



U.S. ENVIRONMENTAL PROTECTION AGENCY  
Office of Pesticide Programs  
Registration Division (H7505C)  
401 "M" St., S.W.  
Washington, D.C. 20460

EPA Reg. Number:  
74530-12

Date of Issuance:  
NOV 19 2003

NOTICE OF PESTICIDE:  
 Registration  
 Reregistration

Term of Issuance:  
Conditional

Name of Pesticide Product:  
Helm Halosate AQ

(under FIFRA, as amended)

Name and Address of Registrant (include ZIP Code):

Helm Agro US, Inc  
9295 Tournament Drive, Suite 310  
Memphis, TN 74530-12

**Note:** Changes in labeling differing in substance from that accepted in connection with this registration must be submitted to and accepted by the Registration Division prior to use of the label in commerce. In any correspondence on this product always refer to the above EPA registration number.

On the basis of information furnished by the registrant, the above named pesticide is hereby registered/reregistered under the Federal Insecticide, Fungicide and Rodenticide Act.

Registration is in no way to be construed as an endorsement or recommendation of this product by the Agency. In order to protect health and the environment, the Administrator, on his motion, may at any time suspend or cancel the registration of a pesticide in accordance with the Act. The acceptance of any name in connection with the registration of a product under this Act is not to be construed as giving the registrant a right to exclusive use of the name or to its use if it has been covered by others.

This product is conditionally registered in accordance with FIFRA section 3(c)(7)(A) provided that you:

1. Submit/cite all data required for registration/reregistration of your product under FIFRA section 3(c)(5) or 4 when the Agency requires all registrants of similar products to submit such data.
2. Make the labeling changes listed below before you release the product for shipment.
  - a. Add the phrase "EPA Registration No. 7430-12."
  - b. Revise the first sentence of your Environmental Hazards section to read "Do not contaminate water when **cleaning of equipment** or disposing of equipment washwaters.
  - c. Within the list of PPE for early re-entry in the Agricultural Use Requirements box, revise the requirement for "waterproof gloves" to a requirement for "chemical-resistant gloves made of any waterproof material.
  - d. Under "Storage and Disposal", revise "Storage" to read "Pesticide Storage."
  - e. Incorporate the following Bulk Container language into your Container Disposal instructions.

Container Disposal (Bulk and Minibulk)

Signature of Approving Official:

Date:

NOV 19 2003

**Instructions fo Users**

“When the container is empty, replace the cap and seal all openings that have been opened during use; and return the container to the point of purchase of this product. If not returned to the point of purchase or a designated location, triple rinse or pressure rinse the empty container and offer for recycling if available.

**Instructions for Users and Refillers**

The container must be refilled with this pesticide product. **Do not Reuse the Container for Any Other Purpose.** Do not transport if this container is damaged or leaking. If the container is damaged, leaking, or obsolete, or to obtain information about recycling refillable container, contact Helm Agro at (insert phone number). Cleaning is not necessary prior to refilling with the same product. Clean container before final disposal. Disposal of this container must be in compliance with state and local regulations.

**Instructions for Refillers**

Prior to refilling, inspect carefully for damage such as cracks, punctures, abrasions, worn-out threads and closure devices. Check for leaks after refilling and before transporting. If the container cannot be refilled, triple rinse or pressure rinse the empty container and offer for recycling if available.

f. Under “General Information” delete the paragraphs entitled “Environmental Fate”, “Volatility”, and “Toxicology”.

g. Add the following maximum rate statement to your label.

--The maximum use rates stated throughout this product’s labeling apply to this product combined with the use of all other herbicides containing glyphosate or sulfosate as the active ingredient, whether applied as mixtures or separately. Calculate the application rates and ensure that the total use of this and other glyphosate or sulfosate containing products does not exceed stated maximum use rates.--

h. Under aerial application, delete the statement “For aerial application in California, refer to the Federal Supplemental Label for aerial applications in that state for specific instructions, restrictions, and requirements.”, since there is not a supplemental label proposed or registered for this product.

i. Add a statement, similar to the one below to the areas of your label where generic tank-mix partners such as atrazine are listed.

–This product may be tank-mixed with products containing atrazine, provided the product tank-mixed is registered for use on this site.

4. Submit three (3) copies of your final printed labeling before you release the product for shipment.

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If these conditions are not complied with, the registration will be subject to cancellation in accordance with FIFRA section 6(e). Your release for shipment of the product constitutes acceptance of these conditions.

A stamped copy of labeling is enclosed for your records.

