


S905-579

10/29/2008

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|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------|---------------------------------------------|
|  <p align="center"> <b>U.S. ENVIRONMENTAL PROTECTION<br/>AGENCY</b><br/> <b>Office of Pesticide Programs</b><br/> <b>Registration Division (7505P)</b><br/> <b>Ariel Rios Building</b><br/> <b>1200 Pennsylvania Ave., NW</b><br/> <b>Washington, D.C. 20460</b> </p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | EPA Reg. Number:<br><br><b>5905-579</b>                           | Date of Issuance:<br><br><b>OCT 29 2008</b> |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | Term of Issuance:<br><br><b>conditional</b>                       |                                             |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | Name of Pesticide Product:<br><br><b>HM-0429 Liquid Herbicide</b> |                                             |
| NOTICE OF PESTICIDE:<br><input checked="" type="checkbox"/> Registration<br><input type="checkbox"/> Reregistration<br>(under FIFRA, as amended)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                                   |                                             |
| Name and Address of Registrant (include ZIP Code):<br><br><b>Helena Chemical Company</b><br><b>225 Schilling Blvd., Suite 300</b><br><b>Collierville, TN 38017</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                                   |                                             |
| <p><b>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.</b></p> <p>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.</p> <p>This product is conditionally registered in accordance with FIFRA sec. 3(c)(7)(A) provided that you:</p> <ol style="list-style-type: none"> <li>Submit and/or cite all data required for registration/reregistration review of your product when the Agency requires all registrants of similar products to submit data.</li> <li>Submit the data listed below:         <ol style="list-style-type: none"> <li>Within one year of the date on this registration notice, submit Storage Stability (830.6317) and Corrosion Characteristics (830.6320) studies.</li> </ol> </li> <li>Make the following label changes:         <ol style="list-style-type: none"> <li>Change statement under Hazards to Humans and Domestic Animals to read:<br/><br/>           Corrosive. Causes irreversible eye damage. Harmful if swallowed. Do not get in eyes or on clothing. Wear protective eyewear (goggles, face shield, or safety glasses). Wash thoroughly with soap and water after handling and before eating, drinking, chewing gum, or using tobacco. Remove and wash contaminated clothing before reuse. Wear: Long-sleeved shirt and long pants, socks and shoes."         </li> </ol> </li> </ol> |                                                                   |                                             |
| Signature of Approving Official:<br><b>Joanne I. Miller</b><br>Product Manager 23<br>Herbicide Branch<br>Registration Division (7505P)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | Date:<br><br><b>OCT 29 2008</b>                                   |                                             |

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- b. Under First Aid, move "If Swallowed" under "If In Eyes".
- c. The proposed label should contain a Note to Physician, which addresses the category I Primary Eye Irritant toxicity. The following statements are suggested types of information that may be included, if applicable:
  - Technical information on symptomatology;
  - use of supportive treatments to maintain life functions;
  - medicine that will counteract the specific physiological effects of the pesticide;
  - company telephone number to specific medical personnel who can provide specialized medical advice.
- d. Revise the EPA Registration Number to read, "EPA Reg. No. 5905-579."

Submit one copy of the revised final printed label for the record.

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

A stamped copy of the label is enclosed for your records.

# HM-0429

## Liquid Herbicide

Contains 2 Lbs. Active Ingredient Per Gallon

**ACTIVE INGREDIENT:**

Hexazinone [3-cyclohexyl-6-(dimethylamino)-1-methyl-1,3,5-triazine-2,4(1H,3H)-dione] ..... 25%

**INERT INGREDIENTS** ..... 75%

**TOTAL** ..... 100%

By Weight

**KEEP OUT OF REACH OF CHILDREN  
DANGER! ¡PELIGRO!**

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

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

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

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

**NOTE TO PHYSICIAN:** Probable mucosal damage may contraindicate the use of gastric lavage.

**SEE INSIDE PANEL FOR ADDITIONAL PRECAUTIONARY STATEMENTS**

SN 073008

- NET CONTENTS:  1 Gallon (3.785 L)  
 2.5 Gallons (9.46 L)  
 55 Gallons (208.18 L)  
 250 Gallons (946.1 L)

MANUFACTURED FOR  
HELENA CHEMICAL COMPANY  
225 SCHILLING BOULEVARD, SUITE 300  
COLLIERVILLE, TENNESSEE 38017

PEEL BACK BOOK HERE AND RESEAL AFTER OPENING ▲

**ACCEPTED  
with COMMENTS  
In EPA Letter Dated:**

**OCT 29 2008**

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

5905-579

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# HM-0429

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Contains 2 Lbs. Active Ingredient Per Gallon

|                                                                                            |                  |
|--------------------------------------------------------------------------------------------|------------------|
| <b>ACTIVE INGREDIENT:</b>                                                                  | <b>By Weight</b> |
| Hexazinone [3-cyclohexyl-6-(dimethylamino)-1-methyl-1,3,5-triazine-2,4(1H,3H)-dione] ..... | 25%              |
| <b>INERT INGREDIENTS</b> .....                                                             | 75%              |
| <b>TOTAL</b> .....                                                                         | 100%             |

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**PRECAUTIONARY STATEMENTS  
HAZARDS TO HUMANS AND DOMESTIC ANIMALS  
DANGER! CAUSES EYE DAMAGE.**

Corrosive. Causes irreversible eye damage. Harmful if swallowed. Do not get in eyes or on clothing. Wash thoroughly with soap and water after handling.

**PERSONAL PROTECTIVE EQUIPMENT**

**Applicators and other handlers must wear:**

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

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

**USER SAFETY RECOMMENDATIONS**

**USERS SHOULD:**

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

**ENVIRONMENTAL HAZARDS**

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

The active ingredient, hexazinone, in this product is known to leach through soil into ground water under certain conditions as a result of agricultural use. Use of this chemical in areas where soils are permeable, particularly where the water table is shallow, may result in ground water contamination.

**GENERAL INFORMATION**

Helena **HM-0429** herbicide is a water-soluble liquid that is mixed in water and applied as a spray for weed control in certain crops, Christmas trees, forestry site preparation and release areas, and industrial areas. It may also be applied undiluted as a basal soil treatment for brush control in reforestation areas, rangeland, pastures and non-crop areas, or by stem injection for brush control.

**HM-0429** is an effective general herbicide providing both contact and residual control of many annual, biennial and perennial weeds and woody plants.

**HM-0429** is noncorrosive to equipment. Care should be exercised when applying **HM-0429** near desirable trees or shrubs as they can absorb **HM-0429** through roots extending into treated areas. 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 intermittent drainage, intermittently flooded low-lying sites, seasonally dry flood plains and transitional areas between upland and lowland sites when no water is present. It is also permissible to treat marshes, swamps and bogs after water has receded, as well as seasonally dry flood deltas. DO NOT make applications to natural or man-made bodies of water such as lakes, reservoirs, ponds, streams and canals.

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**HM-0429** is absorbed through the roots and foliage. Moisture is required to activate **HM-0429** in the soil. Best results are obtained when the soil is moist at the time of application and 1/4-1/2 inches of rainfall occurs within 2 weeks after application.

For best results, apply **HM-0429** preemergence or postemergence when weeds are less than 2 inches in height or diameter. Foliar activity is most effective under conditions of high temperature (above 80°F), high humidity, and good soil moisture. Foliar activity may be reduced when vegetation is dormant, semi-dormant, or under stress.

On herbaceous plants, symptoms usually appear within 2 weeks after application under warm, humid conditions, while 4-6 weeks may be required when weather is cool or dry, or when plants are under stress. If rainfall after application is inadequate to activate **HM-0429** in the soil, plants may recover from contact effects and continue to grow.

On woody plants, symptoms usually appear within 3-6 weeks after sufficient rainfall has carried the herbicide into the root zone during periods of active growth. Defoliation and refoliation may occur, but susceptible plants are killed.

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

- Use rate
- Weed spectrum and size at application
- Environmental conditions at and following treatment

Where a rate range is shown, use the higher levels of the dosage range on hard-to-control species, fine-textured soils, or soils containing greater than 5% organic matter or carbon. Use the lower levels of the dosage range on coarse-textured soils and/or on soils low in organic matter. Refer to specific uses for rate ranges.

**APPLICATION INFORMATION**

**HM-0429** may be applied by ground equipment and, where permitted, aerial equipment. Use rates, minimum spray gallonage, and other application information are described for the various uses.

Dispose of the equipment washwater by applying it to a use site listed on this label or in accordance with directions given in the "Storage and Disposal" section of this label.

Before spraying, calibrate equipment to determine the quantity of water necessary to uniformly and thoroughly cover the vegetation and soil in a measured area to be treated.

**TANK MIXTURES**

**HM-0429** herbicide may be tank mixed with other herbicides and/or adjuvants registered for the uses (crops) specified in the label.

Refer to the label of the tank mix partner(s) for any additional use instructions or restrictions.

**NOTE:** When the air temperature is around 32°F, tank mixtures of "Gramoxone Max" (paraquat dichloride) plus **HM-0429** may form a hard sludge in the spray tank. This effect is most likely to occur when the tank mixture comes into contact with aluminum.

**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.

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#### **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.

#### **DIRECTIONS FOR USE**

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

Helena **HM-0429** should be used only in accordance with recommendations on this label, or in supplemental Helena publications.

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.

The correct use rates by crop and geographical area, specified on this label, and proper mixing/loading site considerations and application procedures must be followed to minimize potential for hexazinone movement into groundwater. Users are encouraged to consult with their state Department of Agriculture, Extension Service, or other pesticide lead agency for information regarding soil permeability, aquifer vulnerability, and best management practices for their area.

#### **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 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.

Do not enter or allow worker entry into treated areas during the restricted-entry interval (REI) of 48 hours. PPE required for early entry to treated areas that is permitted under the Worker Protection Standard and that involves contact with anything that has been treated, such as plants, soil, or water, is:

- Coveralls
- Chemical-resistant gloves made of any waterproof material
- Shoes plus socks
- Protective eyewear.

#### **ALFALFA**

**HM-0429** is recommended for control of certain weeds in established alfalfa grown for hay.

- Do not apply within 30 days of harvest (cutting for hay), or feeding of forage or grazing.
- Do not exceed 6 pints per acre per application.
- Do not exceed 6 pints (1.5 pounds active ingredient hexazinone) per acre per year.
- Do not use on alfalfa grown for seed in any state except California.



**APPLICATION INFORMATION**

**NON-DORMANT AND SEMI-DORMANT VARIETIES**

In the following states, make a single application of **HM-0429** during the winter months when alfalfa plants are in the least active stage of growth:

|            |              |              |            |
|------------|--------------|--------------|------------|
| Arizona    | Montana      | Oklahoma     | Washington |
| California | Nebraska     | Oregon       | Wyoming    |
| Colorado   | Nevada       | South Dakota |            |
| Idaho      | New Mexico   | Texas        |            |
| Kansas     | North Dakota | Utah         |            |

In the following states, make a single application of **HM-0429** either in the spring before new growth exceeds 2 inches in height or to alfalfa stubble after cutting, following hay removal and before regrowth exceeds 2 inches in height:

|             |               |               |               |
|-------------|---------------|---------------|---------------|
| Connecticut | Maine         | New Hampshire | Vermont       |
| Delaware    | Maryland      | New Jersey    | Virginia      |
| Illinois    | Massachusetts | New York      | West Virginia |
| Indiana     | Michigan      | Ohio          | Wisconsin     |
| Iowa        | Minnesota     | Pennsylvania  |               |
| Kentucky    | Missouri      | Rhode Island  |               |

**NOTE:** Severe alfalfa injury may result following application, if after cutting the regrowth is more than 2 inches high, or there is significant stubble left after cutting or grazing, or the air temperature is above 90°F.

**DORMANT VARIETIES**

Make a single application of Helena **HM-0429** after alfalfa becomes dormant and before new growth exceeds 2 inches in height in the spring. Where weeds have emerged, use a surfactant.

**USE RATES**

Use higher rates on hard-to-control species, (see "Weeds Controlled" section below) fine-textured soils, soils containing greater than 5% organic matter, or under adverse environmental conditions such as temperature extremes or when weeds are stressed due to low rainfall.

For dormant alfalfa, use a surfactant approved for crops at the rate of 0.25% v/v (1 quart per 100 gallons of spray solution).

Select the appropriate rate for soil texture and organic matter content as follows:

| Soil Texture                                     | HM-0429 (Pints/Acre)                       |      |     |
|--------------------------------------------------|--------------------------------------------|------|-----|
|                                                  | Percent Organic Matter in Soil Description |      |     |
|                                                  | <1%                                        | 1-5% | >5% |
| <b>Coarse</b>                                    |                                            |      |     |
| Loamy sand, sandy loam                           | 2-3                                        | 2-3  | 4-6 |
| <b>Medium</b>                                    |                                            |      |     |
| Loam, silt loam silt, clay loam, sandy clay loam | 2-3                                        | 3-6  | 4-6 |
| <b>Fine</b>                                      |                                            |      |     |
| Silty clay loam, sandy clay, silty clay, clay    | 3-6                                        | 3-6  | 4-6 |

**NOTE:**

- In the states of MT, ND, SD, and WY, do not exceed a use rate of 4 pints per acre on medium- and fine-textured soils.
- In the state of Montana (MT), do not apply to soils with less than 1.5% organic matter.
- In the state of Wyoming (WY): Do not apply to soils with less than 0.5% organic matter. Apply to irrigated alfalfa only.

