



U.S. ENVIRONMENTAL PROTECTION AGENCY  
 Office of Pesticide Programs  
 Registration Division (7505P)  
 1200 Pennsylvania Ave., N.W.  
 Washington, D.C. 20460

**EPA Reg. Number:**

5905-656

**Date of Issuance:**

7/28/22

**NOTICE OF PESTICIDE:**

Registration  
 Reregistration  
 (under FIFRA, as amended)

**Term of Issuance:**

Unconditional

**Name of Pesticide Product:**

Helena Flumioxazin 4 SC

**Name and Address of Registrant (include ZIP Code):**

Helena Agri-Enterprises, LLC  
 d/b/a Helena Chemical Company  
 225 Schilling Blvd., Suite 300  
 Collierville, TN 38017

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

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

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

This product is unconditionally registered in accordance with FIFRA section 3(c)(5) provided that you:

1. Submit and/or cite all data required for registration/reregistration/registration review of your product when the Agency requires all registrants of similar products to submit such data.
2. Make the following label changes before you release the product for shipment:
  - Revise the EPA Registration Number to read, "EPA Reg. No. 5905-656."

**Signature of Approving Official:**

Shaja B. Joyner, Product Manager 20  
 Fungicide-Herbicide Branch  
 Registration Division 7505P

**Date:**

7/28/22

3. Submit one copy of the revised final printed label for the record before you release the product for shipment.

Should you wish to add/retain a reference to the company's website on your label, then please be aware that the website becomes labeling under the Federal Insecticide Fungicide and Rodenticide Act and is subject to review by the Agency. If the website is false or misleading, the product would be misbranded and unlawful to sell or distribute under FIFRA section 12(a)(1)(E). 40 CFR 156.10(a)(5) list examples of statements EPA may consider false or misleading. In addition, regardless of whether a website is referenced on your product's label, claims made on the website may not substantially differ from those claims approved through the registration process. Therefore, should the Agency find or if it is brought to our attention that a website contains false or misleading statements or claims substantially differing from the EPA approved registration, the website will be referred to the EPA's Office of Enforcement and Compliance.

If these conditions are not complied with, the registration will be subject to cancellation in accordance with FIFRA section 6. Your release for shipment of the product constitutes acceptance of these conditions. A stamped copy of the label is enclosed for your records. Please also note that the record for this product currently contains the following CSFs:

- Basic CSF dated 04/19/2022

If you have any questions, please contact Ernest Kraka via email at [kraka.ernest@epa.gov](mailto:kraka.ernest@epa.gov)

Enclosure



## HELENA FLUMIOXAZIN 4 SC

FOR CONTROL AND/OR SUPPRESSION OF CERTAIN WEEDS IN ALFALFA; ARTICHOKE; ASPARAGUS; BRASSICA (HEAD AND STEM); BUSHBERRIES; CACTUS (PRICKLY PEAR); CANEBERRIES; CELERY; CITRUS FRUIT; CLOVER; COTTON; CUCURBIT VEGETABLES; DRY BEANS; FIELD CORN; FIELD PEAS; FLAX; FRUITING VEGETABLES; GARLIC; GRAPE; HOPS; LENTILS; MINT; ONION (DRY BULB); OLIVE; PEANUT; POME FRUIT; POMEGRANATE; POTATO; SOYBEAN; STONE FRUIT; STRAWBERRY; SUGARCANE; SUNFLOWER AND SAFFLOWER; SWEET POTATO; TREE NUTS; WHEAT; NON-BEARING FRUIT TREES; FALLOWBED USE ON TRANSPLANTED MELON, PEPPER, AND TOMATO BEDS; FALLOW LAND AND TO MAINTAIN BARE GROUND ON NON-CROP AREAS OF FARMS; ORCHARDS AND VINEYARDS.

Active Ingredient	By Wt.
Flumioxazin* .....	41.4%
Other Ingredients .....	58.6%
Total	100.0%

\*2-[7-fluoro-3,4-dihydro-3-oxo-4-(2-propynyl)-2H-1,4-benzoxazin-6-yl]-4,5,6,7-tetrahydro-1H-indole-1,3(2H)-dione

Helena Flumioxazin 4 SC is a suspension concentrate containing 41.4% active ingredient.

**KEEP OUT OF REACH OF CHILDREN**  
**CAUTION**  
**SEE INSIDE BOOKLET FOR ADDITIONAL PRECAUTIONARY STATEMENTS**

EPA Reg. No. \_\_\_\_\_  
 EPA Est. No. \_\_\_\_\_

AD XXXXXX  
 NET CONTENTS: \_\_\_\_\_



Manufactured for  
 Helena Agri-Enterprises, LLC  
 225 Schilling Boulevard, Suite 300  
 Collierville, TN 38017

**A C C E P T E D**  
 07/28/2022  
 Under the Federal Insecticide, Fungicide  
 and Rodenticide Act as amended, for the  
 pesticide registered under  
 EPA Reg. No. 5905-656

**PRECAUTIONARY STATEMENTS**  
**HAZARDS TO HUMANS & DOMESTIC ANIMALS**

**CAUTION.** Harmful if inhaled or absorbed through the skin. Causes moderate eye irritation. Avoid breathing spray mist. Avoid contact with skin, eyes or clothing.

**PERSONAL PROTECTIVE EQUIPMENT (PPE):**

**Applicators and other handlers must wear:** long-sleeved shirt and long pants, chemical-resistant gloves made of any waterproof material including polyethylene or polyvinyl chloride, shoes and socks.

**For aerial application to sugarcane, mixer/loaders must also wear:** coveralls, chemical resistant apron and chemical resistant boots.

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

**USER SAFETY RECOMMENDATIONS**

Users should:

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

**ENVIRONMENTAL HAZARDS**

This product is toxic to non-target plants and aquatic invertebrates. **DO NOT** apply directly to water, to areas where surface water is present or to intertidal areas below the mean high water mark. Drift or runoff may be hazardous to non-target plants and aquatic organisms in neighboring areas. **DO NOT** apply where runoff is likely to occur. **DO NOT** apply when weather conditions favor drift from treated areas. **DO NOT** contaminate water when disposing of equipment washwaters or rinsate.

This pesticide is toxic to plants and should be used strictly in accordance with the drift and run-off precautions on this label in order to minimize off-site exposures.

Under some conditions this product may have a potential to run-off to surface water or adjacent land. Where possible, use methods which reduce soil erosion, including no till, limited till and contour plowing; these methods also reduce pesticide run-off. Use of vegetation filter strips along rivers, creeks, streams, wetlands or on the downhill side of fields where run-off could occur will minimize water run-off.

**Note to EPA reviewer: if this product is shipped in containers greater than 50 lb, the following environmental hazard statement will be added to the label:**

[**DO NOT** discharge effluent containing this product into lakes, streams, ponds, estuaries, oceans, or other waters unless in accordance with the requirements of a National Pollutant Discharge Elimination System (NPDES) permit and the permitting authority has been notified in writing prior to discharge. **DO NOT** discharge effluent containing this product to sewer systems without previously notifying the local

sewage treatment plant authority. For guidance contact your State Water Board or Regional Office of the EPA.]

#### **PHYSICAL OR CHEMICAL HAZARDS**

**DO NOT** mix or allow coming in contact with oxidizing agent. Hazardous chemical reaction may occur.

#### **DIRECTIONS FOR USE**

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

**READ ENTIRE LABEL. USE STRICTLY IN ACCORDANCE WITH PRECAUTIONARY STATEMENTS AND DIRECTIONS, AND WITH APPLICABLE STATE AND FEDERAL REGULATIONS.**

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

#### **AGRICULTURAL USE REQUIREMENTS**

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

**DO NOT** enter or allow worker entry into treated areas during the restricted entry interval (REI) of 12 hours.

PPE required for early entry to treated areas that is permitted under the Worker Protection Standard and that involves contact with anything that has been treated, including plants, soil or water is: coveralls, chemical resistant gloves made of waterproof material, shoes plus socks.

#### **NON-AGRICULTURAL USE REQUIREMENTS**

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

Keep all unprotected persons out of operating areas, or vicinity where there may be drift. **DO NOT** enter or allow others to enter treated areas until sprays have dried.

#### **TANK MIXES**

NOTICE: Tank mixing or use of this product with any other product which is not specifically and expressly authorized by the label shall be the exclusive risk of user, applicator and/or application advisor, to the extent allowed by applicable law.

**Always read and follow the restrictions and limitations for all products whether used alone or in a tank mix. The most restrictive labeling of any product used applies in tank mixtures, including all crop rotational and other crop restrictions.**

### **Resistance Management**

For resistance management, Helena Flumioxazin 4 SC is a Group 14 herbicide. Any weed population may contain or develop plants naturally resistant to Helena Flumioxazin 4 SC and other Group 14 herbicides. The resistant biotypes may dominate the weed population if these herbicides are used repeatedly in the same field. Appropriate resistance-management strategies must be followed.

To delay herbicide resistance take one or more of the following steps:

- Rotate the use of Helena Flumioxazin 4 SC or other Group 14 herbicides within a growing season sequence or among growing seasons with different herbicide groups that control the same weeds in a field.
- Use tank mixtures with herbicides from a different group if such use is permitted; where information on resistance in target weed species is available, use the less resistance-prone partner at a rate that will control the target weed(s) equally as well as the more resistance prone partner. Consult your local extension service or certified crop advisor if you are unsure as to which active ingredient is currently less prone to resistance.
- Adopt an integrated weed-management program for herbicide use that includes scouting and uses historical information related to herbicide use and crop rotation, and that considers tillage (or other mechanical control methods), cultural (e.g., higher crop seeding rates; precision fertilizer application method and timing to favor the crop and not the weeds), biological (weed-competitive crops or varieties) and other management practices.
- Scout after herbicide application to monitor weed populations for early signs of resistance development. Indicators of possible herbicide resistance include: failure to control a weed species normally controlled by the herbicide at the dose applied, especially if control is achieved on adjacent weeds; a spreading patch of noncontrolled plants of a particular weed species; surviving plants mixed with controlled individuals of the same species. If resistance is suspected, prevent weed seed production in the affected area by an alternative herbicide from a different group or by a mechanical method such as hoeing or tillage. Prevent movement of resistant weed seeds to other fields by cleaning harvesting and tillage equipment when moving between fields, and planting clean seed.
- If a weed pest population continues to progress after treatment with this product, discontinue use of this product, and switch to another management strategy or herbicide with a different mode of action, if available.
- Contact your local extension specialist or certified crop advisors for additional pesticide resistance-management and/or integrated weed-management recommendations for specific crops and weed biotypes or to find out if suspected resistant weeds have been found in their region.
- For further information or to report lack of performance or suspected resistance, contact Helena Agri-Enterprises, LLC at 901-761-0050 or at [www.helenaagri.com](http://www.helenaagri.com).

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## PRODUCT INFORMATION

- Helena Flumioxazin 4 SC provides residual control of susceptible weeds.
- Helena Flumioxazin 4 SC provides additional burndown activity when used as part of a burndown program.
- Helena Flumioxazin 4 SC can be applied as part of a fall burndown program for control of susceptible winter annuals.
- Helena Flumioxazin 4 SC can be applied with a hooded or shielded sprayer, as well as part of a layby application, in selected crops for postemergence weed control as well as residual control of susceptible weeds.
- Helena Flumioxazin 4 SC can be used on farms, orchards and vineyards for non-selective vegetation control to maintain bare ground non-crop areas that must be kept weed free.
- **Helena Flumioxazin 4 SC, when applied according to label use directions, will control the weeds claimed in crop specific use directions. This label makes no claims concerning control of other weed species. It is the pesticide user's responsibility to ensure that all products are registered for the intended use. Read and follow the applicable restrictions and limitations and directions for use on all product labels involved in tank mixing. Users must follow the most restrictive directions for use and precautionary statements of each product in the tank mixture.**

Helena Flumioxazin 4 SC Rate Summary	
FL OZ of Helena Flumioxazin 4 SC	Pounds of Flumioxazin
2	0.063
4	0.125
6	0.188
8	0.250
12	0.375
24	0.750

### AVOIDING SPRAY DRIFT AT THE APPLICATION SITE IS THE RESPONSIBILITY OF THE APPLICATOR.

The interaction of many equipment and weather related factors determine the potential for spray drift. The applicator is responsible for considering all of these factors when making decisions. Where states have more stringent regulations, they must be observed.

### RESTRICTIONS AND LIMITATIONS

- **DO NOT** apply Helena Flumioxazin 4 SC when weather conditions favor spray drift from treated areas.
- **DO NOT** apply Helena Flumioxazin 4 SC during low-level inversion conditions, including fog.
- **DO NOT** apply Helena Flumioxazin 4 SC to frozen or snow covered soil.
- **DO NOT** apply Helena Flumioxazin 4 SC to farm alleys or roads where traffic may result in treated dust settling onto crops or other desirable vegetation.
- **DO NOT** apply Helena Flumioxazin 4 SC within 300 yards of non-dormant pears.
- **DO NOT** apply Helena Flumioxazin 4 SC to powdery soils or soils that are susceptible to wind displacement unless irrigation can be applied immediately after application.

## PRECAUTIONS

- When applying Helena Flumioxazin 4 SC by air, observe drift management restrictions and precautions listed under “AERIAL APPLICATION”.
- Mechanical incorporation into the soil will reduce residual weed control.
- Apply post directed and layby applications of Helena Flumioxazin 4 SC only to healthy growing crops.

**Before using spray equipment to apply other products to crop foliage follow cleanout procedures identified in this label. See “SPRAYER CLEANUP” for more information.**

## ENVIRONMENTAL CONDITIONS AND BIOLOGICAL PERFORMANCE

### Preemergence Application (Conventional Tillage)

**Important:** Crop injury may occur from applications made to poorly drained soils and/or applications made under cool, wet conditions. Risk of crop injury can be minimized by using on well drained soils, planting at least 1.5 inches deep, using high quality seed and completely covering seeds with soil prior to preemergence applications. Treated soil that is splashed onto newly emerged crops may result in temporary crop injury.

Moisture is necessary to activate Helena Flumioxazin 4 SC in soil for residual weed control. Dry weather following applications of Helena Flumioxazin 4 SC may reduce effectiveness. However, when adequate moisture is received after dry conditions, Helena Flumioxazin 4 SC will control susceptible germinating weeds. Helena Flumioxazin 4 SC may not control weeds that germinate after application but before an activating rainfall/irrigation or weeds that germinate through cracks resulting from dry soil.

When adequate moisture is not received after a Helena Flumioxazin 4 SC application, weed control may be improved by irrigation with at least 1/4 inch of water. If emerged weeds are controlled by cultivation, residual weed control will be reduced.

