5905-579 8.18.2010 1/44

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

OFFICE OF CHEMICAL SAFETY
AND POLLUTION PREVENTION

AUG 18 2010

Helena Chemical Company
c/o Cheryl Wagner
Wagner Regulatory Associates, Inc.
P.O. Box 640
Hockessin, DE 19707

Subject: Notification: Revised Container Disposal Instructions per PR Notice 2007-4
HM-0429
EPA Reg. No. 5905-579
Your Application Dated July 14, 2010

Dear Ms. Wagner:

The Agency is in receipt of your Application for Pesticide Notification under Pesticide Registration Notice (PRN) 2007-4 for the subject product.

The Registration Division (RD) has conducted a review of this request for applicability under PRN 2007-4 and finds that the label changes requested fall within the scope of PRN-2007-4. The label has been date-stamped "Notification" and will be placed in our records.

Please be reminded that 40 CFR Part 156.140(a)(4) requires that a batch code, lot number, or other code identifying the batch of the pesticide distributed and sold be placed on nonrefillable containers. The code may appear either on the label (and can be added by non-notification/PR Notice 98-10) or durably marked on the container itself.

If you have any questions, please call me directly at (703) 305-1243 or Susan Stanton of my staff at (703) 305-5218.

Sincerely,

Susan L. Stanton, for

Kathryn Montague, Product Manager 23
Herbicide Branch
Registration Division (7505P)
Office of Pesticide Program

Please read instructions on reverse before completing form. Form Approved OMB No. 2070-0060. Approval expires 05-31-98

EPA

United States
Environmental Protection Agency
Washington, DC 20460

		OPP Identifier Number
X	Registration	2/44
	Amendment	
	Other	

Application for Pesticide - Section I

1. Company/Product Number	2. EPA Product Manager	3. Proposed Classification
5905-579	K. Montague	[X] None Restricted
4. Company/Product (Name)	**PM#**	
HM-0429	23	

5. Name and Address of Applicant *(Include Zip Code)*

Helena Chemical Company
c/o Wagner Regulatory Associates, Inc.
P.O. Box 640
Hockessin, DE 19707

☐ *Check if this is a new address*

6. Expedited Review. In accordance with FIFRA Section 3(c)(3)(b)(I), my product is similar or identical in composition and labeling to:
EPA Reg. No.
Product Name

Section - II

☐	Amendment - Explain below.	☐	Final printed labels in response to Agency letter dated
☐	Resubmission in response to Agency letter dated _____	☐	"Me Too" Application.
☒	Notification - Explain below.	☐	Other - Explain below.

NOTIFICATION
AUG 18 2010

Explanation: Use additional page(s) if necessary. (For Section I and Section II.)
Notification of label change per PR Notice 2007-4. This notification is consistent with the provisions of PR Notice 2007-4 and EPA Regulations at 40 CFR 156.10, 154.140, 156.144, 156.146, and 156.156. No other changes have been made to the labeling or the confidential statement of formula of this product. I understand that it is a violation of 18 U.S.C. Sec. 1001 to willfully make any false statement to EPA. I further understand that if this notification is not consistent with the requirements 40 CFR 156.10, 156.140, 156.144, 156.146, and 156.156, this product may be in violation of FIFRA and I may be subject to enforcement action and penalties under Sections 12 and 14 of FIFRA.

