrededor del árbol. Evite las aplicaciones que permiten el desagüe de material cuando se chonea alrededor del árbol o sobre los cortes en árboles que tienen la facilidad de exudar savia de los cortes. En especie tal como esto,

haga el volante o los cortes a un ángulo oblicuo para producir un efecto de ahuecamiento y para utilizar una concentración del 100 por ciento de este producto. Para obtener mejores resultados, la aplicación debe tener lugar durante períodos de crecimiento activo y expansión completa de las hojas. Este tratamiento controlará muchas especies, algunas de las cuales incluyen:

Control	Control parcial
Dogwood	Black gum
Oak	Hickory
Poplar	Maple, red
Sweetgum	
Sycamore	

## 8.6 Inyección en tallos huecos

Este producto puede aplicarse con dispositivos de inyección manuales para administrar las cantidades recomendables de este producto a las plantas con tallo hueco identificadas que crecen en cualquiera de los lugares no cultivados especificados en esta etiqueta. Para controlar las siguientes plantas con tallo hueco, siga las instrucciones de uso indicadas abajo:

#### Castorbean - Semilla de ricino (*Ricinus communis*)

Inyecte 5 mL por planta de este producto en la parte inferior del tallo principal.

#### Hemlock, Poison - Cicuta (*Conium maculatum*)

Inyecte una caña de una hoja por planta a 25-30 cm (10-12 pulgadas) por encima de la corona de la raíz con 6 mL de una solución al 5% v/v de este producto.

#### Hogweed, Giant - Hogweed gigante (*Heracleum mantegazzianum*)

Inyecte una caña de una hoja por planta a 30 cm (12 pulgadas) por encima de la corona de la raíz con 6 mL de una solución al 5% v/v de este producto.

#### Horsetail, Field - Equiseto o cola de caballo (*Equisetum arvense*)

Inyecte un segmento por encima de la corona de la raíz con 0.6 mL de este producto por tallo. Utilice una jeringa pequeña, con capacidad para medir esta cantidad.

#### Knotweed, Bohemian - Polígono bohemio (*Polygonum bohemicum*)

Inyecte 6 mL de este producto por tallo, entre el segundo y el tercer nodo.

#### Knotweed, Giant - Polígono gigante (*Polygonum sachalinense*)

Inyecte 6 mL por tallo de este producto entre el segundo y el tercer entrenudo.

#### Knotweed, Japanese - Polígono japonés (*Polygonum cuspidatum*)

Inyecte 6 mL de este producto por tallo, entre el segundo y el tercer nodo.

#### Reed, Giant - Caña brava (*Arundo donax*)

Inyecte 8 mL por tallo de este producto entre el segundo y el tercer entrenudo.

#### Thistle, Canada - Cardo de Canadá (*Cirsium arvense*)

Use una tijera de podar para cortar un manojito de 8 a 9 de las plantas más altas en la etapa de brotación. Utilice una aguja de cavidad que se introduce en el centro del tallo y luego se extrae lentamente a medida que inyecta 0.6 mL de este producto en cada tallo.

NOTA: Según la dosis de uso anual máxima de glifosato para estos sitios no cultivados, el total combinado de todos los tratamientos no debe exceder 10.6 cuartos de galón de este producto por acre. A 6 mL por tallo, con 10.6 cuartos se pueden tratar aproximadamente 1700 tallos.

## 8.7 Plantas ornamentales, viveros y árboles de Navidad

#### Post-dirigido, recortado de bordes

Este producto puede ser usado como un rocío post-dirigido alrededor de especies ornamentales leñosas establecidas, como arborvitae, azalea, boxwood, crabapple, eucalyptus, euonymus, fir, douglas fir, jobba, hollies, lilac, magnolia, maple, oak, poplar, privet, pine, spruce y yew. Este producto también puede ser usado para recortado de bordes alrededor de árboles, edificios, aceras y carreteras, plantas en macetas y otros objetos de viveros.

Las plantas deseables pueden ser protegidas de la solución usando pantallas o cubriéndolas con cartón o con algún otro material impermeable. ESTE PRODUCTO NO SE RECOMIENDA PARA ROCIARSE DESDE ARRIBA POR DISEMINACIÓN SOBRE PLANTAS ORNAMENTALES Y ARBOLES DE NAVIDAD. Se debe tener mucho cuidado para que el rocío, acarreo o vapor de este producto no hagan contacto con el follaje o la corteza verde de las especies ornamentales establecidas.

#### Preparación del terreno

Este producto puede ser usado antes de plantar cualquier tipo de planta ornamental, de vivero o árboles de Navidad.

#### Aplicadores por frotación

Este producto se puede usar mediante aplicadores de mecha de esponja u otro tipo de aplicadores por frotación adecuados, para controlar total o parcialmente la vegetación indeseable alrededor de eucaliptos o álamos. Consulte la sección "Equipo Especializado" de este rótulo para obtener mayor información sobre el uso adecuado de los aplicadores por frotación.

### Invernaderos/cobertizos

Este producto puede ser usado para controlar las malezas que estén creciendo en o alrededor de los invernaderos y cobertizos. No debe haber vegetación que no se quiera destruir y los equipos de ventilación deben estar apagados.

## 8.8 Parques, áreas recreativas y residenciales

Este producto puede usarse en parques, áreas recreativas y residenciales. Puede aplicarse con cualquiera de los equipos descritos en esta etiqueta. Puede usarse para el recortado de bordes alrededor de árboles, vallas, caminos, alrededor de edificios, aceras y otros objetos en estas áreas. Puede usarse para tratamiento localizado de vegetación no deseable y para eliminar las malezas no deseables que crecen en cuadros de arbustos establecidos y plantaciones ornamentales. Este producto puede usarse antes de plantar un área con plantas ornamentales, flores, césped (tepes o semillas), o antes de colocar asfalto o de comenzar un proyecto de construcción.

Todas las instrucciones de la sección "Áreas No Cultivables y Áreas Industriales" son válidas para los parques y áreas recreativas.

## 8.9 Vías de ferrocarril

Las instrucciones en la sección "Áreas No Cultivables y Áreas Industriales" aplican a los ferrocarriles.

### Suelo vacío, balastos y bordes, cruces y tratamiento localizado

Este producto puede ser usado para mantener el suelo limpio de malezas en balastos y bordes de las vías de ferrocarril. Pueden hacerse aplicaciones repelidas de este producto, a medida que emergen las malezas, para mantener el suelo limpio de malezas. Este producto puede usarse para controlar las malezas altas y rajar la línea visual en los cruces de ferrocarril y reducir la necesidad de segar a lo largo de las servidumbres de vía. Para aplicaciones en los cruces, pueden usarse hasta 80 galones de solución para rociar por acre.

**MEZCLAS DE TANQUE:** Este producto se puede mezclar en tanque con los siguientes productos balasto, arcenes, tratamiento local, terrenos desprovistos de vegetación y cruces siempre y cuando el producto específico esté registrado para utilizarse en tales sitios. Consulte en las etiquetas de estos productos los lugares aprobados no cultivados y las proporciones de aplicación. Lea detenidamente y respete al pie de la letra las advertencias y el resto de la información en las etiquetas de todos los herbicidas que utilice. Use la mezcla conforme a las medidas precautorias más estrictas indicadas para cada producto en la mezcla.

El usuario tiene la responsabilidad de asegurarse de que en la etiqueta del producto de la mezcla se permiten las aplicaciones específicas cuando se mezcla en un tanque un solo ingrediente activo genérico detallado abajo.

Arsenal	Hyvar X	simazine
atrazine	Hyvar XL	Spike 80DF
dicamba*	Krovar I DF	Telar DF
Escort	Oust	Transline
Escort XP	Oust XP	Velpar DF
Garlon 3A	Outrider	Velpar L
Garlon 4	Sahara DG	2,4-D

\*Este producto más las mezclas en tanque de dicamba, no se pueden aplicar por pulverización aérea en California.

### Control de matorrales

Este producto puede ser usado para controlar matorrales leñosos y árboles en las servidumbres de las vías del ferrocarril. Aplique de 4 a 10 cuartos de galón de este producto por acre para aplicaciones deseminadas, usando boquillas tipo aguilón o sin aguilón. Pueden usarse hasta 80 galones de solución para rociar por acre. Aplique una solución de 0.75 a 2% de este producto cuando haga aplicaciones de rociado para mojar a gran escala. Aplique una solución de 5% a 10% de este producto cuando haga aplicaciones de rociado dirigido a pequeña escala para tratamientos localizados. Este producto puede ser mezclado con los siguientes productos para un mejor control de los matorrales leñosos y árboles:

Arsenal	Krenite	Vanquish
Escort	Telar DF	Velpar DF
Escort XP	Tordon K	Velpar L
Garlon 3A	Tordon 22X	
Garlon 4	Transline	

### Mantenimiento del Bermudagrass

Este producto puede ser usado para controlar o controlar parcialmente muchas malezas anuales y perennes para el mantenimiento eficaz de bermudagrass que esté creciendo activamente. Aplique de 1 a 3 pintas de este producto en un máximo de 80 galones de solución para rociar por acre. Para tratar malezas anuales que tengan menos de 6 pulgadas de altura (o el largo de los tallos), use las proporciones más bajas. Use la proporción más alta a medida que las malezas aumenten de tamaño o cuando estén cerca de la floración o de la formación de semillas. Estas proporciones también controlan parcialmente las siguientes especies perennes:

Bahiagrass	Johnsongrass
Bluestem, silver	Trumpet creeper
Fescue, tall	Vaseygrass

Este producto puede ser mezclado con Oust o Oust XP. Si se mezcla en tanques, no use más de 1 a 3 pintas de este producto con 1 a 2 onzas de Oust o Oust XP por acre. Para tratar malezas anuales indicadas en esta etiqueta y en el librito de Oust o Oust XP que tengan menos de 6 pulgadas de altura (o el largo de los tallos), use las proporciones más bajas de cada producto. Use la proporción más alta a medida que las malezas aumenten de tamaño o cuando estén cerca de la floración o de la formación de semillas. Estas proporciones también controlan parcialmente las siguientes especies perennes:

Bahiagrass	Fescue, tall
Blackberry	Johnsongrass
Bluestem, silver	Poa
Broomsedge	Raspberry
Dallisgrass	Trumpet creeper
Dewberry	Vaseygrass
Dock, curly	Vervain, blue
Dogfennel	

Uselo solamente en bermudagrass que esté bien establecido. Como resultado del tratamiento, el bermudagrass puede sufrir detenimiento, pero volverá a crecer si se riega. No se recomienda repetir el tratamiento en la misma estación, ya que esto puede ocasionar daños graves al bermudagrass.

## 8.10 Bordes de las carreteras

Todas las instrucciones de la sección "Áreas No Cultivables y Áreas Industriales" son válidas para las carreteras.

### Tratamiento de bordes

Este producto puede ser usado en los bordes de las carreteras. Puede aplicarse con rociadores de aguilón, rociadores de aguilón con pantalla, boquillas descentradas de gran volumen, equipo de mano y equipos similares.

### Barandas y otros obstáculos para la siega

Este producto puede ser usado para controlar las malezas que crecen debajo de las barandas y alrededor de los postes de la señalización y otros objetos en los bordes de las carreteras.

### Tratamiento localizado

Este producto puede ser usado como tratamiento localizado para controlar la vegetación indeseable que crece a lo largo de los bordes de las carreteras.

**MEZCLAS DE TANQUE:** Este producto puede mezclarse en tanque con los productos siguientes para tratamientos de bordes, barandas, localizados y de suelo vacío a condición de que el producto específico se coloca para el uso en tal sitio. Consulte en las etiquetas de estos productos los lugares aprobados no cultivados y las proporciones de aplicación. Lea detenidamente y respete al pie de la letra las advertencias y el resto de la información en las etiquetas de todos los herbicidas que utiliza. Emplee de acuerdo con las instrucciones más estrictas de la etiqueta de cada producto en la mezcla.