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# HELOSATE™ AQ

**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 is likely to result.**

Active Ingredient(s):

glyphosate*: N-(phosphonomethyl) glycine, isopropylamine salt .....	53.8%
Inert Ingredients .....	46.2%
Total Ingredients .....	100.0%

\*Contains 5.4 pounds per gallon of glyphosate in the form of its isopropylamine salt.

EPA Reg. No. 74530-12

EPA Est. No.

## Keep Out of Reach of Children

### CAUTION

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

**FOR CHEMICAL EMERGENCY: Spill, leak, fire, exposure, or accident, call CHEMTREC: 1-800-424-9300.**

ACCEPTED  
with COMMENTS  
in EPA Letter Dated:

NOV 19 2003

Under the Federal Insecticide,  
Fungicide, and Rodenticide Act,  
as amended, for the pesticide  
registered under EPA Reg. No.  
74530-12

NET CONTENTS:

Helm Agro US, Inc.  
8295 Tournament Drive, Suite 310  
Memphis, Tennessee 38125

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## PRECAUTIONARY STATEMENTS

### Hazards to Humans and Domestic Animals

#### CAUTION

Keep out of reach of children.

#### 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.

#### User Safety Recommendations

Users should

- Wash hands before eating, drinking, chewing gum, using tobacco, or using the toilet.
- Remove contaminated clothing and wash clothing before reuse.

#### Environmental Hazards

Do not contaminate water when disposing of equipment washwaters. Treatment of aquatic weeds can result in oxygen depletion or loss due to decomposition of dead plants. This oxygen loss can cause fish suffocation.

In case of spill or leak, soak up and remove to a landfill.

#### Physical or Chemical Hazards

Spray solutions of this product should be mixed, stored and applied using only stainless steel, aluminum, fiberglass, plastic or plastic-lined steel containers.

Do not mix, store or apply this product or spray solutions of this product in galvanized steel or unlined steel (except stainless steel) containers or spray tanks. This product or spray solutions of this product react with such containers and tanks to produce hydrogen gas which may form a highly combustible gas mixture. This gas mixture could flash or explode, causing serious personal injury, if ignited by open flame, spark, welder's torch, lighted cigarette or other ignition source.

## DIRECTIONS FOR USE

It is a violation of Federal law to use this product in a manner inconsistent with its labeling. 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
- waterproof gloves
- shoes plus socks

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**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.

Uses of this product in utility rights-of-way and all other utility sites are not within the scope of the Worker Protection Standard requirements. Requirements in the Agricultural Use Requirement box do not apply to utility sites. Follow all other label requirements for applications to utility sites. Keep people and pets off treated areas until spray solution has dried to prevent transfer of this product onto desirable vegetation.

**Storage and Disposal**

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

**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. For bulk containers, see container label.

**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.

**Container Disposal:** Emptied container retains vapor and product residue. Observe all labeled safeguards until container is cleaned, reconditioned or destroyed.

**For Refillable Portable Containers:** Do not reuse this container except for refill in accordance with a valid Helm Agro Repackaging Agreement. If not refilled, triple rinse container, then puncture and dispose of in a sanitary landfill, or by incineration, or, if allowed by state and local authorities, by burning. If burned, stay out of smoke.

**For Metal Containers (non-aerosol):** Triple rinse (or equivalent). Then offer for recycling or reconditioning, or puncture and dispose of in a sanitary landfill, or by other procedures approved by state and local authorities.

**For Bulk Containers:** Triple rinse emptied bulk container. Then offer for recycling or reconditioning, or dispose of in a manner approved by state and local authorities.

**For Plastic 1-Way Containers and Bottles:** Do not reuse container. Triple rinse container, then puncture and dispose of in a sanitary landfill, or by incineration, or, if allowed by state and local authorities, by burning. If burned, stay out of smoke.

**For Drums:** Do not reuse container. Triple rinse container, then puncture and dispose of in a sanitary landfill, or by incineration, or, if allowed by state and local authorities, by burning. If burned, stay out of smoke.

**GENERAL INFORMATION**

This product is a postemergent, 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 without surfactant and additional surfactant is needed and recommended.

**Environmental Fate:** When this product comes in contact with the soil, it is bound to soil particles. When used in accordance with label directions, once this product is bound it is not available for plant uptake and will not harm off-site vegetation where roots grow into the treatment area or if the soil is transported off-site. The strong affinity of this product to soil particles prevents this product from leaching out of the soil profile and entering ground water. The affinity between this product and soil particles remains until this product is degraded, which is primarily a biological degradation process carried out under both aerobic and anaerobic conditions by soil microflora.