**WEEDS CONTROLLED**

**HM-0429**, when applied preemergence or early postemergence at the following rates, will control these weed species in alfalfa:

**1-2 PINTS/ACRE**

|              |                            |
|--------------|----------------------------|
| Tansymustard | <i>Descurainia pinnata</i> |
|--------------|----------------------------|

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**2-4 PINTS/ACRE**

|                                |                                |
|--------------------------------|--------------------------------|
| Bluegrass, annual              | <i>Poa annua</i>               |
| Brome, downy (cheatgrass)      | <i>Bromus tectorum</i>         |
| Buckwheat, wild                | <i>Polygonum convolvulus</i>   |
| Catchfy, English               | <i>Silene gallica</i>          |
| Chamomile, mayweed (dogfennel) | <i>Anthemis cotula</i>         |
| Chickweed, common              | <i>Stellaria media</i>         |
| Fiddleneck, tarweed            | <i>Amsinckia lycopsoides</i>   |
| Filaree                        | <i>Erodium spp.</i>            |
| Flixweed                       | <i>Descurainia Sophia</i>      |
| Groundsel, common              | <i>Senecio vulgaris</i>        |
| Henbit*                        | <i>Lamium amplexicaule</i>     |
| Lettuce, Miner's               | <i>Montia perfoliata</i>       |
| Mustard, blue                  | <i>Chorispora tenella</i>      |
| Mustard, Jim Hill (tumble)     | <i>Sisymbrium altissimum</i>   |
| Mustard, wild                  | <i>Brassica kaber</i>          |
| Orchardgrass (seedling)        | <i>Dactylis glomerata</i>      |
| Pennycress, field              | <i>Thlaspi arvense</i>         |
| Pigweed, redroot               | <i>Amaranthus retroflexus</i>  |
| Radish, wild                   | <i>Raphanus raphanistrum</i>   |
| Rocket, London                 | <i>Sisymbrium irio</i>         |
| Rocket, common yellow          | <i>Barbarea vulgaris</i>       |
| Salsify                        | <i>Tragopogon spp.</i>         |
| Shepherdspurse                 | <i>Capsella bursa-pastoris</i> |
| Speedwell, purslane            | <i>Veronica peregrina</i>      |
| Spurry, corn                   | <i>Spergula arvensis</i>       |

**4-6 PINTS/ACRE**

|                                     |                                 |
|-------------------------------------|---------------------------------|
| Alfalfa* (seedling)                 | <i>Medicago sativa</i>          |
| Barley, foxtail (seedling)          | <i>Hordeum jubatum</i>          |
| Bluegrass, perennial* (spring only) | <i>Poa spp.</i>                 |
| Cockle, white*                      | <i>Melandrium album</i>         |
| Dandelion, common*                  | <i>Taraxacum officinale</i>     |
| Dandelion, false* (spotted catsear) | <i>Hypochaeris radicata</i>     |
| Foxtail*                            | <i>Setaria spp.</i>             |
| Kochia                              | <i>Kochia scoparia</i>          |
| Lambsquarters, common               | <i>Chenopodium album</i>        |
| Lettuce, prickly*                   | <i>Lactuca serriola</i>         |
| Mallow, common                      | <i>Malva neglecta</i>           |
| Quackgrass*                         | <i>Elytrigia repens</i>         |
| Ryegrass, Italian (annual)          | <i>Lolium multiflorum</i>       |
| Speedwell, ivyleaf                  | <i>Veronica hederifolia</i>     |
| Tea, Mexican*                       | <i>Chenopodium ambrosioides</i> |
| Thistle, Canada (seedling)          | <i>Cirsium arvense</i>          |
| Thistle, Russian                    | <i>Salsola iberica</i>          |

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

HM-0429, when applied to alfalfa in late spring or after cutting at the following rates, will control these species listed below:

**2-6 PINTS/ACRE**

|                       |                               |
|-----------------------|-------------------------------|
| Crabgrass             | <i>Digitaria spp.</i>         |
| Fleabane              | <i>Conyza spp.</i>            |
| Foxtail               | <i>Setaria spp.</i>           |
| Jimsonweed            | <i>Datura stramonium</i>      |
| Lambsquarters, common | <i>Chenopodium album</i>      |
| Pigweed, redroot      | <i>Amaranthus retroflexus</i> |

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**SPRAY EQUIPMENT**

Apply **HM-0429** using a fixed boom power sprayer or aerial equipment.

For ground applications apply in a minimum of 20 gallons of spray solution per acre and by air in a minimum of 5 gallons per acre. Use at least 5 pints of water per each 1 pint of **HM-0429**.

**CHEMIGATION - ALFALFA**

Apply this product only through center pivot sprinkler irrigation systems. Do not apply this product through any other type of irrigation system. Crop injury, lack of effectiveness, or illegal pesticide residues in the crop can result from nonuniform distribution of treated water. Severe alfalfa injury may result following application after cutting if either the regrowth is more than 2" high or significant stubble is left after alfalfa cutting. If you have questions about calibration, you should contact State Extension Service specialists, equipment manufacturers or other experts. A person knowledgeable of the chemigation system and responsible for its operation, or under the supervision of the responsible person, shall shut the system down and make necessary adjustments should the need arise.

**DORMANT APPLICATIONS**

Select the appropriate rate, see "Use Rate" section, for soil texture and organic matter content using 0.25" to 0.75" of sprinkler irrigation as a continuous injection during the application. Best results are obtained when soil is moist at time of application, and when weeds have not germinated or are less than 2" tall or across.

**APPLICATION AFTER CUTTING**

Apply Helena **HM-0429** at 1 pint per acre to stubble after cutting, following hay removal, and before regrowth exceeds 2" in height. Apply **HM-0429** using 0.25" to 0.75" of sprinkler irrigation as a continuous injection during the application. Best results are obtained when soil is moist at time of application and when weeds have not germinated or are less than 2" tall or across.

**NOTE:** Making an application when daily temperatures are forecast to be in the mid-to-high 90-degree temperature range within 3 to 5 days after treatment may increase the potential for crop injury.

**SPRINKLER CHEMIGATION**

The system must contain a functional check valve, vacuum relief valve, and low pressure drain appropriately located on the irrigation pipeline to prevent water source contamination from backflow.

The pesticide injection pipeline must contain a functional, automatic, quick-closing check valve to prevent the flow of fluid back toward the injection pump.

The pesticide injection pipeline must also contain a functional, normally closed, solenoid-operated valve located on the intake side of the injection pump and connected to the system interlock to prevent fluid from being withdrawn from the supply tank when the irrigation system is either automatically or manually shut down.

The system must contain functional interlocking controls to automatically shut off the pesticide injection pump when the water pump motor stops.

The irrigation line or water pump must include a functional pressure switch which will stop the water pump motor when the water pressure decreases to the point where pesticide distribution is adversely affected.

Systems must use a metering pump, such as a positive displacement injection pump (e.g., diaphragm pump) effectively designed and constructed of materials that are compatible with pesticides and capable of being fitted with a system interlock.

**MIXING INSTRUCTIONS**

1. Fill the supply tank 1/4 to 1/3 full of water.
2. While agitating, add the required amount of **HM-0429** and continue agitation.
3. Once the **HM-0429** is fully dispersed, maintain agitation and continue filling tank with water.
4. As the tank is filling, add tank mix partners (if desired). Follow use precautions and directions on the tank mix partner label.
5. After thorough mixing, the agitation system can be stopped to prevent excessive foaming in the tank. Once thoroughly mixed the solution in the supply tank does not require additional agitation unless specified on the companion products label. If foaming occurs in the injection supply tank, a defoaming agent (defoamer) may be added.
6. Apply **HM-0429** spray mixture within 48 hours of mixing to avoid product degradation.

**USE PRECAUTIONS - CHEMIGATION**

- Do not connect an irrigation system (including greenhouse systems) used for pesticide application to a public water system unless the pesticide label prescribed safety devices for public water systems are in place.
- Distributing treated water in an uneven manner can result in crop injury, lack of effectiveness, or over-tolerance pesticide residues in the crop. Therefore, to ensure that the mixture is applied evenly at the recommended rate, use sufficient water, apply the mixture for the proper length of time and ensure sprinkler produces a uniform water pattern.
- Do not permit runoff during chemigation.

**POSTING OF AREAS TO BE TREATED**

Posting of areas to be chemigated is required when 1) any part of a treated area is within 300 feet of sensitive areas such as residential areas, labor camps, businesses, daycare centers, hospitals, in-patient clinics, nursing homes, or any public areas such as schools, parks, playgrounds, or other public facilities not including public roads, or 2) when the chemigated area is open to the public such as golf courses or retail greenhouses. Posting must conform to all the following requirements:

- Treated areas shall be posted with signs at all usual points of entry and along likely routes of approach from the listed sensitive areas. When there are no usual points of entry, signs must be posted in the corners of the treated areas and in any other location affording maximum visibility to sensitive areas.
- The printed side of the sign should face away from the treated area towards the sensitive area. The signs shall be printed in English.
- Signs must be posted prior to application and must remain posted until foliage has dried and soil surface water has disappeared. Signs may remain in place indefinitely as long as they are composed of materials to prevent deterioration and maintain legibility for the duration of the posting period.
- All words shall consist of letters at least 2-1/2 inches tall, and all letters and the symbol shall be a color which sharply contrasts with their immediate background. At the top of the sign shall be the words "KEEP OUT", followed by an octagonal stop sign symbol at least 8 inches in diameter containing the word "STOP". Below the symbol shall be the words "PESTICIDE IN IRRIGATION WATER".
- Posting required for chemigation does not replace other posting and reentry requirements for farm worker safety.

**REPLANTING (FOLLOWING ALFALFA)**

- Do not replant treated areas to any crop except corn, root crops or sugarcane within two years after treatment, as crop injury may result.
- Corn may be planted 12 months after the last treatment in areas of moderate to high rainfall (greater than 20 inches), provided the use rate did not exceed 3 pints per acre.
- Root crops such as potatoes, sugarbeets, radish and carrots may be planted 12 months after last treatment, provided the use rate does not exceed 2 pints per acre. Sites with use rates higher than 2 pints per acre should not be replanted to any root crop within 2 years after application of Helena **HM-0429**, or unacceptable crop injury may result.
- In areas where irrigation is needed to produce the crop, the crop rotation intervals listed may need to be extended if the normal irrigation amount is reduced for any reason.
- Sugarcane may be planted any time following treatment.
- In California, do not replant seed alfalfa areas to any crop within two years after treatment, as crop injury may result.

**FLOOD IRRIGATED ALFALFA**

In arid climates (10 inches of rainfall or less per year) or areas where drought conditions have prevailed for one or more years, a field bioassay should be completed prior to planting any desired crop. The results of this bioassay may require the rotation intervals listed above to be extended.

A successful bioassay means growing to maturity a test strip of the crop(s) intended for production. The test crop(s) strip should cross the entire field including knolls, low areas, and areas where any berms were located.

In areas where irrigation is needed to produce the crop, the crop rotation intervals listed may need to be extended if the normal irrigation amount is reduced for any reason.

**ALFALFA - IMPREGNATION ON DRY BULK FERTILIZER (EXCEPT CALIFORNIA AND ARIZONA)**

Dry bulk fertilizer may be impregnated or coated with **HM-0429** for application to established alfalfa. All recommendations and precautions on this label must be followed along with state regulations relating to dry bulk fertilizer blending, impregnating and labeling.

If fertilizer materials are excessively dusty, use a suitable additive to reduce dust prior to impregnation, as dusty fertilizer will result in poor distribution during application. The dry fertilizer must be properly impregnated and uniformly applied to the alfalfa to avoid crop injury and/or poor weed control.

To impregnate the fertilizer, use a system consisting of a conveyor or closed drum used to blend dry bulk fertilizer. Any commonly used fertilizer can be impregnated with **HM-0429**, except potassium nitrate or sodium nitrate. Do not use **HM-0429** on limestone.

Use a minimum of 250 lbs. dry bulk fertilizer per acre and up to a maximum of 450 lbs. per acre. To impregnate or coat the dry bulk fertilizer with **HM-0429**, direct the nozzles to deliver a fine spray of this suspension toward the fertilizer for thorough coverage while avoiding spray contact with mixing equipment. Uniform impregnation of **HM-0429** to dry bulk fertilizer will vary, and if the absorptivity is not adequate, the use of an absorptive powder may be required to produce a dry, free-flowing mixture. "Microcel E" is the recommended absorbent powder. When another herbicide is used with **HM-0429**, mix and impregnate the fertilizer immediately.

Apply impregnated fertilizer as soon as possible after impregnation for optimum performance.

Select the rate of **HM-0429** to apply per acre from the appropriate section of this label. Then refer to the rate chart below to determine the amount of **HM-0429** that should be impregnated on a ton of dry bulk fertilizer, based on the amount of fertilizer to be distributed in one acre.

**Rate Chart for Impregnating Fertilizer with Helena HM-0429 Fertilizer**  
HM-0429 Rate Per Acre

| Rate Per Acre | 2 Pints       | 3 Pints       | 4 Pints       | 6 Pints       |
|---------------|---------------|---------------|---------------|---------------|
| 250 pounds    | 16 pts./ton   | 24 pts./ton   | 32 pts./ton   | 48 pts./ton   |
| 300 pounds    | 13.4 pts./ton | 20 pts./ton   | 26.8 pts./ton | 40.2 pts./ton |
| 350 pounds    | 11.4 pts./ton | 17.2 pts./ton | 22.8 pts./ton | 34.2 pts./ton |
| 400 pounds    | 10 pts./ton   | 15 pts./ton   | 20 pts./ton   | 30 pts./ton   |
| 450 pounds    | 8.8 pts./ton  | 13.2 pts./ton | 17.6 pts./ton | 26.4 pts./ton |

For rates other than those listed, use the following formula to calculate the amounts of **HM-0429** to be impregnated per ton of dry fertilizer.

$$\begin{matrix} \text{Pints HM-0429} \\ \text{Per Acre} \end{matrix} \times \begin{matrix} 1 \text{ Ton} \\ \text{Fertilizer} \end{matrix} = \begin{matrix} \text{Pints HM-0429 per} \\ \text{Ton of Fertilizer} \end{matrix}$$

**APPLICATION**

Uniform application of **HM-0429**-impregnated dry fertilizer is essential for satisfactory weed control. Accurate calibration of the application equipment is essential for uniform distribution to the surface. The recommended method of application is to apply 1/2 the recommended rate and overlap 50%. This results in the best distribution pattern.

**USE PRECAUTIONS - ALFALFA**

- Best results are obtained when 1/2-1 inch of rainfall or sprinkler irrigation occurs within two weeks after application, when soil is moist at time of application, and when weeds have not germinated or are less than 2 inches in height or diameter. Heavy rainfall or excessive irrigation after application may result in crop injury or poor performance of the herbicide.
- On soils high in organic matter (greater than 5%), the effectiveness of **HM-0429** can be significantly reduced and weed control may be unsatisfactory.
- Avoid overlapping of spray swaths and shut off spray booms while starting, turning, slowing or stopping or crop injury may result.
- Crop injury, including mortality, may result in fields with restricted root growth due to nonuniform soil profiles such as gravel bases and clay lenses.
- Crop injury may result if hot weather, mid-to-high 90-degree range or higher, occurs within a few days after application.
- Do not apply to snow-covered or frozen ground.

(continued)

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- Since the effect of **HM-0429** on alfalfa varies with soil conditions, uniformity of application, and environmental conditions, growers should limit their first use to small areas.
- If abnormally dry conditions exist following application, restrict the first irrigation to no more than 1/2 acre inch of water.
- Temporary yellowing of alfalfa may occur following **HM-0429** applications.
- *Treat only stands of alfalfa established for one year or for one growing season (except in California), provided:*
  - The alfalfa stand has a well developed tap root structure that is at least 10 inches in length (0.25 inch diameter below the crown) throughout the field and the crop is healthy, vigorous, and not under stress from weather conditions, low fertility, insects or disease damage.
  - In areas with shorter growing seasons, such as, higher elevations, adequate alfalfa tap root growth may not occur and especially when alfalfa is grown together with a cover or nurse crop. If an adequate tap root is not present, delay application of **HM-0429** until the alfalfa has gone through a minimum of two growing seasons.
- In California, fall planted alfalfa may be treated in the following winter months with **HM-0429** at 1 to 2 pints per acre (use higher rate for fine-textured soils) provided:
  - alfalfa root growth exceeds 6 inches in length
  - vegetative top growth of alfalfa has lateral development of secondary growth
  - alfalfa is healthy and vigorous, not growing under stress from insect, disease, winter injury or other types of stress. Injury may result to alfalfa plants that fail to meet these growth criterion listed above.
- Do not use **HM-0429** on seedling alfalfa, alfalfa-grass mixtures, or other mixed stands as injury may result to the seedling alfalfa or companion crop.
- Do not add a surfactant to **HM-0429** when treating non-dormant alfalfa.
- Do not use **HM-0429** on gravelly or rocky soils, exposed subsoils, hardpan, sand, poorly drained soil, or alkali soils.