El usuario tiene la responsabilidad de asegurarse de que en la etiqueta del producto de la mezcla se permiten las aplicaciones específicas cuando se mezcla en un tanque un ingrediente activo genérico detallado abajo.

atrazine	Landmark MP	Poast
Crossbow L	Landmark II MP	Ronstar 50 WSP
dicamba*	Landmark XP	Sahara DF
diuron	Oust	Surflan AS
Endurance	Oust XP	Surflan WDG
Escort	Oust XP	Telar DF
Escort XP	pendimethalin	Velpar DF
Gallery 75DF	Plateau	Velpar L
Krovar I DF	Plateau DG	2,4-D

\*Este producto más las mezclas en tanque de dicamba, no se pueden aplicar por pulverización aérea en California.

Vea la sección "Áreas No Cultivables y Áreas Industriales" de esta etiqueta para las instrucciones generales para mezclarse del tanque.

### Mantenimiento del Bermudagrass y Bahiagrass

#### Aplicaciones cuando estén latentes (durmientes)

Este producto puede usarse para controlar o controlar parcialmente muchas malezas anuales de invierno y tall fescue para el alivio eficaz de bermudagrass y bahiagrass latentes. Trate solamente cuando el césped esté latente y antes de su reverdecimiento primaveral. Este producto puede mezclarse con Oust o Oust XP en tanque para el control residual. Las mezclas de tanque de este producto con Oust o Oust XP pueden retrasar el reverdecimiento.

Para obtener mejores resultados con malezas anuales de invierno, haga el tratamiento cuando las plantas estén en una etapa temprana de su crecimiento (menos de 6 pulgadas de altura) después de que la mayoría haya germinado. Para obtener mejores resultados con tall fescue, haga el tratamiento cuando el fescue esté en o después de su etapa de 4 a 6 hojas.

Aplique entre 8 y 64 onzas fluidas de este producto en una mezcla de tanque con 0.75 a 1.33 onzas del herbicida Outrider por acre. Lea y siga todas las instrucciones de la etiqueta del herbicida Outrider.

Aplique de 8 a 64 onzas fluidas de este producto por acre, solo en mezcla de tanque con 0.25 a 1 onza de Oust o Oust XP por acre. Aplique las proporciones indicadas en la etiqueta en 10 a 40 galones de agua por acre. Uselo solamente en áreas donde el

bermudagrass o bahiagrass son deseables y en las que puede tolerarse un poco de daño o decoloración. Para evitar que el reverdecer se retarde y para minimizar el daño, no agregue más de 1 onza de Oust o Oust XP por acre sobre bermudagrass y no más de 0.5 onzas de Oust o Oust XP por acre sobre bahiagrass, y evite el tratamiento cuando estas hierbas se encuentren en estado semi-latente.

#### Bermudagrass que esté creciendo activamente

Este producto puede ser usado para controlar total o parcialmente muchas malezas anuales y perennes para el mantenimiento eficaz de bermudagrass que esté creciendo activamente. Aplique de 1 a 3 pintas de este producto en 10 a 40 galones de solución para rociar por acre. Para tratar malezas anuales que tengan menos de 6 pulgadas de altura (o el largo de los tallos), use las proporciones más bajas. Use la proporción más alta a medida que las malezas aumenten de tamaño o cuando estén cerca de la floración o de la formación de semillas. Estas proporciones también controlan parcialmente las siguientes especies perennes:

Bahiagrass	Johnsongrass
Bluestem, silver	Trumpet creeper
Fescue, tall	Vaseygrass

Este producto puede ser mezclado en tanque con Oust o Oust XP. Si se mezcla en tanques, no use más de 1 a 2 pintas de este producto con 1 a 2 onzas de Oust o Oust XP por acre. Para tratar malezas anuales indicadas en esta etiqueta y en el librito de Oust o Oust XP, que tengan menos de 6 pulgadas de altura (o el largo de los tallos), use las proporciones más bajas de cada producto. Use la proporción más alta a medida que las malezas aumenten de tamaño o cuando estén cerca de la floración o de la formación de semillas. Estas proporciones también controlan parcialmente las siguientes especies perennes:

Bahiagrass	Fescue, tall
Bluestem, silver	Johnsongrass
Bromsedge	Poorjoe
Dallisgrass	Trumpet creeper
Dock, curly	Vaseygrass
Dogfennel	Vervain, blue

Uselo solamente en bermudagrass que esté bien establecido. Como resultado del tratamiento, el bermudagrass puede sufrir deterioro, pero volverá a crecer si se riega. No se recomienda repetir el tratamiento con la mezcla de tanque en la misma estación, ya que esto puede ocasionar daños graves al bermudagrass.

#### Bahiagrass que esté creciendo activamente

Para suprimir el crecimiento vegetativo y la inhibición de la formación de semillas de bahiagrass durante aproximadamente 45 días, aplique 6 onzas fluidas de este producto en 10 a 40 galones de agua por acre. Aplique de 1 a 2 semanas después de reverdecer completo o después de cortar a una altura uniforme de 3 a 4 pulgadas. Esta aplicación debe ser hecha antes de la emergencia de las semillas.

Para la supresión durante un máximo de 120 días, aplique 4 onzas fluidas de este producto por acre, y a continuación una aplicación de 2 a 4 onzas fluidas por acre unos 45 días más tarde. No haga más de 2 aplicaciones al año.

Este producto se puede usar para el control o el control parcial de Johnsongrass y otras malezas que se indican en la etiqueta del herbicida Outrider en bahiagrass que esté creciendo activamente. Aplique de 6.25 onzas fluidas de este producto con 0.75 a 2.0 onzas del herbicida Outrider por acre. Utilice sólo en bahiagrass bien establecido.

Puede usarse una mezcla de tanque de este producto con Oust o Oust XP. Aplique 6 onzas fluidas de este producto con 0.5 a 1.0 onzas de Oust o Oust XP por acre, 1 a 2 semanas después de la primera siega de la primavera. Haga solamente 1 aplicación al año.

## 8.11 Sitios de servicios públicos

En cuanto a servicios públicos, se recomienda utilizar este producto junto a derechos de paso para alimentación eléctrica, conductos y teléfonos y en otros lugares asociados con estos derechos de paso, como subestaciones, bordes de carreteras, líneas de ferrocarril o derechos de paso similares para servicios públicos.

Este producto se puede utilizar en sitios de servicios públicos y subestaciones para terreno desprovisto de vegetación y para objetos con bordes recortados, para tratamiento localizado de vegetación no deseable y para eliminar las malezas no deseables que crecen en cuadros de arbustos establecidos y plantaciones ornamentales. Este producto puede usarse antes de plantar un área con plantas ornamentales, flores, césped (tepales o semillas), o antes de colocar asfalto o de comenzar un proyecto de construcción.

También se recomienda este producto para preparar o crear claros para la vida silvestre en estos sitios, para mantener los caminos de acceso y para podar los lados de los derechos de paso de servicios públicos.

**MEZCLAS DE TANQUE.** Se pueden emplear mezclas de tanque de este producto para aumentar el espectro de control de malezas herbáceas, arbustos leñosos y árboles. Este producto se puede mezclar en tanque con los siguientes productos. Consulte en las etiquetas de estos productos los lugares aprobados para emplearlos en el establecimiento o cultivados y las proporciones de aplicación. Lea detenidamente y respete al pie de la letra las advertencias y el resto de la información en las etiquetas de todas las herbicidas que utilice. Use la mezcla conforme a las medidas precautorias más estrictas indicadas para cada producto en la mezcla.

El usuario tiene la responsabilidad de asegurarse de que en la etiqueta del producto de la mezcla se permiten las aplicaciones específicas cuando se mezcla en un tanque un ingrediente activo genérico detallado abajo.

Arsenal	Krenite	Surflan AS
atrazine	Krovax I DF	Surflan WDG
dicamba <sup>1</sup>	Oust	Telar DF
diuron	Oust XP	Transline
Endurance	Outrider	Vanquish
Escort	pendimethalin	Yelpar DF
Escort XP	Plateau	Yelpar L
Garlon 3A*	Sahara DG	2,4-D
Garlon 4 <sup>2</sup>	simazine	

<sup>1</sup> Este producto más las mezclas en tanque de dicamba, no se pueden aplicar por pulverización aérea en California.

<sup>2</sup> Para tratamientos de podas laterales se recomienda utilizar este producto solo o en una mezcla de tanque con Garlon 4.

\*Asegúrese de que se haya mezclado completamente Garlon 3A antes de agregar este producto. Agite la mezcla de pulverización en el momento de agregar este producto para evitar problemas de compatibilidad de rociado.

#### Suelo limpio de malezas y recortado de bordes

Este producto puede usarse en sitios y subestaciones de servicios públicos sobre el suelo descubierto, para recortes con bordeadora alrededor de objetos, el tratamiento localizado de vegetación no deseada y para eliminar las malezas no deseadas que crecen en canchales con arbustos o plantas ornamentales. Este producto se puede utilizar sobre ornamentos, flores, césped (hierba o semilla) antes de la plantación en un sitio de servicios públicos o antes de iniciar proyectos de construcción.

Pueden hacerse aplicaciones repetidas de este producto, a medida que emergen las malezas, para mantener el suelo limpio de malezas.

Este producto se puede mezclar en tanque con los siguientes productos. Consulte en las etiquetas de estos productos los lugares aprobados y las proporciones de aplicación.

Arsenal	Plateau
Banvel	Princep DF
Barricade 6SWG	Princep Liquid
diuron	Ronstar 5DWP
Endurance	Sahara
Escort	simazine
Garlon 3A	Surflan

## 9.0 TIPOS DE MALEZAS CONTROLADAS

Use siempre la proporción más alta de este producto por acre, dentro de las proporciones recomendadas, cuando las malezas son densas o cuando crecen en un área no tocada (no cultivada).

Puede haber una disminución de los resultados cuando se traten malezas cubiertas con mucho polvo. Para las malezas que han sido segadas, pastadas o cortadas, permita que vuelvan a crecer antes del tratamiento.

Para las aplicaciones de pulverización dirigidas a bajo volumen, utilice una solución de este producto del 5 al 10 por ciento para el control total o parcial de malezas anuales, malezas perennes o árboles y arbustos leñosos. La cobertura de pulverización debería ser uniforme al menos en el 50 por ciento del follaje. Para obtener resultados óptimos es importante cubrir la mitad superior de la planta. Para garantizar una adecuada cobertura de pulverización, rocíe ambos lados de los arbustos o árboles leñosos grandes o altos, si el follaje es compacto y denso, o donde haya múltiples rebrotes.

Vea las secciones siguientes de la etiqueta para las proporciones recomendadas para el control de malezas anuales y perennes, matorrales leñosos y árboles. Para las malezas perennes, matorrales leñosos y árboles difíciles de controlar, donde las plantas crecen en condiciones de estrés, o donde la infestación es densa, pueden usarse 5 a 10 cuartos de galón por acre de este producto para obtener mejores resultados.

## 9.1 Malezas anuales

Use 1 cuarto de galón por acre si las malezas tienen menos de 6 pulgadas de altura o largo de los tallos y 1.5 cuartos a 4 cuartos de galón por acre si las malezas tienen más de 6 pulgadas de altura o largo de los tallos o cuando las malezas crecen en condiciones de estrés. Cuando deba realizar la aplicación, utilice la proporción más concentrada para especies difíciles de controlar independientemente del tamaño de las malezas. Trate las malezas difíciles de controlar cuanto antes, cuando sean todavía relativamente pequeñas. Este producto se puede mezclar en tanque con los siguientes productos, siempre y cuando el producto específico esté registrado para utilizarse en el lugar objetivo. Consulte en las etiquetas de estos productos los lugares aprobados y las proporciones de aplicación.

Para aplicaciones de rociado para mojar, eplique una solución de 0.5% de este producto a las malezas que tengan menos de 6 pulgadas de altura o largo de los tallos. Haga la aplicación antes de la formación de semillas de la hierba, o la formación de yemas para las malezas de hoja ancha. Para las malezas anuales que tienen más de 6 pulgadas de altura o las malezas más pequeñas que crecen en condiciones de estrés, use una solución del 1 al 2 por ciento. Use la dosis más alta para las especies difíciles de controlar o las malezas de más de 24 pulgadas de altura.