**Stage of Growth:** Annual weeds are easiest to control when they are small. Apply to actively growing woody brush and trees after full leaf expansion and before fall color, leaf drop or frost. Best control of most perennial weeds, brush and trees is obtained after they reach the seedhead or flower formation stage of growth. 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 recommended range.

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.

Always use the higher rate of this product per acre within the recommended range when vegetation growth is heavy or dense and growing in undisturbed areas.

**Time to Symptoms:** This product moves through the plant from the point of foliage contact to and into the root system. Visible effects on most annual weeds occur within 2 to 4 days, but on most perennial weeds may not occur for 7 days

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or more. Symptoms on woody plants and trees may not occur for 30 days or more. Symptoms may not appear prior to frost or senescence with fall treatments. Extremely cool or cloudy weather following treatment may slow activity of this product and delay development of visual symptoms. Visible effects are a gradual wilting and yellowing of the plant which advances to complete browning of above-ground growth and deterioration of underground plant parts.

**Mode of Action in Plants:** The active ingredient in this product inhibits an enzyme found only in plants that is essential to formation of specific amino acids.

**Cultural Considerations:** Reduced control may result when applications are made to annual or perennial weeds, woody brush and trees that have been disturbed through tillage, mowing, grazing, or cutting. After any site disturbance, allow sufficient regrowth of weeds, brush and trees to recommended stage of growth for treatment before making foliar treatments.

Reduced control may result under poor growing conditions such as drought stress, disease or insect damage. Reduced results may also occur when treating vegetation heavily covered with dust.

Allow 7 or more days after application before tillage, mowing or removal of herbaceous weeds. Allow 4 to 6 weeks after application before mowing or mechanical removal of treated brush and trees.

**Rainfastness:** Heavy rainfall soon after application may wash this product off the foliage and a repeat application may be required for additional 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 root stocks of perennials will not be affected by the herbicide.

**Volatility:** Helosate AQ herbicide is non-volatile. Therefore, it cannot move as a vapor after application to affect nearby vegetation.

**Toxicology:** Exposure to workers and other applicators generally is expected to pose minimal risks based on results of short-term toxicity studies. Glyphosate has been thoroughly tested and determined not to cause cancer or other adverse long-term health effects.

**Tank Mixing:** This product does not provide residual weed control. For subsequent residual weed control, follow a label-approved herbicide program. Read and carefully observe the cautionary statements and all other information appearing on the labels of all herbicides used. Use according to the most restrictive label directions for each product in the mixture.

**Grazing Restrictions:** This product may be used to treat undesirable vegetation in utility rights-of-way that pass through pastures, rangeland and on forestry sites that are being grazed. For tank mix applications, comply with all restrictions appearing on the tank mix product label.

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 or frill applications and for cut stump treatments.

For broadcast applications, observe the following restrictions:

- 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.
- All restrictions outlined above apply to lactating dairy animals. No other restrictions apply to lactating dairy animals.

These recommendations do not apply to rangeland outside of utility rights-of-way.

**Annual Maximum Use Rate:** This product has no herbicidal or residual activity in the soil. If repeat treatments are necessary, the combined total of all treatments must not exceed 8 quarts of this product per acre per year.

#### ATTENTION

**AVOID** contact of herbicide with foliage, green stems, exposed non-woody roots or fruit of crops, desirable plants

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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) which are likely to drift. AVOID applying at excessive speed or pressure.

**NOTE:** Use of this product in any manner not consistent with this label may result in injury to persons, animals, or crops, or other unintended consequences. Keep container closed to prevent spills and contamination.

**MIXING**

Clean sprayer parts after using this product by thoroughly flushing with water.

**NOTE:** Reduced results may occur if water containing soil is used, such as visibly muddy water or water from ponds and ditches that is not clear.

**MIXING WITH WATER**

HELOSATE AQ mixes readily with water. Mix spray solutions of this product as follows: Fill the mixing or spray tank with the required amount of water. Add the recommended amount of this product near the end of the filling process and mix well. Use caution to avoid siphoning back into the carrier source. Use approved anti-back-siphoning devices where required by state or local regulations. During mixing and application, foaming of the spray solution may occur. To prevent or minimize foam, avoid the use of mechanical agitators, terminate by-pass and return lines at the bottom of the tank, and, if needed, use an approved anti-foam or defoaming agent.