**SEED ALFALFA (CALIFORNIA ONLY)**

**ADDITIONAL USE PRECAUTIONS**

- Do not use **HM-0429** on fields with sandy loam or loamy sand soils having less than 1% organic matter.
- Do not exceed 2 pints per acre on fields with sandy loam or loamy sand soils having 1-2% organic matter.
- Do not exceed 2 pints per acre on seed alfalfa that has been established for only one growing season.

**BLUEBERRY**

**HIGH BUSH BLUEBERRIES**

**HM-0429** is recommended for control of certain herbaceous and woody weeds in established high bush blueberry fields.

**APPLICATION INFORMATION**

**HM-0429** may be applied to high bush blueberries that have been established for 3 or more years. Apply **HM-0429** in the spring before the lower leaves of the blueberry plant have fully expanded. Avoid contact of the leaves with the spray solution.

Using calibrated ground spray equipment, make the application in sufficient water to provide thorough and uniform coverage to the treated area (usually 20 gallons per acre). Shut off spray booms when starting, turning, slowing or stopping, or injury to the crop may result.

**USE PRECAUTIONS**

- Do not apply through any type of irrigation system.
- Do not apply within 90 days of harvest.
- Do not apply to flooded field with standing water.
- Application to blueberry foliage will result in crop injury.
- Since the effect of Helena **HM-0429** on blueberries varies with soil type, plant vigor, uniformity of applications and amount of rainfall, it is suggested that growers limit their first use to small areas.

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**USE RATES (Pints/Acre)**

**HIGH BUSH BLUEBERRIES**

| Soil Texture Description                                                   | less than or equal to 3% organic matter | greater than 3% organic matter |
|----------------------------------------------------------------------------|-----------------------------------------|--------------------------------|
| <b>Coarse</b><br>loamy sand, sandy loam<br>(50-85% sand)                   | 4                                       | 5                              |
| <b>Medium</b><br>loam, silt loam, silt,<br>clay loam, sandy clay loam      |                                         | 8                              |
| <b>Fine</b><br>silty clay loam, clay loam,<br>sandy clay, silty clay, clay | 4-6*                                    | 8                              |

\*Use the higher rate as the soil organic matter approaches 3%.

**LOW BUSH BLUEBERRIES**

HM-0429 may be used for the control of certain weeds in low bush blueberries.

**APPLICATION INFORMATION**

HM-0429 may only be applied to pruned blueberry fields in the spring before leaf emergence. Using calibrated ground spray equipment, make the application in sufficient water to provide thorough and uniform coverage to the treated area (usually 20 gallons per acre). Shut off spray booms when starting, turning, slowing or stopping, or injury to the crop may result.

**USE RATES (Pints/Acre)**

**LOW BUSH BLUEBERRIES**

| Soil Texture Description                                                   | less than or equal to 3% organic matter | greater than 3% organic matter |
|----------------------------------------------------------------------------|-----------------------------------------|--------------------------------|
| <b>Coarse</b><br>loamy sand, sandy loam<br>(50-85% sand)                   | 4                                       | 5                              |
| <b>Medium</b><br>loam, silt loam, silt,<br>clay loam, sandy clay loam      |                                         | 6                              |
| <b>Fine</b><br>silty clay loam, clay loam,<br>sandy clay, silty clay, clay | 4-8*                                    | 8-12**                         |

\*Use the higher rate as the soil organic matter approaches 3%.

\*\*Use the higher rate for harder-to-control species.

**USE PRECAUTIONS**

- Do not apply through any type of irrigation system.
- Do not apply to flooded field with standing water.
- Do not apply within 450 days of harvest.
- Do not exceed 8 pints per acre if field has been treated with hexazinone within the past 8 years.
- Application to blueberry foliage will result in crop injury.
- Since the effect of HM-0429 on blueberries varies with soil type, plant vigor, uniformity of applications and amount of rainfall, it is suggested that growers limit their first use to small areas. If excessive leaf drop is observed after treatment, reduce rate in future applications.
- Maintain a 50-foot buffer from any well head or water reservoir.

**IMPREGNATION ON DRY BULK FERTILIZER**

Dry bulk fertilizer may be impregnated or coated with **HM-0429** for application to established blueberries. All recommendations and precautions on this label must be followed along with state regulations relating to dry bulk fertilizer blending, impregnating and labeling.

If fertilizer materials are excessively dusty, use a suitable additive to reduce dust prior to impregnation, as dusty fertilizer will result in poor distribution during application. The dry fertilizer must be properly impregnated and uniformly applied to the alfalfa to avoid crop injury and/or poor weed control.

To impregnate the fertilizer, use a system consisting of a conveyor or closed drum used to blend dry bulk fertilizer. Any commonly used fertilizer can be impregnated with **HM-0429**, except potassium nitrate or sodium nitrate. Do not use **HM-0429** on limestone.

Use a minimum of 250 lbs. dry bulk fertilizer per acre and up to a maximum of 450 lbs. per acre. To impregnate or coat the dry bulk fertilizer with **HM-0429**, direct the nozzles to deliver a fine spray of this suspension toward the fertilizer for thorough coverage while avoiding spray contact with mixing equipment. Uniform impregnation of **HM-0429** to dry bulk fertilizer will vary, and if the absorptivity is not adequate, the use of an absorptive powder may be required to produce a dry, free-flowing mixture. "Microcel E" is the recommended **HM-0429** is recommended for the control or absorbent powder. When another herbicide is used with suppression of the following weed species in High and Low **HM-0429**, mix and impregnate the fertilizer immediately.

Apply impregnated fertilizer as soon as possible after impregnation for optimum performance.

Select the rate of **HM-0429** to apply per acre from the appropriate section of this label. Then refer to the rate chart below to determine the amount of **HM-0429** that should be impregnated on a ton of dry bulk fertilizer, based on the amount of fertilizer to be distributed in one acre.

**Rate Chart for Impregnating Fertilizer with Helena HM-0429 Fertilizer**

| Rate Per Acre | HM-0429 Rate Per Acre |               |               |               |
|---------------|-----------------------|---------------|---------------|---------------|
|               | 2 Pints               | 3 Pints       | 4 Pints       | 6 Pints       |
| 250 pounds    | 16 pts./ton           | 24 pts./ton   | 32 pts./ton   | 48 pts./ton   |
| 300 pounds    | 13.4 pts./ton         | 20 pts./ton   | 26.8 pts./ton | 40.2 pts./ton |
| 350 pounds    | 11.4 pts./ton         | 17.2 pts./ton | 22.8 pts./ton | 34.2 pts./ton |
| 400 pounds    | 10 pts./ton           | 15 pts./ton   | 20 pts./ton   | 30 pts./ton   |
| 450 pounds    | 8.8 pts./ton          | 13.2 pts./ton | 17.6 pts./ton | 26.4 pts./ton |

For rates other than those listed, use the following formula to calculate the amounts of **HM-0429** to be impregnated per ton of dry fertilizer.

$$\begin{matrix} \text{Pints } \mathbf{HM-0429} \\ \text{Per Acre} \end{matrix} \times \begin{matrix} 1 \text{ Ton} \\ \text{Fertilizer} \end{matrix} = \begin{matrix} \text{Pints } \mathbf{HM-0429} \text{ per} \\ \text{Ton of Fertilizer} \end{matrix}$$

**APPLICATION**

Uniform application of **HM-0429**-impregnated dry fertilizer is essential for satisfactory weed control. Accurate calibration of the application equipment is essential for uniform distribution to the surface. The recommended method of application is to apply 1/2 the recommended rate and overlap 50%. This results in the best distribution pattern.

**WEEDS CONTROLLED**

**HM-0429** is recommended for the control or suppression of the following weed species in High and Low Bush Blueberry crops:

- |                                  |                               |
|----------------------------------|-------------------------------|
| Aster, heath*                    | <i>Aster ericoides</i>        |
| Barnyardgrass                    | <i>Echinochloa crus-galli</i> |
| Blackberry* (briar)              | <i>Rubus spp.</i>             |
| Bluegrass, Kentucky (perennial)* | <i>Poa pratensis</i>          |

(continued)



Brome, downy (cheatgrass)  
 Broomsedge\*  
 Carrot, wild\*  
 Catchfly, English  
 Chamomile, mayweed  
 Cherry, wild  
 Chickweed, common  
 Cinquefoil  
 Cockle, white\*  
 Dandelion, common\*  
 Dandelion, false\* (spotted catsear)  
 Daisy, oxeye  
 Dock, curly\*  
 Dogfennel  
 Fescue\*  
 Fiddleneck, tarweed  
 Filaree  
 Fireweed\* (willowweed)  
 Fleabane, flax-leaved  
 Flixweed  
 Foxtail, yellow  
 Goldenrod  
 Groundsel, common  
 Hawkweed  
 Horseweed/marestail  
 Jimsonweed  
 Lambsquarters, common  
 Lettuce, Miner's  
 Lettuce, prickly\*  
 Mustard, blue  
 Mustard, Jim Hill (tumble)  
 Orchardgrass\*  
 Orchardgrass (seedling)  
 Panicgrass (witchgrass)  
 Panicum, fall  
 Pearly everlasting  
 Pennycress, field  
 Pigweed, redroot  
 Quackgrass  
 Radish, wild  
 Ragweed, common  
 Raspberry\* (briar)  
 Rocket, London  
 Rocket, common yellow  
 Ryegrass, Italian (annual)  
 Ryegrass, perennial\*  
 Salsify  
 Shepherdspurse  
 Smartweed, Pennsylvania  
 Sorrel, red  
 Sorrel, sheep  
 Spurry, corn

*Bromus tectorum*  
*Andropogon virginicus*  
*Daucus carota*  
*Silene gallica*  
*Anthemis cotula*  
*Prunus serotia*  
*Stellaria media*  
*Potentilla* spp.  
*Meibandrium album*  
*Taraxacum officinale*  
*Hypochaeris radicata*  
*Chrysanthemum leucanthemum*  
*Rumex crispus*  
*Eupatorium capillifolium*  
*Festuca* spp.  
*Amsinckia lycopsoides*  
*Erodium* spp.  
*Epilobium angustifolium*  
*Conyza bonariensis*  
*Descurainia Sophia*  
*Setaria lutescens*  
*Solidago* spp.  
*Senecio vulgaris*  
*Hieracium* spp.  
*Conyza canadensis*  
*Datura stramonium*  
*Chenopodium album*  
*Montia perfoliata*  
*Lactuca serriola*  
*Chorispora tenella*  
*Sisymbrium altissimum*  
*Dactylis glomerata*  
*Dactylis glomerata*  
*Panicum capillare*  
*Panicum dichotomiflorum*  
*Anaphalis margaritacea*  
*Thlaspi arvense*  
*Amaranthus retroflexus*  
*Agropyron repens*  
*Raphanus raphanistrum*  
*Ambrosia elatior*  
*Rubus* spp.  
*Sisymbrium irio*  
*Barbarea vulgaris*  
*Lolium multiflorum*  
*Lolium perenne*  
*Tragopogon* spp.  
*Capsella bursa-pastoris*  
*Polygonum pennsylvanicum*  
*Rumex acetosella*  
*Rumex angiocarpus*  
*Spergula arvensis*

(continued)

|                        |                                 |
|------------------------|---------------------------------|
| Strawberry, wild       | <i>Fragaria virginiana</i>      |
| Tansynustard (pinnate) | <i>Descurainia pinnata</i>      |
| Tea, Mexican*          | <i>Chenopodium ambrosioides</i> |
| Velvetgrass            | <i>Holcus lanatus</i>           |
| Yarrow                 | <i>Achillea spp.</i>            |

**8 to 12 Pints/Acre**

|                      |                            |
|----------------------|----------------------------|
| Dogbane**            | <i>Apocynum spp.</i>       |
| Meadow-sweet         | <i>Filipendula ulmaria</i> |
| Blackberry, trailing | <i>Rubus ursinus</i>       |
| Laurel, sheep        | <i>Kalmia angustifolia</i> |
| Rose, wild**         | <i>Rosa spp.</i>           |

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

**CHRISTMAS TREES**

Helena **HM-0429** is recommended for control of certain weeds where the following species are grown:

|                                  |                              |
|----------------------------------|------------------------------|
| Fir, Douglas (western U.S. only) | <i>Pseudotsuga menziesii</i> |
| Fir, Fraser                      | <i>Abies fraseri</i>         |
| Fir, grand                       | <i>Abies grandis</i>         |
| Fir, noble                       | <i>Abies procera</i>         |
| Pine, Austrian                   | <i>Pinus nigra</i>           |
| Pine, loblolly                   | <i>Pinus taeda</i>           |
| Pine, ponderosa                  | <i>Pinus ponderosa</i>       |
| Pine, Scotch                     | <i>Pinus sylvestris</i>      |
| Spruce, Sitka                    | <i>Picea sitchensis</i>      |

Unless otherwise directed in separately published Helena recommendations, do not use **HM-0429** on Christmas trees in the following states:

|             |               |                |               |
|-------------|---------------|----------------|---------------|
| Alabama     | Louisiana     | New Jersey     | Texas         |
| Arkansas    | Maine         | New York       | Vermont       |
| Connecticut | Maryland      | North Carolina | Virginia      |
| Delaware    | Massachusetts | Pennsylvania   | West Virginia |
| Georgia     | Mississippi   | Rhode Island   |               |
| Florida     | New Hampshire | South Carolina |               |

**APPLICATION INFORMATION**

**EASTERN U.S.**

Apply **HM-0429** as a broadcast spray in the spring prior to bud break. If application is made after bud break, use directional spray equipment to prevent contact with foliage.

**WESTERN U.S.**

Areas of greater than 20 inches annual rainfall: **HM-0429** may be applied as a broadcast spray in the spring prior to conifer bud break. If application is made after bud break, use directional spray equipment to prevent contact with foliage.  
 Areas of less than 20 inches annual rainfall: **HM-0429** may be applied in the fall before the soil freezes or in the spring after snow cover melts, but before conifer bud break occurs.

**USE RATES**

The rates listed below are for broadcast application. For band application, use proportionately less; for example, use 1/2 of the broadcast rates when treating a 3-foot band where row spacing is 6 feet. Use the higher end of the rate range on the heavier soil type.

Do not use more than one application of **HM-0429** per year.

| Soil Texture Description                                    | HM-0429 (Pints/Acre) |                   |
|-------------------------------------------------------------|----------------------|-------------------|
|                                                             | First Year Plantings | Established Trees |
| <b>Coarse Texture</b>                                       |                      |                   |
| Loamy sand, sandy loam<br>(50-85% sand)                     | 4                    | 4-5               |
| <b>Medium Texture</b>                                       |                      |                   |
| Loam, silt loam silt,<br>clay loam, sandy clay loam         | 4-5                  | 5-7               |
| <b>Fine Texture</b>                                         |                      |                   |
| Silty clay loam, clay loam,<br>sandy clay, silty clay, clay | 5-6                  | 7-8               |

**First year plantings** – Transplant stock that is 2 years old or more (1 year old for loblolly pine). Apply **HM-0429** only if rain-fall has settled the soil around the base and root systems of the transplants.