## ESPECIES DE MALEZAS

Anoda, spurred	Kochia
Barley*	Lamb's-quarters*
Barnyardgrass*	Little barley*
Bassia, fivehook	London rocket*
Bittercress*	Mayweed
Black nightshade*	Medusahead*
Bluegrass, annual*	Morningglory
Bluegrass, bulbous*	( <i>Ipomoea spp.</i> )
Brome, downy*	Mustard, blue*
Brome, Japanese*	Mustard, tansy*
Browntop panicum*	Mustard, tumble*
Buttercup*	Mustard, wild*
Carolina foxtail*	Oats
Carolina geranium	Pigweed*
Castorbean	Plains/Tickseed coreopsis*
Cheatgrass*	Prickly lettuce*
Cheeseweed	Puncturevine
( <i>Melva parviflora</i> )	Purslane, common
Chervil*	Ragweed, common*
Chickweed*	Ragweed, giant
Cocklebur*	Red rice
Copperleaf, hophornbeam	Russian thistle
Corn*	Rye*
Corn speedwell*	Ryegrass*
Crabgrass*	Sandbur, field*
Dwarf dandelion*	Shattercane*
Eastern manna grass*	Shepherd's-purse*
Eclipta*	Sicklepod
Fall panicum*	Signalgrass, broadleaf*
Falsedandelion*	Smartweed, ladythumb*
Falsellax, smallseed*	Smartweed, Pennsylvania*
Fiddleneck	Sowthistle, annual
Field pennycress*	Spanishneedles
Fitaree	Speedwell, purslane*
Fleabane, annual*	Sprangletop*
Fleabane, hairy	Spurge, annual
( <i>Conyza bonariensis</i> )*	Spurge, prostrate*
Fleabane, rough*	Spurge, spotted*
Florida pusley	Spurry, umbrella*
Foxtail*	Starthistle, yellow
Goatgrass, jointed*	Stinkgrass*
Goosegrass	Sunflower*
Grain sorghum (milo)*	Teaweed/Prickly sida
Groundsel, common*	Texas panicum*
Hemp sesbania	Velvetleaf
Henbit	Virginia copperleaf
Horseweed/Marestail	Virginia pepperweed*
( <i>Conyza canadensis</i> )	Wheat*
Itchgrass*	Wild oats*
Johnsongrass, seedling	Witchgrass*
Junglerice	Woolly cupgrass*
Knotweed	Yellow rocket

\*Cuando use equipos de aplicación diseminada a nivel del terreno (aplicaciones aéreas o rociadores de aguilón con boquillas tipo abanico plano), estas especies serán controladas o controladas parcialmente con 1 pinta de este producto por acre. Las aplicaciones deben hacerse usando de 3 a 10 galones de volumen por acre. Use boquillas que garanticen una cobertura completa del follaje y haga el tratamiento cuando las malezas estén en su etapa temprana de crecimiento.

## 9.2 Malezas perennes

Los mejores resultados se obtienen cuando las malezas perennes son tratadas una vez que han alcanzado la etapa reproductiva de su crecimiento (inicio de las semillas para hierbas y formación de yemas para malezas de hoja ancha). Para las plantas sin flores, los mejores resultados se obtienen cuando las plantas alcanzan el estado de madurez. En estas condiciones, utilice la dosis de aplicación máxima dentro del rango especificado. Utilice una solución al 2 por ciento sobre las plantas perennes difíciles de controlar, por ejemplo, bermudagrass, ramaza, correhuela, apocino del Canadá, algodoncillo y cardo cundidor.

Asegúrese de que la cobertura sea a fondo cuando emplee tratamientos de rociado para mojar con equipo de mano. Cuando se utilice equipo manual para tratamientos puntuales localizados de bajo volumen, aplique una solución de 5 a 10 por ciento de este producto.

Esperar 7 días o más después de la aplicación antes de labrar.

Especies de malezas	Proporción (cuartos por acre)	% de solución de mano
Alfalfa*	1	2
Alligatorweed*	4	1.5
Anise (fennel)	2 - 4	1 - 2
Bahiagrass	3 - 5	2

Especies de malezas	Proporción (cuartos por acre)	% de solución de mano
Beachgrass, European ( <i>Ammophila arenaria</i> )	—	5
Bentgrass*	1.5	2
Bermudagrass	5	2
Bermudagrass, water (knotgrass)	1.5	2
Bindweed, field	4 - 5	2
Bluegrass, Kentucky	2	2
Blueweed, Texas	4 - 5	2
Brackentern	3 - 4	1 - 1.5
Bromegrass, smooth	2	2
Bursage, woolly-leaf	—	2
Canarygrass, reed	2 - 3	2
Cattail	3 - 5	2
Clover, red, white	3 - 5	2
Cogongrass	3 - 5	2
Dallisgrass	3 - 5	2
Dandelion	3 - 5	2
Dock, curly	3 - 5	2
Dogbane, hemp	4	2
Fescue (except tall)	3 - 5	2
Fescue, tall	1 - 3	2
German ivy	2 - 4	1 - 2
Guineagrass	3	1
Horse nettle	3 - 5	2
Horseradish	4	2
Iceland	2	1.5 - 2
Jerusalem artichoke	3 - 5	2
Johnsongrass	2 - 3	1
Kikuyugrass	2 - 3	2
Knapweed	4	2
Lantana	—	1 - 1.25
Lespedeza	3 - 5	2
Milkweed, common	3	2
Muhly, wirestem	2	2
Mullein, common	3 - 5	2
Napiergrass	3 - 5	2
Nightshade, silverleaf	2	2
Nutsedge, purple, yellow	3	1 - 2
Orchardgrass	2	2
Pampasgrass	3 - 5	1.5 - 2
Paragrass	3 - 5	2
Pepperweed, perennial	4	2
Phragmites*	3 - 5	1 - 2
Poison hemlock	2 - 4	1 - 2
Quackgrass	2 - 3	2
Redvine*	2	2
Reed, giant	4 - 5	2
Ryegrass, perennial	2 - 3	1
Smartweed, swamp	3 - 5	2
Spurge, leafy*	—	2
Sweet potato, wild*	—	2
Thistle, artichoke	2 - 3	1 - 2
Thistle, Canada	2 - 3	2
Timothy	2 - 3	2
Torpedograss*	4 - 5	2
Trumpet creeper*	2 - 3	2
Vaseygrass	3 - 5	2
Velvetgrass	3 - 5	2
Wheatgrass, western	2 - 3	2

\*Control parcial

## 9.3 Matorrales leñosos y árboles

Aplique este producto después de la formación completa de hojas, a menos que se indique de otra manera. Para las plantas más grandes y/o donde la densidad de la vegetación sea alta, use la proporción más alta. En las plantas enredaderas que han alcanzado el estado leñoso de crecimiento, use las proporciones más altas. Los mejores resultados se obtienen cuando se aplica a finales del verano o en el otoño, después de la formación de frutos.

En zonas áridas, se obtienen mejores resultados cuando se aplica en la primavera o a principios del verano cuando las especies que crecen como matorrales tienen alto contenido de humedad y florecen.

Cuando haga tratamientos de rociado para mojar con equipos de mano, asegúrese de que la cobertura sea total. Cuando use equipos de mano para tratamientos localizados con rociado dirigido de poco volumen, aplique una solución del 5 al 10 por ciento de este producto.

Es posible que los síntomas no aparezcan antes de las heladas o del envejecimiento con tratamientos de otoño.

Permita que pasen 7 o más días después de la aplicación antes de labrar, segar o remover. Es posible que se necesite repetir el tratamiento para tratar plantas que emergen de partes enterradas o de semillas. Un poco de colorido otoñal es aceptable en plantas indeseables que pierden las hojas en el otoño, siempre y cuando no hayan sufrido mayor pérdida de hojas. Si la aplicación de otoño se realiza después de que hayan ocurrido heladas, es posible que se obtengan resultados deficientes.

Especies de malezas	Proporción Diseminada (cuartos por acre)	% de solución de mano de rociado para mojar
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
Casaca*	2-5	1-2
Catsclaw*	—	1-1.5
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
Deerweed	2-5	1
Dogwood*	2-5	1-2
Elderberry	2	1
Elm*	2-5	1-2
Eucalyptus	—	2
Gorse*	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
Kudzu	4	2
Locust, black*	2-4	1-2
Madrone resprouts*	—	2
Manzanita*	2-5	1-2
Maple, red	2-4	1-1.5
Maple, sugar	—	1-1.5
Monkey flower*	2-4	1-2
Oak; black, white*	2-4	1-2
Oak, post	3-4	1-1.5
Oak; northern, pin	2-4	1-1.5
Oak, scrub*	2-4	1-1.5
Oak; southern red	2-3	1-1.5
Peppertree, Brazilian (Florida holly)*	2-5	1-2
Persimmon*	2-5	1-2
Pine	2-5	1-2
Poison ivy	4-5	2
Poison oak	4-5	2
Poplar, yellow*	2-5	1-2
Redbud, eastern	2-5	1-2
Rose, multiflora	2	1
Russian olive*	2-5	1-2
Sage, black	2-4	1
Sage, white*	2-4	1-2
Sage brush, California	2-4	1
Salmonberry	2	1
Saltcedar*	2-5	1-2
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

Especies de malezas	Proporción Diseminada (cuartos por acre)	% de solución de mano de rociado para mojar
Swordfern*	2-5	1-2
Tallowtree, Chinese	—	1
Tan oak resprouts*	—	2
Thimbleberry	2	1
Tobacco, tree*	2-4	1-2
Toyon*	—	2
Trumpet creeper	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
Yerba Santa*	—	2

\*Control parcial

## 10.0 LIMITES EN LA GARANTIA Y EN LA RESPONSABILIDAD

Monsanto Company garantiza que este producto concuerda con la descripción química de la etiqueta y es razonablemente adecuado para los propósitos descritos en el librito titulado Instrucciones Completas para el Uso ("Instrucciones") cuando se usa de acuerdo con dichas Instrucciones y las condiciones que allí se detallan. NO SE HACE NINGUNA OTRA GARANTIA EXPRESA O IMPLICITA ACERCA DE LA IDONEIDAD PARA UN USO PARTICULAR O COMERCIALIZACION. Esta garantía está sujeta también a las condiciones y limitaciones que aquí se indican.

El comprador y todos los usuarios deberán reportar con prontitud a esta Compañía acerca de cualquier reclamo que se base en un contrato, negligencia, estricta responsabilidad, y otros actos ilícitos.

El comprador y todos los usuarios son responsables por todas las pérdidas o daños que resultasen por el uso o manipulación en condiciones que estén más allá del control de esta Compañía según lo establecido en la ley vigente, incluyendo pero no limitándose a: incompatibilidad con productos que no sean los señalados en las Instrucciones, aplicación o contacto con vegetación que no se quiera destruir, condiciones climáticas inusuales, condiciones de clima que están 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, así como condiciones de clima que estén fuera de los límites indicados en las Instrucciones, aplicaciones que no estén explícitamente aconsejadas en las Instrucciones, 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 las plantas 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.

SEGÚN LO ESTABLECIDO EN LA LEY VIGENTE, LA ÚNICA Y EXCLUSIVA COMPENSACION AL USUARIO O COMPRADOR Y EL LÍMITE DE RESPONSABILIDAD DE ESTA COMPAÑÍA O DE CUALQUIER OTRO VENDEDOR POR CUALQUIER PERDIDA O POR TODAS LAS PERDIDAS, PERJUICIOS O DAÑOS QUE RESULTASEN DEL USO O MANEJO DE ESTE PRODUCTO (INCLUYENDO RECLAMOS QUE SE BASEN EN UN CONTRATO, NEGLIGENCIA, ESTRUCTA RESPONSABILIDAD Y OTROS ACTOS ILÍCITOS) SERÁ EL PRECIO PAGADO POR EL USUARIO O EL COMPRADOR POR LA CANTIDAD INVOLUCRADA DE ESTE PRODUCTO, O A ELECCION DE ESTA COMPAÑÍA O DE OTRO VENDEDOR, EL REEMPLAZO DE DICHA CANTIDAD, O SI NO SE OBEYED MEDIANTE COMPRA SE REEMPLAZARA DICHA CANTIDAD DEL PRODUCTO. EN LA MEDIDA QUE LO PERMITA LA LEY, EN NINGUN CASO ESTA COMPAÑÍA U OTRO VENDEDOR SERAN 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 GARANTIA 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 recipiente.