Section - III

1. Material This Product Will Be Packaged In:

Child-Resistant Packaging	Unit Packaging	Water Soluble Packaging	2. Type of Container
☐ Yes*	☐ Yes	☐ Yes	☐ Metal
☒ No	☒ No	☒ No	☒ Plastic
	If "Yes" Unit Packaging wgt. / No. per container	If "Yes" Package wgt / No. per container	☐ Glass
			☐ Paper
			☐ Other (Specify) HDPE lined bags

Certification must be submitted

3. Location of Net Contents Information	4. Size(s) Retail Container	5. Location of Label Directions
☒ Label ☐ Container	1 gal., 2.5 gal., 55 gal., 250 gal.	☒ On Label ☐ On Labeling accompanying product

6. Manner in Which Label is Affixed to Product
☐ Lithograph ☒ Paper glued ☐ Stenciled ☐ Other ___adhesive backed label_____

Section - IV

1. Contact Point *(Complete items directly below for identification of individual to be contacted, if necessary, to process this application.)*

Name	Title	Telephone No. (Include Area Code)
Cheryl Wagner	Agent for Helena Chemical Company	(302) 234 8551

Certification
I certify that the statements I have made on this form and all attachments thereto are true, accurate and complete. I acknowledge that any knowingly false or misleading statement may be punishable by fine or imprisonment or both under applicable law.

6. Date Application Received (Stamped)

2. Signature	3. Title
Cheryl Wagner	Agent for Helena Chemical Company
4. Typed Name	**5. Date**
Cheryl Wagner	July 14, 2010

This is a reproduction of EPA Form 8570-1 (Rev. 8-94) Previous editions are obsolete.

3/44

July 14, 2010

WRA
Wagner Regulatory Associates, Inc.
P.O. Box 640
7460 Lancaster Pike, Suite 9
Hockessin, Delaware 19707

Document Processing Desk (NOTIF)
ATTN: Ms. Kathryn Montague, PM 23
Registration Division (7504P)
U.S. Environmental Protection Agency
Room S-4900, One Potomac Yard
2777 South Crystal Drive
Arlington, Virginia 22202-4501

Dear Ms. Montague:

Re: HM-0429
EPA Registration Number 5905-579
Notice of Revised Storage & Disposal Label Language

Wagner Regulatory Associates, Inc., on behalf of Helena Chemical Company, hereby notifies the Agency that the storage and disposal section of the subject label as been revised in accordance with PR Notice 2007-4. Enclosed for the Agency's file is:

- Letter from Helena Chemical Company authorizing Wagner Regulatory to serve as Agent
- EPA Notification form (EPA Form 8570-1)
- One copy of revised labeling

Please feel free to contact me at (302) 234-8551 if you have any questions or require additional information.

Respectfully submitted,

Cheryl Wagner
Agent for Helena Chemical Company

HM-0429 Liquid Herbicide

Contains 2.4 Lbs. Active Ingredient Per Gallon By Weight

ACTIVE INGREDIENT:	
Hexazinone 3-cyclohexyl-6-(dimethylamino)-1-methyl-1,3,5-triazine-2,4(1H,3H)dione]..................	**25%**
INERT INGREDIEN:..	**75%**
TOTAL..	**100%**

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 SWALLOWED:** Call a poison control center or doctor immediately for treatment advice. Have person sip a glass of water if able to swallow. Do not induce vomiting unless told to do so by a poison control center or doctor. Do not give anything by mouth to an unconscious person. **IF ON SKIN OR CLOTHING:** Take off contaminated clothing. Rinse skin immediately with plenty of water for 15-20 minutes. Call a poison control center or doctor for treatment advice.
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 medical emergencies involving this product.
NOTE TO PHYSICIAN: Probable mucosal damage may contraindicate the use of gastric lavage. For specialized medical advice, contact 1-800-424-9300.
SEE INSIDE PANEL FOR ADDITIONAL PRECAUTIONARY STATEMENTS

SN 0609/0809
EPA Est. No. 5905-GA-001
EPA Reg. No. 5905-579
PATENT NUMBER 7,659,229

NET CONTENTS:
□□1Gallon (3.785 L)
□□2.5 Gallons (9.4 L)
□□55 Gallons (208.18 L)
□□□250 Gallons (946.1 L)

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

NOTIFICATION
AUG 18 2010

5/44

TABLE OF CONTENTS

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. Wear protective eyewear (goggles, face shied, 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.

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.