### Burndown Application

For best results, apply Helena Flumioxazin 4 SC as part of a burndown program to actively growing weeds. Applying Helena Flumioxazin 4 SC under conditions that do not promote active weed growth will reduce herbicide effectiveness. Do not apply Helena Flumioxazin 4 SC when weeds are under stress due to drought, excessive water, extremes in temperature, disease or low humidity. Weeds under stress tend to become less susceptible to herbicidal action. Helena Flumioxazin 4 SC is most effective when applied under warm sunny conditions.

Reduced residual weed control may occur when burndown applications are made to fields where heavy crop and/or weed residue exist.

### Postemergence Application

Only apply Helena Flumioxazin 4 SC to healthy crops labeled for postemergence use. **DO NOT** apply Helena Flumioxazin 4 SC to crops that have been weakened by disease, drought, flooding, excessive fertilization, soil salts, previously applied pesticides, nematodes, insects or winter injury.

### Rainfastness

Helena Flumioxazin 4 SC is rainfast one hour after application. **DO NOT** make applications if rain is expected within one hour of application or postemergence efficacy may be reduced.

### **Soil Characteristics**

Application of Helena Flumioxazin 4 SC to soils with high organic matter and/or high clay content may require higher dosages than soils with low organic matter and/or low clay content. Application to cloddy seedbeds can result in reduced weed control.

### **HERBICIDE RATE**

#### **Residual Weed Control (Including Preemergence Applications or Applications as Part of a Fall or Spring Burndown and Fallow Seedbed Program)**

Based upon soil characteristics (organic matter content and texture), the most difficult to control weed species being targeted, and the crop being grown, select the proper Helena Flumioxazin 4 SC dosage from the rate range tables contained in this label.

**CARRIER VOLUME AND SPRAY PRESSURE** (Ground Equipment only. See Information for Aerial Equipment under "AERIAL APPLICATION".)

#### **Preemergence Application (Conventional Tillage)**

To ensure uniform coverage, use 10 to 30 gal of spray solution per acre for conventional tillage applications. Nozzle selection must meet manufacturer's gallonage and pressure guidelines for preemergence herbicide application.

#### **Burndown Application (Prior to Crop Emergence)**

To ensure thorough coverage in burndown applications, use 15 to 60 gals spray solution per acre. Use 20 to 60 gals per acre if dense vegetation or heavy crop residue is present. Nozzle selection must meet manufacturer's gallonage and pressure guidelines for postemergence herbicide application. **DO NOT** use flood jet nozzles.

#### **Postemergence Application (Emerged Crop)**

Check use directions for specific crops in which Helena Flumioxazin 4 SC can be applied postemergence. To ensure thorough coverage in burndown applications, use a minimum of 15 gallons spray solution per acre. Use a minimum of 20 gallons per acre if dense vegetation or heavy crop residue is present. Nozzle selection must meet manufacturer's gallonage and pressure guidelines for postemergence herbicide application.

### **ADDITIVES**

#### **Burndown Application (Prior to Crop Emergence)**

Postemergence control of weeds from Helena Flumioxazin 4 SC tank mixes will require the addition of an agronomically approved adjuvant to the spray mixture. When an adjuvant is to be used with Helena Flumioxazin 4 SC, Helena recommends the use of a Chemical Producers and Distributors Association certified adjuvant. Either a crop oil concentrate or methylated seed oil which contains at least 15% emulsifiers and 80% oil or a non-ionic surfactant at 0.25% v/v, may be used when applying Helena Flumioxazin 4 SC as part of a burndown program. Some tank mix partners, for example Roundup Power Max<sup>®</sup>, are formulated with sufficient adjuvants and **DO NOT** require the addition of a crop oil concentrate, methylated seed oil or nonionic surfactant when tank mixed with Helena Flumioxazin 4 SC. The addition of a crop oil concentrate or methylated seed oil may increase the burndown activity on certain weeds including cutleaf eveningprimrose and Carolina geranium. Verify mixing compatibility qualities by a jar test.

A spray grade nitrogen source (either ammonium sulfate at 2 to 2.5 lb/A or a 28 to 32% nitrogen solution at 1 to 2 qt/A) may be added to the spray mixture along with either a crop oil concentrate, methylated seed oil or non-ionic surfactant to enhance weed control. The addition of a nitrogen source does not replace the need for a crop oil concentrate, a methylated seed oil or a non-ionic surfactant.

#### **JAR TEST TO DETERMINE COMPATIBILITY OF ADJUVANTS AND HELENA FLUMIOXAZIN 4 SC**

When using Helena Flumioxazin 4 SC and an adjuvant, including in stale seed bed, layby, hooded/shielded or reduced tillage situations, perform a jar test before mixing commercial quantities of Helena Flumioxazin 4 SC, when using Helena Flumioxazin 4 SC for the first time, when using new adjuvants or when a new water source is being used.

1. Add 1 pt of the water to a quart jar. Use water from the same source and temperature as which will be used in the spray tank mixing operation.
2. Add 1 g of Helena Flumioxazin 4 SC to the quart jar for every 3 fl oz of Helena Flumioxazin 4 SC per acre being applied (4 g if 12 fl oz/A is the desired Helena Flumioxazin 4 SC rate), gently mix until product goes into suspension.
3. Add 60 ml (4 Tbsp or 2 fl oz) of the crop oil or methylated seed oil to the quart jar or 1 ml of non-ionic surfactant if it is being used in place of oil, gently mix.
4. If nitrogen is being used, add 16 ml (1 Tbsp or 0.5 oz) of the 28 to 32% nitrogen source to the quart jar. If ammonium sulfate is being used, add 19 g AMS to the quart jar in place of the 28 to 32% nitrogen.
5. Place cap on jar, invert 10 times, let stand for 15 minutes, evaluate.
6. An ideal tank mix combination will be uniform and free of suspended particles. Question the choice of adjuvant if any of the following conditions are observed:
  - a) Layer of oil or globules on the mixture's surface.
  - b) Flocculation: fine particles in suspension or as a layer on the bottom of the jar.
  - c) Clabbering: thickening texture (coagulated) like gelatin.

#### **SPRAYER PREPARATION**

Before applying Helena Flumioxazin 4 SC, start with clean, well maintained application equipment. The spray tank, as well as all hoses and booms, must be cleaned to ensure no residue from the previous spraying operation remains in the sprayer. Some pesticides, including but not limited to, the sulfonyleurea and phenoxy herbicides, (i.e., Classic® and 2,4-D respectively) are active at very small amounts and can cause crop injury when applied to susceptible crops. The spray equipment must be cleaned according to the manufacturer's directions for the last product used before the equipment is used to apply Helena Flumioxazin 4 SC. If two or more products were tank mixed prior to Helena Flumioxazin 4 SC application, follow the most restrictive cleanup procedure.

#### **MIXING INSTRUCTIONS**

1. Fill clean spray tank 1/2 to 2/3 of desired level with clean water.
2. If a drift retardant is to be used, add 10 lb of spray grade ammonium sulfate per 100 gallon of spray solution.
3. While agitating, slowly add Helena Flumioxazin 4 SC to the spray tank. Agitation creates a rippling or rolling action on the water surface.
4. If tank mixing Helena Flumioxazin 4 SC with other labeled herbicides, add water soluble bags first, followed by dry formulations, flowables, emulsifiable concentrates and then solutions. Prepare no more spray mixture than is required for the immediate spray operation.
5. Add any required adjuvants.
6. Fill spray tank to desired level with water. Continue agitation until all spray solution has been applied.



7. Mix only the amount of spray solution that can be applied the day of mixing. Apply Helena Flumioxazin 4 SC within 6 hours of mixing.

### **SPRAYER CLEANUP**

Spray equipment, including mixing vessels and nurse tanks, must be cleaned each day following Helena Flumioxazin 4 SC application. After Helena Flumioxazin 4 SC is applied, the following steps must be used to clean the spray equipment:

1. Completely drain the spray tank, rinse the sprayer thoroughly, including the inside and outside of the tank and all in-line screens.
2. Fill the spray tank with clean water and flush all hoses, booms, screens and nozzles.
3. Top off tank, add 1 gallon of 3% household ammonia (or equivalent) for every 100 gallons of water, circulate through sprayer for 5 minutes, and then flush all hoses, booms, screens and nozzles for a minimum of 15 minutes. If diaphragms are being used on the spray boom, loosen diaphragms before flushing the spray system, allowing cleaning solution to spray through the open diaphragm. If spray lines have any end caps, they must be loosened before flushing the system, allowing cleaning solution to spray through the loosened caps. To enhance removal of Helena Flumioxazin 4 SC from the spray system, add a tank cleaner for example "WipeOut XS" from Helena Agri-Enterprises, LLC, in place of ammonia and allow the cleaning solution to remain in the pressurized spray system (spray tank, hoses and boom) overnight before flushing the system for a minimum of 15 minutes.
4. Drain tank completely.
5. Add enough clean water to the spray tank to allow all hoses, booms, screens and nozzles to be flushed for 2 minutes.
6. Remove all nozzles and screens and rinse them in clean water.

Thoroughly clean spray equipment, including all tanks, hoses, booms, screens and nozzles, cleaned before it is used to apply postemergence pesticides. Equipment with Helena Flumioxazin 4 SC residue remaining in the system may result in crop injury to the subsequently treated crop.

### **APPLICATION EQUIPMENT**

Ensure application equipment is clean and in good repair, nozzles are uniformly spaced on the boom and frequently checked for accuracy.

### **BROADCAST APPLICATION**

Apply Helena Flumioxazin 4 SC, and Helena Flumioxazin 4 SC tank mixes, with ground equipment using standard commercial sprayers equipped with flat fan or flood nozzles (preemergence applications only) designed to deliver the desired spray pressure and spray volume.

### **BAND APPLICATION**

When banding, use proportionately less water and Helena Flumioxazin 4 SC per acre. The rate of Helena Flumioxazin 4 SC required per acre, when applied as a banded application, can be calculated with the following formula:

Amount Needed per Acre for Banded Application	=	$\frac{\text{Band Width in Inches}}{\text{Row Width in Inches}}$	X	Rate per Broadcast Acre
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## AERIAL APPLICATION

Spray drift away from the site of application may cause damage to non-target vegetation. To minimize drift, apply the largest droplet size consistent with uniform coverage and satisfactory weed control. To obtain satisfactory application and avoid drift, the following directions must be observed:

### Restrictions

- **DO NOT** apply during low-level inversion conditions (including fog), when winds are gusty or under other conditions that favor drift. **DO NOT** spray when wind velocity is less than 2 mph or more than 10 mph.
- **DO NOT** apply this product by air within 40 ft of non-target plants including non-target crops.
- **DO NOT** apply this product by air within 100 ft of emerged cotton crops.
- **DO NOT** apply this product by air within 40 ft of streams, wetlands, marshes, ponds, lakes and reservoirs.
  
- **Carrier Volume and Spray Pressure:** When used as part of a burndown weed control program, apply Helena Flumioxazin 4 SC in 7 to 10 gallons of water per acre. Application at less than 7 gallons per acre may provide inadequate control. When used for preemergence weed control, apply Helena Flumioxazin 4 SC in 5 to 10 gallons of water per acre. The higher gallonage applications afford more consistent weed control. **DO NOT** exceed the nozzle manufacturer's specified pressures. For many nozzle types, lower pressure produces larger droplets. When higher flow rates are needed, use higher flow rate nozzles instead of increasing pressure.
  
- **Nozzle Selection and Orientation:** Formation of very small drops may be minimized by appropriate nozzle selection, by orienting nozzles away from the air stream as much as possible and by avoiding excessive spray pressure. Use nozzles that produce flat or hollow cone spray patterns. Use non-drip type nozzles, for example diaphragm type nozzles, to avoid unwanted discharge of spray solution. The nozzles must be directed toward the rear of the aircraft, at an angle between 0 and 15° downward. **DO NOT** place nozzles on the outer 25% of the wings or rotors.
  
- **Adjuvants and Drift Control Additives:** Refer to tank mix partner's label for adjuvant selection. Drift control additives may be used. When a drift control additive is used, read and carefully observe the cautionary statements and all other information appearing on the additive label.

## CHEMIGATION

Follow all label directions for crops regarding rates, timing of application, special instructions and precautions.

Apply this product only through center pivot systems. End guns must be turned off due to uneven application.

**Restriction: DO NOT** apply this product through any other type of irrigation system.

Crop injury, lack of efficacy or illegal pesticide residues in the crop can result from non-uniform distribution of treated water.

The system must be properly calibrated (with water only) to ensure that the amount of Helena Flumioxazin 4 SC applied corresponds to the specified rate.

Apply Helena Flumioxazin 4 SC in 1/2 to 3/4 inches of water during the first sprinkler set. Allow time for all lines to flush the herbicide through all nozzles before turning off irrigation water. To ensure the lines are flushed and free of remaining herbicide, a dye indicator may be injected into the lines to mark the end of the application period. Once chemigation has begun, the run must be completed to ensure no product is left in the system.

If you have any questions about calibration, contact your State Extension Service Specialist, equipment manufacturers or other experts.

### **Special Precautions for Chemigation**

1. **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.
2. 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 if the need arises.
3. The system must be free of leaks and clogged nozzles.
4. The pesticide must be supplied continuously for the duration of the aqueous application. An uneven application may cause injury to the crop or poor weed control.
5. Agitation must be maintained in the nurse tank.
6. The sprinkler chemigation 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.
7. The pesticide injection pipeline must contain a functional, automatic, quick closing check valve to prevent the flow of fluid back toward the injection pump.
8. The pesticide injection pipeline must 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.
9. The system must contain functional interlocking controls to automatically shut off the pesticide injection pump when the water pump motor stops, or in the case where there is no water pump, when the water pressure decreases to the point where pesticide distribution is adversely affected.
10. 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.
11. Systems must use a metering pump, for example a positive displacement injection pump (e.g., diaphragm pump), effectively designed and constructed of materials that are compatible with the pesticides and capable of being fitted with a system interlock.
12. **DO NOT** apply when wind speed favors drift beyond the area intended for treatment.

### Chemigation Systems Connected to Public Water Systems

1. Public water system means a system for the provision to the public of piped water for human consumption, if such a system has at least 15 service connections or regularly serves an average of at least 25 individuals daily at least 60 days out of the year.
2. Chemigation systems connected to the public water system must contain a functional, reduced pressure zone, backflow preventer (RPZ) or the functional equivalent in the water supply line upstream from the point of pesticide introduction. As an option to the RPZ, discharge the water from the public water system into a reservoir tank prior to pesticide introduction. There shall be a complete physical break (air gap) between the outlet end of the fill pipe and the top overflow rim of the reservoir tank of at least twice the inside diameter of the fill pipe.
3. All chemigation systems connected to the public water system must also follow restrictions listed in the preceding section titled **“Special Precautions for Chemigation”**.