Roundup PRO, Certainty y Outrider es una marca comercial de la empresa Monsanto Technology LLC.

Todas las otras marcas registradas son la propiedad de sus dueños respectivos.

Este producto está protegido por la patente de los Estados Unidos Nos. 5,683,958; 5,703,015; 6,063,733; 6,121,199; 6,121,200. No se han otorgado licencias bajo ninguna patente que no sea de los Estados Unidos.

Registro en la EPA Nº 524-475

En caso de que se presente una emergencia relacionada con este producto, llame por cobrir a cualquier hora del día o de la noche, al teléfono (314)-694-4000.

Embalado Para:  
MONSANTO COMPANY  
800 N. LINDBERGH BLVD.  
ST. LOUIS, MISSOURI, 63167 U.S.A.  
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012810



# DuPont™ Oust® Extra

herbicide

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®

*“..... A Growing Partnership With Nature”*

## **DUPONT™ OUST® EXTRA HERBICIDE HIGHLIGHTS**

- “OUST® EXTRA controls many annual and perennial grasses and broadleaf weeds in conifer plantations and non-crop sites.”
- “OUST® EXTRA may be used for general weed control on terrestrial non-crop sites and for selective weed control in certain types of unimproved turf grasses on these same sites.”
- “OUST® EXTRA may also be used for selective weed control in conifer site preparation and in the release of certain conifers and hardwoods.”
- “The best results are obtained when the application is made before or during the early stages of weed growth before weeds develop an established root system.”
- “Do not apply more than 10 2/3 ounces per acre per year.”
- “OUST® EXTRA can be tank mixed with other herbicides registered for use in conifer plantations and non-crop sites; when tank mixing use the most restrictive limitations from the labeling of both products.”
- “Consult label text for complete instructions. Always read and follow label directions for use.”
- “It is a violation of federal law to use this product in a manner inconsistent with its labeling.”

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# DuPont™ Oust® Extra

## herbicide

### Dispersible Granules

Active Ingredient	By Weight
Sulfometuron methyl {Methyl 2-[[[(4,6-dimethyl-2-pyrimidinyl)amino]-carbonyl]amino]sulfonyl]benzoate}	56.25%
Metsulfuron methyl Methyl 2-[[[(4-methoxy-6-methyl-1,3,5-triazin-2-yl)amino]-carbonyl]amino]sulfonyl]benzoate	15.00%
<b>Inert Ingredients</b>	28.75%
<b>TOTAL</b>	100%

EPA Reg. No. 352-622

## 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.)

### 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 five 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 1-800-441-3637 for emergency medical treatment information.

### PRECAUTIONARY STATEMENTS

#### HAZARDS TO HUMANS AND DOMESTIC ANIMALS

**CAUTION!** Harmful if absorbed through skin. Causes moderate eye irritation. Avoid contact with skin, eyes, or clothing.

### PERSONAL PROTECTIVE EQUIPMENT

**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 Control Statement:** 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.

### 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.

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

## GENERAL INFORMATION

DuPont™ OUST® EXTRA herbicide is a dispersible granule that is mixed in water and applied as a spray or impregnated on dry, bulk fertilizer. OUST® EXTRA controls many annual and perennial grasses and broadleaf weeds in conifer plantations and non-crop sites. It also may be used to control certain hardwoods and vines when applied in site preparation treatments.

OUST® EXTRA may be used for general weed control on terrestrial non-crop sites and for selective weed control in certain types of unimproved turf grasses on these same sites. OUST® EXTRA may be used for the control of certain woody plants, vines and herbaceous weeds in site preparation and release of various conifers. OUST® EXTRA can be tank mixed with other herbicides registered for use in conifer plantations and non-crop sites; when tank mixing, use the most restrictive limitations from the labeling of both products.

Herbaceous weed are controlled by both preemergence and postemergence activity. The best results on undesirable hardwoods and vines are obtained with a foliar spray between full leaf expansion in the spring and normal defoliation in the fall. The best results are obtained when the application is made before or during the early stages of weed growth before weeds develop an established root system. Moisture is required to move OUST® EXTRA into the root zone of weeds for preemergence control.

This product may be applied on conifer 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 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.

A drift control agent may be used at the manufacturer's recommended rate in the application of OUST® EXTRA.

OUST® EXTRA is noncorrosive, nonflammable, nonvolatile and does not freeze.

For best postemergence results, apply OUST® EXTRA to young, actively growing weeds. The use rate depends upon the weed species, weed size at application, and soil texture. 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

Use a high rate on established plants and on fine-textured soils and a lower rate on smaller weeds and coarse-textured soils.

OUST® EXTRA contains sulfometuron methyl. When applied alone or in combination with other products containing sulfometuron methyl, do not apply more than 6 ounces of active ingredient per acre per year.

OUST® EXTRA contains metsulfuron methyl. When applied alone or in combination with other products containing metsulfuron methyl, do not apply more than 2.4 ounces of active ingredient per acre per year.

## ENVIRONMENTAL CONDITIONS AND BIOLOGICAL ACTIVITY

When applied as a spray, OUST® EXTRA is absorbed by both the roots and foliage of plants, rapidly inhibiting the growth of susceptible weeds. When applied on dry fertilizer, OUST® EXTRA is absorbed primarily by the roots. Two to 3 weeks after application to weeds, leaf growth slows, and the growing points turn reddish-purple. Within 4 to 6 weeks of application, leaf veins and leaves become discolored, and the growing points subsequently die.

Warm, moist conditions following application accelerate the herbicidal activity of OUST® EXTRA; cold, dry conditions delay the herbicidal activity. In addition, undesirable hardwoods, vines and weeds hardened-off by drought stress are less susceptible to OUST® EXTRA. Moisture is needed to move OUST® EXTRA into the soil for preemergence weed control.

## 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 MIXTURES

DuPont™ OUST® EXTRA may be tank mixed with other herbicides and/or adjuvants registered for use in conifer plantations, non-crop sites and unimproved turf.

Refer to the tank mixture partner label for any additional use instructions or restrictions.

## DIRECTIONS FOR USE

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

OUST® EXTRA should be used only in accordance with recommendations on this label or in DuPont supplemental labeling.

DuPont will not be responsible for losses or damages resulting from the use of this product in any manner not specifically recommended by DuPont. User assumes all risks associated with such nonrecommended use.

Do not apply more than 10 2/3 ounces per acre per year.

Do not use on food or feed crops.

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.

## 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.

Chemical resistant gloves made of any waterproof material, such as, polyethylene or polyvinylchloride.

Shoes plus socks.

## CONIFER PLANTATIONS

### APPLICATION INFORMATION

When applied as a spray, OUST® EXTRA is recommended to control certain undesirable woody plants, vines and many broadleaf weeds and grasses in conifer plantation sites. Apply sprays by ground equipment or by helicopter. Apply impregnated fertilizer by ground equipment or by air (helicopter or fixed wing aircraft) to control broadleaf weeds and grasses.

When applied as a spray, OUST® EXTRA controls woody plants and vines by postemergent foliar activity. The best results are obtained with a foliar spray between full leaf expansion in the spring and normal defoliation in the fall.

OUST® EXTRA may be tank mixed with other herbicides registered for use in conifer plantations; when tank mixing use the most restrictive limitations from the labels of both products.

### APPLICATION TIMING

To control broadleaf weeds and grasses, apply OUST® EXTRA sprays before herbaceous weeds emerge or shortly thereafter. Apply impregnated fertilizer before weeds emerge.

### APPLICATION RATES

Apply OUST® EXTRA at the rates indicated by conifer species. Use a lower rate on coarse-textured soils (i.e., loamy sands, sandy loams) and a higher rate on fine-textured soils (i.e. sandy clay loams and silty clay loams).

### WEEDS CONTROLLED

OUST® EXTRA effectively controls or suppresses the weeds and vines listed under the "Weeds Controlled" in the Non-Crop section of this label when applied at the rates specified.

## CONIFER SITE PREPARATION

### APPLICATION BEFORE TRANSPLANTING

Make all applications before transplanting to control specified hardwoods, vines, broadleaf weeds and grasses. To improve control of targeted pests, add a surfactant at the rate specified on the manufacturer's label or as limited by the companion product (tank mixtures) label.

### USE RATES FOR SELECTED SPECIES

#### USE RATES BEFORE TRANSPLANTING CONIFERS

Species	Rate ounces/acre	When to Transplant into Treated Areas
Loblolly Pine, Longleaf Pine	3 to 4	Planting season following application.
Slash Pine	3	Planting season following application.
Black Spruce	2 2/3 to 5 1/3	Not less than 13 months following application.
Red Pine	1 1/3 to 2 2/3	The following spring or summer but not less than 3 months after application. Areas receiving 2/3 to 1 1/3 oz/acre may be transplanted in a min. of 30 days following application.
Douglas Fir	2 2/3 to 5 1/3	Planting season following application.
Sitka Spruce	2 2/3 to 5 1/3	Planting season following application.
Western Hemlock	2 2/3 to 5 1/3	Planting season following application.
Ponderosa Pine	2 2/3 to 5 1/3	Arid regions: Apply in fall and plant the next spring. West of Cascades: Planting season following application.
Western Red Cedar	2.0 to 3.0	Planting season following application.
Grand Fir	2.0 to 3.0	Planting season following application.

Other species of conifers may be planted providing the user has experience indicating acceptable tolerance to DuPont™ OUST® EXTRA. Without prior experience, it is recommended that small area plantings be tested for tolerance to OUST® EXTRA before large scale plantings are made. The user accepts all responsibility for injury on any conifer species not listed above.

### TANK MIXTURES South/Southeast US

OUST® EXTRA may be tank mixed with site preparation treatments applied in the late summer to broaden the spectrum of undesirable hardwoods controlled and provide herbaceous weed control in the year following transplanting. The tank mixture rates recommended below are for the specific brush species listed in each section or in the tank mixture partner label.

#### GLYPHOSATE

Tank mix 4 to 8 ounces of OUST® EXTRA with 2 to 10 pounds of active ingredient (isopropylamine salt) of glyphosate per acre. Refer to the glyphosate product container for a list of species controlled.

#### IMAZAPYR

Tank mix 4 to 8 ounces of OUST® EXTRA with 5 to 12 ounces of active ingredient (isopropylamine salt) of imazapyr per acre. This tank mixture controls:

Cherry	Oak, water
Dogwood	Persimmon
Elms	Sassafras
Hickory*	Sweetgum
Oak, red	

#### GLYPHOSATE + IMAZAPYR

Mix 3 to 4 ounces of OUST® EXTRA with 8 to 32 ounces of active ingredient (isopropylamine salt) of glyphosate plus 5 to 6 ounces of active ingredient (isopropylamine salt) of imazapyr per acre. This tank mixture controls:

Cherry	Oak, water
Dogwood	Persimmon
Elms	Sassafras
Hickory*	Sweetgum
Oak, red	

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

#### DUPONT™ VELPAR® DF, VELPAR® L OR VELPAR® ULW

Tank mix 4 to 8 ounces of OUST® EXTRA per acre with the rates recommended on the VELPAR® label for various soil textures. Refer to the VELPAR® product label for a list of species controlled.

#### IMPROVED BRUSH CONTROL

Following a spring VELPAR® ULW application, a tank mixture of OUST® EXTRA at 4 ounces per acre plus a minimum of 2.5 ounces of active ingredient imazapyr (isopropylamine salt) per acre will provide improved brush control.

These brush species include but are not limited to:

American beautyberry	<i>Callicarpa americana</i>
Southern dewberry	<i>Rubus spp</i>
Huckleberry	<i>Vaccinium spp.</i>

Application should be made in the summer or fall following a spring application of VELPAR® ULW. For best results make the application after brush species have completely defoliated twice following the VELPAR® ULW application and refoilation of target brush species is evident.