ENVIRONMENTAL CONDITIONS AND BIOLOGICAL ACTIVITY

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.

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:

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

2-4 PINTS/ACRE	
Bluegrass, annual	Poa annua
Brome, downy (cheatgrass)	Bromus tectorum
Buckwheat, wild	Polygonum convolvulus
Catchfly, English	Silene gallica
Chamomile, mayweed (dogfennel)	Anthemis cotula
Chickweed, common	Stellaria media
Fiddleneck, tarweed	Amsinckia lycopsoides
Filaree	Erodium spp.
Flixweed	Descurainia Sophia
Groundsel, common	Senecio vulgaris
Henbit*	Lamium amplexicaule
Lettuce, Miner's	Montia perfoliata
Mustard, blue	Chorispora tenella
Mustard, Jim Hill (tumble)	Sisymbrium altissimum
Mustard, wild	Brassica kaber
Orchardgrass (seedling)	Dactylis glomerata
Pennycress, field	Thlaspi arvense
Pigweed, redroot	Amaranthus retroflexus
Radish, wild	Raphanus raphanistrum
Rocket, London	Sisymbrium irio
Rocket, common yellow	Barbarea vulgaris
Salsify	Tragopogon spp.
Shepherdspurse	Capsella bursa-pastoris
Speedwell, purslane	Veronica peregrina
Spurry, corn	Spergula arvensis

4-6 PINTS/ACRE	
Alfalfa* (seedling)	Medicago sativa
Barley, foxtail (seedling)	Hordeum jubatum
Bluegrass, perennial* (spring only)	Poa spp.
Cockle, white*	Melandrium album
Dandelion, common*	Taraxacum officinale
Dandelion, false* (spotted catsear)	Hypochaeris radicata
Foxtail*	Setaria spp.
Kochia	Kochia scoparia
Lambsquarters, common	Chenipodium album
Lettuce, prickly*	Lactuca serriola
Mallow, common	Malva neglecta
Quackgrass*	Elytrigia repens
Ryegrass, Italian (annual)	Lolium multiflorum
Speedwell, ivyleaf	Veronica hederaefolia
Tea, Mexican*	Chenopodium ambrosioides
Thistle, Canada (seedling)	Cirsium arvense
Thistle, Russian	Salsola iberica

*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	Digitaria spp.
Fleabane	Conyza spp.
Foxtail	Setaria spp.
Jimsonweed	Datura stramonium
Lambsquarters, common	Chenopodium album
Pigweed, redroot	Amaranthus retroflexus

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 non-uniform 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

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.

Pints **HM-0429™** Per Acre	X 1 Ton Fertilizer	= Pints **HM-0429™** per Ton of Fertilizer	

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 non-uniform 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.
- 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.

USE RATES (Pints/Acre) HIGH BUSH BLUEBERRIES		
Soil Texture Description	**Less than or equal to 3% organic matter**	**Greater than 3% organic matter**
Coarse loamy sand, sandy loam (50-85% sand)	4	5
Medium loam, silt loam, silt, clay loam, sandy clay loam		8
Fine silty clay loam, clay loam, 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**
Coarse loamy sand, sandy loam (50-85% sand)	4	5
Medium loam, silt loam, silt, clay loam, sandy clay loam		6
Fine silty clay loam, clay loam, 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	17.61 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.