**TANK MIXING**

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 recommended 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.

Refer to the "Tank Mixing" section of "General Information" for additional precautions.

**SURFACTANT**

This product requires use of a nonionic surfactant. When using this product, mix 0.5 percent or more of a nonionic surfactant. Increasing the rate of surfactant up to 2 1/2 percent may enhance performance on hard to control woody brush, trees and vines. Other examples of when to use more than 2 1/2 quarts of surfactant include, but are not limited to: high water volumes, adverse environmental conditions, plants under stress, surfactants with less than 70 percent active ingredient, tank mixes, etc.

For forestry conifer release the use Entry™ II surfactant is recommended to avoid possible injury with this product.

**COLORANTS OR DYES**

Agriculturally-approved colorants or marking dyes may be added to this product. Colorants or dyes used in spray solutions of this product may reduce performance, especially at lower rates or dilution. Use colorants or dyes according to the manufacturer's recommendations.

**DRIFT CONTROL ADDITIVES**

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.

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## APPLICATION EQUIPMENT AND TECHNIQUES

Apply these spray solutions in properly maintained and calibrated equipment capable of delivering desired volumes.

### Spray Drift Management

**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.

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.

**Ground Application:** Apply recommended rates of this product in 10 to 60 gallons of water per acre as a broadcast spray. For optimum spray distribution and coverage, use flat fan or low volume flood nozzles. When using flood nozzles, space them no more than 40 inches apart and ensure double overlap of spray pattern. Refer to the manufacturer's recommendations for correct pressure and nozzle height above the target canopy. Avoid pressure and nozzles which produce fine droplets or mist.

Use appropriate marking devices to ensure uniform spray coverage and best results from this product.

**Aerial Application:** Apply the recommended rates of this product in 10 to 30 gallons of water per acre as a broadcast spray. To prevent injury to adjacent desirable vegetation, appropriate buffer zones must be maintained.

### 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. These requirements do not apply to forestry applications or to public health uses.

1. The distance of the outermost nozzles on the boom must not exceed  $\frac{3}{4}$  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.

**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" sections of this label).

### Controlling Droplet Size

- **Volume** - Use high flow rate nozzles to apply the highest practical spray volume. Nozzles with higher rated flows produce larger droplets.
- **Pressure** - 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  $\frac{3}{4}$  of the wingspan or rotor length may further reduce drift without reducing swath width.
- **Application Height** - Applications should not be made at a height greater than 10 feet above the top of the 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.).

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### **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).

### **AERIAL EQUIPMENT**

Do not apply this product using aerial spray equipment except under conditions as specified within this label.

For aerial application in California, refer to the Federal Supplemental Label for aerial applications in that state for specific instructions, restrictions, and requirements. This product plus Banvel™ tank mixtures may not be applied by air in California.

**AVOID DRIFT.** Do not apply during low level inversion conditions, when winds are gusty or under any other condition which favors drift. Drift is likely to cause damage to any vegetation contacted to which treatment is not intended.

This product is recommended for aerial application by helicopter only. Apply the recommended rate of this product in 5 to 30 gallons of water per acre. Use the higher recommended spray volumes where weeds, brush and trees are dense or form multiple canopy layers.

For aerial broadcast applications, unless otherwise specified, use this product at the rate of 3/4 to 1 1/2 quarts per acre for annual weeds, 1 1/2 to 3 3/4 quarts per acre for perennial weeds, and 3 3/4 to 7 1/2 quarts per acre for woody brush and trees. 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 which dispense spray as fine spray droplets.

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

### **GROUND BROADCAST EQUIPMENT**

For broadcast ground application, unless otherwise specified, use this product at the rate of 3/4 to 1 1/2 quarts per acre for annual weeds, 1 1/2 to 3 3/4 quarts per acre for perennial weeds, and 3 3/4 to 7 1/2 quarts per acre for woody brush and trees. 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.

Apply the recommended rate in 10 to 60 gallons per acre. As density of herbaceous weeds and woody brush increases, spray volume should be increased within the recommended range to ensure complete coverage. Carefully select proper nozzles to avoid spraying a fine mist. Check for even distribution of spray droplets.

### **HAND-HELD AND HIGH-VOLUME EQUIPMENT**

Use coarse sprays only.

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Unless otherwise specified, use the recommended rates listed in the following "Application Rates" table for various methods of foliar application using high volume, backpack, knapsack and similar types of handheld equipment. 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.