### APPLICATION WITH DRY BULK FERTILIZERS

Dry bulk fertilizer may be impregnated or coated with Helena Flumioxazin 4 SC. Application of dry bulk fertilizer with Helena Flumioxazin 4 SC provides weed control equal to, or slightly below, the same rate of Helena Flumioxazin 4 SC applied in liquid carriers, due to better coverage with application via spray equipment. Follow label directions for Helena Flumioxazin 4 SC regarding rates, special instructions, cautions and special precautions. Apply 400 to 700 lbs. of the fertilizer/herbicide mixture per acre to obtain adequate soil coverage. Apply the mixture to the soil with properly calibrated equipment immediately after blending. Uniform application of the herbicide/fertilizer mixture is essential to prevent possible crop injury and to obtain uniform weed control.

**DO NOT** use ammonium nitrate and/or limestone as the sole source of fertilizer, as the Helena Flumioxazin 4 SC may not adhere to these materials.

Compliance with all Federal and State regulations relating to blending pesticide mixtures with dry bulk fertilizer, registrations, labeling and application are the responsibility of the individual and/or company offering the fertilizer and Helena Flumioxazin 4 SC mixture for sale.

Helena Flumioxazin 4 SC must be premixed with water to form a slurry prior to impregnation on dry bulk fertilizer. For best results, use a minimum of 1 pt of water for each 2 fl oz of Helena Flumioxazin 4 SC. Use a minimum of 6 pt of the Helena Flumioxazin 4 SC slurry to impregnate 2000 lb of the fertilizer for uniform coverage of the fertilizer. Closed drum, belt, ribbon or other commonly used dry bulk blenders may be used.

The amount of Helena Flumioxazin 4 SC required can be calculated with the following formula:

fluid ounces of Helena Flumioxazin 4 SC per ton of fertilizer	=	fluid ounces of Helena Flumioxazin 4 SC per acre	X	2000	÷	pounds of fertilizer per acre
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Thoroughly clean dry fertilizer blending equipment after Helena Flumioxazin 4 SC has been placed in the system to avoid injury to sensitive crops that may be treated with fertilizers blended after the equipment has been used for Helena Flumioxazin 4 SC. Rinse the sides of the blender and the herbicide tank with water. Then impregnate the rinsate onto a load of dry fertilizer intended for an approved crop.

Use a maximum rate of 1 gallon of rinsate per ton of fertilizer. Follow with 1 to 2 loads of unimpregnated fertilizer in the blender before switching herbicides.

### ROTATIONAL RESTRICTIONS

The following rotational crops may be planted after applying Helena Flumioxazin 4 SC at the listed rate. Planting earlier than the specified rotational interval may result in crop injury.

• **Do not plant any crop, except corn (field), cotton, peanut, soybean, sugarcane and sweet potato earlier than 30 days after applying Helena Flumioxazin 4 SC.**

Application Rates	Crops	Rotation Intervals
1 fl oz/A	Cotton (no-till or strip-till only)	14 days <sup>(1)</sup>
1.5 to 2 fl oz/A	Cotton (no-till or strip-till only)	21 days <sup>(1)</sup>
2 fl oz/A or less	Peanut, Soybean, Sugarcane and Sweet Potato	immediately
	Field Corn (minimum and no-till)	7 days
	Cotton and Field Corn (conventional tillage), Rice, Sorghum, Sunflower, Tobacco and Wheat	30 days <sup>(1)</sup>
	Barley, Dry and Snap Beans, Flax, Peas, Rye, Safflower and Sweet Corn	3 months
	Alfalfa, Canola, Clover, Oats, Potato, Sugar Beet and all other crops not listed <sup>(2)</sup>	4 months if soil is tilled prior to planting 8 months if no tillage is performed
	Lentil	6 months
Up to 3 fl oz/A	Peanut, Soybean, Sugarcane and Sweet Potato	immediately
	Field Corn (minimum and no-till)	14 days
	Field Corn (conventional tillage) and Sorghum	30 days <sup>(1)</sup>
	Cotton, Rice, Sunflower, Tobacco and Wheat	2 months <sup>(1)</sup>
	Barley, Dry and Snap Beans, Flax, Pea, Rye, Safflower and Sweet Corn	4 months
	Alfalfa, Clover, Oats, Potato, Sugar Beet	5 months if soil is tilled prior to planting 10 months if no tillage is performed
	Canola and all other crops not listed <sup>(2)</sup>	6 months if soil is tilled prior to planting 12 months if no tillage is performed
	Lentil	7 months
Up to 4 fl oz/A	Sugarcane	Immediately
	Alfalfa, Canola, Potato, Sugar Beet and all other crops not listed <sup>(2)</sup>	6 months if soil is tilled prior to planting 12 months if no tillage is performed
	Cotton, Field Corn, Peanut, Rice, Sorghum, Soybean, Sunflower, Tobacco and Wheat	4 months
	Transplanted on raised beds only: melon, pepper and tomato	2 months (if the top 4 inches of the beds have been removed)

6 to 12 fl oz/A	Cotton, Field Corn, Peanut, Rice, Sorghum, Soybean, Sunflower, Tobacco and Wheat	9 months
	Alfalfa, Canola, Sugar Beet and all other crops not listed <sup>(2)</sup> Trees can be transplanted 2 months after an application <sup>(3)</sup>	12 months if soil is tilled prior to planting 18 months if no tillage is performed

<sup>(1)</sup> At least one inch of rainfall/irrigation must occur between application and planting or crop injury may occur.

<sup>(2)</sup> Successful soil bioassay must be performed prior to planting these crops.

<sup>(3)</sup> Transplanted apple, apricot, avocado, bushberries (including blueberry), cherry, fig, grape, grapefruit, lemon, nectarine, olive, orange, peach, pear, plum (including dried plum), tangerine and tree nuts (including pistachio) can be planted 2 months after a Helena Flumioxazin 4 SC application of 2 to 12 fl oz/A.

**Table 1. Broadleaf Weeds Controlled by Residual Activity of Helena Flumioxazin 4 SC**

<b>BROADLEAF WEED SPECIES</b>				
<b>Section A</b>				
<b>Common Name</b>	<b>Scientific Name</b>	<b>Organic Matter</b>	<b>Soil Type</b>	<b>Application Rate</b>
Carpetweed	<i>Mollugo verticillata</i>	Up to 5%	All Soil Types	2 fl oz/A
Chickweeds				
Common	<i>Stellaria media</i>			
Mouseear	<i>Cerastium vulgatum</i>			
Dandelion	<i>Taraxacum officinale</i>			
Eclipta	<i>Eclipta prostrate</i>			
Eveningprimrose, Cutleaf	<i>Oenothera laciniata</i>			
Field Pennycress[*]	<i>Thlaspi arvense</i>			
Florida Pusley	<i>Richardia scabra</i>			
Henbit	<i>Lamium amplexicaule</i>			
Lambsquarters, Common	<i>Chenopodium album</i>			
Little Mallow	<i>Malva parviflora</i>			
Marestail/Horseweed	<i>Conyza canadensis</i>			
Mayweed/False Chamomile	<i>Matricaria maritime</i>			
Nightshades				
Black	<i>Solanum nigrum</i>			
Eastern Black	<i>Solanum ptycanthum</i>			
Hairy	<i>Solanum sarrachoides</i>			
Pigweeds				
Redroot	<i>Amaranthus retroflexus</i>			
Smooth	<i>Amaranthus hybridus</i>			
Spiny Amaranth	<i>Amaranthus spinosus</i>			
Tumble	<i>Amaranthus albus</i>			
Prickly Lettuce	<i>Lactuca serriola</i>			
Prickly Sida (Teaweed)	<i>Sida spinosa</i>			
Puncturevine	<i>Tribulus terrestris</i>			

[\*Not for use in California]

continued

**Table 1. Broadleaf Weeds Controlled by Residual Activity of Helena Flumioxazin 4 SC (continued)**

<b>Section B</b>						
<b>All weeds listed in Section A plus:</b>						
<b>Common Name</b>	<b>Scientific Name</b>	<b>Organic Matter</b>	<b>Soil Type</b>	<b>Application Rates <sup>(2)</sup></b>		
Purslane, Common	<i>Portulaca oleracea</i>	Up to 3%	All Soil Types	2 fl oz/A Cotton and Dry Bean 2.5 fl oz/A Field Corn and Soybean 3 fl oz/A Peanut and all other labeled crops		
Radish, Wild	<i>Raphanus raphanistrum</i>					
Redmaids	<i>Calandrinia ciliata var menziessii</i>					
Shepherd's-purse	<i>Capsella bursa-pastoris</i>					
Smallflower Morningglory	<i>Jacquemontia tamnifolia</i>					
Sowthistle, Prickly[*]	<i>Sonchus asper</i>					
Spotted Spurge	<i>Euphorbia maculate</i>					
Venice Mallow	<i>Hibiscus trionum</i>					
Coffee Senna	<i>Cassia occidentalis</i>					
Common Ragweed <sup>(1)</sup>	<i>Ambrosia artemisiifolia</i>					
False Chamomile[*]	<i>Tripleurospermum maritima</i>					
Florida Beggarweed	<i>Desmodium tortuosum</i>					
Golden Crownbeard	<i>Verbesina encelioides</i>					
Hairy Indigo	<i>Indigofera hirsute</i>	3 to 5%	Coarse and Medium Soils: (sandy loam, loamy sand, loamy, siltloam, silt, sandy clay, sandy clay loam)	2 fl oz/A Cotton and Dry Bean 2.5 fl oz/A Field Corn and Soybean 3 fl oz/A Peanut and all other labeled crops		
Hemp Sesbania	<i>Sesbania exaltata</i>					
Jimsonweed	<i>Datura stramonium</i>					
Kochia	<i>Kochia scoparia</i>					
London Rocket[*]	<i>Sisymbrium irio</i>					
Morningglories <sup>(3)</sup>						
Entireleaf	<i>Ipomoea hederacea var. integriuscula</i>					
Ivyleaf	<i>Ipomoea hederacea</i>					
Red/Scarlet	<i>Ipomoea coccinea</i>					
Tall	<i>Ipomoea purpurea</i>					
Mustard, Wild	<i>Brassica kaber</i>					
Palmer Amaranth	<i>Amaranthus palmeri</i>					
Spurred Anoda	<i>Anoda cristata</i>				Fine Soils: (silty clay, silty clay loam, clay, clay loam)	2 fl oz/A Cotton and Dry Bean 3 fl oz/A Field Corn, Peanut, Soybean and all other labeled crops
Tropic Croton	<i>Croton glandulosus</i>					
Waterhemp <sup>(1)</sup>						
Common	<i>Amaranthus rudis</i>					
Tall	<i>Amaranthus tuberculatus</i>					
Wild Poinsettia	<i>Euphorbia heterophylla</i>					
Yellow Rocket[*]	<i>Barbarea vulgaris</i>					



[\*Not for use in California.]

<sup>(1)</sup>A postemergence herbicide, including Cobra® Herbicide, Phoenix™ Herbicide glyphosate (Roundup Ready® soybeans only) may be needed following a preemergence application of Helena Flumioxazin 4 SC to adequately control common ragweed or waterhemp in soybean fields with heavy pressure.

[<sup>(2)</sup>Helena Flumioxazin 4 SC will provide residual control of these weeds at 2 fl oz/A when applied under a cotton canopy.]

<sup>(3)</sup>Morningglory species are not adequately controlled on fine soils or soils with greater than 3% organic matter.

**Table 2. Weeds Suppressed by Residual Activity of Helena Flumioxazin 4 SC Application Rates**

<b>Broadleaf Weed Species</b>					
<b>Common Name</b>	<b>Scientific Name</b>	<b>Organic Matter</b>	<b>Application Rates</b>		
Bristly Starbur	<i>Acanthospermum hispidum</i>	Up to 5%	2 to 3 fl oz/A		
Copperleaf, Hophornbeam	<i>Acalypha ostryifolia</i>				
Ragweed, Giant	<i>Ambrosia trifida</i>				
Russian Thistle	<i>Salsola iberica</i>				
Smartweeds					
Ladysthumb	<i>Polygonum persicaria</i>				
Pennsylvania	<i>Polygonum pennsylvanicum</i>				
Smellmelon[*]	<i>Cucumis melo</i>				
Velvetleaf	<i>Abutilon theophrasti</i>				
Wild Buckwheat	<i>Polygonum convolvulus</i>				
Wormwood, Biennial	<i>Artemisia biennis</i>				
<b>Grass Weed Species</b>					
Barnyardgrass	<i>Echinochloa crus-galli</i>			Up to 5%	1.5 to 3 fl oz/A
Bluegrass, Annual	<i>Poa annua</i>				
Crabgrass, Large	<i>Digitaria sanguinalis</i>				
Foxtail, Giant	<i>Setaria faberi</i>				
Goosegrass	<i>Eleusine indica</i>				
Lovegrass, California	<i>Eragrostis diffusa</i>				
Panicums					
Fall	<i>Panicum dichotomiflorum</i>				
Texas	<i>Panicum texanum</i>				
Ryegrass, Italian[*]	<i>Lolium multiflorum</i>				
Signalgrass, Broadleaf	<i>Brachiaria platyphylla</i>				
Cheat	<i>Bromus secalinus</i>				
Downy Brome[*]	<i>Bromus tectorum</i>				

[\*Not for use in California]

**DIRECTIONS FOR USE IN FALL AND SPRING PREPLANT BURNDOWN AND FALLOW SEEDBED PROGRAMS IN FIELD CORN, PEANUT AND SOYBEAN  
(Preemergence to Crop)  
[For Use in Arizona, California and Hawaii Only]**

**RESTRICTIONS AND LIMITATIONS**

- **DO NOT** apply to frozen or snow covered soil.
- **DO NOT** perform any tillage operation after application or residual weed control will be reduced.
- Observe all rotational intervals prior to planting as listed in the “ROTATIONAL RESTRICTIONS” table.

**FALL BURNDOWN AND FALLOW SEEDBED PROGRAMS**

Helena Flumioxazin 4 SC [ at 2 to 4 fl oz/A] can be used in the fall to provide residual weed control in fields that will be planted the following spring with field corn, peanut or soybean (refer to Rotational Restrictions table for rates and rotational intervals prior to planting). Weeds controlled by residual activity are listed in Table 1 (sections A and B), Broadleaf Weeds Controlled by Residual Activity of Helena Flumioxazin 4 SC ; Table 3, Weeds Controlled by Fall and Spring Preplant Burndown Programs; and Table 7, Weeds Controlled by Residual Activity of Helena Flumioxazin 4 SC . If weeds have emerged at the time of application, use Helena Flumioxazin 4 SC in combination with a labeled burndown herbicide. [Application must be made no earlier than October 15 in Region 2 or November 15 in Region 1 or when soil temperature falls below 50°F at a 2 inch depth to maintain residual weed control into the spring (April 1 in Region 1 and May 1 in Region 2) or up until planting, whichever comes first.] Helena Flumioxazin 4 SC can be used in a fall burndown or fallow seedbed program [outside of Regions 1 and 2], however the length of residual control may be variable.