**Established trees** – Trees that have been planted in the plantation for 1 year or more.

**WEEDS CONTROLLED**

**HM-0429** is recommended for the control or suppression of the following weed species in Christmas tree crops:

|                                     |                                   |
|-------------------------------------|-----------------------------------|
| Aster, heath*                       | <i>Aster ericoides</i>            |
| Barnyardgrass                       | <i>Echinochloa crus-galli</i>     |
| Bentgrass, common                   | <i>Agrostis alba</i>              |
| Bluegrass, annual                   | <i>Poa annua</i>                  |
| Bromegrass                          | <i>Bromus spp.</i>                |
| Burnweed, American*                 | <i>Erechtites hieracifolius</i>   |
| Carrot, wild                        | <i>Daucus carota</i>              |
| Crabgrass*                          | <i>Digitaria spp.</i>             |
| Curly dock*                         | <i>Rumex crispus</i>              |
| Daisy, oxeye                        | <i>Chrysanthemum leucanthemum</i> |
| Dandelion, common*                  | <i>Taraxacum officinale</i>       |
| Dandelion, false* (spotted catsear) | <i>Hypochaeris radicata</i>       |
| Fescue*                             | <i>Festuca spp.</i>               |
| Fleabane                            | <i>Coryza spp.</i>                |
| Foxtail                             | <i>Setaria spp.</i>               |
| Goldenrod*                          | <i>Solidago spp.</i>              |
| Groundsel, common                   | <i>Senecio vulgaris</i>           |
| Horseweed/marestail                 | <i>Coryza canadensis</i>          |
| Orchardgrass*                       | <i>Dactylis glomerata</i>         |
| Ragweed, common                     | <i>Ambrosia elatior</i>           |
| Ryegrass, Italian (annual)          | <i>Lolium multiflorum</i>         |
| Ryegrass, perennial*                | <i>Lolium perenne</i>             |
| Smartweed, Pennsylvania             | <i>Polygonum pensylvanicum</i>    |
| Velvetgrass, common                 | <i>Holcus lanatus</i>             |

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

**SPRAY EQUIPMENT**

**HM-0429** may be applied by ground equipment or by air.

Select a spray volume that will ensure a thorough and uniform application. Apply a minimum of 5 gallons per acre by air and a minimum of 10 gallons per acre by ground equipment.

**USE PRECAUTIONS – CHRISTMAS TREES**

- Do not use **HM-0429** in nurseries, seed beds, or ornamental plantings.
- Do not add a surfactant in applications over the top of conifers.

- Weed control results from spring applications depend on sufficient moisture to activate **HM-0429**.
- Do not cut treated vegetation for forage or hay nor graze domestic animals on treated areas for 80 days following application.
- Poor weed and brush control may result from the following:
  - Heavy duff or slash present at the time of application.
  - Use on poorly drained sites.
  - Applications made when soil is saturated with water and rain is imminent within 24 hours.
  - Applications to soils high in organic matter (greater than 5%).
- Injury may occur when Helena **HM-0429** is used on the following:
  - Trees that show poor vigor, insect damage, disease, winter injury, or other stress conditions.
  - Any soil containing less than 1% organic matter.
  - Loamy sand or sandy loam with less than 2% organic matter (except Jeffrey Pine and Ponderosa Pine).
  - Foliage after bud break.
  - Gravelly or rocky soils, exposed subsoils, clay knobs, sand, or sandy soil with 85% or more sand.

**PINEAPPLE**

**HM-0429** is recommended for control of certain weeds in pineapple.

**APPLICATION INFORMATION**

Mix the proper amount of **HM-0429** in water. Add a surfactant at 0.25% by volume of water.

Use the lower rates on coarse-textured soils or in areas where rainfall exceeds 65 inches per year. Use the higher rates on fine-textured soils or in areas where rainfall is less than 65 inches per year.

**Intercrop period** - Apply **HM-0429** as a broadcast spray in 100 - 400 gallons of water per acre at the rate of 0.9 - 7 pints per acre. For aerial application, use at least 10 gallons water per acre.

**Post-mulch, preplant** - Apply **HM-0429** as a broadcast spray in 100 - 400 gallons of water per acre at the rate of 0.9 - 7 pints per acre.

**Post-plant, before planting material starts active growth** - Apply **HM-0429** as a broadcast spray in 100 - 400 gallons of water per acre at the rate of 0.9 - 7 pints per acre. A post-plant application should be made after planting material starts to grow only when weed growth has escaped control by other herbicide applications.

**Post-plant crop harvest, prior to forcing first ratoon** - Apply **HM-0429** as a broadcast spray in 100 - 400 gallons of water per acre at the rate of 0.9 - 7 pints per acre.

**Directed postemergence (pineapple and weeds) inter-space application** - Apply **HM-0429** as a directed spray 3 - 10 months after planting in 50 - 200 gallons of water per acre (broadcast basis) at the rate of 0.9 - 7 pints per acre (broadcast basis) using a stroller boom or knapsack.

**Directed spot treatments for perennial grasses before floral induction** - Spray perennial grasses postemergence to wet (50 - 200 gallons per acre depending on size) with 3.5 - 7 pints per 100 gallons of water as a spot treatment.

**Treatments to field edges and roadsides** - Apply **HM-0429** at 7 - 14.5 pints per acre in 100 - 400 gallons of water.

**WEEDS CONTROLLED**

**HM-0429** is recommended for the control or suppression of the following weeds in pineapple crops:

- |                  |                             |
|------------------|-----------------------------|
| Ageratum, tropic | <i>Ageratum conyzoides</i>  |
| Balsamapple      | <i>Momordica charantia</i>  |
| Castorbean       | <i>Ricinus communis</i>     |
| Crabgrass        | <i>Digitaria spp.</i>       |
| Crotalaria       | <i>Crotalaria spp.</i>      |
| Dallisgrass      | <i>Paspalum dilatatum</i>   |
| Guineagrass      | <i>Panicum maximum</i>      |
| Junglerice       | <i>Echinochloa colonum</i>  |
| Kao haole*       | <i>Leucaena glauca</i>      |
| Moana loa vine*  | <i>Canavalia cathartica</i> |

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|               |                            |
|---------------|----------------------------|
| Morningglory  | <i>Ipomoea spp.</i>        |
| Oxalis        | <i>Oxalis spp.</i>         |
| Popolo        | <i>Solanum sandwicense</i> |
| Richardsonium | <i>Richardsonia spp.</i>   |
| Vaseygrass    | <i>Paspalum urvillei</i>   |

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

**USE PRECAUTIONS - PINEAPPLE**

- Do not exceed 1.8 gallons **HM-0429** per acre per crop.
- Do not apply **HM-0429** within 181 days of harvest.

**SUGARCANE**

**HM-0429** is recommended for selective weed control in sugarcane except in the State of Florida.

**APPLICATION INFORMATION**

Apply a single treatment of **HM-0429** per year using a fixed-boom sprayer and a minimum of 25 gallons of spray per acre unless otherwise directed.

**HAWAII**

Apply **HM-0429** pre- or postemergence at the following rates for the indicated soil texture:

| Soil Texture Description                           | <b>HM-0429 (Pints/Acre)</b><br><b>(Plus surfactant 0.25% by volume)</b> |
|----------------------------------------------------|-------------------------------------------------------------------------|
| <b>Coarse</b><br>Sand, loamy sand, sandy loam      | 1.8 - 3.5                                                               |
| <b>Medium</b><br>Loam, silty loam, silty clay loam | 1.8 - 7.0                                                               |
| <b>Fine</b><br>Clay, gray hydromorphic clay        | 7.0 - 14.5                                                              |

Use the higher levels of the recommended dosage ranges on soils high in organic matter. Do not apply more than twice the highest recommended rate for the indicated soil texture per crop (18-24 months).

A surfactant is recommended for all uses. For preemergence use only, **HM-0429** may be applied with aerial equipment using at least 10 gallons of spray per acre.

Apply Helena **HM-0429** herbicide as a spot spray application for emerged weeds in sugarcane. Mix 3 to 12 pints of **HM-0429** per 100 gallons of water. Apply a sufficient volume of spray solution to thoroughly wet weed foliage but do not exceed a use rate of 14.4 pints per acre. Use the lower concentrations on coarse-textured soils that are low in organic matter, and use the higher concentrations on fine-textured soils that are high in organic matter.

**LOUISIANA**

Apply 1.8 - 3.5 pints of **HM-0429** per acre broadcast in the fall before sugarcane emerges or in the spring before active cane tillering begins. Fall treatments of 1.8 - 3 pints per acre may be followed by a spring treatment of 1.8 - 3 pints per acre. Do not apply more than 6 pints per year. Use the higher levels of the recommended dosage range on fine-textured soils.

**PUERTO RICO**

For preemergence treatments, apply 0.9 - 1.8 pints of **HM-0429** per acre. For postemergence treatments, apply 0.9 - 1.8 pints of **HM-0429** per acre to weeds after they have emerged. Use the lower rates on coarse-textured soils and the higher rates on fine-textured soils (high in clay or organic matter). Each ratoon may receive up to 1.8 pints of **HM-0429** per acre.

For spot treatment of emerged weeds, **HM-0429** may be applied with a knapsack sprayer in concentrations of 0.9 - 1.8 pints per 100 gallons of water. Apply a sufficient spray volume to wet the weed foliage. Do not exceed 100 gallons of spray per treated acre. Use the lower concentration on coarse-textured soils and the higher concentration on fine-textured soils.

**NOTE:** Since it is difficult to calibrate "spot" knapsack applications, extra care must be taken not to exceed the rate equivalent of the maximum of 1.8 pints **HM-0429** per acre.

Do not apply more than 3.6 pints of **HM-0429** per acre per crop.

**TEXAS**

Apply 1.8 - 7 pints of **HM-0429** per acre. On plant cane, apply the herbicide before the cane emerges or as a directed layby treatment. On stubble cane, apply **HM-0429** preemergence (up to the 3-leaf stage) or as a directed layby treatment. A pre- or early postemergence treatment may be followed by a layby treatment, provided at least 60 days have elapsed and 3 inches of rainfall or sprinkler irrigation have occurred since the first treatment.

Do not apply more than 7 pints of **HM-0429** per acre per crop. Use the following rates for the soil texture:

| Soil Texture Description | HM-0429 (Pints/Acre) |         |
|--------------------------|----------------------|---------|
|                          | Preemergence         | + Layby |
| <b>Coarse*</b>           |                      |         |
| Sandy loam               | 1.8                  | 1.8     |
| <b>Medium</b>            |                      |         |
| Loam, silt loam          | 2.7                  | 2.7     |
| <b>Fine</b>              |                      |         |
| Clay loam                | 3.5                  | 3.5     |

\*With at least 2% organic matter

On dormant cane, a surfactant may be added to the spray mixture to increase control of emerged weeds.

**WEEDS CONTROLLED**

**HM-0429** is recommended for the control or suppression of the following species in sugarcane crops:

|                               |                                    |
|-------------------------------|------------------------------------|
| Ageratum, tropic*             | <i>Ageratum conyzoides</i>         |
| Alexandergrass                | <i>Bracharia plantaginea</i>       |
| Balsamapple                   | <i>Momordica charantia</i>         |
| Barnyardgrass                 | <i>Echinochloa crus-galli</i>      |
| Bermudagrass*                 | <i>Cynodon dactylon</i>            |
| Burnweed, American (fireweed) | <i>Erechtites hieracifolius</i>    |
| Chickweed, common             | <i>Stellaria media</i>             |
| Crabgrass, large              | <i>Digitaria sanguinalis</i>       |
| Crabgrass, smooth             | <i>Digitaria ischaemum</i>         |
| Crotalaria, fuzzy             | <i>Crotalaria incana</i>           |
| Crotalaria, showy             | <i>Crotalaria spectabilis</i>      |
| Cuphea, tarweed               | <i>Cuphea carthagenensis</i>       |
| Dallisgrass                   | <i>Paspalum dilatatum</i>          |
| Fingergrass, radiate          | <i>Chloris radiata</i>             |
| Fingergrass, swollen          | <i>Chloris barbata</i>             |
| Foxtail, bristly              | <i>Setaria verticillata</i>        |
| Foxtail, yellow               | <i>Setaria lutescens</i>           |
| Geranium, Carolina            | <i>Geranium carolinianum</i>       |
| Goosegrass                    | <i>Elusine indica</i>              |
| Guineagrass                   | <i>Panicum maximum</i>             |
| Henbit                        | <i>Lamium amplexicaule</i>         |
| Itchgrass*                    | <i>Rottboellia cochinchinensis</i> |
| Job's-tears                   | <i>Coix lacryma</i>                |
| Johnsongrass (seedling)       | <i>Sorghum halepense</i>           |
| Junglerice                    | <i>Echinochloa colonum</i>         |
| Lambsquarters, common         | <i>Chenopodium album</i>           |

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Millet, Texas  
 Morningglory, hairy  
 Morningglory, threelobe  
 Mustard, wild  
 Oxalis  
 Paintbrush, Flora's  
 Panicum, browntop  
 Paspalum, ricegrass  
 Paspalum, sour  
 Pigweed, redroot  
 Pigweed, slender (green)  
 Pigweed, smooth  
 Popolo  
 Purslane, common  
 Sandbur  
 Sensitive plant (hila hila)  
 Signalgrass, broadleaf  
 Sowthistle, common  
 Spanishneedles  
 Sprangletop  
 Spurge, prostrate  
 Spurge, graceful  
 Sunflower  
 Vaseygrass  
 Waltheria (hia loa)

*Panicum texanum*  
*Ipomoea pentaphylla*  
*Ipomoea triloba*  
*Sinapis arvensis*  
*Oxalis* spp.  
*Emilia sonchifolia*  
*Panicum fasciculatum*  
*Paspalum orbiculare*  
*Paspalum conjugatum*  
*Amaranthus retroflexus*  
*Amaranthus viridis*  
*Amaranthus chlorostachys*  
*Solanum sandwicense*  
*Portulaca oleracea*  
*Cenchrus* spp.  
*Mimosa* spp.  
*Bracharia platyphylla*  
*Sonchus oleraceus*  
*Bidens bipinnata*  
*Leptochloa* spp.  
*Euphorbia humistrata*  
*Chamaesyce hypericifolia*  
*Helianthus* spp.  
*Paspalum urvillei*  
*Waltheria* spp.

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

**USE PRECAUTIONS - SUGARCANE**

- Do not plant any crop other than sugarcane following an application of Helena **HM-0429**.
- Do not feed sugarcane forage to livestock.
- Do not apply **HM-0429**
  - Within 180 days of harvest in Hawaii.
  - Within 234 days of harvest in Louisiana.
  - Within 288 days of harvest in Puerto Rico.
  - Within 234 days of harvest in Texas.
- To avoid injury to sugarcane, observe the following precautions:
  - Do not use **HM-0429** on cane that shows poor vigor because of insect damage, disease, or winter injury, or shows symptoms of other stress conditions such as drought stress.
  - Do not add a surfactant in applications unless otherwise specified or allowed.
  - Do not use **HM-0429** on gravelly or rocky soils, thinly covered subsoils, or coarse-textured soils (sands to sandy loams) with less than 1% organic matter.
  - Temporary chlorosis of the crop may result from application over emerged cane. Applications during active cane growth should be directed to cover the weeds and soil while minimizing crop contact.
  - Do not use **HM-0429** on varieties known to be susceptible to herbicides.
- Extremely heavy rainfall after application may result in poor weed control and/or crop injury, especially if the application is made to dry soil.