Pints **HM-0429™** Per Acre	X 1 Ton Fertilizer	=	Pints **HM-0429™** per Ton of Fertilizer

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*	Aster ericoides
Barnyardgrass	Echinochloa crus-galli
Blackberry* (briar)	Rubus spp.
Bluegrass, Kentucky (perennial)*	Poa pratensis
Brome, downy (cheatgrass)	Bromus tectorum
Broomsedge*	Andropogon virginicus
Carrot, wild*	Daucus carota
Catchfly, English	Silene gallica
Chamomile, mayweed	Anthemis cotula
Cherry, wild	Prunus serotia
Chickweed, common	Stellaria media
Cinquefoil	Potentilla spp.
Cockle, white*	Melandrium album
Dandelion, common*	Taraxacum officinale
Dandelion, false* (spotted catsear)	Hypochaeris radicata
Daisy, oxeye	Chrysanthemum leucanthemum
Dock, curly*	Rumex crispus
Dogfennel	Eupatorium capillifolium
Fescue*	Festuca spp.
Fiddleneck, tarweed	Amsinckia lycopsoides
Filaree	Erodium spp.
Fireweed* (willowweed)	Epilobium angustifolium
Fleabane, flax-leaved	Conyza bonariensis
Flixweed	Descurainia Sophia
Foxtail, yellow	Setaria lutescens
Goldenrod	Solidago spp.
Groundsel, common	Senecio vulgaris
Hawkweed	Hieracium spp.
Horseweed/marestail	Conyza canadensis
Jimsonweed	Datura stramonium
Lambsquarters, common	Chenopodium album
Lettuce, Miner's	Montia perfoliata
Lettuce, prickly*	Lactuca serriola

Mustard, blue	Chorispora tenella
Mustard, Jim Hill (tumble)	Sisymbrium altissimum
Orchardgrass*	Dactylis glomerata
Orchardgrass (seedling)	Dactylis glomerata
Panicgrass (witchgrass)	Panicum capillare
Panicum, fall	Panicum dichotomiflorum
Pearly everlasting	Anaphalis margaritacea
Pennycress, field	Thlaspi arvense
Pigweed, redroot	Amaranthus retroflexus
Quackgrass	Agropyron repens
Radish, wild	Raphanus raphanistrum
Ragweed, common	Ambrosia elatior
Raspberry* (briar)	Rubus spp.
Rocket, London	Sisymbrium irio
Rocket, common yellow	Barbarea vulgaris
Ryegrass, Italian (annual)	Lolium multiflorum
Ryegrass, perennial*	Lolium perenne
Salsify	Tragopogon spp.
Shepherdspurse	Capsella bursa-pastoris
Smartweed, Pennsylvania	Polygonum pensylvanicum
Sorrel, red	Rumex acetosella
Sorrel, sheep	Rumex angiocarpus
Spurry, corn	Spergula arvensis
Strawberry, wild	Fragaria virginiana
Tansymustard (pinnate)	Descurainia pinnata
Tea, Mexican*	Chenopodium ambrosioides
Velvetgrass	Holcus lanatus
Yarrow	Achillea spp.

8-12 PINTS/ACRE

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

*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)	Pseudotsuga menziesii
Fir, Fraser	Abies fraseri
Fir, grand	Abies grandis
Fir, noble	Abies procera
Pine, Austrian	Pinus nigra
Pine, loblolly	Pinus taeda
Pine, ponderosa	Pinus ponderosa
Pine, Scotch	Pinus sylvestris
Spruce, Sitka	Picea sitchensis

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.

	HM-0429™ (Pints/Acre)	
Soil Texture Description	**First Year Plantings**	**Established Trees**
Coarse Texture Loamy sand, sandy loam (50-85% sand)	4	4-5
Medium Texture Loam, silt loam silt, clay loam, sandy clay loam	4 – 5	5 – 7
Fine Texture Silty clay loam, clay loam, 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 rainfall 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*	Aster ericoides
Barnyardgrass	Echinochloa crus-galli
Bentgrass, common	Agrostis alba
Bluegrass, annual	Poa annua
Bromegrass	Bromus spp.
Burnweed, American*	Erechtites hieracifolius
Carrot, wild	Daucus carota
Crabgrass*	Digitaris spp.
Curly dock*	Rumex crispus
Daisy, oxeye	Chrysanthemum leucanthemum
Dandelion, common*	Taraxacum officinale
Dandelion, false* (spotted catsear)	Hypochaeris radicata
Fescue*	Festuca spp.
Fleabane	Conyza spp.