Abnormally warm or wet winters will reduce the length of weed control observed in the spring.

[Fall Application Regions:

Region 1: Alabama, Arkansas, Georgia, Kentucky, Mississippi, Oklahoma, Tennessee and Virginia

Region 2: Delaware, Kansas, Illinois, Indiana, Iowa, Maryland, Michigan, Minnesota, Missouri, Nebraska, North Dakota, Ohio, Pennsylvania, South Dakota, West Virginia and Wisconsin]

Weeds controlled by postemergence or residual activity are listed in Table 3.

**Preplant burndown treatment tank mixes and rates are:**

<b>Herbicide</b>	<b>Product Rate</b>
<b>Program 1<sup>(1)</sup></b>	
Helena Flumioxazin 4 SC <b>Plus</b>	2 to 3 fl oz/A
glyphosate <b>Plus</b>	0.5 to 1.0 lb ai/A (equivalent to 1 to 2 pt/A of Roundup Original <sup>®</sup> )
2,4-D LVE (2,4-D for use on preplant soybeans only) <b>Plus</b>	0.5 to 1.0 lb ai/A (equivalent to 1 to 2 pt/A of 2,4-D 4 LVE)
NIS + AMS	0.5% v/v + 17 lb/100 gals of water

or

Program 2 <sup>(1)</sup>	
Helena Flumioxazin 4 SC <b>Plus</b>	2 to 3 fl oz/A
glyphosate <b>Plus</b>	0.5 to 1.0 lb ai/A (equivalent to 1 to 2 pt/A of Roundup Original)
COC(2) or NIS + AMS	1pt/A or 0.5% v/v + 17 lb/100 gals of water

or

Program 3 <sup>(1)</sup>	
Helena Flumioxazin 4 SC <b>Plus</b>	2 to 3 fl oz/A
2,4-D LVE (2,4-D for use on preplant soybeans only) <b>Plus</b>	0.5 to 1.0 lb ai/A (equivalent to 1 to 2 pt/A of 2,4-D 4 LVE)
COC	1 pt/A

<sup>(1)</sup>Dicamba (Banvel®), at 0.188 lb ai/A (6 fl oz/A of Banvel 4) can be added to Programs 1, 2 & 3 to assist in the control emerged broadleaves. Refer to dicamba label for rotational restrictions.

<sup>(2)</sup>Crop oil concentrate has been found to increase glyphosate burndown of emerged cutleaf eveningprimrose and Carolina geranium.

**Table 3. Weeds Controlled by Fall and Spring Preplant Burndown Programs**

Weeds Controlled <sup>(1)</sup>		Postemergence			Residual
Common Name	Scientific Name	Program 1	Program 2	Program 3	
<b>Weeds 3 inches or less</b>					
Chamomile, False	<i>Matricaria maritima</i>	Yes	Yes	No	Yes
Cheatgrass	<i>Bromus tectorum</i>	Yes	Yes	No	Yes
Chickweed, Common	<i>Stellaria media</i>	Yes	Yes	No	Yes
Chickweed, Mouseear	<i>Cerastium vulgatum</i>	Yes	Yes	No	Yes
Cockle, White	<i>Silene latifolie</i>	No	Yes	Yes	Yes
Dandelion	<i>Taraxacum officinale</i>	Yes	No	Yes <sup>(2)</sup>	Yes
Deadnettle, Purple	<i>Lamium purpureum</i>	Yes	Yes	Yes	Yes
Groundsel, Cressleaf	<i>Senecio glabellus</i>	Yes	Yes	-	Yes
Henbit	<i>Lamium amplexicaule</i>	Yes	Yes	Yes	Yes
Kochia	<i>Kochia scoparia</i>	Yes	Yes	Yes	Yes
Marestail/Horseweed	<i>Conyza canadensis</i>	Yes	Yes <sup>(3)</sup>	Yes	Yes
Mallow, Common	<i>Malva neglecta</i>	Yes	Yes	No	Yes
Prickly Lettuce	<i>Lactuca serriola</i>	Yes	Yes	Yes	Yes
Wormwood, Biennial	<i>Artemisia biennis</i>	Yes	Yes	Yes	Yes

continued

**Table 3. Weeds Controlled by Fall and Spring Preplant Burndown Programs continued**

Common Name	Scientific Name	Postemergence			Residual
		Program 1	Program 2	Program 3	
		Weeds 12 inches or less			
Canola, Volunteer	<i>Brassica napus</i>	Yes	Yes	Yes	Yes
Carolina Geranium	<i>Geranium carolinianum</i>	Yes	Yes	Yes	-
Eveningprimrose, Cutleaf <sup>(4)</sup>	<i>Oenothera laciniata</i>	Yes	Yes	Yes	Yes
Flixweed	<i>Descurainia sophia</i>	Yes	Yes	Yes	Yes
Mustard, Tansy	<i>Descurainia pinnata</i>	Yes	Yes	Yes	Yes
Mustard, Wild	<i>Brassica kaber</i>	Yes	Yes	Yes	Yes
Shepherd's-purse	<i>Capsella bursa-pastoris</i>	Yes	Yes	Yes	Yes

<sup>(1)</sup> Refer to glyphosate and/or 2,4-D labels for additional weeds controlled and rotational restrictions.

<sup>(2)</sup> Use 1 lb ai/A of 2,4-D LVE (equivalent to 2 pt/A of 2,4-D 4 LVE) for control of emerged dandelion.

<sup>(3)</sup> Program 2 will not control emerged glyphosate resistant marestalk/horseweed.

<sup>(4)</sup> Use Program 1 to control cutleaf eveningprimrose that are nearing 12 inches in height or are past the rosette stage. Use Programs 2 or 3 to control cutleaf evening primrose that are 12 inches or less and in the rosette stage.

#### **SPRING BURNDOWN PROGRAMS**

Helena Flumioxazin 4 SC can be used in combination with labeled preplant burndown herbicides to assist in the postemergence burndown of emerged weeds and provide residual weed control prior to crop emergence. Weeds controlled by residual activity are listed in Table 1.

No-till planters that incorporate the soil during planting may result in decreased weed control in the row. Apply Helena Flumioxazin 4 SC after planting peanuts and soybeans when these types of planters are used (within 3 days after planting soybeans, within 2 days after planting peanuts and before the crop emerges). Helena Flumioxazin 4 SC cannot be applied after planting field corn.

Helena Flumioxazin 4 SC can be used [at 1 to 3 fl oz/A] with labeled preplant burndown herbicides to enhance the speed of burndown and increase weed spectrum.

Helena Flumioxazin 4 SC can be used [at 1 to 3 fl oz/A] [1 to 2 fl oz/A] in field corn, peanut and soybean burndown programs. See "DIRECTIONS FOR USE IN FIELD CORN", "DIRECTIONS FOR USE IN PEANUT", "DIRECTIONS FOR USE IN SOYBEAN" for more information.

**DIRECTIONS FOR USE IN FALL AND SPRING BURNDOWN  
PROGRAMS IN COTTON AND SUGARCANE**

[For Use in Arizona, California and Hawaii Only]

**RESTRICTIONS AND LIMITATIONS**

- **DO NOT** apply to frozen or snow covered soil.
- **DO NOT** perform any tillage operation after application or residual weed control will be reduced.
- Helena Flumioxazin 4 SC can be used [at 1 to 2 fl oz/A] with labeled burndown herbicides to enhance the speed of burndown and increase weed spectrum.
- A minimum of 30 days must pass, and 1 inch of rainfall/irrigation must occur, between Helena Flumioxazin 4 SC application and planting of conventionally tilled cotton.
- A minimum of 14 days must pass, and 1 inch of rainfall/irrigation must occur, between Helena Flumioxazin 4 SC application and planting of no-till or strip-till cotton when a Helena Flumioxazin 4 SC rate of 1 fl oz/A is used and 21 days when a Helena Flumioxazin 4 SC rate of 1.5 to 2 fl oz/A is used. The field must contain the stubble from the previous crop.
- Helena Flumioxazin 4 SC can be applied as part of a burndown application to sugarcane until cane emergence.
- Observe all rotational intervals prior to planting as listed in the “ROTATIONAL RESTRICTIONS” table.
- Refer to most restrictive label for minimum interval between application and planting.

**FALL BURNDOWN PROGRAMS**

Helena Flumioxazin 4 SC [, at 2 to 4 fl oz/A,] can be used in the fall to provide residual weed control in fields that will be planted the following spring with cotton or sugarcane (refer to Rotational Restrictions table for rates and rotational intervals prior to planting). Weeds controlled by residual activity are listed in Table 1 and Table 7. If weeds have emerged at the time of application, use Helena Flumioxazin 4 SC in combination with a labeled burndown herbicide. [Application must be made no earlier than October 15 in Region 2 or November 15 in Region 1 or when soil temperature falls below 50°F at a 2 inch depth to maintain residual weed control into the spring (April 1 in Region 1 and May 1 in Region 2) or up until planting, whichever comes first.] [Helena Flumioxazin 4 SC can be used in a fall burndown or fallow seedbed program outside of Regions 1 and 2.]

Abnormally warm or wet winters will reduce the length of weed control observed in the spring.

**SPRING BURNDOWN PROGRAMS**

Helena Flumioxazin 4 SC [, at 1 to 2 fl oz/A,] can be used in combination with labeled preplant burndown herbicides to assist in the postemergence burndown of emerged weeds and provide residual weed control prior to crop emergence in fields that will be planted with cotton or sugarcane. Weeds controlled by residual activity are listed in Table 1.

No-till planters that incorporate the soil during planting may result in decreased weed control in the row.

**DIRECTIONS FOR USE IN FALL AND SPRING BURNDOWN PROGRAMS IN RICE,  
SORGHUM, SUNFLOWER, TOBACCO AND WHEAT (Preplant to Crop)**

[For Use in Arizona, California and Hawaii Only]

**RESTRICTIONS AND LIMITATIONS**

- **DO NOT** apply to frozen or snow covered soil.
- **DO NOT** perform any tillage operation after application or residual weed control will be reduced.
- Helena Flumioxazin 4 SC can be used [at 1 to 2 fl oz/A] with labeled burndown herbicides to enhance the speed of burndown and increase weed spectrum. A minimum of 30 days must pass, and 1 inch of rainfall/irrigation must occur, between Helena Flumioxazin 4 SC application and planting of rice, sorghum, sugarcane, sunflowers, tobacco or wheat. Refer to most restrictive label for minimum interval between application and planting.
- Observe all rotational intervals prior to planting as listed in the “ROTATIONAL RESTRICTIONS” table.

**FALL BURNDOWN PROGRAMS**

Helena Flumioxazin 4 SC can be used in combination with labeled burndown programs to control emerged weeds and provide residual weed control in fields that will be planted the following spring (refer to Rotational Restrictions table for rates and rotational intervals prior to planting). [Application must be made no earlier than October 15 in Region 2 or November 15 in region 1 or when soil temperature falls below 50°F. at a two inch depth to maintain residual weed control into the spring.]

Abnormally warm winters may reduce the length of weed control observed in the spring.

**SPRING BURNDOWN PROGRAMS**

Helena Flumioxazin 4 SC can be used in combination with labeled burndown programs to control emerged weeds and provide residual weed control prior to crop emergence. Weeds controlled by residual activity are listed in Table 1 Section A. Crops that will be planted following application must be in compliance with the rotational interval listed in the “Rotational Restriction” table above.

No-till planters that incorporate the soil during planting may result in decreased weed control in the row.

**DIRECTIONS FOR USE IN FALL BURNDOWN PROGRAMS IN FIELDS TO BE PLANTED TO  
BARLEY, FIELD PEAS, FLAX, LENTIL, SAFFLOWER, SUNFLOWER AND SPRING WHEAT (Preplant to Crop)**

[For Use in Arizona, California and Hawaii Only]

**RESTRICTIONS AND LIMITATIONS**

- **DO NOT** apply to frozen or snow covered soil.
- **DO NOT** perform any tillage operation after application or residual weed control will be reduced.
- Helena Flumioxazin 4 SC can be mixed with 2,4-D and/or glyphosate formulations labeled for burndown programs (preplant to crop) in accordance with the most restrictive label limitations and precautions.

- **DO NOT** mix Helena Flumioxazin 4 SC with any product containing a label prohibition against such mixing.
- Observe all rotational intervals prior to planting as listed in the “ROTATIONAL RESTRICTIONS” table.

### **FALL BURNDOWN PROGRAMS**

Helena Flumioxazin 4 SC can be used [at 2 to 4 fl oz/A] with labeled burndown herbicides to enhance the speed of burndown, increase weed spectrum and provide residual weed control of the weeds listed in Table 3 until the following spring. Rotational intervals must be followed for crop to be planted in the spring following the fall Helena Flumioxazin 4 SC application. Refer to most restrictive label for minimum interval between application and planting.

### **DIRECTIONS FOR USE IN FALLOW LAND**

[For Use in Arizona, California and Hawaii Only]

Helena Flumioxazin 4 SC may be used as a preemergence fallow treatment. Weeds controlled by residual activity are listed in Table 1.

Helena Flumioxazin 4 SC [, at 2 to 4 fl oz/A,] can be used in the fall to provide residual weed control in fallow fields (refer to Rotational Restrictions table for rates and rotational intervals prior to planting). If weeds have emerged at the time of application, use Helena Flumioxazin 4 SC in combination with a labeled fallow herbicide. [Application must be made no earlier than October 15 in Region 2 or November 15 in Region 1 or when soil temperature falls below 50°F at a 2 inch depth to maintain residual weed control into the spring (April 1 in Region 1 and May 1 in Region 2).] Abnormally warm or wet winters will reduce the length of weed control observed in the spring.

Helena Flumioxazin 4 SC [, at 1 to 4 fl oz/A,] can be used in spring in combination with labeled burndown herbicides to control emerged weeds and provide residual weed control.

### **DIRECTIONS FOR USE IN ESTABLISHED ALFALFA**

#### **RESTRICTIONS AND LIMITATIONS**

- **DO NOT** apply more than 4 fl oz of Helena Flumioxazin 4 SC per acre per application.
- **DO NOT** make more than 2 applications of Helena Flumioxazin 4 SC per acre per year.
- **DO NOT** apply more than 8 fl oz of Helena Flumioxazin 4 SC per acre per year.
- **DO NOT** make a sequential Helena Flumioxazin 4 SC application within 60 days of the first Helena Flumioxazin 4 SC application.
- **DO NOT** apply to alfalfa with greater than 6 inches of growth. Application will result in burning of treated leaves and stems. Understand and accept this risk before using Helena Flumioxazin 4 SC on alfalfa.
- **DO NOT** apply within 25 days of harvest or grazing.
- **DO NOT** use on alfalfa grown for seed unless approved by a State authority to support a Special Local Need (SLN) under FIFRA section 24(c).
- Only apply with an adjuvant or tank mix with products formulated as an emulsifiable concentrate “EC” when targeting control of emerged weeds (expect and accept crop burn

and/or stunting if Helena Flumioxazin 4 SC is used with an adjuvant, a tank mix partner formulated as an emulsifiable concentrate (EC) or a tank mix partner formulated with an adjuvant.)