**FORESTRY**

**SITE PREPARATION**

**HM-0429** is recommended for weed and brush control in areas where the following species are grown:

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**EASTERN U.S. AND LAKE STATES**

|                 |                         |
|-----------------|-------------------------|
| Fir, balsam     | <i>Abies balsamea</i>   |
| Pine, Austrian  | <i>Pinus nigra</i>      |
| Pine, loblolly  | <i>Pinus taeda</i>      |
| Pine, longleaf  | <i>Pinus palustris</i>  |
| Pine, ponderosa | <i>Pinus ponderosa</i>  |
| Pine, red       | <i>Pinus resinosa</i>   |
| Pine, Scotch    | <i>Pinus sylvestris</i> |
| Pine, shortleaf | <i>Pinus echinata</i>   |
| Pine, slash     | <i>Pinus elliottii</i>  |
| Pine, Virginia  | <i>Pinus virginiana</i> |
| Spruce, black   | <i>Picea mariana</i>    |
| Spruce, red     | <i>Picea rubens</i>     |
| Spruce, white   | <i>Picea glauca</i>     |

**WESTERN U.S.**

|                  |                              |
|------------------|------------------------------|
| Fir, Douglas     | <i>Pseudotsuga menziesii</i> |
| Fir, grand       | <i>Abies grandis</i>         |
| Fir, Noble       | <i>Abies procera</i>         |
| Fir, white       | <i>Abies concolor</i>        |
| Pine, Jeffrey    | <i>Pinus jeffreyi</i>        |
| Pine, lodgepole  | <i>Pinus contorta</i>        |
| Pine, ponderosa  | <i>Pinus ponderosa</i>       |
| Spruce, blue     | <i>Picea pungens</i>         |
| Spruce, Engelman | <i>Picea engelmannii</i>     |
| Spruce, Sitka    | <i>Picea sitchensis</i>      |

**APPLICATION INFORMATION**

**EASTERN U.S.**

Apply **HM-0429** from early spring to early summer after hardwoods have broken bud and before the foliage has hardened off.

| Soil Texture Description                                          | HM-0429 (Quarts/Acre)<br>Eastern U.S. |
|-------------------------------------------------------------------|---------------------------------------|
| <b>Coarse</b>                                                     |                                       |
| Sand, loamy sand, sandy loam                                      | 4 - 6                                 |
| <b>Medium</b>                                                     |                                       |
| Loam, silt loam, sandy clay loam                                  | 6 - 8                                 |
| <b>Fine</b>                                                       |                                       |
| Silty clay loam, clay loam,<br>sandy clay, silt, silty clay, clay | 8 - 10                                |

The rates listed are for broadcast application. Use the lower rates on coarse-textured soils and soils low in organic matter. Use the higher rates where weeds identified in this label as "partial control or suppression" predominate.

**WESTERN U.S.**

For **SITE PREPARATION**, **HM-0429** may be applied at 2 to 6 quarts pre acre. Use the lower rates on coarse-textured soils and soils low in organic matter. Use the higher rates on fine-textured soils and soils high in organic matter. Use the higher rates where weeds identified in this label as "partial control or suppression" predominate.

In areas where other conifer species may be mixed in with the conifers listed above, **HM-0429** may be applied if the user has prior experience with **HM-0429** on the other conifer species. With no prior experience, it is recommended that either a small area of plantings be tested for conifer safety prior to treating larger areas, or make no application of **HM-0429** in these areas within the site preparation area. Conifer species that are sensitive to **HM-0429** (hexazinone) L, such as, sugar pine and western larch, require 18 months before interplanting on treated sites.



Applications made to shelter wood sites may also result in mortality to over-story conifers. Factors that may influence conifer sensitivity in these sites could include application rate, conifer species, soil characteristics, uniformity of spray distribution across the treatment swath and environmental stress.

**Rain Belt** (areas of high spring rainfall): For best results, apply in late winter or spring when weeds and brush are actively growing.

**Snow Belt** (areas of low spring rainfall): For best results, apply in the fall before soil freezes, or in the spring after snow cover melts in anticipation of rainfall. Weed and brush control results from spring applications will be dependent on sufficient rainfall following application to activate **HM-0429**.

**PLANTS CONTROLLED**

Helena **HM-0429** is recommended for the control or suppression of the following species in forestry site preparation:

**HERBACEOUS PLANTS**

|                                     |                                   |
|-------------------------------------|-----------------------------------|
| Asters                              |                                   |
| Aster, heath*                       | <i>Aster ericoides</i>            |
| Barryardgrass                       | <i>Echinochloa crus-galli</i>     |
| Bentgrass                           | <i>Agrostis spp.</i>              |
| Bluegrass, annual                   | <i>Poa annua</i>                  |
| Bromegrass                          | <i>Bromus spp.</i>                |
| Carrot, wild                        | <i>Daucus carota</i>              |
| Crabgrass*                          | <i>Digitaria spp.</i>             |
| Daisy, oxeye                        | <i>Chrysanthemum leucanthemum</i> |
| Dandelion, common*                  | <i>Taraxacum officinale</i>       |
| Dandelion, false* (spotted catsear) | <i>Hypochaeris radicata</i>       |
| Dock, curly*                        | <i>Rumex crispus</i>              |
| Elksedge                            | <i>Carex geyeri</i>               |
| Fescue*                             | <i>Festuca spp.</i>               |
| Fireweed*(willowweed)               | <i>Epilobium angustifolium</i>    |
| Fleabane                            | <i>Coryza spp.</i>                |
| Foxtail                             | <i>Setaria spp.</i>               |
| Goldenrod*                          | <i>Solidago spp.</i>              |
| Groundsel, common                   | <i>Senecio vulgaris</i>           |
| Horseweed/marestail                 | <i>Coryza canadensis</i>          |
| Mullein, common**                   | <i>Verbascum thapsus</i>          |
| Orchardgrass*                       | <i>Dactylis glomerata</i>         |
| Pinegrass                           | <i>Calamagrostis rubescens</i>    |
| Quackgrass*                         | <i>Agropyron repens</i>           |
| Ragweed, common                     | <i>Ambrosia elatior</i>           |
| Ryegrass, Italian (annual)          | <i>Lolium multiflorum</i>         |
| Ryegrass, perennial*                | <i>Lolium perenne</i>             |
| Smartweed, Pennsylvania             | <i>Polygonum pennsylvanicum</i>   |
| Squawcarpet                         | <i>Ceanothus prostratus</i>       |
| Thistle, Canada*                    | <i>Cirsium arvense</i>            |
| Velvetgrass, common                 | <i>Holcus lanatus</i>             |

\*\*For western U.S. site preparation, apply at 6 quarts per acre.

**WOODY PLANTS**

|                  |                              |
|------------------|------------------------------|
| Ash              | <i>Fraxinus spp.</i>         |
| Aspen, big tooth | <i>Populus grandidentata</i> |
| Aspen, trembling | <i>Populus tremuloides</i>   |
| Birch            | <i>Betula spp.</i>           |
| Blackgum         | <i>Nyssa sylvatica</i>       |

(continued)

|                         |                               |
|-------------------------|-------------------------------|
| Cherry, black           | <i>Prunus serotina</i>        |
| Deerbrush               | <i>Ceanothus integerrimus</i> |
| Dogwood, flowering*     | <i>Cornus florida</i>         |
| Elm                     | <i>Ulmus spp.</i>             |
| Hawthorn                | <i>Crataegus spp.</i>         |
| Hazel                   | <i>Corylus spp.</i>           |
| Hickory                 | <i>Carya spp.</i>             |
| Honeysuckle*            | <i>Lonicera spp.</i>          |
| Manzanita, Greenleaf    | <i>Arctostaphylos patula</i>  |
| Maple, red*             | <i>Acer rubrum</i>            |
| Oaks                    | <i>Quercus spp.</i>           |
| Poplar, balsam          | <i>Populus balsamifera</i>    |
| Snowbrush (varnishleaf) | <i>Ceanothus velutinus</i>    |
| Sourwood*               | <i>Oxydendrum arboreum</i>    |
| Sweetgum                | <i>Liquidambar spp.</i>       |
| Willows                 | <i>Salix spp.</i>             |

\*Suppression is a visible reduction in plant competition (reduced population and/or vigor) as compared to an untreated area. Degree of suppression will vary with rate applied, size of plants at application and environmental conditions following treatment. Species indicated above, especially resprouts of these species, may require a follow-up treatment for acceptable control. Burning, as a follow-up treatment, will enhance control of resprouts.

Within several weeks after **HM-0429** activation by rainfall, affected vegetation may be burned, if desired. This burn may further enhance control of vegetation. Burn the vegetation only after any residual stand is completely defoliated, at least twice, allowing for sufficient root uptake of **HM-0429**. In the West, results may take one to two years in areas of low rainfall.

**SPRAY EQUIPMENT**

When applied as a liquid spray using water as the carrier, **HM-0429** may be applied by ground equipment or by air (helicopter only).

For ground application, use enough water for thorough coverage, usually a minimum of 25 gallons per acre. For aerial applications, use at least 5 gallons of water per acre and at least 5 gallons of water for every 1 gallon of **HM-0429**.

**GRID APPLICATION**

Apply undiluted **HM-0429** directly to the soil surface in a grid pattern using an exact delivery handgun applicator. This equipment delivers a thin stream of a predetermined volume. **HM-0429** should be applied during the period from hardwood bud break to early summer.

Selection of the rate per acre and grid pattern will depend on soil texture and woody plant composition. Use the lower rates on coarse-textured soils and when the major component of the hardwoods are susceptible species. Use the high rates on fine-textured soils and where weeds identified in the label as "partial control or suppression" predominate.

|                    | Application Patterns and Rates For Undiluted HM-0429 |            |             |
|--------------------|------------------------------------------------------|------------|-------------|
|                    | ML/Spot                                              | Grid (Ft.) | Quarts/Acre |
| <b>Coarse</b>      | 0.6                                                  | 3 X 3      | 3           |
|                    | 2.0                                                  | 4 X 4      | 6           |
|                    | 3.1                                                  | 4 X 6      | 6           |
| <b>Medium/Fine</b> | 1.6                                                  | 3 X 3      | 8           |
|                    | 2.8                                                  | 4 X 4      | 8           |
|                    | 3.5                                                  | 4 X 4      | 10          |
|                    | 5.2                                                  | 4 X 6      | 10          |

**BASAL (SOIL) SINGLE STEM TREATMENT**

Apply undiluted **HM-0429** to the soil with an exact delivery handgun applicator. Apply at the rate of 2-4 ml for each inch of stem diameter at breast height. Direct the treatment to the soil within 3 feet of the root collar of woody plants to be controlled. When treating large stems and when more than one delivery of **HM-0429** is needed per stem, make application on opposite sides of the stem.

For multi-stemmed and low-growing brush that have stem diameters that are difficult to determine, apply **HM-0429** at the rate of 2-4 ml per 3 feet of canopy width. For tall, slender (columnar) brush types, apply 4-8 ml per 3 feet of height. Base the rate on whichever canopy dimension is greater (width or height).

When treating brush that requires more than a single 4 ml application of **HM-0429**, apply subsequent applications equally spaced around the plant. If treating brush on sloped sites, apply most of the **HM-0429** on the uphill side of the stem. If treating resprouts from brush disturbed by cutting or shredding, the rate of application should be proportional to the original tree size, not just the small regrowth of sprouts.

**INJECTION**

No Worker Protection Standard worker entry restrictions or worker notification requirements apply when this product is directly injected into agricultural plants.

Inject 1 ml of undiluted Helena **HM-0429** through the bark of undesirable trees. Injections should be made at 4-inch intervals around the circumference of the tree. When using tubular injection equipment, inject near the ground level. When using the "Hypo-Hatchet" Tree Injector or a similar device, inject at waist height. Treatment should be made in the summer. Woody species controlled include black cherry, oaks, and sweetgum.

**USE PRECAUTIONS - SITE PREPARATION**

Where burning is desired, burn the vegetation only after any residual brush has completely defoliated, at least twice, allowing for sufficient root uptake of **HM-0429**.

Following harvest, allow sufficient time for stumps and injured trees to adequately resprout before applying **HM-0429**.

**FORESTRY RELEASE**

**HM-0429** is recommended for conifer release where the following species are grown:

**EASTERN U.S. AND LAKE STATES**

- |                 |                         |
|-----------------|-------------------------|
| Fir, balsam     | <i>Abies balsamea</i>   |
| Pine, loblolly  | <i>Pinus taeda</i>      |
| Pine, longleaf  | <i>Pinus palustris</i>  |
| Pine, red       | <i>Pinus resinosa</i>   |
| Pine, shortleaf | <i>Pinus echinata</i>   |
| Pine, slash     | <i>Pinus elliotti</i>   |
| Pine, Virginia  | <i>Pinus virginiana</i> |
| Spruce, black   | <i>Picea mariana</i>    |
| Spruce, Norway  | <i>Picea abies</i>      |
| Spruce, red     | <i>Picea rubens</i>     |
| Spruce, white   | <i>Picea glauca</i>     |

**WESTERN U.S.**

- |                   |                              |
|-------------------|------------------------------|
| Fir, Douglas      | <i>Pseudotsuga menziesii</i> |
| Fir, grand        | <i>Abies grandis</i>         |
| Fir, Noble        | <i>Abies procera</i>         |
| Fir, white        | <i>Abies concolor</i>        |
| Hemlock, Western  | <i>Tsuga heterophylla</i>    |
| Pine, Jeffrey     | <i>Pinus jeffreyi</i>        |
| Pine, lodgepole   | <i>Pinus contorta</i>        |
| Pine, ponderosa   | <i>Pinus ponderosa</i>       |
| Spruce, blue      | <i>Picea pungens</i>         |
| Spruce, Englemann | <i>Picea engelmannii</i>     |
| Spruce, Sitka     | <i>Picea sitchensis</i>      |

**APPLICATION INFORMATION**

**EASTERN U.S.**

Apply **HM-0429** from early spring to early summer after hardwoods have broken bud and before full leaf expansion. Applications made over the top of pines may result in excessive pine injury under conditions of high humidity and temperature (80 degrees F).

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**WESTERN U.S.**

**Rainbelt** (areas of high spring rainfall): For best results, apply in late winter or spring when brush is actively growing, but prior to conifer budbreak. If application is made after bud break, use directional spray equipment to prevent contact with conifer foliage, as injury may result.

**Snowbelt** (areas of low spring rainfall): For best results, apply in the fall before soil freezes and after the final resting bud has hardened on the conifers. Or, spring applications may be made after snow cover melts in anticipation of rainfall prior to conifer budbreak. Brush control results from spring treatments will be dependent on sufficient rainfall following application to activate **HM-0429**.

**USE RATES**

The rates listed below are for broadcast application. Use the higher rate range for the harder-to-control ("suppression") species in the "PLANTS CONTROLLED" listings of the "Site Prep" and "Release" sections. Do not use more than one application of **HM-0429** per year.