Foxtail	Setaria spp.
Goldenrod*	Solidago spp.
Groundsel, common	Senecio vulgaris
Horseweed/marestail	Conyza canadensis
Orchardgrass*	Dactylis glomerata
Ragweed, common	Ambrosia elatior
Ryegrass, Italian (annual)	Lolium multiflorum
Ryegrass, perennial*	Lolium perenne
Smartweed, Pennsylvania	Polygonum pensylvanicum
Velvetgrass, common	Holcus lanatus

*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 60 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	Ageratum conycoides
Balsamapple	Momordica charantia
Castorbean	Ricinus communis
Crabgrass	Digitaria spp.
Crotalaria	Crotolaria spp.
Dallisgrass	Paspalum dilatatum
Guineagrass	Panicum maximum
Junglerice	Echinochloa colonum
Kao haole*	Leucaena glauca
Moana loa vine*	Canavalia cathartica
Morningglory	Ipomoea spp.
Oxalis	Oxalis spp.
Popolo	Solanum sandwicense
Richardsonium	Richardsonia spp.
Vaseygrass	Paspalum urvillei

*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:

HM-0429™ (Pints/Acre)	
Soil Texture Description	**(Plus surfactant 0.25% by volume)**
Coarse Sand, loamy sand, sandy loam	1.8 – 3.5
Medium Loam, silty loam, silty clay loam	1.8 – 7.0

Fine 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:

	HM-0429™ (Pints/Acre)	
Soil Texture Description	**Preemergence +**	**Layby**
Coarse* Sandy loam	1.8	1.8
Medium Loam, silt loam	2.7	2.7
Fine 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*	Ageratum conycoides
Alexandergrass	Brachiaria plantaginea
Balsamapple	Momordica charantia
Barnyardgrass	Echinochloa crus-galli
Bermudagrass*	Cynodon dactylon
Burnweed, American (fireweed)	Erechtites hieracifolius
Chickweed, common	Stellaria media
Crabgrass, large	Digitaria sanguinalis
Crabgrass, smooth	Digitaria ischaemum
Crotalaria, fuzzy	Crotalaria incana
Crotalaria, showy	Crotalaria spectabilis
Cuphea, tarweed	Cuphea carthagenensis
Dallisgrass	Paspalum dilatatum
Fingergrass, radiate	Chloris radiata
Fingergrass, swollen	Chloris barbata
Foxtail, bristly	Setaria verticillata
Foxtail, yellow	Setaria lutescens
Geranium, Carolina	Geranium carolinianum
Goosegrass	Elusine indica
Guineagrass	Panicum maximum
Henbit	Lamium amplexicaule
Itchgrass*	Rottboellia cochinchinensis
Job's-tears	Coix lacryma
Johnsongrass (seedling)	Sorghum halepense
Junglerice	Echinochloa colonum
Lambsquarters, common	Chenopodium album
Millet, Texas	Panicum texanum
Morningglory, hairy	Ipomoea pentaphylla
Morningglory, threelobe	Ipomoea triloba
Mustard, wild	Sinapis arvensis
Oxalis	Oxalis spp.
Paintbrush, Flora's	Emilia sonchifolia
Panicum, browntop	Panicum fasciculatum
Paspalum, ricegrass	Paspalum orbiculare
Paspalum, sour	Paspalum conjugatum
Pigweed, redroot	Amaranthus retroflexus
Pigweed, slender (green)	Amaranthus viridus
Pigweed, smooth	Amaranthus chlorostachys
Popolo	Solanum sandwicense
Purslane, common	Portulaca oleracea
Sandbur	Cenchrus spp.
Sensitive plant (hila hila)	Mimosa spp.
Signalgrass, broadleaf	Brachiaria platyphylla
Sowthistle, common	Sonchus oleraceus
Spanishneedles	Bidens bipinnata
Sprangletop	Leptochloa spp.
Spurge, prostrate	Euphorbia humistrata
Spurge, graceful	Chamaesyce hypericifolia
Sunflower	Helianthus spp.
Vaseygrass	Paspalum urvillei
Waltheria (hia loa)	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:

EASTERN U.S. AND LAKE STATES

Fir, balsam	Abies balsamea
Pine, Austrian	Pinus negra
Pine, loblolly	Pinus taeda
Pine, longleaf	Pinus palustris
Pine, ponderosa	Pinus ponderosa
Pine, red	Pinus resinosa
Pine, Scotch	Pinus sylvestris
Pine, shortleaf	Pinus echinata
Pine, slash	Pinus elliottii
Pine, Virginia	Pinus virginiana
Spruce, black	Picea mariana
Spruce, red	Picea rubens
Spruce, white	Picea glauca

WESTERN U.S.

Fir, Douglas	Pseudotsuga menziesii
Fir, grand	Abies grandis
Fir, Noble	Abies procera
Fir, white	Abies concolor
Pine, Jeffrey	Pinus jeffreyi
Pine, lodgepole	Pinus contorta
Pine, ponderosa	Pinus ponderosa
Spruce, blue	Picea pungens
Spruce, Engleman	Picea englemannii
Spruce, Sitka	Picea sitchensis

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.

HM-0429™ (Quarts/Acre)	
Soil Texture Description	**Eastern U.S.**

Coarse Sand, loamy sand, sandy loam	4 – 6
Medium Loam, silt loam, sandy clay loam	6 – 8
Fine Silty clay loam, clay loam, 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*	Aster ericoides
Barnyardgrass	Echinochloa crus-galli
Bentgrass	Agrostis spp.
Bluegrass, annual	Poa annua
Bromegrass	Bromus spp.
Carrot, wild	Daucus carota
Crabgrass*	Digitaria spp.
Daisy, oxeye	Chrysanthemum leucanthemum
Dandelion, common*	Taraxacum officinale
Dandelion, false* (spotted catsear)	Hypochaeris radicata
Dock, curly*	Rumex crispus
Elksedge	Carex geyeri
Fescue*	Festuca spp.
Fireweed*(willowweed)	Epilobium angustifolium
Fleabane	Conyza spp.

Foxtail	Setaria spp.
Goldenrod*	Solidago spp.
Groundsel, common	Senecio vulgaris
Horseweed/marestail	Conyza canadensis
Mullein, common**	Verbascum thapsus
Orchardgrass*	Dactylis glomerata
Pinegrass	Calamagrostis rubescens
Quackgrass*	Agropyron repens
Ragweed, common	Ambrosia elatior
Ryegrass, Italian (annual)	Lolium multiflorum
Ryegrass, perennial*	Lolium perenne
Smartweed, Pennsylvania	Polygonum pensylvanicum
Squawcarpet	Ceanothus prostratus
Thistle, Canada*	Cirsium arvense
Velvetgrass, common	Holcus lanatus

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

WOODY PLANTS

Ash	Fraxinus spp.
Aspen, big tooth	Populus grandidentata
Aspen, trembling	Populus tremuloides
Birch	Betula spp.
Blackgum	Nyssa sylvatica
Cherry, black	Prunus serotina
Deerbrush	Ceanothus integerrimus
Dogwood, flowering*	Cornus florida
Elm	Ulmus spp.
Hawthorn	Crataegus spp.
Hazel	Corylus spp.
Hickory	Carya spp.
Honeysuckle*	Lonicera spp.
Manzanita, Greenleaf	Arctostaphylos patula
Maple, red*	Acer rubrum
Oaks	Quercus spp.
Poplar, balsam	Populus balsamifera
Snowbrush (varnishleaf)	Ceanothus velutinus
Sourwood*	Oxydendrum arboretum
Sweetgum	Liquidambar spp.
Willows	Salix spp.