- Application with paraquat can be used to burndown winter annuals prior to winter dormant period.
- **DO NOT** use on intended mixed alfalfa-grass stands.

#### **TIMING TO ALFALFA**

Helena Flumioxazin 4 SC may be applied to established alfalfa with a maximum amount of growth of 6 inches or less for the preemergence control of the weeds listed in Table 7, Weeds Controlled by Residual Activity of Helena Flumioxazin 4 SC . Established alfalfa is defined as alfalfa planted in the fall or spring which has gone through a first cutting/mowing. Application to alfalfa with greater than 6 inches of growth may result in unacceptable crop injury.

For control of winter annual weeds: the best timing for preemergence control is in the fall immediately after the last cutting or sheepling-off has occurred.

For control of summer annual weeds: the best timing for preemergence control is in the spring prior to alfalfa growth and before 6 inches of growth.

#### **TIMING TO WEEDS**

##### **Preemergence – Preemergence To Weeds**

Apply Helena Flumioxazin 4 SC before alfalfa growth exceeds 6 inches in height for the preemergence control of weeds listed in Table 7, Weeds Controlled by Residual Activity of Helena Flumioxazin 4 SC. Make applications as soon as possible after cutting and removing alfalfa to minimize injury to alfalfa growth.

##### **Postemergence Dodder Suppression**

Apply Helena Flumioxazin 4 SC at 4 fl oz per acre with an adjuvant for postemergence suppression of dodder. Tank mixes with Pursuit® Herbicide or Raptor® Herbicide will increase control.

### **DIRECTIONS FOR USE IN ARTICHOKE**

#### **RESTRICTIONS AND LIMITATIONS**

- **DO NOT** apply more than 4 fl oz of Helena Flumioxazin 4 SC per acre per application on annual or perennial artichoke varieties after new planting.
- **DO NOT** apply more than 6 fl oz of Helena Flumioxazin 4 SC per acre per application on perennial artichoke varieties after cutback.
- **DO NOT** make more than 1 application of Helena Flumioxazin 4 SC per acre per year.
- **DO NOT** apply more than 6 fl oz of Helena Flumioxazin 4 SC per acre per year.
- Application to artichoke foliage may result in unacceptable crop injury.

#### **TIMING TO ARTICHOKE**

**Annual Varieties:** Helena Flumioxazin 4 SC may be applied to artichoke beds prior to transplanting. Application of Helena Flumioxazin 4 SC must be made to the beds no later than 2 days prior to transplanting. Irrigation or rainfall after transplanting is necessary to activate the Helena Flumioxazin 4 SC . Do not irrigate the Helena Flumioxazin 4 SC before transplanting. Heavy irrigation or rainfall may



result in crop injury. The injury is usually transitory and the plants will quickly grow out of the crop damage. Take care to minimize soil disturbance during transplanting, as preemergence weed control will decrease as soil disturbance increases.

**Perennial Varieties:** Helena Flumioxazin 4 SC may be applied to artichokes after planting of crown pieces or “cut back” of mature plants. Applications of Helena Flumioxazin 4 SC must be made within 2 days after planting or cut back and prior to artichoke emergence. Application after the artichokes have begun to crack, or are emerged, will result in crop injury. Apply before artichokes have begun to emerge (cracking).

#### **TIMING TO WEEDS**

##### **Pre-plant (annual)/Preemergence (perennial) to Artichokes - Preemergence to Weeds**

Apply Helena Flumioxazin 4 SC pre-plant to annual artichokes for preemergence control of the weeds. For perennial artichokes apply before cracking for preemergence control the weeds. Apply prior to weed emergence. A post-emergence herbicide may be necessary to control emerged weeds. Helena Flumioxazin 4 SC may be applied to annual or perennial artichokes as specified above for preemergence control of weeds listed in Table 7, Weeds Controlled by Residual Activity of Helena Flumioxazin 4 SC.

### **DIRECTIONS FOR USE IN ESTABLISHED ASPARAGUS**

#### **RESTRICTIONS AND LIMITATIONS**

- **DO NOT** apply more than 6 fl oz of Helena Flumioxazin 4 SC per acre per application.
- **DO NOT** make more than 1 application of Helena Flumioxazin 4 SC per acre per year.
- **DO NOT** apply more than 6 fl oz of Helena Flumioxazin 4 SC per acre per year.
- Apply only to dormant asparagus no less than 14 days before spears emerge. Application to non-dormant asparagus may result in unacceptable crop injury.
- [**DO NOT** work soil within 60 days prior to application in the spring. Soil can be worked after spear harvest in preparation for Helena Flumioxazin 4 SC application prior to fern emergence. Treated soil that is splashed onto the ferns may result in spotting.]

#### **TIMING TO ASPARAGUS - Dormant**

Helena Flumioxazin 4 SC may be applied to dormant asparagus for preemergence control of the weeds listed in Table 10, Weeds Controlled by Preemergence Application of Helena Flumioxazin 4 SC. Application to non-dormant asparagus will result in unacceptable crop injury. Apply a minimum of two weeks before spear emergence. Scoring may result if a minimum of 0.5 inch of either rainfall or irrigation has not occurred two weeks prior to emergence.

#### **TIMING TO ASPARAGUS – Post Harvest**

Apply Helena Flumioxazin 4 SC after the final harvest of the year, but prior to fern emergence, for preemergence control of the weeds listed in Table 10, Weeds Controlled by Preemergence Application of Helena Flumioxazin 4 SC. Application after fern emergence will result in unacceptable crop injury. Apply no less than two weeks prior to fern emergence and must be sprinkler or rainfall incorporated with 1/2 to 3/4 inches of water. Add a burndown tank mix partner for the control of emerged weeds labeled for asparagus in accordance with the most restrictive labeled limitations and precautions.

## **TIMING TO WEEDS**

### **Burndown – Dormant Asparagus, Postemergence to Weeds**

Helena Flumioxazin 4 SC may be used for residual weed control, as well as to assist in postemergence burndown of many annual and perennial weeds where asparagus is dormant. For control of emerged weeds, tank mix Helena Flumioxazin 4 SC with paraquat. Refer to paraquat label for rates and application parameters. To ensure thorough coverage, use a minimum of 15 gallons of spray solution per acre. Helena Flumioxazin 4 SC tank mixes applied to assist in the control of emerged weeds must be applied with a non-ionic surfactant at 0.25% v/v. A spray grade nitrogen source (either ammonium sulfate at 2 to 2.5 lb/A or 28 to 32% nitrogen solution at 1 to 2 qt/A) may be added to increase herbicidal activity.

### **Burndown – After Last Harvest of Season, Postemergence to Weeds**

Use Helena Flumioxazin 4 SC for residual weed control and to assist in postemergence burndown for many annual and perennial weeds where asparagus harvest has been completed for the year. For control of emerged weeds, use a labeled tank mix partner with activity on the emerged weeds.

### **Preemergence – Dormant Asparagus or After Last Harvest of the Year, Preemergence to Weeds**

Apply Helena Flumioxazin 4 SC for the preemergence control of weeds listed in Table 10, Weeds Controlled by Preemergence Application of Helena Flumioxazin 4 SC.

## **DIRECTIONS FOR USE ON BRASSICA HEAD AND STEM VEGETABLES CROP GROUP 5-16**

**Includes:** Broccoli; Brussels Sprouts; Cabbage; Cabbage, Chinese, napa; Cauliflower; cultivars, varieties, and/or hybrids of these.

## **FOR DISTRIBUTION AND USE ONLY WHERE THIRD PARTY INDEMNIFICATION IS IN EFFECT**

### **ROW MIDDLES**

#### **RESTRICTIONS AND LIMITATIONS**

- **DO NOT** apply after crops are transplanted.
- **DO NOT** apply more than 3 fl oz of Helena Flumioxazin 4 SC per acre per application. For Cabbage **DO NOT** apply more than 4 oz of Helena Flumioxazin 4 SC per acre per application.
- **DO NOT** make more than 2 applications of Helena Flumioxazin 4 SC per acre per year.
- **DO NOT** apply more than 6 fl oz of Helena Flumioxazin 4 SC per acre per year. For Cabbage do not apply more than 8 oz of Helena Flumioxazin 4 SC per acre per year.

#### **PRECAUTIONS**

- Helena Flumioxazin 4 SC can only be applied in row middles between raised plastic mulched beds that are at least 4 inches higher than the treated row middle and the mulched bed must have a minimum of a 24- inch bed width.
- Spray must remain between raised beds and contact no more than the bottom 1 inch of the side of the raised bed.
- All applications must be made with shielded or hooded equipment.
- Injury can occur if soil particles treated with Helena Flumioxazin 4 SC contact the crop.
- A rainfall after application but prior to transplanting is required.

## **RATE**

Up to 4 fl oz per acre per application.

## **TIMING TO CROP**

Helena Flumioxazin 4 SC may be applied at 3 fl oz per acre (except cabbage may be applied at 4 oz/A) as a shielded or hooded application to row middles after plastic is laid up to transplanting. Transplanting or seeding can take place any time after spray has dried. Spray must be directed to the row middle and contact no more than approximately the bottom 1 inch of the side of the raised bed. If the top of the mulch beds (where plants are to be transplanted) is contacted, severe injury can occur due to foliage contact with treated plastic.

## **WEED CONTROL AND TANK MIXING**

Helena Flumioxazin 4 SC provides preemergence residual control of the weeds listed in Table 7, Weeds Controlled by Residual Activity of Helena Flumioxazin 4 SC, as well as to assist in the postemergence control of emerged weeds. A registered preemergence grass herbicide may be added for control of additional grassy weeds. For control of emerged weeds, tank mix Helena Flumioxazin 4 SC with paraquat, Aim™, glyphosate, or other registered burndown herbicide. Refer to tank mix partner label for rates and application parameters.

## **DIRECTIONS FOR USE ON CACTUS (PRICKLY PEAR)**

### **RESTRICTIONS AND LIMITATIONS**

- **DO NOT** apply more than 12 fl oz of Helena Flumioxazin 4 SC per acre per application.
- **DO NOT** make more than 2 applications of Helena Flumioxazin 4 SC per acre per year at the 6 fl oz rate.
- **DO NOT** apply more than 12 fl oz of Helena Flumioxazin 4 SC per acre per year.
- Use a maximum Helena Flumioxazin 4 SC rate of 6 oz/A per application on any soil that has a sand plus gravel content over 80% if plants are less than 3 years of age. (Two applications of 6 oz/A in a 12 month period can still be made as long as there have been 60 days between applications).
- **DO NOT** apply to farm alleys or roads where traffic may result in treated dust settling onto crops or other desirable vegetation.
- Raise mower height during all mowing to reduce dust. Dust created by mowing can drift onto desirable vegetation resulting in injury.
- **DO NOT** mow treated areas. Dust created by mowing may drift onto desirable vegetation resulting in injury.
- Follow the most restrictive label limitations and precautions of the tank mix product(s) being used.
- Avoid direct or indirect spray contact to foliage.
- **DO NOT** apply within 60 days prior to harvest.
- **DO NOT** apply to plants established less than one year.

Apply Helena Flumioxazin 4 SC as a uniform broadcast application to the plantation floor or as a uniform band directed at the base of the cactus. The preferred application timing for Helena Flumioxazin 4 SC is

in the fall to maximize the potential for rainfall to activate and set the herbicide. **DO NOT** apply over the top of crop or allow spray to come in contact with crop as a result of application or drift.

### **Preemergence Application**

Apply 6 to 12 fl oz of Helena Flumioxazin 4 SC per broadcast acre as a preemergence application. Helena Flumioxazin 4 SC applications must be made prior to weed emergence for control of weeds listed in Table 10, Weeds Controlled by Preemergence Application of Helena Flumioxazin 4 SC . Make preemergence (to weed emergence) applications of Helena Flumioxazin 4 SC to a weed-free soil surface. Preemergence applications of Helena Flumioxazin 4 SC must be completed prior to weed emergence. Moisture is necessary to activate Helena Flumioxazin 4 SC on soil for residual weed control. Dry weather following application of Helena Flumioxazin 4 SC may reduce effectiveness. However, when adequate moisture is received after dry conditions, Helena Flumioxazin 4 SC will control susceptible germinating weeds.

### **[Postemergence Application**

Apply 6 to 12 fl oz of Helena Flumioxazin 4 SC per broadcast acre plus an adjuvant (0.25% v/v non-ionic surfactant or 1 qt/A crop oil concentrate). The addition of an adjuvant enhances Helena Flumioxazin 4 SC activity on emerged weeds. Thorough spray coverage is necessary to maximize the postemergence activity of Helena Flumioxazin 4 SC.

Refer to Table 13, Weeds Controlled by Postemergence Activity of Helena Flumioxazin 4 SC for weeds controlled by the residual activity of Helena Flumioxazin 4 SC. Tank mix Helena Flumioxazin 4 SC with a labeled burndown herbicide for control of the emerged weeds.

Residual weed control will be reduced if vegetation prevents the Helena Flumioxazin 4 SC from reaching the soil surface. If vegetation is heavy, use a burndown herbicide with Helena Flumioxazin 4 SC and make a sequential Helena Flumioxazin 4 SC application prior to the emergence of new weeds.]

### **Carrier Volume and Spray Pressure**

To ensure thorough coverage in burndown applications, use a minimum of 15 gallons of spray solution per acre. Use higher gallonage if dense vegetation or heavy crop residue is present.

Nozzle selection must meet manufacturer's gallonage and pressure guidelines.

### **Banded Application**

Rates listed in Table 13, Weeds Controlled by Postemergence Activity of Helena Flumioxazin 4 SC Tank Mixes, refer to a broadcast application covering the entire acre. Refer to the Band Application table in Use Information Section to calculate amount needed per acre when making a banded application. 33

## **DIRECTIONS FOR USE IN CELERY**

[For Use in] [California,] [Michigan and Wisconsin Only]

### **RESTRICTIONS AND LIMITATIONS**

- **DO NOT** apply more than 3 fl oz of Helena Flumioxazin 4 SC per acre during a pre-transplant application.
- **DO NOT** apply more than 3 fl oz of Helena Flumioxazin 4 SC per acre during a post-transplant application.