**EASTERN U.S.**

| <b>Crop Species</b> | <b>Soil Texture Description</b>                          | <b>HM-0429 (Quarts/Acre) Established Trees</b> |
|---------------------|----------------------------------------------------------|------------------------------------------------|
| Loblolly pine       | Loamy sand, sandy loam                                   | 2-3                                            |
| Longleaf pine       |                                                          |                                                |
| Shortleaf pine      | Loam, silty loam, silt, sandy clay loam                  | 2-4                                            |
| Virginia pine       |                                                          |                                                |
| Slash pine          | Silty clay loam, clay loam, sandy clay, silty clay, clay | 4.5-6                                          |
| Red pine            | Loamy sand, sandy loam                                   | 2-4                                            |
|                     | Loam, silt loam, silt, sandy clay loam                   | 4-6                                            |
|                     | Silty clay loam, clay loam, sandy clay, silty clay, clay | 6-8                                            |

**Established Trees**

- 4 years of age from transplanting on coarse-textured soils
- 3 years of age from transplanting on medium-textured soils
- 2 years of age from transplanting for Red Pine

**WESTERN U.S.**

Application rates by soil type for Helena **HM-0429** in the following western conifers: Blue spruce, Douglas fir, Engleman spruce, Grand fir, Jeffrey pine, Lodgepole pine, Noble fir, Ponderosa pine, Sitka spruce, Western hemlock, and White fir.

| <b>Soil Texture Description</b>                                | <b>HM-0429 (Quarts/Acre)</b> |
|----------------------------------------------------------------|------------------------------|
| Loamy sand, sandy loam                                         | 2-4.5                        |
| Loam, silt loam, sandy clay loam                               | 3.5-6                        |
| Silt, silty clay loam, clay loam, sandy clay, silty clay, clay | 5-6                          |

For first-year plantings using bare root stock, treat only transplant stock that is 2 years old (2-0, 1-1) or more, except (1-0) for Ponderosa and Jeffrey pines. Apply **HM-0429** only if rainfall has settled the soil around the base and root systems of the transplants.

**BRUSH CONTROLLED**

**HM-0429** is recommended for the control or suppression of the following species in forestry release sites:

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|                         |                               |
|-------------------------|-------------------------------|
| Ash                     | <i>Fraxinus spp.</i>          |
| Aspen, big tooth        | <i>Populus grandidentata</i>  |
| Aspen, trembling        | <i>Populus tremuloides</i>    |
| Birch                   | <i>Betula spp.</i>            |
| Elder, box              | <i>Acer negundo</i>           |
| Brambles                | <i>Rubus spp.</i>             |
| Cherry, black           | <i>Prunus serotina</i>        |
| Cherry, pin             | <i>Prunus pensylvanica</i>    |
| Deerbrush               | <i>Ceanothus integerrimus</i> |
| Dogwood, flowering*     | <i>Cornus florida</i>         |
| Elm                     | <i>Ulmus spp.</i>             |
| Hawthorn                | <i>Crataegus spp.</i>         |
| Hazel                   | <i>Corylus spp.</i>           |
| Honeysuckle*            | <i>Lonicera spp.</i>          |
| Manzanita, greenleaf    | <i>Arctostaphylos patula</i>  |
| Maple, red*             | <i>Acer rubrum</i>            |
| Oaks                    | <i>Quercus spp.</i>           |
| Poplar, balsam          | <i>Populus balsamifera</i>    |
| Snowbrush (varnishleaf) | <i>Ceanothus velutinus</i>    |
| Sourwood*               | <i>Oxydendrum arboretum</i>   |
| Sweetgum                | <i>Liquidambar spp.</i>       |
| Willows                 | <i>Salix spp.</i>             |

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

In addition to brush controlled, herbaceous species listed in "Weeds Controlled" section of Release-Herbaceous Weed Control may be controlled with these applications.

**SPRAY EQUIPMENT**

When applied as a liquid spray using water as the carrier, **HM-0429** may be applied by ground equipment or by air (helicopter only).

For ground application, use enough water for thorough coverage, usually a minimum of 25 gallons per acre. For aerial applications, use at least 5 gallons of water per acre and at least 5 gallons of water for every 1 gallon of **HM-0429**.

**GRID APPLICATION**

Apply undiluted **HM-0429** directly to the soil surface in a grid pattern using an exact delivery handgun applicator. This equipment delivers a thin stream of a predetermined volume when triggered. Apply **HM-0429** during the period from hardwood bud break to early summer.

Selection of the rate per acre and grid pattern depends on soil texture and woody plant composition. Use the lower rates on coarse-textured soils and when the major component of the hardwoods are susceptible species. Use the high rates on fine-textured soils and where weeds identified in this label as "partial control or suppression" predominate.

| Application Patterns and Rates For Undiluted HM-0429 |         |            |             |
|------------------------------------------------------|---------|------------|-------------|
|                                                      | ML/Spot | Grid (Ft.) | Quarts/Acre |
| <b>Coarse</b>                                        | 0.5     | 3 X 4      | 2           |
|                                                      | 1.2     | 3 X 6      | 3           |
|                                                      | 2.1     | 4 X 6      | 4           |
| <b>Medium/Fine</b>                                   | 1.2     | 3 X 3      | 6           |
|                                                      | 2.3     | 3 X 6      | 6           |
|                                                      | 1.6     | 3 X 3      | 8           |
|                                                      | 3.1     | 3 X 6      | 8           |

\*Use on deep sands with pines four years or more of age.

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**BASAL (SOIL) SINGLE STEM TREATMENT**

Apply undiluted **HM-0429** to the soil with an exact delivery handgun applicator. Apply at the rate of 2-4 ml for each inch of stem diameter at breast height. Direct the treatment to the soil within 3 feet of the root collar of woody plants to be controlled. When treating large stems and when more than one delivery of **HM-0429** is needed per stem, make application on opposite sides of the stem.

For multi-stemmed and low-growing brush that have stem diameters that are difficult to determine, apply **HM-0429** at the rate of 2-4 ml per 3 feet of canopy width. For tall, slender (columnar) brush types, apply 4-8 ml per 3 feet of height. Base rate on whichever canopy dimension is greater (width or height).

When treating brush that requires more than a single 4 ml application of **HM-0429**, apply subsequent applications equally spaced around the plant. If treating brush on sloped sites, apply most of the **HM-0429** on the uphill side of the stem. If treating resprouts from brush disturbed by cutting or shredding, the rate of application should be proportional to the original tree size, not just the small regrowth of sprouts.

**INJECTION**

No Worker Protection Standard worker entry restrictions or worker notification requirements apply when this product is directly injected into agricultural plants.

Inject 1 ml of undiluted **HM-0429** through the bark of undesirable trees. Injections should be made at 4-inch intervals around the circumference of the tree. When using tubular injection equipment, inject **HM-0429** near the ground level. When using the "Hypo-Hatchet" Tree Injector or a similar device, inject at waist height. Treatment should be made in the summer. Woody species controlled include black cherry, oaks, and sweetgum.

**USE PRECAUTIONS - RELEASE UNDILUTED APPLICATIONS**

- Application of Helena **HM-0429** spots closer than 36 inches to conifer seedlings in their first season or directly up slope from these seedlings may result in injury or mortality.
- Use **HM-0429** on seedlings in their first or fourth year and older. Injury may result from use on two- and three-year-old seedlings where root growth is extensive but hardness is lacking.

**RELEASE - HERBACEOUS WEED CONTROL**

**HM-0429** is recommended for controlling herbaceous weeds where the following species are grown for forestry release sites:

**EASTERN U.S.**

|               |               |          |            |
|---------------|---------------|----------|------------|
| Loblolly pine | Longleaf pine | Red pine | Slash pine |
|---------------|---------------|----------|------------|

**WESTERN U.S.**

|                 |                |                |                 |
|-----------------|----------------|----------------|-----------------|
| Blue spruce     | Grand fir      | Noble fir      | Western hemlock |
| Douglas fir     | Jeffrey pine   | Ponderosa pine | White fir       |
| Engleman spruce | Lodgepole pine | Sitka spruce   |                 |

**APPLICATION TIMING**

**EASTERN U.S.**

Apply **HM-0429** as a broadcast or banded spray in the spring prior to conifer bud break to lessen conifer injury potential.

**WESTERN U.S.**

**Rainbelt** (areas of high spring rainfall): For best results, apply as a broadcast or banded spray in the late winter or spring when weeds are actively growing, but prior to conifer budbreak. If application is made after conifer bud break, use directional spray equipment to prevent contact with conifer foliage, as injury may result.

**Snowbelt** (areas of low spring rainfall): For best results, apply as a broadcast or banded spray in the fall before soil freezes and after the final resting bud has hardened on the conifers. Or, spring applications may be made after snow cover melts in anticipation of rainfall prior to conifer budbreak. Weed control results from spring treatments will be dependent on sufficient rainfall following application to activate **HM-0429**.

**USE RATES**

The rates listed below are for broadcast application. For band application, use proportionately less. For example, use 1/2 of the broadcast rates when treating a 3-foot band where row spacing is 6 feet.

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**EASTERN U.S.**

| Soil Texture Description                                    | HM-0429 (Pints/Acre) |                   |
|-------------------------------------------------------------|----------------------|-------------------|
|                                                             | First Year Plantings | Established Trees |
| Loamy sand, sandy loam<br>(50-85% sand)                     | 4                    | 4-5               |
| Loam, silt loam, silt,<br>sandy clay loam                   | 4-5                  | 5-7               |
| Silty clay loam, clay loam,<br>sandy clay, silty clay, clay | 5-6                  | 7-8               |

Red pine only - Refer to recommended rates in the "APPLICATION INFORMATION - Eastern U.S. table" on page 21.

**WESTERN U.S.**

Refer to recommended rates in the "APPLICATION INFORMATION - Western U.S. table" on page 21.

**WEEDS CONTROLLED - RELEASE**

HM-0429 is recommended for the control or suppression of the following species in forestry release sites:

- |                                     |                                   |
|-------------------------------------|-----------------------------------|
| Asters                              | <i>Aster</i> spp.                 |
| Aster, heath*                       | <i>Aster encoides</i>             |
| Barnyardgrass                       | <i>Echinochloa crus-galli</i>     |
| Bentgrass                           | <i>Agrostis</i> spp.              |
| Bluegrass, annual                   | <i>Poa annua</i>                  |
| Brackenfern                         | <i>Pteridium aquilinum</i>        |
| Bromegrass                          | <i>Bromus</i> spp.                |
| Carrot, wild                        | <i>Daucus carota</i>              |
| Crabgrass*                          | <i>Digitaria</i> spp.             |
| Daisy, oxeye                        | <i>Chrysanthemum leucanthemum</i> |
| Dandelion, common*                  | <i>Taraxacum officinale</i>       |
| Dandelion, false* (spotted catsear) | <i>Hypochaeris radicata</i>       |
| Dock, curly*                        | <i>Rumex crispus</i>              |
| Fescue*                             | <i>Festuca</i> spp.               |
| Fireweed* (willowweed)              | <i>Epiobium angustifolium</i>     |
| Fleabane                            | <i>Conyza</i> spp.                |
| Foxtail                             | <i>Setaria</i> spp.               |
| Goldenrod*                          | <i>Solidago</i> spp.              |
| Groundsel, common                   | <i>Senecio vulgaris</i>           |
| Horseweed/marestail                 | <i>Conyza canadensis</i>          |
| Orchardgrass*                       | <i>Dactylis glomerata</i>         |
| Panicums                            | <i>Panicum</i> spp.               |
| Pinegrass                           | <i>Calamagrostis rubescens</i>    |
| Ragweed, common                     | <i>Ambrosia eliator</i>           |
| Ryegrass, Italian (annual)          | <i>Lolium multiflorum</i>         |
| Ryegrass, perennial*                | <i>Lolium perenne</i>             |
| Smartweed, Pennsylvania             | <i>Polygonum pensylvanicum</i>    |
| Squawcarpet                         | <i>Ceanothus prostratus</i>       |
| Velvetgrass, common                 | <i>Holcus lanatus</i>             |

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

**FORESTRY - IMPREGNATION ON DRY BULK FERTILIZER**

HM-0429 is recommended for impregnating or coating dry bulk fertilizer to be applied on forested sites for the establishment or release of conifer plantations (except longleaf pine) as specified on this label.

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**PLANTS CONTROLLED**

Fertilizer impregnated with **HM-0429** is recommended for the control and suppression of the weeds and brush identified for the specific applications on this label. Consult the appropriate segment of this label to determine the appropriate rate of Helena **HM-0429** to be applied per acre. Apply this amount of **HM-0429** to the volume of fertilizer to be applied per acre.

**IMPREGNATION EQUIPMENT**

To impregnate or coat the fertilizer use a system consisting of conveyor or closed drum used to blend dry bulk fertilizer.

**IMPREGNATION INSTRUCTIONS**

**HM-0429** may be used undiluted or mixed with a sufficient quantity of water to ensure thorough coverage of the fertilizer.

Direct the spray nozzles of the impregnation equipment to deliver a fine spray of the mixture toward the fertilizer for thorough coverage while avoiding contact with mixing equipment. The use of a colorant or dye may be beneficial to visually determine the uniformity of impregnation.

Uniform impregnation of dry bulk fertilizer may vary. If absorption of the spray is not adequate, the use of an absorptive powder or additive, such as "Microcel E" or "HiSil 233", may be required to produce a dry, free-flowing mixture.

Apply the fertilizer as soon as possible after impregnation for optimum performance. Impregnated fertilizer may become lumpy and difficult to apply following storage.

Diammonium phosphate, potassium chloride, 16-16-16 and 24-4-4 have been successfully impregnated.

**APPLICATION EQUIPMENT**

Applications of impregnated fertilizer may be made by ground equipment or by air (helicopter or fixed wing). Accurate calibration and patterning of the equipment is essential for uniform distribution of the impregnated fertilizer on the soil surface.

**USE PRECAUTIONS - IMPREGNATED FERTILIZER FOR FORESTRY**

- If fertilizer materials are excessively dusty, use a suitable additive to reduce dust prior to impregnation. Application of dusty fertilizer which has been impregnated may result in off-target drift and injury to desirable vegetation. Such drift and associated injury may be aggravated by high wind conditions.
- The dry fertilizer must be properly impregnated and uniformly applied to avoid pine injury/mortality and poor weed and brush control.
- Uniform and precise application of the impregnated fertilizer is essential for satisfactory weed and brush control and to minimize pine injury. Overlaps or skips between adjoining swaths or nonuniform distribution of impregnated fertilizer within the swath will deliver poor results and may result in pine injury or mortality.
- Do not impregnate potassium nitrate, sodium nitrate or triple super phosphate fertilizers with **HM-0429 L** as herbicidal action will be lost.