*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**
Coarse	0.6	3X3	3
	2.0	4X4	6
	3.1	4X6	6
Medium/Fine	1.6	3X3	8
	2.8	4X4	8
	3.5	4X4	10
	5.2	4X6	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	Abies balsamea
Pine, loblolly	Pinus taeda
Pine, longleaf	Pinus palustris
Pine, red	Pinus resinosa
Pine, shortleaf	Pinus echinata
Pine, slash	Pinus elliotti
Pine, Virginia	Pinus virginiana
Spruce, black	Picea mariana
Spruce, Norway	Picea abies
Spruce, red	Picea rubens
Spruce, white	Picea glauca

WESTERN U.S.

Fir, Douglas	Pseudotsuga menziesii
Fir, grand	Abies grandis
Fir, Noble	Abies procera
Fir, white	Abies concolor
Hemlock, Western	Tsuga heterophylla
Pine, Jeffrey	Pinus jeffreyi
Pine, lodgepole	Pinus contorta
Pine, ponderosa	Pinus ponderosa
Spruce, blue	Picea pungens
Spruce, Englemann	Picea englemannii
Spruce, Sitka	Picea sitchensis

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).

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 restingbud has hardened on the conifers. Or, spring applications maybe 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.

Crop Species	Soil Texture Description	HM-0429™ (Quarts/Acre) Established Trees
Loblolly pine Longleaf pine Shortleaf pine Virginia pine Slash pine	Loamy sand, sandy loam	2 – 3
	Loam, silty loam, silt, sandy clay loam	2 – 4
	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	4 – 6

	loam	
	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.

Soil Texture Description	HM-0429™ (Quarts/Acre)
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:

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

*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**
Coarse	0.5	3X4	2*
	1.2	3X6	3
	2.1	4X6	4
Medium/Fine	1.2	3X3	6
	2.3	3X6	8
	1.6	3X3	8
	3.1	3X6	8

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

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 hardiness 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.

EASTERN U.S.

Soil Texture Description	HM-0429™ (Pints/Acre)	
	First Year Plantings	Established Trees
Loamy sand, sandy loam (50-85% sand)	4	4 – 5
Loam, silt loam, silt, sandy clay loam	4 – 5	5 – 7
Silty clay loam, clay loam, 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	Aster spp.
Aster, heath*	Aster ericoides

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

*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.

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 non-uniform 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
  - –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.

2.75–4.5 PINTS/ACRE	
Barley, little	Hordeum pusillum
Barnyardgrass	Echinochloa crus-galli
Dogfennel	Eupatorium capillifolium
Fescue	Festuca spp.
Lespedeza	Lespedeza cuneata
Oxalis	Oxalis spp.
Passionflower, maypop	Passiflora incarnate

Pepperweed, Virginia	Lepidium virginicum
Pigweed	Amaranthus spp.
Smutgrass*	Sporobolus indicus

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

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

*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™**.

- 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 toproduce 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 rights-of-way, sewage disposal areas); uncultivated agricultural areas (non-crop producing, which includes: farmyards, fuel storage areas, fence rows, barrier strips); industrial sites (outdoor, such as lumberyards, pipeline and tank farms).

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.

1–2.5 GALLONS/ACRE	
Barnyardgrass	Echinochloa crus-galli
Bindweed, field*	Convolvulus arvensis
Bouncingbet*	Saponaria officinalis
Bromegrass	Bromus spp.
Buffalograss*	Buchloe dactyloides
Burdock	Arctium spp.
Cocklebur	Xanthium spp.
Crabgrass	Digitaria spp.
Crown vetch	Coronilla varia
Curly dock*	Rumex crispus
Dandelion, common*	Taraxacum officinale
Dandelion, false* (spotted catsear)	Hypochaeris radicat
Dogbane*	Apocynum cannabinum
Fiddleneck, tarweed	Amsinckia lycopsoides
Filaree	Erodium spp.
Fleabane, flax-leaved	Conyza bonariensis
Goatsbeard vine (sweet briar)	Aruncus sylvester
Goldenrod	Solidago spp.