- **DO NOT** make more than 1 application of Helena Flumioxazin 4 SC per acre per year.
- **DO NOT** apply more than 3 fl oz of Helena Flumioxazin 4 SC per acre during per year.
- **DO NOT** use with an adjuvant.
- Post-transplant applications must be made between 3 to 7 days following transplanting.
- **DO NOT** apply as part of a tank mix.

**[PRECAUTIONS]**

- [In the state of California, use as pre-transplant application only.]

**TIMING TO CELERY**

Apply Helena Flumioxazin 4 SC at 3 fl oz/A prior to transplanting, or between 3 and 7 days following transplanting, for preemergence control of the weeds listed in Table 1, Broadleaf Weeds Controlled by Residual Activity of Helena Flumioxazin 4 SC.

**TIMING TO WEEDS**

Use Helena Flumioxazin 4 SC prior to weed emergence for residual control.

**Refer to Product Information section for tank mix guidance. Helena Flumioxazin 4 SC, when applied according to label use directions, will control the weeds listed in Table 1, Broadleaf Weeds Controlled by Residual Activity of Helena Flumioxazin 4 SC.**

**DIRECTIONS FOR USE IN ESTABLISHED CLOVER AND CLOVER GROWN FOR SEED**

For Use in Idaho, Oregon and Washington Only

**RESTRICTIONS AND LIMITATIONS**

- **DO NOT** apply more than 4 fl oz of Helena Flumioxazin 4 SC per acre per application.
- **DO NOT** make more than 1 application of Helena Flumioxazin 4 SC per acre per year.
- **DO NOT** apply more than 4 fl oz of Helena Flumioxazin 4 SC per acre per year.
- **DO NOT** apply within 25 days of harvest or grazing.
- Application to clover with greater than 6 inches of growth may result in unacceptable crop injury.

**PRECAUTIONS**

- Applications to clover with 6 inches of growth will result in burning of treated leaves and stems. Understand and accept this risk before using Helena Flumioxazin 4 SC on clover.
- Only apply with an adjuvant or tank mix with products formulated as an emulsifiable concentrate “EC” when targeting control of emerged weeds (expect and accept crop may be burned and/or stunting when applying tank mixes of Helena Flumioxazin 4 SC with an adjuvant).
- Application with paraquat can be used to burndown winter annuals prior to winter dormant period.
- Application to mixed clover grass stands may result in unacceptable injury to the grass.

**TIMING TO CLOVER**

Helena Flumioxazin 4 SC may be applied to established clover with a maximum amount of growth of 6 inches or less for the preemergence control of the weeds listed in Table 7, Weeds Controlled by Residual

Activity of Helena Flumioxazin 4 SC. Established Clover is defined as clover planted in the fall or spring which has gone through a first cutting/mowing.

For control of winter annual weeds: the best timing for preemergence control is in the fall immediately after the last cutting or sheepling-off has occurred.

For control of summer annual weeds: the best timing for preemergence control is in the spring prior to clover growth and before 6 inches of growth.

## **TIMING TO WEEDS**

### **Preemergence – Preemergence to Weeds**

Apply Helena Flumioxazin 4 SC before clover growth exceeds 6 inches in height for the preemergence control of weeds listed in Table 7, Weeds Controlled by Residual Activity of Helena Flumioxazin 4 SC. Make applications as soon as possible after cutting and removing clover to minimize injury to clover growth.

### **Postemergence Dodder Suppression**

Apply Helena Flumioxazin 4 SC at 4 oz per acre with an adjuvant for postemergence suppression of dodder. Tank mixes with Pursuit Herbicide or Raptor Herbicide will increase control.

## **DIRECTIONS FOR USE IN COTTON**

[For Use in Arizona, California and Hawaii Only]

## **RESTRICTIONS AND LIMITATIONS**

- **DO NOT** apply more than 2 fl oz of Helena Flumioxazin 4 SC per acre per application.
- **DO NOT** make more than 2 applications of Helena Flumioxazin 4 SC per acre per year.
- **DO NOT** apply more than 4 fl oz of Helena Flumioxazin 4 SC per acre per year.
- **DO NOT** make a sequential Helena Flumioxazin 4 SC1 application within 30 days of the first Helena Flumioxazin 4 SC application.
- **DO NOT** apply within 60 days of harvest.

## **ENVIRONMENTAL CONDITIONS AND BIOLOGICAL PERFORMANCE**

### **Hooded, Shielded and Layby Application**

For best results, apply Helena Flumioxazin 4 SC to actively growing weeds within the growth stages indicated in this label. Applying Helena Flumioxazin 4 SC under conditions that **DO NOT** promote active weed growth will reduce herbicide effectiveness. **DO NOT** apply Helena Flumioxazin 4 SC when the crop or weeds are under stress due to drought, excessive water, extremes in temperature, disease or low humidity. Weeds under stress tend to become less susceptible to herbicidal action. Helena Flumioxazin 4 SC is most effective when applied under sunny conditions at temperatures above 65qF.

Helena Flumioxazin 4 SC is rainfast one hour after application. **DO NOT** make applications if rain is expected within one hour of application or postemergence efficacy may be reduced.

## HERBICIDE RATE

### Hooded, Shielded and Layby Application

For postemergence weed control, apply Helena Flumioxazin 4 SC through a hooded or shielded sprayer or at layby, at 2 fl oz/A, in combinations with MSMA or at 1 to 2 oz/A in combination with glyphosate, to assist in the control of weeds listed in Table 4. Residual weed control can also be obtained through hooded, shielded and layby application of Helena Flumioxazin 4 SC. Weeds that are controlled through residual activity of Helena Flumioxazin 4 SC are listed in Table 1. Weeds that are suppressed by residual activity of Helena Flumioxazin 4 SC are listed in Table 2.

**Table 4. Emerged Broadleaf Weeds Controlled by Hooded, Shielded and Layby Application of Helena Flumioxazin 4 SC Tank Mixes With Glyphosate or MSMA in Cotton**

Broadleaf Weed Species		Weed Height (inches) 2 fl oz/A
Common Name	Scientific Name	
Bindweed, Field <sup>(1)</sup>	<i>Convolvulus arvensis</i>	4
Carpetweed	<i>Mollugo verticillata</i>	4
Chickweed, Common	<i>Stellaria media</i>	4
Cocklebur, Common	<i>Xanthium strumarium</i>	4
Florida Beggarweed	<i>Desmodium tortuosum</i>	2
Hemp Sesbania	<i>Sesbania exaltata</i>	6
Jimsonweed	<i>Datura stramonium</i>	4
Lambsquarters, Common	<i>Chenopodium album</i>	4
Morningglories		
Entireleaf	<i>Ipomoea hederacea</i> var. <i>integriuscula</i>	4
Ivyleaf	<i>Ipomoea hederacea</i>	4
Pitted	<i>Ipomoea lacunose</i>	4
Red	<i>Ipomoea coccinea</i>	4
Tall	<i>Ipomoea purpurea</i>	2
Mustard, Wild	<i>Brassica kaber</i>	6
Nightshades		
Black	<i>Solanum nigrum</i>	4
Eastern Black	<i>Solanum ptycanthum</i>	4
Hairy	<i>Solanum sarrachoides</i>	4
Pigweeds		
Palmer Amaranth	<i>Amaranthus palmeri</i>	4
Redroot	<i>Amaranthus retroflexus</i>	4
Smooth	<i>Amaranthus hybridus</i>	4
Plantain, Broadleaf	<i>Plantago major</i>	6
Prickly Sida (Teaweed)	<i>Sida spinosa</i>	4

(continued)

**Table 4. Emerged Broadleaf Weeds Controlled by Hooded, Shielded and Layby Application of Helena Flumioxazin 4 SC Tank Mixes With Glyphosate or MSMA in Cotton continued**

Broadleaf Weed Species		Weed Height (inches) 2 fl oz/A
Common Name	Scientific Name	
Purslane, Common	<i>Portulaca oleracea</i>	2
Ragweeds		
Common	<i>Ambrosia artemisiifolia</i>	2
Giant	<i>Ambrosia trifida</i>	4
Rice Flatsedge	<i>Cyperus iria</i>	2
Sicklepod	<i>Senna obtusifolia</i>	4
Smartweeds		
Ladysthumb	<i>Polygonum persicaria</i>	4
Pale	<i>Polygonum lapathifolium</i>	4
Pennsylvania	<i>Polygonum pennsylvanicum</i>	4
Spotted Spurge	<i>Euphorbia maculata</i>	4
Velvetleaf	<i>Abutilon theophrasti</i>	4
Venice Mallow	<i>Hibiscus trionum</i>	2
Waterhemp		
Common	<i>Amaranthus rudis</i>	2
Tall	<i>Amaranthus tuberculatus</i>	2

<sup>(1)</sup> Helena Flumioxazin 4 SC tank mixes will control the above ground portion of field bindweed.

Repeated applications will be needed to control regrowth.

#### **CARRIER VOLUME AND SPRAY PRESSURE**

##### **Hooded, Shielded and Layby Application**

To ensure thorough coverage in hooded, shielded and layby applications, use 15 to 30 gallons spray solution per treated acre. Use 20 to 30 gallons per treated acre under heavy weed pressure. Nozzle selection must meet manufacturer’s gallonage and pressure guidance for application method being used. **DO NOT** use “Flood Jet” nozzles, as they tend to increase the chance of crop injury.

#### **ADDITIVES**

##### **Hooded, Shielded and Layby Application**

Weed control from hooded, shielded or layby application of Helena Flumioxazin 4 SC in cotton requires the addition of an agronomically approved non-ionic surfactant to the spray mixture. Non-ionic surfactant must contain at least 80% active ingredient. Verify mixing compatibility qualities by a jar test.

**The use of crop oil concentrates, methylated seed oils, organo-silicant surfactants or products containing these ingredients, may result in severe crop injury.**

#### **APPLICATION EQUIPMENT**

Apply Helena Flumioxazin 4 SC tank mixes, with ground equipment using standard commercial sprayers equipped with nozzles designed to deliver the desired spray pressure and spray volume. Application equipment must be clean and in good repair. Nozzles must meet manufacturer’s guidelines for spray pattern and placement on spray boom and must be checked frequently for accuracy.



## TIMING TO COTTON

### Hooded and Shielded Application

Helena Flumioxazin 4 SC1 tank mixes may be applied with a hooded or shielded sprayer after cotton has reached a minimum of 6 inches in height. All nozzles must be under the hood or behind the shield to ensure no spray solution comes in contact with the cotton. Care must be taken to ensure the spray solution or drift does not come in contact with the cotton or severe crop injury can occur.

### Layby Application

Layby application of Helena Flumioxazin 4 SC tank mixes may be made once cotton has reached a minimum of 16 inches in height. Cotton that is smaller than 16 inches in height may be injured by Helena Flumioxazin 4 SC applications. Helena Flumioxazin 4 SC application must be directed to the lower 2 inches of the cotton stem to avoid crop injury.

## TIMING TO WEEDS

Helena Flumioxazin 4 SC tank mix applications must be made to weeds within the height range given in Table 4.

## TANK MIXES

Helena Flumioxazin 4 SC must be tank mixed with one of the herbicides listed in Table 5 for postemergence control of the weeds listed in Table 4.

**Table 5. Tank Mixes with Helena Flumioxazin 4 SC for Hooded, Shielded and/or Layby Use in Cotton**

Tank Mix Partner	Target Weeds	Hooded and Shielded	Layby
Glyphosate	Perennial Grasses and Broadleaves	X	X <sup>(1)</sup>
MSMA	Annual Grasses Yellow Nutsedge	X	X

<sup>(1)</sup> For use only in cotton with the Roundup Ready gene.

## DIRECTIONS FOR USE IN CUCURBIT VEGETABLES

**Cucurbit Vegetables (Crop Group 9) including:** chayote (fruit); Chinese Waxgourd (Chinese preserving melon); citron melon; cucumber; gherkin; gourd, edible (includes hyotan, cucuzza, hechima, Chinese okra); Momordica spp. (includes balsam apple, balsam pear, bittermelon, Chinese cucumber); muskmelon (includes cantaloupe); pumpkin; squash, summer; squash, winter (includes butternut squash, calabaza, hubbard squash, acorn squash, spaghetti squash); watermelon

## FOR DISTRIBUTION AND USE ONLY WHERE THIRD PARTY INDEMNIFICATION IS IN EFFECT ROW MIDDLES

Many weather related factors, including high wind or heavy rains or cool conditions at or near crop transplanting, may result in crop injury in fields treated with Helena Flumioxazin 4 SC. On occasion this has resulted in a delay in maturity. Understand and accept these risks before using Helena Flumioxazin 4 SC.

Refer to Product Information section for tank mix guidance. Helena Flumioxazin 4 SC, when applied according to label use directions, will control the weeds listed in Table 7, Weeds Controlled by Residual Activity of Helena Flumioxazin 4 SC.

#### **RESTRICTIONS AND LIMITATIONS**

- **DO NOT** apply more than 4 fl oz of Helena Flumioxazin 4 SC per acre per application.
- **DO NOT** make more than 2 applications of Helena Flumioxazin 4 SC per acre per year.
- **DO NOT** apply more than 8 fl oz of Helena Flumioxazin 4 SC per acre per year.
- **DO NOT** use with an adjuvant.
- Grow plants on raised plastic mulched beds that are higher than the treated row middle.
- Spray must be directed to the row middle, away from the crop bed and with minimal contact with plastic, including the sides of the bed. If top of mulch beds (where plants are to be transplanted) is contacted, severe injury can occur due to foliage contact with treated plastic. In this scenario, a rainfall event of 1/2 inch (natural or irrigation) must occur prior to transplanting to reduce Helena Flumioxazin 4 SC residues.
- Drift of treated soil particles onto plants may cause contact injury.
- Irrigate treated field after application and prior to transplanting with minimum of 1/4 inch of water if rainfall does not occur between application and transplanting.
- All applications must be made with hooded or shielded equipment.

#### **TIMING TO CUCURBIT VEGETABLES**

Apply Helena Flumioxazin 4 SC at 4 fl oz per acre as a hooded or shielded application to row middles up to 14 days prior to transplanting or seeding for preemergence control of the weeds listed in Table 7, Weeds Controlled by Residual Activity of Helena Flumioxazin 4 SC, as well as to assist in the postemergence control of emerged weeds. A second application of Helena Flumioxazin 4 SC at 4 fl oz per acre may be applied up to 21 days after transplanting or emergence if needed. **DO NOT** apply during or after bloom.

#### **TIMING TO WEEDS**

Helena Flumioxazin 4 SC may be used for residual weed control, as well as to assist in postemergence burndown of many annual and perennial weeds in row middles. A registered preemergence grass herbicide may be added for control of additional grassy weeds. For assisting in the control of emerged weeds, tank mix Helena Flumioxazin 4 SC with paraquat, Aim™ or other registered burndown herbicide. **DO NOT** tank mix with glyphosate after transplanting. Refer to tank mix partner's label for rates and use directions.