**USE PRECAUTIONS - FORESTRY**

- Do not use **HM-0429** in nurseries, seedbeds, or ornamental plantings.
- On tracts of land where various soil types are present and **HM-0429** rate selection is difficult, conifer damage or less-than-expected vegetation suppression may occur due to the different rates required for various soil types.
- Poor weed and brush control may result from the following:
  - Heavy duff or slash present at time of application.
  - Use on poorly drained sites.
  - Applications made when the soil is saturated with water and rain is imminent within 24 hours.
  - Applications to soils high in organic matter (greater than 5%).
- Following harvest, allow stumps and injured trees sufficient time to adequately resprout before applying **HM-0429**.
- Where burning is desired, burn vegetation only after any brush has completely defoliated, at least twice, allowing for sufficient root uptake of **HM-0429**.
- Do not use **HM-0429** on frozen soils; use in spring after snow melt.
- Do not add a surfactant in applications over the top of conifers.
- Weed control results from spring applications depend on sufficient moisture to activate **HM-0429**.
- When applying **HM-0429** after transplanting, wait until rainfall has settled the soil around the base and root systems of the transplants before making the treatment.
- Crop injury may occur when **HM-0429** is used:
  - On trees that show poor vigor, insect damage, disease, winter injury, or other stress conditions

(continued)



- On any soil containing less than 1% organic matter
- On loamy sand or sandy loam with less than 2% organic matter, except Jeffrey pine and Ponderosa pine
- On conifer foliage after conifer bud break
- On gravelly or rocky soils, exposed subsoils, clay knobs, sand, or sandy soil with 85% or more sand
- On crop species not listed on this label
- Do not cut treated vegetation for forage or hay nor graze domestic animals on treated areas for 60 days following application.

**YELLOW POPLAR PLANTINGS**

HM-0429 is recommended for the control of herbaceous weeds in the establishment of yellow poplar plantations. Applications may be made over the top of planted seedlings after the soil has settled around the root systems but before the seedlings have broken dormancy (bud break). A subsequent application may be made before dormancy break in the Spring of the second year.

Apply 4 to 6 pints per acre of Helena HM-0429 as recommended on the package label for "RELEASE - HERBACEOUS WEED CONTROL" in pine plantations in the eastern U.S. Follow the label recommendations regarding varying the application rate by soil texture.

For ground application, use enough water for thorough coverage, usually a minimum of 25 gallons per acre. For aerial applications, use at least 5 gallons of water per acre and at least 5 gallons of water for every 1 gallon of HM-0429.

For broader spectrum control HM-0429 may be tank mixed with Metsulfuronmethyl 60% a.i. herbicide. Add Metsulfuronmethyl 60% a.i. herbicide at a rate of 1/2 ounce per acre to a tank mix with the prescribed rate of HM-0429.

**USE PRECAUTIONS - YELLOW POPLAR PLANTINGS**

- Applications of HM-0429 and tank mixes of HM-0429 and Metsulfuronmethyl 60% a.i. herbicide made to yellow poplar seedlings that are suffering from loss of vigor caused by insects, disease, drought, winter damage, animal damage, excessive soil moisture, planting shock or other stresses may injure or kill the seedlings.
- Applications of HM-0429 and tank mixes of HM-0429 and Metsulfuronmethyl 60% a.i. herbicide should only be made after adequate rainfall has closed the planting slit and settled the soil around the roots following transplanting.
- The use of surfactant with HM-0429 is not recommended for applications made over the tops of seedlings.
- Careful consideration must be given by an experienced and knowledgeable forester to ensure the specific growth requirements of yellow poplar will be provided by the selected planting site. Treatment of yellow poplar planted on a site inadequate to meet its requirements may injure or kill the seedlings.
- Refer to package labels for information regarding spray drift management.

**PASTURE/RANGELAND**

HM-0429 is recommended for control of brush and weeds in pasture.

**BERMUDAGRASS/BAHIAGRASS**

HM-0429 is recommended for control of smutgrass and other weeds in established stands of bermudagrass and bahiagrass.

**APPLICATION INFORMATION**

Make a single application of HM-0429 per year when weeds are actively growing.

**WEEDS CONTROLLED - USE RATES**

HM-0429 effectively controls the following weeds at the rates shown. Use a lower rate on coarse-textured soils (sand to sandy loam). Use the higher rate on fine-textured soils (clay loam to clay) and on soils high in organic matter.

**2-3/4 - 4-1/2 Pints/Acre**

|                       |                                 |
|-----------------------|---------------------------------|
| Barley, little        | <i>Hordeum pusillum</i>         |
| Barnyardgrass         | <i>Echinochloa crus-galli</i>   |
| Dogfennel             | <i>Eupatorium capillifolium</i> |
| Fescue                | <i>Festuca</i> spp.             |
| Lespedeza             | <i>Lespedeza cuneata</i>        |
| Oxalis                | <i>Oxalis</i> spp.              |
| Passionflower, maypop | <i>Passiflora incarnate</i>     |

(continued).

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|                      |                            |
|----------------------|----------------------------|
| Pepperweed, Virginia | <i>Lepidium virginicum</i> |
| Pigweed              | <i>Amaranthus spp.</i>     |
| Smutgrass*           | <i>Sporobolus indicus</i>  |

\*Suppression may result with some of the giant (larger) smutgrass species.

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

**SPRAY EQUIPMENT**

Apply **HM-0429** uniformly over the desired area using ground equipment only.

For ground application, use enough water for thorough coverage usually a minimum of 25 gallons per acre. The use of a surfactant may increase the potential for bermudagrass or bahiagrass injury.

**USE PRECAUTIONS – BERMUDAGRASS/BAHIAGRASS**

- Use **HM-0429** only in stands of bermudagrass and bahiagrass established for at least one year. Do not treat newly sprigged or sodded areas.
- Some temporary discoloration of the bermudagrass or bahiagrass may occur after application.
- Treatment of mixed pastures containing forage species other than bermudagrass or bahiagrass may result in injury or mortality to the other forage species.
- Injury may result when desirable grasses are under stress from drought, insects, disease, cold temperature, or poor fertility.
- Injury to or loss of desirable trees or other plants may result if **HM-0429** is applied or if equipment is drained or flushed on or near desirable trees or other plants, on areas where their roots may extend, or in locations where the chemical may be washed or moved into contact with their roots.
- Severe crop injury may occur if applications are made on gravelly or rocky soils, thinly covered subsoils, or soils with less than 1% organic matter.

**PASTURE/RANGELAND BRUSH CONTROL**

**HM-0429** is recommended for the control of undesirable brush in pasture or rangeland.

**APPLICATION INFORMATION**

Apply **HM-0429** from late winter through summer, pre-budbreak until new growth hardens off.

In areas where the soil remains frozen during the winter and spring rains are usually inadequate for soil activation, a fall or winter treatment may be applied before the soil freezes.

For rates needed to control the species below, see the "Forestry – Release, Use Rates" section.

**BRUSH CONTROLLED**

Helena **HM-0429** is recommended for the control or suppression of the following brush species in pasture and rangeland:

|                     |                               |
|---------------------|-------------------------------|
| Alder               | <i>Alnus spp.</i>             |
| Ash                 | <i>Fraxinus spp.</i>          |
| Aspen               | <i>Populus spp.</i>           |
| Birch               | <i>Betula spp.</i>            |
| Blackgum            | <i>Nyssa sylvatica</i>        |
| Bay, sweet          | <i>Magnolia virginiana</i>    |
| Cactus, cholla†     | <i>Opuntia imbricata</i>      |
| Catclaw acacia      | <i>Acacia greggii</i>         |
| Cedar, Eastern red  | <i>Juniperus virginiana</i>   |
| Cherry, black       | <i>Prunus serotina</i>        |
| Chinaberry*         | <i>Melia azedarach</i>        |
| Deerbrush           | <i>Ceanothus integerrimus</i> |
| Dogwood, flowering* | <i>Cornus florida</i>         |
| Elm, American       | <i>Ulmus Americana</i>        |
| Elm, Chinese        | <i>Ulmus parvifolia</i>       |
| Hackberry, common   | <i>Celtis occidentalis</i>    |
| Hawthorn            | <i>Crataegus spp.</i>         |

(continued)

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|                         |                                |
|-------------------------|--------------------------------|
| Hazel                   | <i>Corylus spp.</i>            |
| Hickory                 | <i>Carya spp.</i>              |
| Huisache                | <i>Acacia farnesiana</i>       |
| Juniper                 | <i>Juniperus spp.</i>          |
| Locust                  | <i>Robinia spp.</i>            |
| Lotebush                | <i>Ziziphus obtusifolia</i>    |
| Manzanita, Greenleaf    | <i>Arctostaphylos patula</i>   |
| Maple, red              | <i>Acer rubrum</i>             |
| Mesquite                | <i>Prosopis glandulosa</i>     |
| Mulberry                | <i>Morus spp.</i>              |
| Oaks                    | <i>Quercus spp.</i>            |
| Osage-orange            | <i>Maclura pomifera</i>        |
| Persimmon               | <i>Diospyros spp.</i>          |
| Plum, wild              | <i>Prunus munsoniana</i>       |
| Poplar, balsam          | <i>Populus balsamifera</i>     |
| Poplar, yellow          | <i>Liriodendron tulipifera</i> |
| Privet                  | <i>Ligustrum spp.</i>          |
| Rose, multiflora        | <i>Rosa multiflora</i>         |
| Sassafras*              | <i>Sassafras albidum</i>       |
| Soapweed, small (yucca) | <i>Yucca glauca</i>            |
| Snowbrush (varnishleaf) | <i>Ceanothus velutinus</i>     |
| Sourwood                | <i>Oxydendrum arboretum</i>    |
| Sumac                   | <i>Rhus spp.</i>               |
| Sweetgum                | <i>Liquidambar spp.</i>        |
| Tallow, Chinese         | <i>Sapium sebiferum</i>        |
| Waxmyrtle               | <i>Myrica cerifera</i>         |
| Whitebrush              | <i>Aloysia gratissima</i>      |
| Willow                  | <i>Salix spp.</i>              |

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

†For Cholla cactus (tree-type cactus) apply **HM-0429** at the rate of 4 milliliters (mls) of product for plants up to 2 feet tall. Apply 8 mls of product for Cholla cactus plants between 2 and 6 feet tall. For plants taller than 6 feet, apply 4 mls for each additional 2 feet of height. When treating plants it is desirable to make applications equally spaced around the plant.

**SPRAY EQUIPMENT AND APPLICATION TECHNIQUES**

Basal (Soil) Undiluted -Apply **HM-0429** undiluted with an exact-delivery handgun applicator. This equipment delivers a thin stream of a predetermined volume when triggered. Apply **HM-0429** at the rate of 2-4 ml for each inch of stem diameter at breast height. Do not exceed 1/3 gallon of **HM-0429** per acre per year. Direct the treatment to the soil within 3 inches of the root collar of woody plants to be controlled. When treating large stems and when more than one delivery of **HM-0429** is needed per stem, make applications on opposite sides of the stem.

**USE PRECAUTIONS - PASTURE/RANGELAND**

- Injury to or loss of desirable trees or other plants may result if **HM-0429** is applied or if equipment is drained or flushed on or near desirable trees or other plants, on areas where their roots may extend, or in locations where the chemical may be washed or moved into contact with their roots.
- Poor weed and brush control may result from the following:
  - Use on poorly drained sites.
  - Applications made when the soil is saturated with water and rain is imminent within 24 hours.
  - Applications to soils high in organic matter (greater than 5%).
- Following mechanical cutting or clearing, allow stumps and injured trees sufficient time to adequately resprout before applying **HM-0429**.
- Do not use **HM-0429** on frozen soils.
- Weed and brush control results depend on sufficient moisture to activate **HM-0429**.

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- When **HM-0429** is applied as a basal soil treatment, there is no restriction on grazing by domestic animals nor on cutting surrounding vegetation for forage or hay.
- For broadcast pasture applications of **HM-0429**, do not cut treated vegetation for forage or hay nor graze domestic animals on treated areas for 60 days.

### 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.

Industrial and Pasture/Rangeland weed and brush control applications as described on this label for Helena **HM-0429** are not within the scope of the Worker Protection Standard.

The area being treated must be vacated by unprotected persons.

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

#### APPLICATION INFORMATION

**HM-0429** 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).

### NON-CROP INDUSTRIAL SITES

Helena **HM-0429** is recommended for control of many annual, biennial, and perennial weeds in noncrop, industrial sites.

#### APPLICATION TIMING

Apply **HM-0429** as a preemergence or postemergence spray when weeds are actively germinating or growing.

#### WEEDS CONTROLLED - USE RATE

**HM-0429** effectively controls the following weeds when applied at the use rates shown in industrial sites. When applied at lower rates, **HM-0429** provides short-term control of the weeds listed; when applied at higher rates, weed control is increased and extended. Use lower rate on coarse-textured soils (sand to sandy loam). Use the higher rate on fine-textured soils (clay loam to clay) and on soils high in organic matter.

#### 1 - 2-1/2 Gallons/Acre

|                                     |                               |
|-------------------------------------|-------------------------------|
| Barnyardgrass                       | <i>Echinochloa crus-galli</i> |
| Birdweed, field*                    | <i>Convolvulus arvensis</i>   |
| Bouncingbet*                        | <i>Saponaria officinalis</i>  |
| Bromegrass                          | <i>Bromus spp.</i>            |
| Buffalograss*                       | <i>Buchloe dactyloides</i>    |
| Burdock                             | <i>Arctium spp.</i>           |
| Cocklebur                           | <i>Xanthium spp.</i>          |
| Crabgrass                           | <i>Digitaria spp.</i>         |
| Crown vetch                         | <i>Coronilla varia</i>        |
| Curly dock*                         | <i>Rumex crispus</i>          |
| Dandelion, common*                  | <i>Taraxacum officinale</i>   |
| Dandelion, false* (spotted catsear) | <i>Hypochaeris radicata</i>   |
| Dogbane*                            | <i>Apocynum cannabinum</i>    |
| Fiddleneck, tarweed                 | <i>Amsinckia lycopsoides</i>  |
| Filaree                             | <i>Erodium spp.</i>           |
| Fleabane, flax-leaved               | <i>Conyza bonariensis</i>     |

(continued)

|                               |                             |
|-------------------------------|-----------------------------|
| Goatsbeard vine (sweet briar) | <i>Aruncus sylvester</i>    |
| Goldenrod                     | <i>Solidago spp.</i>        |
| Horseweed/marestail           | <i>Conyza canadensis</i>    |
| Lespedeza                     | <i>Lespedeza cuneata</i>    |
| Milkweed, common*             | <i>Asclepias syriaca</i>    |
| Mustard, wild                 | <i>Sinapis arvensis</i>     |
| Nutsedge*                     | <i>Cyperus spp.</i>         |
| Oats, wild*                   | <i>Avena fatua</i>          |
| Orchardgrass*                 | <i>Dactylis glomerata</i>   |
| Orchardgrass (seedling)       | <i>Dactylis glomerata</i>   |
| Oxalis                        | <i>Oxalis spp.</i>          |
| Paragrass                     | <i>Panicum purpurascens</i> |
| Parsnip, wild                 | <i>Pastinaca sativa</i>     |
| Pigweed                       | <i>Amaranthus spp.</i>      |
| Purslane, common              | <i>Portulaca oleracea</i>   |
| Quackgrass                    | <i>Agropyron repens</i>     |
| Ryegrass, Italian (annual)    | <i>Lolium multiflorum</i>   |
| Smartweed                     | <i>Polygonum spp.</i>       |
| Spurge                        | <i>Euphorbia spp.</i>       |
| Star thistle                  | <i>Centaurea spp.</i>       |
| Trumpetcreeper*               | <i>Campsis radicans</i>     |

**3-4 Gallons/Acre**

|                      |                                 |
|----------------------|---------------------------------|
| Aster, heath         | <i>Aster ericoides</i>          |
| Bahiagrass*          | <i>Paspalum notatum</i>         |
| Bermudagrass*        | <i>Cynodon dactylon</i>         |
| Blackberry           | <i>Rubus spp.</i>               |
| Bluegrass            | <i>Poa spp.</i>                 |
| Broomsedge           | <i>Andropogon virginicus</i>    |
| Camphorweed          | <i>Heterotheca subaxillaris</i> |
| Canada thistle*      | <i>Cirsium arvense</i>          |
| Carrot, wild         | <i>Daucus carota</i>            |
| Chickweed            | <i>Stellaria media</i>          |
| Clovers              | <i>Trifolium spp.</i>           |
| Dewberry             | <i>Rubus trivialis</i>          |
| Dogfennel            | <i>Eupatorium capillifolium</i> |
| Fescue*              | <i>Festuca spp.</i>             |
| Fingergrass          | <i>Digitaria ciliaris</i>       |
| Foxtail              | <i>Setaria spp.</i>             |
| Guineagrass          | <i>Panicum maximum</i>          |
| Honeysuckle          | <i>Lonicera spp.</i>            |
| Horseweed/marestail  | <i>Conyza canadensis</i>        |
| Lantana              | <i>Lantana camara</i>           |
| Lettuce, prickly     | <i>Lactuca scariola</i>         |
| Natalgrass (red top) | <i>Rhynchelytrum repens</i>     |
| Plantain             | <i>Plantago spp.</i>            |
| Ragweed, common      | <i>Ambrosia elatior</i>         |
| Smutgrass**          | <i>Sporobolus indicus</i>       |
| Spanishneedles       | <i>Bidens bipinnata</i>         |
| Vaseygrass           | <i>Paspalum urvillei</i>        |

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

\*\*Suppression may result with some of the giant (larger) smutgrass species.