OUST® EXTRA applied at this time will provide herbaceous weed control into the early growing season of the year following application. This treatment also targets brush species remaining after the spring VELPAR® ULW application.

Loblolly, slash, and longleaf pine may be transplanted the planting season following application.

Where burning is desired, burn only after adequate rainfall has occurred to move OUST® EXTRA into the soil. Soil disturbance from bedding or plowing may reduce spring herbaceous weed control.

## CONIFER RELEASE APPLICATION AFTER TRANSPLANTING

Apply DuPont™ OUST® EXTRA after transplanting to control certain species of hardwoods, broadleaf weeds and grasses as listed in the Weeds Controlled list in the Non-Crop section of this label.

### USE RATES FOR SELECTED SPECIES

#### Use Rates After Transplanting Conifers

Species	Rate (ounces/acre)
Loblolly Pine	2 2/3 to 4
Slash Pine	2 2/3 to 3

### TANK MIXTURES

#### HERBACEOUS WEED CONTROL

For loblolly pines, apply OUST® EXTRA at 2 to 4 ounces per acre plus imazapyr (4 pound active per gallon) at 4 to 6 fluid ounces per acre.

For slash pines, apply OUST® EXTRA at 2 ounces per acre plus imazapyr at 4 fluid ounces per acre.

This tank mixture controls:

Common ragweed	Late boneset
Dogfennel	Panicgrass
Fireweed	Pokeweed

In addition to the herbaceous weeds listed, this tank mixture will aid in the suppression of perennial grasses, such as, bermudagrass and johnsongrass.

#### UNDESIRABLE HARDWOOD CONTROL

Apply 4 ounces of OUST® EXTRA with 8 to 16 fluid ounces of imazapyr (4 pound active per gallon) per acre to control herbaceous weeds, grasses and undesirable hardwoods. 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, broadcast release treatments may be made late in the growing season.

For loblolly pine, a registered conifer release surfactant may be added at the rate recommended on the surfactant label.

For slash pine, over the top broadcast release treatments must be made after mid-August and only in stands 2 to 5 years old. For over the top applications to slash pine do not add a surfactant. For light (sandy) soils do not exceed 12 fluid ounces of imazapyr (4 pound active per gallon) per acre.

This tank mixture controls:

Ash	Myrtle dahoon
Black gum	Oak, red
Blackberry*	Oak, white
Cherry	Oak, water
Dogwood*	Persimmon*
Elms*	Red maple*
Hawthorn	Sassafrass
Hickories*	Sweetgum
Honeysuckle	Vaccinium
Hophornbeam	

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

## SPECIFIC WEED PROBLEMS SITE PREPARATION OR AFTER PLANTING KUDZU

OUST® EXTRA applied at 8 ounces per acre is recommended as part of a kudzu abatement program. Retreatment of any re-sprouting kudzu crowns following the initial treatment is necessary to fully control kudzu. Make applications to kudzu after leaves are fully mature and the plant has begun to bloom. Applications may continue until first frost. Apply OUST® EXTRA as a broadcast treatment for the initial application. Use spot-spray or broadcast follow-up applications as needed for thorough coverage. Thoroughly treat foliage and stems (spray-to-wet) without excess runoff. For handgun applications use a minimum of 100 gallons per acre. Boom or boom-less sprayer applications made by ground or air (helicopter only) equipment should use a minimum of 30 gallons per acre per application pass. Double pass applications from different directions can improve spray coverage. Prior to planting use a non-ionic surfactant (90% active ingredient) at the rate of 1 quart per 100 gallons of spray solution (0.25% v/v). After planting use a crop oil concentrate at the rate of 1 quart per 100 gallons of spray solution.

### FERTILIZER IMPREGNATION

Dry bulk fertilizer may be impregnated or coated with OUST® EXTRA for application in the establishment of conifer plantations.

#### IMPREGNATION

To impregnate the fertilizer, use a system consisting of a conveyor or closed drum used to blend dry bulk fertilizer. Some fertilizers such as potassium nitrate, sodium nitrate and triple super phosphate are not compatible with OUST® EXTRA. Diammonium phosphate, potassium chloride, 16-16-16 and 24-4-4 have been used successfully. Do not use OUST® EXTRA on limestone.

If fertilizer materials are excessively dusty, use a suitable additive to reduce dust prior to impregnation. Dusty fertilizer may result in poor distribution and excessive risk of drift during application. The dry fertilizer must be properly impregnated and uniformly applied to avoid potential tree injury or mortality and poor weed control.

Consult the Application Rates section of this label for the appropriate rate of OUST® EXTRA to be used per acre. Apply this amount of OUST® EXTRA to the volume of fertilizer to be applied per acre. To impregnate dry bulk fertilizer, mix the amount of OUST® EXTRA as prescribed above in a sufficient quantity of water to uniformly coat the desired amount of fertilizer. Suspensions of OUST® EXTRA will require thorough agitation. Direct the spray nozzles to deliver a fine spray of the mixture toward the fertilizer for uniform coverage. The use of a colorant may be beneficial to visually determine the uniformity of impregnation.

Impregnation of OUST® EXTRA to dry bulk fertilizer may vary. If absorption of the impregnating spray by the fertilizer is not adequate, the use of an absorptive powder or additive,

such as Microcel E (Johns Manville Product Company) or HiSil - 233 (Pittsburg Plate Glass) may be required to produce a dry, free-flowing mixture.

Apply impregnated fertilizer as soon as possible after impregnation for optimum performance. Impregnated fertilizer may become lumpy and difficult to apply following storage.

Uniform and precise application of the fertilizer impregnated with DuPont™ OUST® EXTRA is essential for satisfactory weed control and to minimize tree injury.

Follow the instructions for spray tank cleanout on this label for cleaning the equipment used to impregnate, transport, and apply the fertilizer.

Low rates of OUST® EXTRA can kill or severely injure most crops. Following a OUST® EXTRA application, the use of spray equipment to apply other pesticides to crops on which OUST® EXTRA or its active ingredients are 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.

### **BROADCAST APPLICATION**

Applications may be made by ground or air (helicopter or fixed wing aircraft). Accurate calibration of the application equipment is essential for uniform distribution on the soil surface. Overlaps or skips between adjoining swaths or non-uniform distribution of impregnated fertilizer within the swath will deliver poor results and may result in tree injury or mortality.

### **IMPORTANT PRECAUTIONS CONIFER PLANTATIONS ONLY**

- Applications of OUST® EXTRA made to conifers that are suffering from loss of vigor caused by insects, diseases, drought, winter damage, animal damage, excessive soil moisture, planting shock, previous agricultural practices, or other stresses, may injure or kill the trees.
- Applications of OUST® EXTRA made after transplanting should only be made after adequate rainfall has closed the planting slit and settled the soil around the roots following transplanting.
- Do not apply OUST® EXTRA to conifers grown for Christmas trees or ornamentals.
- Do not use a surfactant with OUST® EXTRA for herbaceous weed control when making over the top applications to conifer seedlings in the spring after transplanting. A surfactant specifically registered for conifer release may be used when targeting specific weed problems, such as, undesirable hardwoods. Refer to the surfactant label for recommended use rates.
- OUST® EXTRA applications may result in damage and mortality to other species of trees when they are present on sites with those listed in the preceding recommendations for conifer plantations uses.

## **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.

Use on noncrop sites and turf (unimproved) are not within the scope of the Worker Protection Standard.

Do not enter or allow others to enter the treated area until sprays have dried.

## **NON-CROP SITES**

### **APPLICATION INFORMATION**

OUST® EXTRA is recommended for general weed and brush control as follows: uncultivated nonagricultural areas (such as, airports, highway, railroad and utility right-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).

OUST® EXTRA is not recommended for use on recreation areas or for direct application to paved areas (surfaces).

Apply OUST® EXTRA as a preemergence or early postemergence spray before or during the rainy season when weeds are actively germinating or growing.

Apply by ground or helicopter.

Combination with other herbicides broadens the spectrum of weeds controlled. In addition, total vegetation control can be achieved with higher rates of OUST® EXTRA plus residual-type companion herbicides. To improve the control of weeds, add surfactant at the rate of 0.25% by volume or at the rate specified on the manufacturer's label.

Apply OUST® EXTRA at the rates indicated by weed type. When applied at lower rates, OUST® EXTRA provides short term control of weeds listed; when applied at higher rates, weed control is extended.

## WEEDS CONTROLLED

DuPont™ OUST® EXTRA effectively controls the following broadleaf weeds and grasses when applied at the rates shown in non-crop sites:

### OUST® EXTRA—2 2/3 TO 3 OUNCES PER ACRE

Annual bluegrass	Lambsquarters
Annual sowthistle	Little barley
Aster	Marestail/horseweed*
Bahiagrass	Maximillion sunflower
Barnyard grass	Medusahead
Beackchervil (bur, woodland)	Miners lettuce
Bearded sprangletop	Mouseear chickweed
Beebalm	Oxeye daisy
Bitter sneezeweed	Pennsylvania smartweed
Black mustard	Pepperweed
Blackeyed-susan	Plains coreopsis
Blue mustard	Plantain
Bouncingbet	Poison hemlock
Bur buttercup	Prickly coontail
Bur clover	Red brome
Carolina geranium	Red fescue
Chicory	Redroot pigweed
Clover	Redstem filaree
Cocklebur	Reed Canarygrass
Common chickweed	Ripgut brome
Common groundsel	Rough fleabane
Common mallow	Rye
Common mullein	Salsify
Common pokeweed	Sandbur (southern, field)
Common purslane	Seashore saltgrass
Common ragweed	Seaside heliotrope
Common speedwell	Shepherd's purse
Common tansy	Signalgrass
Common vetch	Silky crazyweed
Common yarrow	Smallseed falseflax
Conical catchfly	Smooth pigweed
Corn cockle	Snowberry, western
Cow cockle	Spreading orach
Crown vetch	Sweet clover
Dandelion	Tansy ragwort
Downy brome (cheat)	Tansymustard
False chamomile	Treacle mustard
Fescue	Tumble mustard
Fiddleneck tarweed	Tumble pigweed
Field pennycress	Western ragweed
Flixweed	Wheat
Florida pusley	Whiteweed
Foxtail barley	Whitestem filaree
Foxtail fescue	Wild barley
Goldenrod	Wild carrot
Green foxtail	Wild garlic
Hairy vetch	Wild lettuce
Hop clover	Wild mustard
Houndstongue	Wild oat
Italian ryegrass	Wood sorrel
Japanese stiltgrass	Wooly croton
Johnsongrass	Yankeweed
Jointed goatgrass	Yellow foxtail

\*Certain biotypes of marestail/horseweed are less sensitive to OUST® EXTRA and may be controlled by tank mixes with herbicides with a different mode of action.

### OUST® EXTRA—3 TO 4 OUNCES PER ACRE

Black henbane	Honeysuckle
Blackberry	Multiflora rose (wild roses)
Broom snakeweed	Musk thistle
Buckhorn plantain	Panicums (annual)
Bull thistle	Plumeless thistle
Common crupina	Poorjoe
Common sunflower	Prostrate knotweed
Crabgrass	Rosering gaillardia
Curly dock	Scotch thistle
Dewberry	Seaside arrowgrass
Dogfennel	Sericea lespedeza
Dyer's woad	Snowberry
Fireweed	St. Johnswort
Gorse	Teasel
Gumweed	White snakeroot
Halogeton	Whiteweed, hairy
Henbit	Wild caraway

### OUST® EXTRA—4 TO 5 1/3 OUNCES PER ACRE

Crimson clover	Perennial pepperweed
Dogfennel	Purple starthistle
Giant foxtail	Rush
Giant ragweed	Yellow nutsedge
Little mallow	Yellow rocket
Palmer pigweed	

**Note:** Use the higher level of recommended rate ranges under the following conditions:

- heavy weed growth
- soils containing more than 2-1/2% organic matter
- high soil moisture areas, such as along road edges or railroad shoulders

## SPECIFIC WEED PROBLEMS

### KOCHIA, RUSSIAN THISTLE, AND PRICKLY LETTUCE

Since biotypes of kochia, marestail, Russian thistle, and prickly lettuce are known to be resistant to OUST® EXTRA, tank mixture combinations with herbicides having different modes of action, such as DuPont™ KARMEX® XP, DuPont™ HYVAR® X or DuPont™ KROVAR® I DF, must be used. In areas where resistance is known to exist, these weeds should be treated postemergence with other herbicides registered for their control, such as 2,4-D or dicamba. Do not allow kochia, Russian thistle, or prickly lettuce to form mature seed.