#### **DIRECTIONS FOR USE IN DRY BEANS**

Dried cultivars of bean (*Lupinus*); bean (*Phaseolus*) (includes field bean, kidney bean, lima bean (dry), navy bean, pinto bean, tepary bean); bean (*Vigna*) (includes adzuki bean, blackeyed pea, catjang, cowpea, crowder pea, moth bean, mung bean, rice bean, southern pea, urd bean); broad bean (dry); chickpea (garbanzo bean); guar; lablab bean and lentil

**WEED SUPPRESSION IN DRY BEANS AND WEED CONTROL IN CHICKPEAS (GARBANZO BEANS) [Arizona, California, Colorado, Hawaii, Idaho, Montana, Nebraska, Oregon and Washington only]**

## RESTRICTIONS AND LIMITATIONS

- For Chickpeas, **DO NOT** apply more than 2 fl oz of Helena Flumioxazin 4 SC per acre per application. For all other Dry Beans, **DO NOT** apply more than 1.5 fl oz of Helena Flumioxazin 4 SC per acre per application.
- **DO NOT** make more than 1 application of Helena Flumioxazin 4 SC per acre per year.
- For Chickpeas, **DO NOT** apply more than 2 fl oz of Helena Flumioxazin 4 SC per acre per year. For all other Dry Beans, **DO NOT** apply more than 1.5 fl oz of Helena Flumioxazin 4 SC per acre per year.

**Many weather related factors, including high wind, splashing or heavy rains or cool conditions at or near crop emergence, may result in dry bean injury in fields treated with Helena Flumioxazin 4 SC. On occasion this has resulted in a delay in maturity. Understand and accept these risks before using Helena Flumioxazin 4 SC.**

## TIMING TO DRY BEANS AND CHICKPEAS

Helena Flumioxazin 4 SC may be applied to dry beans within 2 days after planting for the preemergence suppression of the weeds listed in Table 1, Broadleaf Weeds Controlled by Residual Activity of Helena Flumioxazin 4 SC or Table 8, Weeds Suppressed by Residual Activity of Helena Flumioxazin 4 SC. Tank mix Helena Flumioxazin 4 SC with other labeled herbicides for broad spectrum weed control.

## TIMING TO WEEDS

Helena Flumioxazin 4 SC may be applied to dry beans prior to planting or preemergence (after planting). Preemergence application of Helena Flumioxazin 4 SC must be made within 2 days after planting and prior to dry bean emergence. To avoid severe crop injury, **DO NOT** apply to dry beans after beans begin to crack or have emerged. Preplant incorporation (PPI) applications may result in reduced weed control.

## ADDITIONAL RESIDUAL GRASS CONTROL

Helena Flumioxazin 4 SC can be tank mixed with pendimethalin for additional grass control.

## HARVEST AID

[All states]

### RESTRICTIONS AND LIMITATIONS

- **DO NOT** apply more than 3 fl oz of Helena Flumioxazin 4 SC per acre per application.
- **DO NOT** make more than 1 application of Helena Flumioxazin 4 SC per acre per year.
- **DO NOT** apply more than 3 fl oz of Helena Flumioxazin 4 SC per acre per year.
- **DO NOT** harvest within 5 days of application.

Desiccation from Helena Flumioxazin 4 SC requires the addition of an agronomically approved adjuvant to the spray mixture. Use a methylated seed oil which contains at least 15% emulsifiers and 80% oil at 2% v/v. A spray grade nitrogen source (either ammonium sulfate at 2 to 2.5 lb/A or a 28 to 32% nitrogen solution at 1 to 2 qt/A) may be added to the spray mixture along with either a crop oil concentrate or methylated seed oil to enhance desiccation. The addition of a nitrogen source does not replace the need for a crop oil concentrate or a methylated seed oil. Tank mixing Helena Flumioxazin 4 SC with glyphosate or paraquat will increase control of emerged weeds and aid in harvest. Add a burndown tank mix partner for the control of emerged weeds labeled for dry bean in accordance with the most restrictive labeled limitations and precautions.

### **TIMING TO DRY BEANS AND CHICKPEAS**

Apply when crop is mature and at least 80% of the pods are yellowing and mostly ripe with no more than 40% (bush type beans) or 30% (vine type beans) of the leaves still green in color. Dry beans can be harvested 5 days after application. To ensure thorough coverage use 15 to 30 gallons spray solution per acre. Nozzle selection must meet manufacturer's gallonage and pressure guidelines for postemergence application.

### **DIRECTIONS FOR USE IN FIELD CORN**

[For Use in Arizona, California and Hawaii Only]

#### **RESTRICTIONS AND LIMITATIONS**

- Use only on no-till or minimum tillage fields where last years crop residue has not been incorporated into the soil.
- Corn must be planted between 14 and 30 days after application unless the application is made as part of a Fall burndown program.
- Corn can be planted 7 days after an application of 2 fl oz/A if a minimum of 25% of the soil surface is covered with the residue of the preceding crop and a minimum of 1/4 inch of rainfall has occurred between application and planting.
- **DO NOT** apply more than 3 fl oz of Helena Flumioxazin 4 SC per acre per application.
- **DO NOT** make more than 1 application of Helena Flumioxazin 4 SC per acre per year.
- **DO NOT** apply more than 3 fl oz of Helena Flumioxazin 4 SC per acre per year.
- **DO NOT** irrigate between emergence and 2-leaf corn.
- **DO NOT** use on popcorn, sweet corn or corn grown for seed.

#### **TIMING TO FIELD CORN**

- Apply Helena Flumioxazin 4 SC , at 2 to 3 fl oz/A, between 7 and 30 days prior to planting field corn for the preemergence control of the weeds listed in Table 1, Broadleaf Weeds Controlled by Residual Activity of Helena Flumioxazin 4 SC .
- Apply Helena Flumioxazin 4 SC at 2 fl oz/A between 7 and 30 days prior to planting field corn if a minimum of 25% of the soil surface is covered with the residue of the preceding crop and a minimum of 1/4 inch of rainfall has occurred between application and planting.
- Apply Helena Flumioxazin 4 SC at 3 fl oz/A between 14 and 30 days prior to planting field corn.

#### **Burndown Use Directions – For Preplant Applications in Field Corn**

Helena Flumioxazin 4 SC, applied as part of a burndown program, may be used for residual weed control, as well as to assist in postemergence burndown of many weeds where field corn will be planted directly into the residue of the previous year. See Directions for Use in Fall and Spring Preplant Burndown and Fallow Seedbed Programs in Field Corn, Peanut and Soybean for rates and timing of applications. For control of emerged weeds, Helena Flumioxazin 4 SC must be applied with an appropriate burndown tank mix partner listed in Table 6. To ensure thorough coverage, use a minimum of 15 gallons of spray solution per acre. Refer to tank mix partner's label for application pressures and adjuvant systems.

### INCREASING SPEED OF GLYPHOSATE BURNDOWN ACTIVITY

Helena Flumioxazin 4 SC , at 1 fl oz/A, may be tank mixed with glyphosate (Roundup® ) to increase the speed of burndown activity compared to glyphosate applied alone. Residual weed control will not be provided at rates lower than 2 fl oz/A; however, suppression of the weeds in Table 2 may occur at Helena Flumioxazin 4 SC rates as low as 1 fl oz/A. Applications of Helena Flumioxazin 4 SC at 1 fl oz/A must be made a minimum of 14 days prior to planting field corn.

### TANK MIXES

Helena Flumioxazin 4 SC may be tank mixed with the herbicides listed in Table 6 for pre-plant burndown applications.

Refer to tank mix partner's label for adjuvants.

**Table 6. Tank Mix Partners for Burndown and/or Residual Control of Weeds in Field Corn**

TANK MIX PARTNERS <sup>1</sup>	
2,4-D LVE	metribuzin
atrazine	paraquat
Basis®	Python®
Dicamba	Resolve®
Express®	simazine
glyphosate	Weedmaster®
Hornet®	

<sup>1</sup> Refer to tank mix product labels for specific application directions.

### TANK MIX RESTRICTIONS

Tank mixes with flufenacet (Axiom or Domain), metolachlor or s-metolachlor (Dual Magnum or Dual II Magnum), dimethenamid or dimethenamid-p (Frontier or Outlook), or acetochlor (Surpass or Harness) may result in injury to field corn when application is followed by prolonged periods of cool wet weather.

## DIRECTIONS FOR USE IN FIELD PEAS

### WEED CONTROL

[For Use in Idaho, Montana, Oregon and Washington only.]

### RESTRICTIONS AND LIMITATIONS

- **DO NOT** apply more than 2 fl oz of Helena Flumioxazin 4 SC per acre per application.
- **DO NOT** make more than 1 application of Helena Flumioxazin 4 SC per acre per year.
- **DO NOT** apply more than 2 fl oz of Helena Flumioxazin 4 SC per acre per year.

**Many weather related factors, including high wind, splashing or heavy rains or cool conditions at or near crop emergence, may result in peas injury in fields treated with Helena Flumioxazin 4 SC. On occasion this has resulted in a delay in maturity. Understand and accept these risks before using Helena Flumioxazin 4 SC.**

### **TIMING TO FIELD PEAS**

Helena Flumioxazin 4 SC may be applied to field peas within 2 days after planting for the preemergence control of the weeds listed in Table 1, Broadleaf Weeds Controlled by Residual Activity of Helena Flumioxazin 4 SC or Table 8, Weeds Suppressed by Residual Activity of Helena Flumioxazin 4 SC. Tank mix Helena Flumioxazin 4 SC with other labeled herbicides for broad spectrum weed control.

### **TIMING TO WEEDS**

Helena Flumioxazin 4 SC may be applied to field peas prior to planting or preemergence (after planting). Preemergence application of Helena Flumioxazin 4 SC must be made within 2 days after planting and prior to field pea emergence. To avoid severe crop injury, **DO NOT** apply to field peas after peas begin to crack or have emerged.

Preplant incorporation (PPI) applications may result in reduced weed control.

### **ADDITIONAL RESIDUAL GRASS CONTROL**

Helena Flumioxazin 4 SC can be tank mixed with pendimethalin for additional grass control.

### **HARVEST AID**

[All states]

#### **RESTRICTIONS AND LIMITATIONS**

- **DO NOT** apply more than 3 fl oz of Helena Flumioxazin 4 SC per acre per application.
- **DO NOT** make more than 1 application of Helena Flumioxazin 4 SC per acre per year.
- **DO NOT** apply more than 3 fl oz of Helena Flumioxazin 4 SC per acre per year.
- **DO NOT** harvest within 5 days of application.

Desiccation from Helena Flumioxazin 4 SC requires the addition of an agronomically approved adjuvant to the spray mixture. Use a methylated seed oil which contains at least 15% emulsifiers and 80% oil at 1 qt/A. A spray grade nitrogen source (either ammonium sulfate at 2 to 2.5 lb/A or a 28 to 32% nitrogen solution at 1 to 2 qt/A) may be added to the spray mixture along with methylated seed oil to enhance desiccation. The addition of a nitrogen source does not replace the need for methylated seed oil. Tank mixing Helena Flumioxazin 4 SC with glyphosate will increase control of emerged weeds and aid in harvest.

### **TIMING TO FIELD PEAS**

Apply Helena Flumioxazin 4 SC, at 1.5 to 2 fl oz/A, when crop is physiologically mature and a minimum of 80% of the pods are yellow to tan in color and 20% are yellow in color. If field peas are treated too early, a reduction in seed quality may occur. **DO NOT** spray Helena Flumioxazin 4 SC on any area of the field with a significant amount of plants with green color. Peas can be harvested 5 days after application. To ensure thorough coverage, use 15 to 30 gallons of spray solution per acre and select nozzle type using manufacturer's gallonage and pressure guidelines for postemergence application.

## DIRECTIONS FOR USE IN FLAX

### HARVEST AID

#### RESTRICTIONS AND LIMITATIONS

- **DO NOT** apply more than 3 fl oz of Helena Flumioxazin 4 SC per acre per application.
- **DO NOT** make more than 2 applications of Helena Flumioxazin 4 SC per acre per year at the 1.5 fl oz rate.
- **DO NOT** apply more than 3 fl oz of Helena Flumioxazin 4 SC per acre per year.
- **DO NOT** harvest within 5 days of application.

Desiccation from Helena Flumioxazin 4 SC requires the addition of an agronomically approved adjuvant to the spray mixture. Use a methylated seed oil which contains at least 15% emulsifiers and 80% oil at 1 qt/A. A spray grade nitrogen source (either ammonium sulfate at 2 to 2.5 lb/A or a 28 to 32% nitrogen solution at 1 to 2 qt/A) may be added to the spray mixture along with methylated seed oil to enhance desiccation. The addition of a nitrogen source does not replace the need for methylated seed oil.

### TIMING TO FLAX

Apply Helena Flumioxazin 4 SC, at 1.5 to 2 fl oz/A, when crop is physiologically mature and at least 75% of the bolls are brown in color. Flax can be harvested 5 days after application. To ensure thorough coverage, use 15 to 30 gallons of spray solution per acre and select nozzle type using manufacturer's gallonage and pressure guidelines for postemergence application.

## DIRECTIONS FOR USE IN FRUITING VEGETABLES

African eggplant; Bush Tomato; Bell Pepper; Cocona; Currant Tomato; Eggplant, Garden Huckleberry; Goji Berry; Groundcherry, Martynia; Naranjilla; Okra, Pea Eggplant; Pepino; Nonbell Pepper; Roselle; Scarlet Eggplant; Sunberry; Tomatillo; Tomato; Tree Tomato; cultivars, varieties and /or hybrids of these.

### FOR DISTRIBUTION AND USE ONLY WHERE THIRD PARTY INDEMNIFICATION IS IN EFFECT ROW MIDDLES

Many weather related factors, including high wind or heavy rains or cool conditions at or near crop transplanting, may result in crop injury in fields treated with Helena Flumioxazin 4 SC. On occasion this has resulted in a delay in maturity. Understand and accept these risks before using Helena Flumioxazin 4 SC.

#### RESTRICTIONS AND LIMITATIONS

- **DO NOT** apply more than 4 fl oz of Helena Flumioxazin 4 SC per acre per application.
- **DO NOT** make more than 2 applications of Helena Flumioxazin 4 SC per acre per year.
- **DO NOT** apply more than 8 fl oz of Helena Flumioxazin 4 SC per acre per year.
- Grow plants on raised or plastic mulched beds that are higher than the treated row middle.
- Spray must be directed to the row middle, away from the crop bed and with minimal contact with plastic, including the sides of the bed. If top of mulch beds (where plants are to be transplanted) is contacted, severe injury can occur due to foliage contact with treated plastic. In this scenario, a rainfall event of 1/2 inch (natural or irrigation) must occur prior to transplanting to reduce Helena Flumioxazin 4 SC residues.