APPLICATION RATES		
Application	Helosate AQ	Spray Volume Gallons/Acre
Spray-to Wet		
Handgun or Backpack	3/4% to 2% by volume	spray-to-wet*
Low Volume Directed Spray		
Backpack	3 3/4% to 7 1/2% by volume	15 to 25**
Modified High Volume	1 1/2% to 3% by volume	40 to 60**

\*For applications made on a spray-to-wet basis, spray coverage should be uniform and complete. Do not spray to the point of runoff.

\*\*For low volume directed spray applications, coverage should be uniform with at least 50 to 75 percent of the foliage contacted. Coverage of the top one half of the plant is important for best results. Low volume directed applications with backpacks work best when treating weeds and brush less than 10 feet tall. For taller weeds and brush, high volume handguns can be modified by reducing nozzle size and spray pressure to produce a low volume directed spray. To ensure adequate spray coverage, spray both sides of large or tall woody brush and trees, when foliage is thick and dense, or where there are multiple sprouts.

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

**Spray Solution**

Desired Volume	Amount of HELOSATE AQ						
	0.75%	1.0%	1.5%	2%	3%	5%	7.5%
1 gal	1 fl. oz.	1 1/3 fl. oz.	1 2/3 fl. oz.	2 2/3 fl. oz.	4 oz.	6 1/2 fl. oz.	9 1/2 fl. oz.
25 gal	1 1/2 pt	1 qt	1 1/4 qt	2 qt	3 qt	5 qt	7 1/2 qt
100 gal	3 qt	1 gal	1 1/4 gal	2 gal	3 gal	5 gal	7 1/2 gal

2 tablespoons = 1 fluid ounce

For use in backpack, knapsack, or pump-up sprayers, it is suggested that the recommended amount of this product be mixed with water in a larger container. Fill the sprayer with the mixed solution.

**CUT STUMP APPLICATION**

Cut stump treatments may be made on any site listed on this label. This product will give control or partial control of woody brush and trees, some of which are listed below. Apply this product using suitable equipment to ensure coverage of the entire cambium. Cut trees or resprouts close to the soil surface. Apply a 50 to 100 percent solution of this product to the freshly cut surface immediately after cutting. Delays in application may result in reduced performance. For best results, applications should be made during periods of active growth and full leaf expansion.

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

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DO NOT make cut stump applications when the roots of desirable woody brush or trees may be grafted to the roots of the cut stump. Injury resulting from root grafting is likely to occur in adjacent woody brush or trees.

**INJECTION AND FRILL APPLICATION**

This product will control woody brush and trees by injection or frill applications. Apply this product using suitable equipment which must penetrate into the living tissue. Apply the equivalent of 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 these, 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, application should be made during periods of active growth and after full leaf expansion. Injection or frill applications of this product will control many woody brush and tree species, some of which are listed below:

Control	Partial Control
Oak	Black gum
Poplar	Dogwood
Sweetgum	Hickory
Sycamore	Maple, red

**SELECTIVE EQUIPMENT**

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

AVOID contact of herbicide with desirable vegetation as serious injury or death is likely to occur.

Applicators used above desired vegetation should be adjusted so that the lowest spray stream or wiper contact point is at least 2 inches above the desirable vegetation. Droplets, mist, foam or splatter of the herbicide solution settling on desirable vegetation is likely to result in discoloration, stunting or destruction.

Best results are obtained when the foliage of herbaceous weeds and woody brush is contacted by the herbicide solution. Vegetation not contacted by the herbicide solution will not be affected. Poor contact may occur in dense clumps, severe infestations or when the height of the plants varies so that not all of the undesirable plant foliage is contacted. In these instances, repeat treatment may be necessary.

**Shielded and Hooded Applicators**

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 Applications and Sponge Bars**

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 mph. Performance may be improved by reducing speed in areas of heavy weed infestations to ensure adequate wiper saturation. Better results may be obtained if 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.

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** - solutions ranging from 33 to 75 percent of this product in water may be used.

**For Porous Plastic Applicators and Pressure Feed Systems** - solutions ranging from 33 to 100 percent of this product

in water may be used.

**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 recommended.

**SITE RECOMMENDATIONS**

Unless otherwise specified, applications of this product may be made for control or partial control of herbaceous weeds, woody brush and trees listed in the "Weeds Controlled" section of this label.

**FORESTRY SITE PREPARATION**

This product is recommended for the control or partial control of woody brush, trees and herbaceous weeds in forestry. This product is also recommended for use in preparing or establishing wildlife openings within these sites and maintaining logging roads.