### KUDZU

OUST® EXTRA applied at 8 ounces per acre is recommended as part of a kudzu abatement program. Retreatment of any re-sprouting kudzu crowns following the initial treatment is necessary to fully control kudzu. Make applications to kudzu after leaves are fully mature and the plant has begun to bloom. Applications may continue until first frost. Apply OUST® EXTRA as a broadcast treatment for the initial application. Use spot-spray or broadcast follow-up applications as needed for thorough coverage. Thoroughly treat foliage and stems (spray-to-wet) without excess runoff. For handgun applications use a minimum of 100 gallons per acre. Boom or boom-less sprayer applications made by ground or air (helicopter only) equipment should use a

minimum of 30 gallons per acre per application pass. Double pass applications from different directions can improve spray coverage. Use a non-ionic surfactant (90% active ingredient) or crop oil concentrate at the rate of 1 quart per 100 gallons of spray solution (0.25% v/v).

### TANK MIX COMBINATIONS

To improve preemergence to early postemergence control of weeds and grasses, add 2 2/3 to 5 1/3 ounces of DuPont™ OUST® EXTRA per acre to the recommended rates of the following herbicides: DuPont™ HYVAR® X herbicide, DuPont™ KARMEX® XP herbicide, DuPont™ KROVAR® I DF herbicide, DuPont™ VELPAR® L herbicide, VELPAR® DF herbicide, DuPont™ TELAR® herbicide, glyphosate, dicamba, or 2,4-D.

Apply OUST® EXTRA plus a companion herbicide at the rates and timing as shown on package labels for target weeds. For application method and other use specifications, use the most restrictive directions for the intended combination.

Do not tank mix OUST® EXTRA with HYVAR® X-L herbicide.

## TURF (UNIMPROVED ONLY)

### APPLICATION INFORMATION

OUST® EXTRA is recommended to control weeds on unimproved turf, on roadsides, or on other non-crop sites where the turf is well established as a ground cover.

Applications may temporarily suppress grass growth and inhibit seedhead formation (chemical mowing).

### BERMUDAGRASS RELEASE

#### APPLICATION TIMING

Apply OUST® EXTRA at 1/2 to 2 ounces per acre after bermudagrass has broken dormancy and is well established, usually 30 days after initial spring flush. If additional applications are necessary, apply OUST® EXTRA again during late spring to early summer. On established weeds, apply OUST® EXTRA 1 to 2 weeks after mowing for the best results.

OUST® EXTRA may also be applied in late fall or early winter. Use the lower rates on small seedling weeds and a higher rate on larger weeds.

### TANK MIX COMBINATIONS—BERMUDAGRASS (SOUTH ONLY)

Apply 1 to 2 ounces OUST® EXTRA per acre as a tank mix with 3 to 4 pounds active ingredient of MSMA per acre on well established bermudagrass during the summer. Refer to the MSMA package label for a list of additional weeds that may be controlled. Two or more sequential applications of MSMA alone may be necessary to maintain weed control.

### CENTIPEDEGRASS RELEASE

#### APPLICATION TIMING

Apply 1/2 to 2 ounces per acre of OUST® EXTRA in the fall or early winter, or in the early summer following green-up of the centipede. Refer to the listing of Weeds Controlled in this

section for use rates and species controlled by OUST® EXTRA.

## SMOOTH BROME AND CRESTED WHEATGRASS RELEASE AND SUPPRESSION

### APPLICATION TIMING

Apply 1/2 to 1 1/2 ounce per acre of OUST® EXTRA per acre to turf after green-up and before seedheads emerge (boot stage). Ensure that desirable grasses are well-established at application, as premature treatment may result in top kill and stand reduction of desirable turf. Make only one application per year.

### WEEDS CONTROLLED

OUST® EXTRA may be used to control the following weeds in turf (unimproved only) when applied at the use rates shown.

#### OUST® EXTRA—1/2 TO 1 OUNCE PER ACRE

Asters (except heath aster)	Field pennycress
Buttercups	Fleabanes
Common broomweed	Goldenrod
Common chickory	Little barley
Common chickweed	Mouseear chickweed
Common sunflower	Redroot pigweed
Common vetch	Sweetclover
Common yarrow	Tansymustard
Curly dock	White clover
False chamomile	Wild garlic

#### OUST® EXTRA—1 TO 2 OUNCES PER ACRE

Bitter sneezeweed	Hopclover
Buckhorn plantain	Japanese stiltgrass
Carolina geranium	Jointed goatgrass
Cheat (Downy brome)	Medusahead
Common dandelion	Musk thistle
Common mullein	Prairie coneflower
Common ragweed	Redstem filaree
Crimson clover	Tumble mustard
Eveningprimrose	Wild carrot
Foxtail barley	Wild oats
Giant ragweed	Wild parsnip
Hairy vetch	

## IMPORTANT PRECAUTIONS UNIMPROVED TURF

- Excessive injury to turf may result if a surfactant is used with OUST® EXTRA applications made to actively growing turf. The user assumes all responsibility for turf injury if a surfactant is used with OUST® EXTRA treatments applied to actively growing turf.
- OUST® EXTRA may temporarily discolor or cause top kill of turf grasses. Applications made while turf is dormant may delay green-up in the spring.
- Annual retreatments may reduce vigor, particularly at the higher recommended rates, where bahiagrass, crested wheatgrass and smooth brome are grown.
- OUST® EXTRA application on turf that is under stress from drought, insects, disease, cold temperatures or late spring frost, may result in injury.

## GRASS REPLANT INTERVALS

Following a treatment with DuPont™ OUST® EXTRA at use rates up to 2 ounces per acre the following grasses may be replanted:

Alta fescue	Smooth brome
Meadow foxtail	Sheep fescue
Orchardgrass	Western wheatgrass

The intervals recommended are for soils with a pH of less than 7.5. Soils having a pH greater than 7.5 will require longer intervals. The recommended intervals are for applications made in the spring. Because OUST® EXTRA degradation is slowed by cold or frozen soils, applications made in the fall should consider the intervals as beginning in the spring following treatment.

Testing has indicated that there is considerable variation in response among species of grasses when seeded into areas treated with OUST® EXTRA. If species other than those listed above are to be planted into areas treated with OUST® EXTRA a field bioassay should be performed, or previous experience may be used to determine the feasibility of replanting treated areas.

## IMPORTANT PRECAUTIONS FOR CONIFER PLANTATIONS, NON-CROP SITES AND TURF

Injury to or loss of desirable trees or other plants may result from failure to observe the following:

- If equipment is drained or flushed 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.
- 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 OUST® EXTRA may injure or kill most crops. Injury may be more severe when the crops are irrigated. Do not apply OUST® EXTRA when these conditions are identified and powdery, dry soil or light or sandy soil are known to be prevalent in the area to be 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, 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 OUST® EXTRA. Do not treat frozen soil. Treated soil should be left undisturbed to reduce the potential for OUST® EXTRA movement by soil erosion due to wind or water.

Do not use on lawns, walks, driveways, tennis courts, or similar areas.

Keep from contact with fertilizers, insecticides, fungicides, and seeds.

Do not apply in or on irrigation ditches or canals including their outer banks.

Do not apply through any type of irrigation system.

If non-crop or conifer plantation sites treated with OUST® EXTRA are to be converted to a food, feed, or fiber agricultural crop, or to a horticultural crop, do not plant the treated sites for at least one year after the OUST® EXTRA application. A field bioassay must then be completed before planting to crops. To conduct a field bioassay, grow to maturity test strips of the crop(s) you plan to grow the following year. The test strips should cross the entire field including knolls and low areas. Crop response to the bioassay will indicate whether or not to plant the crop(s) grown in the test strips. In the case of suspected off-site movement of OUST® EXTRA to cropland, soil samples should be quantitatively analyzed for OUST® EXTRA or any other herbicide which could be having an adverse effect on the crop, in addition to conducting the above-described bioassay.

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.

## ADDITIONAL USE INSTRUCTIONS FOR CONIFER PLANTATIONS, NON-CROP SITES AND TURF

### SPRAY EQUIPMENT

Low rates of OUST® EXTRA can kill or severely injure most crops. Following a OUST® EXTRA application, the use of spray equipment to apply other pesticides to crops on which OUST® EXTRA or its active ingredients are 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.

### APPLICATION

#### GROUND

Use a sufficient volume of water to ensure thorough coverage when applying OUST® EXTRA as a broadcast or directed spray. Select a spray volume and delivery system that will ensure thorough coverage and a uniform spray pattern. Be sure the sprayer is calibrated before use. Avoid overlapping and shut off spray booms while starting, turning, slowing, or stopping to avoid injury to desired species.

#### AIR

Select a spray volume and delivery system that will ensure thorough coverage and a uniform spray pattern. Be sure the sprayer is calibrated. Avoid overlapping and shut off spray booms while starting, turning or slowing to avoid injury to desired species.

## MIXING INSTRUCTIONS

1. Fill spray tank 1/2 full of water.
2. With the agitator running, add the proper amount of DuPont™ OUST® EXTRA.
3. If using a companion product, add the recommended amount.
4. For postemergent applications, add the proper amount of spray adjuvants.
5. Add the remaining water.
6. Agitate the spray tank thoroughly.

OUST® EXTRA spray preparations are stable if they are pH neutral or alkaline and stored at or below 100° F.

## SPRAYER CLEANUP

Thoroughly clean all mixing and spray equipment following applications of OUST® EXTRA as follows:

1. Drain tank; thoroughly rinse spray tanks, boom, and hoses with clean water.
2. Fill the tank with clean water and 1 gal of household ammonia (contains 3% active) for every 100 gal 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 min. Flush the hoses, boom, and nozzles again with the cleaning solution, and then drain the tank. Equivalent amounts of an alternate-strength ammonia solution or a commercial cleaner can be used in the cleanout procedure. If a commercial cleaner is used, carefully read and follow the individual cleaner instructions.
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 directions for rinsate disposal on the label.

### Notes:

1. Do not use chlorine bleach in combination with ammonia when cleaning spray equipment. Do not clean spray equipment in an enclosed area.
2. Steam-cleaning aerial spray tanks is recommended before performing the above cleanout procedure to facilitate the removal of any caked deposits.
3. When OUST® EXTRA is tank mixed with other pesticides, all required cleanout procedures should be examined and the most rigorous procedure should be followed.

## 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 these factors when making application decisions.

**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 **Surface 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

- **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 (aircraft)** - The boom length should not exceed 3/4 of the wing length, using shorter booms decreases drift potential. For helicopters use a boom length and position that prevents droplets from entering the rotor vortices.
- **Boom Height (aircraft)** - Application more than 10 ft 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 variable direction and 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 APPLICATIONS DURING GUSTY OR WINDLESS CONDITIONS.**

**Note:** Local terrain can influence wind patterns. Every applicator should be familiar with local wind patterns and how they effect 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.

## SURFACE TEMPERATURE INVERSIONS

Drift potential is high during a surface temperature inversion. Surface inversions restrict vertical air mixing, which causes small suspended droplets to remain close to the ground and move laterally in a concentrated cloud. Surface 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 and moves laterally in a concentrated cloud (under low wind conditions) indicates a surface 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.

## 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).

## STORAGE AND DISPOSAL

Do not contaminate water, food, or feed by storage or 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 may be disposed of on site or at an approved waste disposal facility.

**Container Handling: For plastic jugs and transfer containers:** 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 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 paper, plastic and/or fiber flexible bags and/or sacks:** Nonrefillable container. Do not reuse or refill this container. Completely empty bag into application equipment. Then offer for recycling if available or dispose of empty bag or sack in a sanitary landfill, or by incineration. Do not burn, unless allowed by state and local ordinances. **For fiber drums with liners:** Nonrefillable container. Do not reuse or refill this container. Completely empty liner by shaking and tapping sides and bottom to loosen clinging particles. Empty residue into application equipment Then offer 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. **For plastic refillable drums:** Refillable container. Refill this container with sulfometuron methyl and metsulfuron methyl 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. 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.