Horseweed/marestail	Conyza canadensis
Lespedeza	Lespedeza cuneata
Milkweed, common*	Asclepias syriacea
Mustard, wild	Sinapis arvensis
Nutsedge*	Cyperus spp.
Oats, wild*	Avena fatua
Orchardgrass*	Dactylis glomerata
Orchardgrass (seedling)	Dactylis glomerata
Oxalis	Oxalis spp.
Paragrass	Panicum purpurascens
Parsnip, wild	Pastinaca sativa
Pigweed	Amaranthus spp.
Purslane, common	Portulaca oleracea
Quackgrass	Agropyron repens
Ryegrass, Italian (annual)	Lolium multiflorum
Smartweed	Polygonum spp.
Spurge	Euphorbia spp.
Star thistle	Centaurea spp.
Trumpetcreeper*	Campsis radicans

3-4 GALLONS/ACRE

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

*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.

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.

2.75–4.5 PINTS/ACRE	
Barley, little	Hordeum pusillum
Barnyardgrass	Echinochloa crus-galli
Dogfennel	Eupatorium capillifolium
Fescue	Festuca spp.
Lespedeza	Lespedeza cuneata
Oxalis	Oxalis spp.
Passionflower, maypop	Passiflora incarnate
Pepperweed, Virginia	Lepidium virginicum
Pigweed	Amaranthus spp.
Smutgrass*	Sporobolus indicus

*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 asurfactant 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.

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

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

*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.

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; 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:
NONREFILLABLE CONTAINER (EQUAL TO OR LESS THAN 5 GALLONS): Do not reuse or refill this container. Triple rinse container (or equivalent) promptly after emptying. Triple rinse as follows: Empty the remaining contents into application equipment or a mix tank and drain for 10 seconds after the flow begins to drip. Fill the container ¼ full with water and recap. Shake for 10 seconds. Pour rinsate into application equipment or a mix tank or store rinsate for later use or disposal. Drain for 10 seconds after the flow begins to drip. Repeat this procedure two more times. Offer for recycling, if available, or puncture and dispose of in a sanitary landfill, or incineration, or, if allowed by State and local authorities, by burning. If burned, stay out of smoke.
NONREFILLABLE CONTAINER (GREATER THAN 5 GALLONS): Do not reuse or refill this container. Triple rinse container (or equivalent) promptly after emptying. Triple rinse as follows: Empty the remaining contents into application equipment or a mix tank. Fill the container ¼ full with water. Replace and tighten closures. Tip container on its side and roll it back and forth, ensuring at least one complete revolution, for 30 seconds. Stand the container on its end and tip it back and forth several times. Turn the container over onto its other end and tip it back and forth several times. Empty the rinsate into application equipment or a mix tank or store rinsate for later use or disposal. Repeat this procedure two more times. Offer for recycling, if available, or puncture and dispose of in a sanitary landfill, or incineration, or, if allowed by State and local authorities, by burning. If burned, stay out of smoke.
REFILLABLE CONTAINER: Refill this container with pesticide only. **Do not reuse this container for any other purpose.** Cleaning the container before final disposal is the responsibility of the person disposing of the container. Cleaning before refilling is the responsibility of the refiller. To clean the container before final disposal, empty the remaining contents from this container into application equipment or mix tank. Fill the container about 10 percent full with water. Agitate vigorously or recirculate water with the pump for 2 minutes. Pour or pump rinsate into application equipment or rinsate collection system. Repeat this rinsing procedure two more times. Offer for recycling, if available, or puncture and dispose of in a sanitary landfill, or incineration, or, if allowed by State and local authorities, by burning. If burned, stay out of smoke.

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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