This product is recommended for use in site preparation prior to planting any tree species, including Christmas trees, eucalyptus, hybrid tree cultivars and silvicultural nursery sites.

**Tank Mixtures**

Tank mixtures of this product may be used to increase the spectrum of vegetation controlled. When tank mixing, read and carefully observe the label claims, cautionary statements and all information on the labels of all products 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 recommended rate of this product may be used in a tank mix with the following products for forestry site preparation.

PRODUCT	BROADCAST RATE
Arsenal™ Applicators Concentrate	2 to 16 fl. oz. / a
Escort™	1/2 to 3 1/2 oz. / a
Chopper™	4 to 32 fl. oz. / a
Garlon™ 4	1 to 4 qts. / a
Oust™	1 to 4 oz. / a

PRODUCT	SPRAY-TO-WET RATES
Arsenal Applicators Concentrate	1/32% to 1/2% by volume

PRODUCT	LOW VOLUME DIRECTED SPRAY RATES
Arsenal Applicators Concentrate	1/8% to 1/2 % by volume

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

**CONIFER AND HERBACEOUS RELEASE**

This product can be used for conifer release as a broadcast spray at rates of 3/4 to 1 1/2 quarts per acre, unless otherwise stated below for control, partial control or suppression of herbaceous weeds and hardwoods listed in the "Weeds Controlled" section of this label. Use only where conifers have been established for more than one year unless otherwise stated below. This product may be applied as a directed spray or by using selective equipment in forestry hardwood and conifer sites, including Christmas tree plantations and silvicultural nurseries.

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In Maine and New Hampshire, this product can be applied at rates up to 2 1/4 quarts per acre for control and suppression of difficult hardwood species.

**NOTE:** This product may require use with a surfactant. To avoid possible conifer injury, use of Entry II surfactant at 5 to 30 fluid ounces per acre is recommended. Entry II rates should not exceed 20 fluid ounces per acre at elevations above 1500 feet, or 10 fluid ounces per acre in coastal range or at elevations below 1500 feet in Washington and Oregon. Use of a surfactant is not recommended for release of hemlock species or California redwood. In mix conifer stands injury to these species may result if a surfactant is used.

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.

For release of the following conifer species outside the Southeastern United States: Douglas fir, Fir, Hemlock, Pines\*, California Redwood, Spruce

\*Includes all species except loblolly pine, longleaf pine, shortleaf pine or slash pine.

Use 3/4 to 1 1/2 quarts of this product per acre as a broadcast spray.

To release Douglas fir and pine and spruce species at the end of the first growing season (except in California), this product can be used at the lower recommended rates of 3/4 to 1 1/8 quarts per acre. Ensure that the conifers are well hardened off before application.

For release of Spruce (*pinea spp.*) In Michigan, Minnesota and Wisconsin, up to 2 1/4 quarts per acre of this product may be used for the control of difficult woody brush and tree species and application must be made after formation of final conifer resting buds in the fall.

For release of the following conifer species in the Southeastern United States: Loblolly pine, Slash pine, Eastern white pine, Virginia pine, Shortleaf pine, Longleaf pine

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 pines have hardened off.

For applications made at the end of the first growing season, use 3/4 quart per acre of this product.

#### **Tank Mixtures**

This product may be tank mixed with the following products for conifer or herbaceous release.

When tank mixing, read and carefully observe the label claims, cautionary statements and all information on the labels of all products used. Use according to the most restrictive precautionary statements and label uses for each product in the mixture.

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. Use only on conifer species that are labeled for over-the-top sprays for both products.

#### **ATRAZINE**

#### **ARSENAL APPLICATOR CONCENTRATE**

#### **OUST**

#### **Late Summer and Fall Ater Resting Bud Formation**

For release of jack pine, white pine and white spruce, apply 3/4 to 1 1/2 quarts of this product plus 1 to 3 ounces of Oust per acre. For white pine tank mix a maximum of 1 to 1 1/2 ounces of Oust per acre.

For conifer release of Douglas fir, use 3/4 to 1 1/8 quarts of this product plus 2 to 6 ounces of Arsenal Applicator Concentrate per acre. For conifer release of balsam fir and red spruce, apply 1 1/2 quarts of this product plus 1 to 2 1/2 ounces of Arsenal Applicator Concentrate per acre.