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# THE COMMONWEALTH OF MASSACHUSETTS

EXECUTIVE OFFICE OF ENERGY AND ENVIRONMENTAL AFFAIRS



## Department of Agricultural Resources

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### 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 (15). 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 half-lives 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 LD50s of 4,320 and 5,600 mg/kg in male and female rats (15,4). The oral LD50s of the two major glyphosate products Rodeo and Roundup are 5,000 and 5,400 mg/kg in the rat (15).

A dermal LD50 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 LC50s 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 EC50 for midge larvae of 55 mg/L to a 96 hr TL50 for the fiddler crab of 934 mg/L (15).

Roundup: Acute toxicity ranges from a 48 hr EC50 for *Daphnia* of 3 mg/L to a 95 hr LC50 for catfish 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 LC50s 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 LC50 for the fathead minnow of 2.3 mg/L to a 96 hr TL50 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 (LC50s greater than 10 mg/L), whereas Roundup is considered to be toxic to some species of fish, having LC50s 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 LD50s 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

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### 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-1,3,5-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 mobile 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 CrI:CD Rats. In the first study the LD50 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 *in vivo* bone marrow cytogenic assay in rats (doses were 500, 1,000, and 5,000 mg/kg 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). The 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 (F1) matings was low in both control and treated groups with no apparent cause. There was a decrease in pup size in the F1a but not the F1b, 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 F1a and then the F1b. The F1b rats were then fed the appropriate 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 LD50 is greater than 2150 mg/kg in the duck. Two, 8 day dietary studies have been done. The 8 day LC50 is greater than 5620 ppm in both the duck and the quail (9).

## Invertebrates

The 48 hour LC50 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 LC50 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



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### SULFOMETURON 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 NAME(S): Oust

CHEMICAL NAME : N-[4,6-dimethylpyrimidin-2-yl) amino-carbonyl -2-methoxycarbonylbenzenesulfonamide

CAS NO: 74222-97-2

#### GENERAL INFORMATION

Sulfometuron methyl, the active ingredient in the herbicide Oust, is a member of the group of sulfonylurea herbicides. Sulfometuron Methyl is a broad-spectrum selective weed control agent used in non-crop areas. Oust is applied pre- or post-emergence which provides control against many broad-leaf weeds and grasses through contact and residual activity. (15)

#### ENVIRONMENTAL FATE

##### Mobility

The mobility of sulfometuron methyl has been reported in literature and the database available is complete. Sulfometuron methyl is a weak acid (pKa 5.2) and consequently, adsorption coefficients were calculated for various soils at pH values of 5, 6, and 7. In a low organic matter I soil (1%) the adsorption coefficients were 2.0, 0.8 and 0.3 at the respective pH values. This study indicates that sulfometuron methyl is more strongly adsorbed to soil as the pH decreased, and as organic matter increases. (15)

Soil thin layer chromatography and adsorption coefficients were performed and calculated for four standard soils. Kd values ranged from 0.71 to 2.85 and Rf values ranged from 0.33 to 0.85 indicated a moderate mobility. In addition, soil column studies using the same four soils indicate a moderate to moderately high mobility pesticide. Koc values calculated from the soil Kd values range from 61 to 122 which is lower than the EPA guideline of 400. (101)

In a field mobility study, sulfometuron methyl was applied to soil tubes in five locations (Delaware, North Carolina, Oregon, Colorado, and Saskatchewan, Canada) at a rate of 1 lb a.i./Acre. There was no report of rainfall at these sites. Each application was made at a different time making it difficult to compare results. Samples were taken for a minimum of a year and at some for two years, and at 8 cm (3 in) intervals to 32 cm (12 inches). Results indicate that sulfometuron methyl is moderately mobile under most conditions. One surprising fact is that immediately after application, all locations had detectable residues in a layer below the top layer of soil, and in two locations (Colorado and Oregon) in the deepest layer sampled. All locations except Delaware also had detectable residues at the 24-32 cm layer at other times during the study. There are also indications that sulfometuron methyl would leach further than the deepest soil layer which was sampled. (102)

### **Persistence**

Sulfometuron methyl is degraded by microbial action, photo-decomposition and by hydrolysis at acidic pH's. The photolysis half-life on soil is between 1 to 2 weeks and in distilled water, approximately 160 hours. The hydrolysis half-life at pH 2 and 5 is 100 and 475 hours respectively. At neutral or basic pH's, sulfometuron methyl is stable to hydrolysis. (15,100, 101)

Reports indicate that the overall rate of sulfometuron methyl degradation in soil depends on pH and soil moisture content. Half-lives of one week were reported under laboratory conditions, but field studies at neutral pH revealed greater persistence. Increased soil moisture content resulted in increased degradation rates, but only approximately 10%. (15, 101)

The soil half-life is reported as four weeks with longer times in colder conditions. A review of available studies, however reveals that the shortest half-life was six weeks in Delaware. In the same study the half-life ranged from six weeks to one year in Oregon. (15, 102)

The reported half-life of four weeks is relatively short and would not be cause for concern. However, it seems evident that in most circumstances it may be significantly longer. In all cases reported in this study, the half-life was six weeks or longer and a more realistic estimate may be closer to two months. Another point discussed in the literature is the lack of any significant degradation during the cold periods of the year. Applications in the late fall could lead to longer half-lives and thereby more potential for increased leaching.

The field study discusses the faster degradation rates of sulfometuron methyl in the east as possibly attributable to the more acidic and moister soils in the east. This is certainly true and may in fact have contributed to shorter half-lives, but a point which is not discussed was the timing of the applications. The two western sites were treated in early to mid-July, whereas the western sites were treated in the fall. Saskatchewan was treated in late July, but the climate at that location is cooler and becomes much colder.

### **TOXICITY REVIEW**

Five animals per sex per group were gavaged with sulfometuron methyl suspended in corn oil at a dosage of 5,000 mg/kg. Gross pathological examination revealed slight weight increase in the lungs that were pale red with grey foci in males and similar lung effects in one female. In addition, four females had a pink thymus and one had a slight liver weight. The oral LD50 in male and female ChR-CD rats was determined to be greater than 5,000 mg/kg. (110)

The inhalation LC50 was tested in groups of five male and five female Crl:CD rats. Rats were exposed to control air or test concentrations of either 6.4 or 11 mg/L. There were no clinical or pathological differences between controls or test groups. The inhalation LC50 was greater than 5.0 mg/L (111) while sulfometuron methyl was tested at 6.4 and 11 mg/L. The EPA cutoff for LC50 concentration is 5 mg/L.

Acute skin absorption LD50 tests were performed on five male and five female New Zealand white rabbits. Doses of 2,000 mg/kg of pesticide were applied to abraded skin on the back of the rabbit. Clinical signs in males were sporadic weight loss, slight erythema 1 to 2 days after treatment and diarrhea at 11 days. Gross pathological examination showed no changes due to the test material. The dermal LD50 in rabbits was greater than 2,000

mg/kg. (112)

In a separate acute dermal LD50 test, four groups of five adult male and one group of five adult female New Zealand rabbits were used. Groups of males were dosed at the following levels: 1,500 mg/kg, 2,000 mg/kg, and 8,000 mg/kg and the females were dosed at 2,000 mg/kg. Clinical signs in all the groups of males were moderate to mild redness and sporadic weight loss. The animals in the two highest dose experienced mild swelling, the 2,000 mg/kg group showed moderate swelling while the 1,500 mg/kg group had slight swelling. Clinical signs in the females were severe to mild redness, severe to slight swelling and sporadic weight loss. There were no compound related pathological observations. There was one death in the male 2,000 mg/kg group, but it was not believed to be related to the compound. The LD50 for the acute skin absorption in rabbits was greater than 2,000 mg/kg. (116)

Eye irritation studies were performed by placing 10 mg of solid test material in the conjunctival sac of each of two albino rabbits. There were no corneal or iritic effect. However, there was redness (1 hour to 1 day; not washed eyes and mild for 1 hour unwashed eyes); swelling (1 to 4 hours unwashed eyes) and no discharge was observed. Both washed and unwashed eyes were normal within 1 to 2 days. (113)

In guinea pigs, both primary skin irritation and sensitization tests were run. Ten animals per group were exposed to 0.05 ml of either a 50% or a 5% suspension of sulfometuron methyl. The 50% suspension showed mild to no skin irritation response in 24 hours and no irritation at 48 hours. The 5% suspension reproduced no skin irritation. There was no sensitization response. (114)

The oral LD50 test was conducted with the formulation using young male and female adult Crl:CD rats, five rats per group. 5,000 mg/kg was administered by gavage in a 25% suspension in corn oil. The only clinical finding was alopecia in males. Gross pathological examination showed in both males and females slightly heavy lungs that were pale to pale red with red to dark red foci and white mottling in 1 to 3 animals. The LD50 is greater than 5,000 mg/kg. Additionally in a range finding study, no mortalities were seen in doses from up to 7,500 mg/kg. (115)

Nine male albino rabbits were tested for eye irritation studies. The right eyes were treated with 0.1 ml (61.8 mg) of test material. The left eyes served as untreated controls. Results indicated a transient localized area of slight corneal cloudiness in 2 of the 6 unwashed eyes. The eyes returned to normal in 2 to 3 days. Two of the three eyes treated and washed showed a transient localized area slight corneal cloudiness and mild conjunctivitis with no iritic effects. The washed eyes returned to normal within 3 to 4 days. This compound was considered a slight to mild irritant. (117)

Skin irritation tests were conducted on six male albino rabbits. Doses of 0.5 g of solid pesticide (moistened with saline) were applied to two intact and two abraded skin areas on each rabbit. Each rabbit serves as its own control; treated areas were compared to adjacent untreated areas. Observations and scoring were done by the method of Draize (118) and at 24 and 72 hours after exposure. The compound was not found to be a primary irritant on either intact or abraded skin of rabbits. (119)

Primary skin irritation tests were performed on ten guinea pigs. The procedure was the same as used in testing the technical sulfometuron methyl. Doses of 0.05 ml of a 50% suspension of the pesticide in dimethyl phthalate were used. The 50% suspension caused mild to no irritation in five of the animals. No irritation was caused by the 5% suspension. No sensitization response was observed. (120)

### **Subchronic and Chronic Studies (Mammalian)**

Male and female CD-1 mice were fed diets to which had been added 0, 100, 1,000, or 7,500 ppm (0, 13.3, 133, or 997 mg/kg) (a) sulfometuron methyl for 90 days. Hematological evaluations were conducted on all mice (tail cut bleeding at approximately 1, 2 and 3 months after study initiation. All mice were sacrificed and necropsied at 90 days. Organs were weighed and examined histologically. Male mice fed the diet containing 7,500 ppm pesticide showed reduced mean body weights and weight gains. Growth of the 100 and 1,000 ppm groups of males and all treated females was the same as that in the control group. No mortalities occurred. (121)

Hemolytic effects were seen as a result of dietary exposure to sulfometuron methyl in all groups. Significant increases in leukocyte count were found in the 7,500 ppm (997 mg/kg) males. There were statistically significant changes in other blood parameters that were not dose related. Mean absolute and relative liver weights were elevated in all male treatment groups. Histological examination revealed bile stasis in five of ten males in the 7,500 ppm group. In the females, a slight increase in relative liver weight and increased hepatocellular cytoplasmic granularity was observed. Decreases in both mean and relative thymus weights were observed in all treated male groups. Thymic cortical atrophy occurred in three males in the 7,500 ppm group and one male in the 100 ppm group. Because of low frequency of occurrence 7,500 and 100 ppm and absence in the 1,000 ppm group, the thymic cortical atrophy is not considered to be related to the decreased thymus weights. Based on the observed hemolytic effect, there was no NOEL from this study.