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**SPECIFIC WEED PROBLEMS**

**Control of Canada Thistle in Crown Vetch - HM-0429** is recommended for control of Canada thistle in established stands of crown vetch on noncrop sites. Make a single application of 3-5 pints of **HM-0429** from late spring through mid-summer, when thistle is actively growing prior to flowering. Do not use a surfactant. Some discoloration of the crown vetch foliage may occur after application.

**SPRAY EQUIPMENT**

Apply **HM-0429** uniformly over the desired area, using ground equipment or helicopter. Do not apply more than 3 gallons per acre of **HM-0429** by air.

Use enough water for thorough coverage. For ground application this is usually 25 gallons per acre. Higher volumes may be needed to obtain uniform application with handgun equipment. For aerial applications (helicopter only) this usually a minimum of 5 gallons per acre. Higher volumes of water may be needed when water temperatures are cold or the higher rates of **HM-0429** are used.

**INDUSTRIAL TURF (UNIMPROVED ONLY)**

**HM-0429** is recommended for selective weed control in established stands of bermudagrass and/or bahiagrass in noncrop areas.

**APPLICATION TIMING**

Make a single application of **HM-0429** per year when weeds are actively growing.

**WEEDS CONTROLLED - USE RATE**

Helena **HM-0429** effectively controls the following weeds at the rates shown in industrial turf (unimproved only). Use a lower rate on coarse-textured soils (sand to sandy loam). Use the higher rate on fine-textured soils (clay loam to clay) and on soils high in organic matter.

**2-3/4 - 4-1/2 Pints/Acre**

|                       |                                 |
|-----------------------|---------------------------------|
| Barley, little        | <i>Hordeum pusillum</i>         |
| Barnyardgrass         | <i>Echinochloa crus-galli</i>   |
| Dogfennel             | <i>Eupatorium capillifolium</i> |
| Fescue                | <i>Festuca spp.</i>             |
| Lespedeza             | <i>Lespedeza cuneata</i>        |
| Oxalis                | <i>Oxalis spp.</i>              |
| Passionflower, maypop | <i>Passiflora incarnate</i>     |
| Pepperweed, Virginia  | <i>Lepidium virginicum</i>      |
| Pigweed               | <i>Amaranthus spp.</i>          |
| Smutgrass*            | <i>Sporobolus indicus</i>       |

\*Suppression may result with some of the giant (larger) smutgrass species. Suppression - a visible reduction in plant population and/or plant vigor as compared to an untreated area and generally not accepted as control.

**SPRAY EQUIPMENT**

Apply **HM-0429** uniformly over the desired area using ground equipment only.

For ground application, use enough water for thorough coverage usually a minimum of 25 gallons per acre. The use of surfactant is not recommended.

**USE PRECAUTIONS - INDUSTRIAL UNIMPROVED TURF**

- Use **HM-0429** only in stands of bermudagrass and bahiagrass established for at least one year. Do not treat newly sprigged or sodded areas.
- Some discoloration of the bermudagrass or bahiagrass may occur after application.
- Injury may result when desirable grasses are under stress from drought, insects, disease, cold temperature, or poor fertility.
- Severe turf injury may occur if applications are made on gravelly or rocky soils, thinly covered subsoils, or soils with less than 1% organic matter.

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**NON-CROP BRUSH CONTROL**

HM-0429 is recommended for the control of undesirable woody plants in noncrop sites.

**APPLICATION INFORMATION**

Apply HM-0429 from late winter through summer, prebud break until new growth hardens off.

In areas where the soil remains frozen during the winter and spring rains are usually inadequate for soil activation, a fall or winter treatment may be applied before the soil freezes.

**BROADCAST**

Apply 2 to 4 gallons of HM-0429 per acre as coarse spray by ground equipment or 2 to 3 gallons per acre by air (helicopter only). Use enough water for thorough coverage. For ground equipment, usually a minimum of 25 gallons per acre. For aerial equipment, usually a minimum of 10 gallons per acre. Higher volumes of water may be needed when water temperatures are cold or the higher rates of HM-0429 are used.

**BASAL (SOIL)**

Undiluted - Apply HM-0429 undiluted with an exact-delivery handgun applicator. This equipment delivers a thin stream of a predetermined volume when triggered. Apply HM-0429 at the rate of 2 to 4 ml for each inch of stem diameter at breast height. Do not exceed 4 gallons of HM-0429 per acre per year. Direct the treatment to the soil within 3 feet of the root collar of woody plants to be controlled. When treating large stems and when more than one delivery of HM-0429 is needed per stem, make applications on opposite sides of the stem.

For multi-stemmed and low-growing brush that have stem diameters that are difficult to determine, apply HM-0429 at the rate of 2 to 4 ml per 3 feet of canopy width. For tall, slender (columnar) brush types, apply 4 to 8 ml per 3 feet of height. Base the rate on whichever canopy dimension is greater (width or height).

When treating brush that requires more than a single 4 ml application of HM-0429, apply subsequent applications equally spaced around the plant. If treating brush on sloped sites, apply most of the HM-0429 on the uphill side of the stem. If treating resprouts from brush disturbed by cutting or shredding, the rate of application should be proportional to the original tree size, not just the small regrowth of sprouts.

Diluted - Mix one gallon of HM-0429 with 5 or more gallons of water. Apply 2 to 4 gallons of HM-0429 per acre. Direct the spray to the soil in a serpentine pattern so that the swath on the soil is 6 to 12 inches wide at the base of the brush. Swaths should be 2 to 4 feet apart.

**BRUSH CONTROLLED - USE RATE**

**2 - 4 Gallons/Acre**

|                     |                               |
|---------------------|-------------------------------|
| Alder               | <i>Alnus spp.</i>             |
| Ash                 | <i>Fraxinus spp.</i>          |
| Aspen               | <i>Populus spp.</i>           |
| Birch               | <i>Betula spp.</i>            |
| Blackgum            | <i>Nyssa sylvatica</i>        |
| Bay, sweet          | <i>Magnolia virginiana</i>    |
| Cactus, cholla†     | <i>Optunia imbricata</i>      |
| Catclaw acacia      | <i>Acacia greggii</i>         |
| Cedar, Eastern red  | <i>Juniperus virginiana</i>   |
| Cherry, black       | <i>Prunus serotina</i>        |
| Chinaberry*         | <i>Melia azedarach</i>        |
| Deerbrush           | <i>Ceanothus integerrimus</i> |
| Dogwood, flowering* | <i>Cornus florida</i>         |
| Elm, American       | <i>Ulmus Americana</i>        |
| Elm, Chinese        | <i>Ulmus parvifolia</i>       |
| Hackberry, common   | <i>Celtis occidentalis</i>    |
| Hawthorn            | <i>Crataegus spp.</i>         |
| Hazel               | <i>Corylus spp.</i>           |
| Hickory             | <i>Carya spp.</i>             |

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|                         |                                |
|-------------------------|--------------------------------|
| Huisache                | <i>Acacia farnesiana</i>       |
| Juniper                 | <i>Juniperus spp.</i>          |
| Locust                  | <i>Robinia spp.</i>            |
| Lotebush                | <i>Ziziphus obtusifolia</i>    |
| Manzanita, Greenleaf    | <i>Arctostaphylos patula</i>   |
| Maple, red              | <i>Acer rubrum</i>             |
| Mesquite                | <i>Prosopis glandulosa</i>     |
| Mulberry                | <i>Morus spp.</i>              |
| Oaks                    | <i>Quercus spp.</i>            |
| Osage-orange            | <i>Maclura pomifera</i>        |
| Persimmon               | <i>Diospyros spp.</i>          |
| Plum, wild              | <i>Prunus munsoniana</i>       |
| Poplar, balsam          | <i>Populus balsamifera</i>     |
| Poplar, yellow          | <i>Liriodendron tulipifera</i> |
| Privet                  | <i>Ligustrum spp.</i>          |
| Rose, multiflora        | <i>Rosa multiflora</i>         |
| Sassafras*              | <i>Sassafras albidum</i>       |
| Soapweed, small (yucca) | <i>Yucca glauca</i>            |
| Snowbrush (varnishleaf) | <i>Ceanothus velutinus</i>     |
| Sourwood                | <i>Oxydendrum arboretum</i>    |
| Sumac                   | <i>Rhus spp.</i>               |
| Sweetgum                | <i>Liquidambar spp.</i>        |
| Tallow, Chinese         | <i>Sapium sebiferum</i>        |
| Waxmyrtle               | <i>Myrica cerifera</i>         |
| Whitebrush              | <i>Aloysia gratissima</i>      |
| Willow                  | <i>Salix spp.</i>              |

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

†For Cholla cactus (tree-type cactus) apply Helena **HM-0429** at the rate of 4 milliliters (mls) of product for plants up to 2 feet tall. Apply 8 mls of product for Cholla cactus plants between 2 and 6 feet tall. For plants taller than 6 feet, apply 4 mls for each additional 2 feet of height.

When treating plants it is desirable to make applications equally spaced around the plant.

**USE PRECAUTIONS - NON-CROP**

- Injury to or loss of desirable trees or other plants may result if **HM-0429** is applied or if equipment is drained or flushed on or near desirable trees or other plants, on areas where their roots may extend, or in locations where the chemical may be washed or moved into contact with their roots.
- Application spray drift may injure desirable plants.
- Poor weed and brush control may result from the following:
  - Use on poorly drained sites.
  - Applications made when the soil is saturated with water and rain is imminent within 24 hours.
  - Applications to soils high in organic matter (greater than 5%).
- Following mechanical cutting or clearing, allow stumps and injured trees sufficient time to adequately resprout before applying **HM-0429**.
- Do not use **HM-0429** on frozen soils.
- Do not use **HM-0429** on lawns, driveways, tennis courts, or other residential or recreational areas.
- Weed and brush control results from spring applications depend on sufficient moisture to activate **HM-0429**.
- Do not cut treated vegetation for forage or hay nor graze domestic animals on treated areas for 60 days following application. For rates above 3 gallons per acre, do not cut treated vegetation for forage or hay nor graze domestic animals for 1 year.



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## ADDITIONAL USE INFORMATION

### 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 (greater than 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 the "Wind", "Temperature and Humidity", and "Temperature Inversions" sections below.

### 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 feet above the canopy increases the potential for spray drift.
- **Boom Height (ground)** – Setting the boom at the lowest labeled height (if specified) 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 GUSTY OR WINDLESS CONDITIONS.

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

### TEMPERATURE AND HUMIDITY

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

### 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;

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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).

**SPRAY TANK CLEAN-OUT**

Thoroughly clean all traces of Helena **HM-0429** from application equipment immediately after use. Flush the tank, pump, hoses, and boom with several changes of water after removing nozzle tips and screens (clean these parts separately).

**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 DISPOSAL: For Plastic Containers:** Triple rinse (or equivalent). Then offer for recycling or reconditioning, or puncture and dispose of in a sanitary landfill, or incineration, or, if allowed by State and local authorities, by burning. If burned, stay out of smoke. **For Metal Containers (non-aerosol):** Triple rinse (or equivalent) the container. 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.

**Container Refilling and Disposal (For Containers up to 250 gal):** This is a refillable container. If the container is to be refilled, do not rinse with any material or introduce any pesticide other than **HM-0429**. Reseal and return the container to any authorized Helena refilling facility. If the container is not to be refilled, triple rinse (or equivalent) and offer for recycling or reconditioning, or puncture and dispose of in a sanitary landfill, or by incineration, or by open burning, if allowed by state and local authorities. If burned, keep out of smoke.

For minor spills, leaks, etc., follow all precautions indicated on this label and clean up immediately. Take special care to avoid contamination of equipment and facilities during cleanup procedures and disposal of wastes. In the event of a major spill, fire or other emergency, contact CHEMTREC at 1-800-424-9300.

**Container Disposal for Bulk Containers:** When this 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 or to a designated location named at time of purchase of this product. The container must only be refilled with this pesticide product. **DO NOT REUSE THE CONTAINER FOR ANY OTHER PURPOSE.** 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. Do not transport if this container is damaged or leaking. If the container is damaged, leaking or obsolete, contact Helena Chemical Company at 1-901-761-0050. If not returned to the point of purchase or to a designated location, triple rinse emptied container and offer for recycling. Disposal of this container must be in compliance with state and local regulations.

For minor spills, leaks, etc., follow all precautions indicated on this label and clean up immediately. Take special care to avoid contamination of equipment and facilities during cleanup procedures and disposal of wastes. In the event of a major spill, fire or other emergency, contact CHEMTREC at 1-800-424-9300.

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

Microcel E is a trademark of Johns Manville Product Corporation.  
HiSil 233 is a trademark of Pittsburgh Plate Glass.  
Gramoxone Max is a trademark of Syngenta Crop Protection.

### LIMITATION OF WARRANTY AND LIABILITY

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

It is impossible to eliminate all risks associated with the use of this product. Such risks arise from weather conditions, soil factors, off target movement, unconventional farming techniques, presence of other materials, the manner of use or application, or other unknown factors, all of which are beyond the control of Helena Chemical Company. These risks can cause: ineffectiveness of the product, crop injury, or injury to non-target crops or plants. WHEN YOU BUY OR USE THIS PRODUCT, YOU AGREE TO ACCEPT THESE RISKS.

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

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

To the extent consistent with applicable law that allows such requirement, Helena Chemical Company or its Ag Retailer must have prompt notice of any claim so that an immediate inspection of buyer's or user's growing crops can be made. Buyer and all users shall promptly notify Helena Chemical Company or a Helena Ag Retailer of any claims, whether based on contract, negligence, strict liability, other tort or otherwise, or be barred from any remedy.

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