#### **Herbaceous Release**

For spring and early summer herbaceous release of loblolly pine, Virginia and longleaf pine, apply 12 to 18 ounces of

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this product with 2 to 4 ounces of Oust. Add up to 3.2 ounces per acre of Entry II as the nonionic surfactant. For early spring release of Douglas fir, prior to bud swell, apply 3/4 quart of this product plus 4 pounds a.i. of atrazine per acre. Allow one full growing season before application. Do not add surfactant to this treatment.

**UTILITY RIGHTS-OF-WAY SITES**

In utilities, this product is recommended for use 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 is also recommended for use 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. When tank mixing, read and carefully observe the label claims, cautionary statements and all information on the labels of all products used. Use according to the most restrictive precautionary statements for each product in the mixture. Any recommended rate of this product may be used in a tank mix.

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

**NOTE:** For side trimming treatments, it is recommended that this product be used alone or in tank mixture with Garlon 4.

PRODUCT	BROADCAST RATE	USE SITES
Arsenal 2WSL	6 to 32 fl. oz. / a	utility sites
Escort	1 to 2 oz. / a	utility sites
Garlon 3A*, Garlon 4	1 to 4 qts. / a	utility sites / side trimming
Oust	1 to 4 oz. / a	utility sites

PRODUCT	SPRAY-TO-WET RATES	USE SITES
Arsenal 2WSL	1/32% to 1/2% by volume	utility sites
Escort	1 to 2 oz. / a	utility sites

PRODUCT	LOW VOLUME DIRECTED SPRAY RATES	USE SITES
Arsenal 2WSL	1/8% to 1/2% by volume	utility sites
Escort	1 to 2 oz. / a	utility sites

\*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 constructions products.

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 noncrop sites and application rates:

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Arsenal	Plateau™
Banvel	Princep™ DF
Barricade™ 65WG	Princep Liquid
Diuron	Ronstar™ 50WP
Endurance™	Sahara™
Escort	Simazine
Garlon 3A	Surflan™

**WETLAND SITES**

This product may be used in and around water 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 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. 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.

Do not spray open bodies of water where woody brush, trees, and herbaceous weeds do not exist. The maximum application rate of 7 1/2 pints 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 rights-of-way
- where applications will result in less than 20 percent of the total water area being treated.

**WEEDS CONTROLLED**

When applied as recommended under the conditions described, this product CONTROLS or PARTIALLY CONTROLS most herbaceous weeds, woody brush, and trees, some of which are listed below:

**WOODY BRUSH AND TREES**

Alder	Elm*
Ash*	Eucalyptus
Aspen, quaking	Gallberry
Bearclover (Bearmat)*	Gorse*
Beech*	Hackberry, western
Birch	Hasardia*
Blackberry	Hawthorn
Blackgum	Hazel
Bracken	Hickory*
Broom, French, Scotch	Honeysuckle
Buckwheat, California*	Hornbeam, American*



Cascara*	Huckleberry
Catsclaw*	Kudzu**
Ceanothus*	Locust, black*
Chamise*	Magnolia, sweetbay
Cherry, bitter	Madrone resprouts*
Cherry, black	Manzanita*
Cherry, pin	Maple, red
Cottonwood, eastern	Maple, sugar
Coyote brush	Monkey flower*
Cypress; swamp, bald	Oak; black, white*
Deerweed	Oak; post
Dogwood *	Oak; Northern, pin
Elderberry	Oak, Scrub*
Orange, Osage	Oak, Southern red
Peppertree, Brazilian (Florida holly)*	Sassafras*
Persimmon*	Sourwood*
Pine	Sumac;
Poison-ivy**	Laurel
Poison-oak**	Poison
Poplar, yellow*	Smooth
Prunus	Sugarbush
Raspberry	Winged*
Redbud, eastern	Sweetgum
Redcedar, eastern	Swordfern*
Rose, multiflora	Tallowtree, Chinese
Russian-olive*	Tan oak resprouts*
Sage, black	Thimbleberry
Sage, white*	Tobacco, tree*
Sagebrush, California	Toyon*
Salmonberry	Trumpet creeper
Saltcedar*	Vine maple*
Saltbush, sea myrtle	Virginia creeper
	Waxmyrtle, southern*
	Willow
	Yerbasanta*