In a second mouse study, five groups of 80 males and 80 female Crl:CD-1 (1 CR)BR mice were fed diets containing one of the following concentrations of sulfometuron methyl: 0, 5, 20, 100, or 1,000 ppm (0, 0.66, 2.66, 13.3, 133 mg/kg) for 18 months. Food consumption was monitored throughout the study, mice were weighted and hematological evaluations were performed at regular intervals. At 18 months, mice were sacrificed and necropsied. Mean body weights and mean body weight gains in all treatment groups except for the 1,000 ppm female group were comparable to control groups. Sporadic changes in weight gain were observed in that group.

(a) In these discussions the assumptions made for conversion of ppm (diet) to mg/kg/D were:

**SPECIES BODYWEIGHT (kg) INTAKE ((kg)**

Rat 0.35 0.020 Mouse 0.03 0.004 Dog 10 0.4  
(133)

When data was presented as ppm the does was estimated in mg/kg and is presented in parenthesis.

Mild anemia was observed in the female 1,000 ppm group as evidenced by statistically significant decreases in erythrocyte count, hemoglobin concentration and hematocrit. There was also a significant increase in mean corpuscular volume and platelet count. While the hematological results appear to differ from those in the 90 day mouse study, the data indicate that there were several statistically significant changes in some blood parameters at the three month (90 day) sampling time which were not apparent at other sampling times. However, although reticulocyte smears were made, they were not evaluated and it cannot be ascertained that a response to a hemolytic effect actually occurred. If it did, a NOEL in this strain of mice for a hemolytic effect at 90 days in the 18 month study would be 5 ppm. There was a non-dose related but, statistically significant increase in the incidence of amyloidosis in the female 1,000 ppm groups, but no specific target organ was identified. The overall NOEL for dietary intake of sulfometuron methyl for male and female mice was 1,000 ppm (133 mg/kg) and 100 ppm (13.3 mg/kg) respectively under the conditions of this study based on body weight, body weight gain, clinical pathology and pathological findings. (124)

Groups of 16 male and 16 female CD rats were fed diets containing 0, 100, 1,000, 5,000 ppm (0, 5.7 57, 285 mg/kg) sulfometuron methyl. At 1, 2 and 3 months after the study initiation, hematological, urological and clinical chemistry evaluations were performed. At the end of the study, ten rats from each group were sacrificed and evaluated pathologically. There were no differences between treatments and controls in body weight, weight gain, food consumption and food efficiency. There were no mortalities. The only clinical sign observed was alopecia in three males in the 100 ppm group. The male 5,000 ppm treatment group showed slightly elevated mean leukocyte counts, increased mean relative number of lymphocytes and decreased mean relative number of neutrophils. Due to the effects of white blood cells in male 5,000 ppm group, the NOEL dietary concentration in this study was 1,000 ppm (56 mg/kg/D). (122)

Four groups of five male and five female New Zealand white rabbits were dermally exposed to either 1, 125, 500, or 2,000 mg/kg, six hours per day for 21 consecutive days. After the exposure period, three male and three female rabbits per group were sacrificed for pathological evaluation. The remaining two males and two females from each group were sacrificed and evaluated pathologically following a two week recovery period. Clinical signs observed in rabbits from all test groups including controls were sporadic weight loss and diarrhea. Histopathological and clinical pathological examination showed no compound-related effects. One rabbit died after the eighth dose from

causes not related to the test substance. (123)

Groups of 80 male and 80 female Crl:CD (SD) BR rats were fed diets containing 0, 50, 500 or 5,000 ppm (0, .8, 28.5, or 285 mg/kg) sulfometuron methyl for approximately two years. Hematological, clinical chemistry and urological testing was conducted at 3, 6, 9, 12, 18, and 24 months. After 12 months, ten male and ten female rats per group were randomly selected, sacrificed and pathologically examined. At 24 months, all surviving rats were sacrificed, necropsied, and examined pathologically.

In the female 5,000 ppm group, food consumption throughout the study was slightly depressed and overall mean weight gain during the first year and mean body weights during the second year were significantly depressed. There were no abnormalities in appearance or behavior observed during the study.

Decreased erythrocyte count and hematocrit in the male 500 and 5,000 ppm groups were observed at the 24 month clinical evaluation suggesting a minimal dose-related hemolytic effect. There were no other compound related hematological, clinical chemistry or urological abnormalities observed. Mean absolute brain weights were significantly lower in the male 5,000 ppm group at both one and two sacrifice times. However, no abnormal gross or histological observations were noted. Mean relative and absolute thymus weight of the 500 and 5,000 ppm males was decreased compared to controls at terminal sacrifice. Mean testes weights of rats in the 500 and 5,000 ppm groups were less than controls.

Histological examinations revealed dose-dependent increases in the incidence of bile duct hyperplasia and fibrosis in the female 500 and 5,000 ppm groups at the two year sacrifice. Severity of the lesions were minimal to mild, suggesting a slightly toxic effect of sulfometuron methyl on the livers of these female rats.

The NOEL in this strain of rat under these study conditions was 50 ppm (2.8 mg/kg/D). (125)

### **Oncogenicity Studies**

Oncogenic endpoints were evaluated in the chronic mouse and rat studies for sulfometuron methyl. Cr1: CD-1 (1 CR) BR mice received 0, 5, 20, 100, or 1,000 ppm sulfometuron in the diet for 18 months. There were no compound related increases in tumor incidence (124). CRL:CD (SD) BR rats received 0, 50, 500, or 5,000 ppm sulfometuron in the diet for two years. There was no increase in frequency of occurrence of tumors in these rats (125). Sulfometuron methyl is not carcinogenic in rats and mice under these conditions.

### **Mutagenicity Testing**

The Ames Salmonella/microsome assay tested the ability of Sulfometuron methyl to revert four strains of Salmonella typhimurium from histidine dependence to histidine independence. The assay was performed both with and without a rat liver homogenate (S-9) activation system. The test substance was found not to be mutagenic for these strains of bacteria under the test conditions at doses from 2.5 to 1,000 mg/plate. (129)

Frequency of chromosome aberrations was tested in CHO cells both with and without metabolic activation (S-9). The doses tested ranged from 300 ug/ml to 10 ng/ml in a half log series. No increase in chromosome aberrations was observed in culture exposed under the test conditions to these concentrations of the test material. (130)

The CHO cell line was used to test mutations in the gene coding for the enzyme hypoxanthineguanine phosphoribosyl transferase (HGPRT) both in the presence and absence of an activation (S-9) system. Concentration of the test material ranged from 0 to .1 mM. No mutagenic activity was detected. (131)

The ability of sulfometuron methyl to induce unscheduled DNA (UDS) synthesis in freshly isolated rat hepatocytes was tested. Concentrations of test material ranged from  $1 \times 10^{-5}$  to 1.0 mM in half log increments. Under these test conditions, no induction of UDS was detected. (132)

### **Developmental Studies**

Groups of 17 female artificially inseminated rabbits were gavaged with test material on days 6 to 18 of gestation. Dosage levels were 0, 30, 100, and 300 mg/kg suspended in 0.5% methylcellulose in water. Animals were sacrificed on day 29 of gestation and fetuses were removed by cesarean section. No treatment-related effects were observed in the maternal clinical observations or gross pathology. There were no statistically significant differences between control and treatment groups in any of the other parameters measured (maternal body weight changes, clinical observations, survival, gross pathology pregnancy rates, numbers and percentages of corpora lutea, implantations, resorptions in each maternal animal, fetal sex, viability and development). Under the conditions of this study, sulfometuron methyl was not considered to be teratogenic in New Zealand white rabbits. (127)

A teratology study was conducted using female Crl:CD (SR) BR rats which were fed a diet containing sulfometuron methyl. Concentrations of 0, 50, 1,000, and 5,000 ppm were used. Thirty-five rats were used as controls, 25 rats were assigned to the 50 and 1,000 ppm group and 15 rats were assigned to the 5,000 ppm group. Rats were fed the test diet on days 6 to 15 of gestation and sacrificed on day 21 of gestation for gross and histological examination. (128)

Rats on the highest dose level gained significantly less weight and ate significantly less feed than controls. The fetuses of this exposure group weighed significantly less than those of the control dams. No other adverse effects were noted in the lower exposure groups. No teratogenicity was demonstrated in this study. The minimum effect level of maternal toxicity and embryofetal toxicity was 5,000 ppm (286 mg/kg) and the NOEL under these study conditions was 1,000 ppm (57 mg/kg). (128) Reproductive studies were performed in conjunction with the 90 day feeding study in rats and the two year feeding study in rats.

In the 90 day feeding study (122), six male and six female rats which had been fed diets obtaining 0, 100, 1,000, and 5,000 ppm of sulfometuron methyl (for 90 days) were mated and delivered litters. No adverse effects were observed as indicated by fertility, gestation, viability and lactation indices. In addition, there were no differences between treatment and controls in the mean body weights and survival of weaning pups.

In the two year feeding study (125), 20 rats per group were used in a two generation, four litter reproduction study, initiated 90 days after the start of the long-term feeding study. F<sub>0</sub> rats were mated. Females were allowed to give birth and F<sub>1</sub> pups were followed until weaning (21 days) at which time they were sacrificed. F<sub>0</sub> females were again mated, but to different F<sub>0</sub> males. F<sub>1</sub> pups were delivered and observed. At weaning, 20 males and 20 females were selected from each dietary level (0, 50, 500, and 5,000 ppm) and continued on the treatment for 90 days. F<sub>1</sub> rats were bred twice within their respective group, producing F<sub>2a</sub> and F<sub>2b</sub> litters. Ten males and ten females from the F<sub>2b</sub> litters were sacrificed and examined histologically. (125)

During the 90 day feeding period for F<sub>1</sub> b rats, body weight and diet consumption were decreased in the female 5,000 ppm group. The number of pups born and the number of pups born alive to the 5,000 ppm groups was consistently lower in both the F<sub>1</sub> and F<sub>2</sub> generations and was statistically significant for F<sub>2b</sub> litters. Decreased pup counts may reflect the general health status of the mother as evidenced by decreased body weight and diet consumption of the F<sub>1</sub> b 5,000 ppm group. No gross or histopathological changes or effects on organ weights were observed in the weaned F<sub>2b</sub> rats. The NOEL established, based on this sub-study was 500 ppm (28 mg/kg). (125)

### **Avian Toxicity**

Sulfometuron methyl has been tested in the bobwhite quail and the mallard duck. The 8 day dietary LC<sub>50</sub>'s were greater than 5,620 and 5,000 ppm respectively. The acute oral LD<sub>50</sub> in the mallard duck was greater than 5,000 mg/kg. (101)

### **Invertebrate Toxicity**

The aquatic invertebrate, *Daphnia magna* was tested and the 48 hour LOSO was greater than 12.5 ppm sulfometuron methyl. (15)

### **Aquatic Toxicity**

Species tested on the aquatic toxicity studies include bluegill sunfish (96 hour) and rainbow trout (96 hour). In both cases the LC50 was greater than 12.5 ppm.

A life stage study was done using the fathead minnow. There were no effects observed on embryo hatch, larval survival or growth at concentrations of 1.2 mg/L or less. (15)

## **SUMMARY**

Sulfometuron methyl is a material both moderately mobile and moderately persistent. A closer look at the material however, reveals that the Oust is applied at the average rate of five ounces of product (3.75 oz a.i.)/acre or 106 grams per acre. These studies were conducted with applications of 1 lb a.i./acre. The lower application rates both minimize the persistence of sulfometuron methyl in soil and thereby diminish the amount of material which is available to leach through the soil. Therefore, sulfometuron may be used if the application rates are kept sufficiently low. This is because the soil organic material and soil microorganisms are able to absorb and degrade lower rates of pesticides.

The oral LD50 in rats for sulfometuron methyl is greater than 5,000 mg/kg and the dermal LD50 is greater than 2,000 mg/kg in rabbits.

The sub-chronic and chronic NOELS are 50 ppm (2.8 mg/kg/D) in rates; 200 ppm (1 mg/kg/D) in dogs; and 5 ppm (0.66 mg/kg/D) at 90 days for the reversible hemolytic effect and 100 ppm (13.3 mg/kg/D) at two years in the mouse. This makes the mouse at 90 days the most sensitive species with a transient hemolytic effect, to sulfometuron methyl exposure.

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