\*Partial control

\*\* Use a minimum of 4 quarts per acre

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**PERENNIAL WEEDS**

Alfalfa*	Lantana
Alligatorweed*	Lespedeza
Anise (fennel)	Loosestrife, purple
Artichoke, Jerusalem	Lotus, American
Bahiagrass	Maidencane
Beachgrass, European (Ammophila arenaria)	Milkweed, common
Bentgrass*	Muhly, wirestem
Bermudagrass	Mullein, common
Bermudagrass, water (knotgrass)	Napiergrass
Bindweed, field	Nightshade, silverleaf
Bluegrass, Kentucky	Nutsedge; purple, yellow
Blueweed, Texas	Orchardgrass
Brackenfern	Pampasgrass
Bromegrass, smooth	Paragrass
Bursage, woolly-leaf	Pepperweed, perennial
Canarygrass, reed	Phragmites*
Cattail	Quackgrass
Clover; red, white	Redvine*
Cogongrass	Reed, giant
Cordgrass	Ryegrass, perennial
Cutgrass, giant*	Smartweed, swamp
Dallisgrass	Spatterdock
Dandelion	Spurge, leafy*
Dock, curly	Starthistle, yellow
Dogbane, hemp	Sweet potato, wild*
Fescue (except tall)	Thistle, artichoke
Fescue, tall	Thistle, Canada
Guineagrass	Timothy
Hemlock, poison	Torpedograss*
Horsenettle	Trumpetcreeper*
Horseradish	Tules, common
Ice Plant	Vaseygrass
Ivy; German, cape	Velvetgrass
Johnsongrass	Waterhyacinth
Kikuyugrass	Waterlettuce
Knapweed	Waterprimrose

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	Wheatgrass, western
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\*Partial Control

**ANNUAL WEEDS**

Annoda, spurred	Knotweed
Barley	Kochia
Barnyardgrass	Lambsquarters
Bassia, fivehook	Little barley
Bittercress	London rocket
Black nightshade	Mayweed
Bluegrass, annual	Medusahead
Bluegrass, bulbous	Morningglory ( <i>Ipomoea spp.</i> )
Brome, downy	Mustard, blue
Brome, Japanese	Mustard, tansy
Broomsedge	Mustard, tumble
Browntop panicum	Mustard, wild
Buttercup	Oats
Carolina foxtail	Pigweed*
Carolina geranium	Plains/Tickseed coreopsis
Castorbean	Prickly lettuce
Cheatgrass	Puncturevine
Cheeseweed ( <i>Malva parviflora</i> )	Purslane, commone
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 mannagrass	Shepherd's purse
Eclipta	Sicklepod
Fall panicum	Signalgrass, broadleaf
Falsedandelion	Smartweed, ladysthumb
Falseflax, smallseed	Smartweed, Pennsylvania
Fiddleneck	Sowthistle, annual
Field pennycress	Spanishneedles
Filaree	Speedwell, purslane

Fleabane, annual	Sprangletop
Fleabane, hairy ( <i>Conyza bonariensis</i> )	Spurge, annual
Fleabane, rough	Spurge, prostrate
Florida pusley	Spurge, spotted
Foxtail	Spurry, umbrella
Goatgrass, jointed	Stinkgrass
Goosegrass	Sunflower
Grain sorghm (milo)	Teaweed/Prickly sida
Groundsel, common	Texas panicum
Hemp sesbania	Velvetleaf
Henbit	Virginia copperleaf
Horseweed/Marestail ( <i>Conyza canadensis</i> )	Virginia pepperweed
Itchgrass	Wheat
Johnsongrass, seedling	Wild oats
Junglerice	Witchgrass
	Woolly cupgrass
	Yellow rocket

**CONDITIONS OF SALE AND WARRANTY**

HELM AGRO US, INC. AND SELLER OFFER THIS PRODUCT AND THE BUYER AND USER ACCEPTS THIS PRODUCT UNDER THE FOLLOWING AGREED CONDITIONS OF SALE AND WARRANTY.

The directions for use of this product are believed to be reliable and should be followed carefully. However, it is impossible to take into account all variables and to eliminate all risks associated with its use. Injury or damage may result because of conditions which are beyond the control of HELM AGRO US, INC. or the Seller. HELM AGRO US, INC. warrants only that this product conforms to the chemical description on the label and is believed to be reasonably fit for the purposes referred to in the Directions for Use when used as directed under normal conditions. HELM AGRO US, INC. MAKES NO OTHER EXPRESS OR IMPLIED WARRANTY OF FITNESS OR MERCHANTABILITY OR ANY OTHER EXPRESS OR IMPLIED WARRANTY. In no case shall HELM AGRO US, INC. or the Seller be liable for consequential, special or indirect damages resulting from the use or handling of this product. Any variation or exception from this warranty must be in writing and signed by an authorized HELM AGRO US, INC. representative.

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