- Drift of treated soil particles onto plants may cause contact injury.
- Irrigate treated field after application and prior to transplanting with minimum of 1/4 inch of water if rainfall does not occur between application and transplanting.
- All applications must be made with hooded or shielded equipment.

#### **TIMING TO FRUITING VEGETABLES**

Apply Helena Flumioxazin 4 SC at 4 fl oz per acre as a hooded or shielded application to row middles up to 14 days prior to transplanting or seeding for preemergence control of the weeds listed in Table 7, Weeds Controlled by Residual Activity of Helena Flumioxazin 4 SC, as well as to assist in the postemergence control of emerged weeds. A second application of Helena Flumioxazin 4 SC at 4 fl oz per acre may be applied up to 21 days after transplanting or emergence if needed. **DO NOT** apply during or after bloom.

#### **TIMING TO WEEDS**

Helena Flumioxazin 4 SC may be used for residual weed control, as well as to assist in postemergence burndown of many annual and perennial weeds in row middles. A registered preemergence grass herbicide may be added for control of additional grassy weeds. For assisting in the control of emerged weeds, tank mix Helena Flumioxazin 4 SC with paraquat, Aim™ or other registered burndown herbicide. **DO NOT** tank mix with glyphosate after transplanting or crop emergence. Refer to tank mix partner's label for rates and application parameters.

### **DIRECTIONS FOR USE IN GARLIC**

#### **RESTRICTIONS AND LIMITATIONS**

- **DO NOT** apply more than 6 fl oz of Helena Flumioxazin 4 SC per acre per application.
- **DO NOT** make more than 1 application of Helena Flumioxazin 4 SC per acre per year.
- **DO NOT** apply more than 6 fl oz of Helena Flumioxazin 4 SC per acre per year.

#### **TIMING TO GARLIC**

Helena Flumioxazin 4 SC may be applied, at 6 fl oz/A, to garlic prior to garlic emergence. Make application within 3 days after planting garlic.

#### **TIMING TO WEEDS**

##### **Preemergence – Preemergence To Weeds**

Apply Helena Flumioxazin 4 SC to weed free garlic for preemergence control of the weeds listed in Table 10, Weeds Controlled by Preemergence Application of Helena Flumioxazin 4 SC.

### **DIRECTIONS FOR USE IN HOPS**

[Not For Use in California and New York]

#### **RESTRICTIONS AND LIMITATIONS**

- **DO NOT** apply more than 6 fl oz of Helena Flumioxazin 4 SC per acre per application.
- **DO NOT** make more than 1 application of Helena Flumioxazin 4 SC per acre per year.
- **DO NOT** apply more than 6 fl oz of Helena Flumioxazin 4 SC per acre per year.



- **DO NOT** allow spray to contact green stem (unless used for sucker control), foliage, flowers or cones or unacceptable injury may occur.
- **DO NOT** apply within 30 days of harvest.
- **DO NOT** use with an adjuvant.
- Helena Flumioxazin 4 SC can be used in hops for preemergence weed control as well as sucker control.

#### **TIMING TO HOPS FOR SUCKER CONTROL**

Apply Helena Flumioxazin 4 SC at 6 fl oz/A as a directed application after hops have reached a minimum of 6 feet in height for sucker control. Direct application to the lower 2 feet of the hops.

#### **TIMING TO HOPS FOR PREEMERGENCE WEED CONTROL**

Apply Helena Flumioxazin 4 SC at 6 fl oz/A as a 1 to 1.5 foot band to each side of the hop row, to dormant hops November thru February to ensure time for rain incorporation and activation. If weeds are emerged at the time of application, tank mix Helena Flumioxazin 4 SC with a labeled burndown herbicide including paraquat or glyphosate to assist with control of emerged weeds. **DO NOT** mow or rake over treated areas, as dust created by mowing may drift onto sensitive crops or vegetation resulting in injury.

#### **TIMING TO WEEDS**

Helena Flumioxazin 4 SC applications must be made prior to weed emergence for control of weeds listed in Table 10, Weeds Controlled by Preemergence Application of Helena Flumioxazin 4 SC . Refer to Product Information section for tank mix guidance. Helena Flumioxazin 4 SC , when applied according to label use directions, will control the weeds listed in Table 10, Weeds Controlled by Preemergence Application of Helena Flumioxazin 4 SC .

### **DIRECTIONS FOR USE IN LENTILS**

#### **HARVEST AID**

##### **RESTRICTIONS AND LIMITATIONS**

- **DO NOT** apply more than 3 fl oz of Helena Flumioxazin 4 SC per acre per application.
- **DO NOT** make more than 1 application of Helena Flumioxazin 4 SC per acre per year.
- **DO NOT** apply more than 3 fl oz of Helena Flumioxazin 4 SC per acre per year.
- **DO NOT** harvest within 5 days of application.

Desiccation from Helena Flumioxazin 4 SC requires the addition of an agronomically approved adjuvant to the spray mixture. Use a methylated seed oil which contains at least 15% emulsifiers and 80% oil at 1 qt/A. A spray grade nitrogen source (either ammonium sulfate at 2 to 2.5 lb/A or a 28 to 32% nitrogen solution at 1 to 2 qt/A) may be added to the spray mixture along with methylated seed oil to enhance desiccation. The addition of a nitrogen source does not replace the need for methylated seed oil. Tank mixing Helena Flumioxazin 4 SC with glyphosate or paraquat will increase control of emerged weeds and aid in harvest.

### **TIMING TO LENTILS**

Apply Helena Flumioxazin 4 SC, at 1.5 to 2 fl oz/A, when crop is physiologically mature and a minimum of 80% of the pods are yellow to tan in color and 20% are yellow in color. If lentils are treated too early, a reduction in seed quality may occur. **DO NOT** spray Helena Flumioxazin 4 SC on any area of the field with a significant amount of plants with green color. Lentils can be harvested 5 days after application. To ensure thorough coverage, use 15 to 30 gallons of spray solution per acre and select nozzle type using manufacturer's gallonage and pressure guidelines for postemergence application.

### **DIRECTIONS FOR USE IN MINT** (Peppermint and Spearmint)

#### **RESTRICTIONS AND LIMITATIONS**

- **DO NOT** apply more than 4 fl oz of Helena Flumioxazin 4 SC per acre per application.
- **DO NOT** make more than 2 applications of Helena Flumioxazin 4 SC per acre per year.
- **DO NOT** apply more than 8 fl oz of Helena Flumioxazin 4 SC per acre per year.
- **DO NOT** make a sequential Helena Flumioxazin 4 SC application within 60 days of the first Helena Flumioxazin 4 SC application.
- Apply only to dormant mint. Application to non-dormant mint may result in unacceptable crop injury.
- **DO NOT** apply within 80 days of harvest.

#### **PRECAUTIONS**

To avoid crop injury:

- Application to stands established longer than 3 years may result in crop injury.
- Applications to stands with weak, thin, or damaged roots or rhizomes may result in crop injury.
- Application to mint in Southern Union County (south of Ladd Canyon) or Baker County in Oregon may result in unacceptable crop injury.
- Use only on established meadow mint.
- Applications to mint that has been weakened by diseases, insects (example mint root borer), nematodes, drought, soil salts, high soil pH, previous pesticides, winter injury or double cutting, may result in severe injury. Apply only to healthy vigorous mint with undamaged rhizomes. Many weather related factors, including high wind, splashing or heavy rains or cool conditions at or near mint emergence, may result in mint injury in fields treated with Helena Flumioxazin 4 SC. Understand and accept these risks before using Helena Flumioxazin 4 SC.

Tank mixes with labeled rates of paraquat are recommended to control emerged weeds and increase crop safety.

#### **TIMING TO MINT**

As a spray, Helena Flumioxazin 4 SC may be applied only to established, dormant mint for preemergence control of the weeds listed in Table 7 as well as to assist in the postemergence control of emerged weeds. Application to non-dormant mint or to baby (row) mint (time from planting of mint roots through the first cutting), may result in unacceptable crop injury. As a bulk fertilizer application, Helena Flumioxazin 4 SC may be applied at least 80 days prior to harvest. Leaves must be dry at the time of applications or severe injury may occur.

## **TIMING TO WEEDS**

### **Burndown – Dormant Mint, Postemergence To Weeds**

Helena Flumioxazin 4 SC may be used for residual weed control, as well as to assist in postemergence burndown of many annual and perennial weeds where established mint is dormant. For control of emerged weeds, tank mix Helena Flumioxazin 4 SC with paraquat. Refer to paraquat label for rates and use directions. To ensure thorough coverage, use a minimum of 15 gallons of spray solution per acre. Helena Flumioxazin 4 SC tank mixes applied to assist in the control of emerged weeds must be applied with a non-ionic surfactant at 0.25% v/v. A spray grade nitrogen source (either ammonium sulfate at 2 to 2.5 lb/A or 28 to 32% nitrogen solution at 1 to 2 qt/A) may be added to increase herbicidal activity.

### **Preemergence – Dormant Mint, Preemergence To Weeds**

Apply Helena Flumioxazin 4 SC to dormant mint for the preemergence control of weeds listed in Table 7. Fall applications of Helena Flumioxazin 4 SC, followed by a sequential application in the Spring, have resulted in better Summer annual weed control than a single Fall or single Spring application.

Fall application is most effective for Fall germinating weeds for example groundsel. Fields plowed or harrowed after a Helena Flumioxazin 4 SC application will result in less effective preemergence activity. In furrow irrigated fields, corrugating that is done after a Helena Flumioxazin 4 SC application will expose untreated soil and break the herbicide barrier resulting in poor weed control.

**Table 7. Weeds Controlled by Residual Activity of Helena Flumioxazin 4 SC**

<b>Broadleaf Weed Species</b>				
<b>Common Name</b>	<b>Scientific Name</b>	<b>Organic Matter</b>	<b>Soil Type</b>	<b>Application Rate</b>
Bristly Starbur	<i>Acanthospermum hispidum</i>	Up to 5%	All Soil Types	4 fl oz/A
Carpetweed	<i>Mollugo verticillata</i>			
Chickweeds				
Common	<i>Stellaria media</i>			
Mouseear	<i>Cerastium vulgatum</i>			
Coffee Senna	<i>Cassia occidentalis</i>			
Copperleaf, Hophornbeam	<i>Acalypha ostryifolia</i>			
Dandelion	<i>Taraxacum officinale</i>			
Dodder (suppression only)[*] <sup>(1)</sup>	<i>Cuscuta spp.</i>			
Eclipta	<i>Eclipta prostrate</i>			
Evening Primrose, Cutleaf	<i>Oenothera laciniata</i>			
False Chamomile[*]	<i>Tripleurospermum maritima</i>			
Fiddleneck, Coast[*]	<i>Amsinckia menziesii</i>			
Field Pennycress[*]	<i>Thlaspi arvense</i>			
Fleabane, Hairy[*]	<i>Conyza bonariensis</i>			
Flixweed[*]	<i>Descurainia spophia</i>			
Florida Beggarweed	<i>Desmodium tortuosum</i>			
Florida Pusley	<i>Richardia scabra</i>			
Golden Crownbeard	<i>Verbesina encelioides</i>			
Groundsel, Common	<i>Senecio vulgaris</i>			
Hairy Indigo	<i>Indigofera hirsuta</i>			
Hemp Sesbania	<i>Sesbania exaltata</i>			
Henbit	<i>Lamium amplexicaule</i>			
Jimsonweed	<i>Datura stramonium</i>			
Kochia	<i>Kochia scoparia</i>			
Lambsquarters, Common	<i>Chenopodium album</i>			
Little Mallow	<i>Malva parviflora</i>			
London Rocket[*]	<i>Sisymbrium irio</i>			
Marestail/Horseweed	<i>Conyza canadensis</i>			
Mayweed/ False Chamomile[*]	<i>Matricaria maritima</i>			

[\*Not for use in California.]

continued

<sup>(1)</sup> Helena Flumioxazin 4 SC at 4 fl oz/A will provide postemergence dodder suppression when applied in combination with Pursuit Herbicide or Raptor Herbicide at labeled rates. Pursuit Herbicide and Raptor Herbicide require the use of NIS, which will result in burn and stunting of alfalfa. Understand and accept these risks before tank mixing with Helena Flumioxazin 4 SC.

**Table 7. Weeds Controlled by Residual Activity of Helena Flumioxazin 4 SC (continued)**

Broadleaf Weed Species				
Common Name	Scientific Name	Organic Matter	Soil Type	Application Rate
Morningglories		Up to 5%	All Soil Types	4 fl oz/A
Entireleaf	<i>Ipomoea hederacea</i> var. <i>integriuscula</i>			
Ivyleaf	<i>Ipomoea hederacea</i>			
Red/Scarlet	<i>Ipomoea coccinea</i>			
Smallflower	<i>Jacquemontia tamnifolia</i>			
Tall	<i>Ipomoea purpurea</i>			
Mustard				
Tansy[*]	<i>Descurainia pinnata</i>			
Tumble[*]	<i>Sisymbrium altissimum</i>			
Wild	<i>Brassica kaber</i>			
Nettle, Burning[*]	<i>Urtica urens</i>			
Nightshades				
Black	<i>Solanum nigrum</i>			
Eastern Black	<i>Solanum ptycanthum</i>			
Hairy	<i>Solanum sarrachoides</i>			
Pigweeds				
Palmer Amaranth	<i>Amaranthus palmeri</i>			
Redroot	<i>Amaranthus retroflexus</i>			
Smooth	<i>Amaranthus hybridus</i>			
Spiny Amaranth	<i>Amaranthus spinosus</i>			
Tumble	<i>Amaranthus albus</i>			
Prickly Lettuce (China Lettuce)	<i>Lactuca serriola</i>			
Prickly Sida (Teaweed)	<i>Sida spinosa</i>			
Puncturevine	<i>Tribulus terrestris</i>			
Purslane				
Common	<i>Portulaca oleracea</i>			
Horse[*]	<i>Trianthema portulacastrum</i>			
Radish, Wild	<i>Raphanus raphanistrum</i>			
Ragweed, Common	<i>Ambrosia artemisiifolia</i>			
Redmaids	<i>Calandrinia ciliata</i> var. <i>menziesii</i>			
Russian Thistle	<i>Salsola iberica</i>			
Shepherd's-purse	<i>Capsella bursa-pastoris</i>			
Smartweeds				
Ladysthumb	<i>Polygonum persicaria</i>			
Pennsylvania	<i>Polygonum pensylvanicum</i>			
Smellmelon[*]	<i>Cucumis melo</i>			
Sowthistle, Prickly[*]	<i>Sonchus asper</i>			

[\*Not for use in California.]

continued

<b>Broadleaf Weed Species</b>				
<b>Common Name</b>	<b>Scientific Name</b>	<b>Organic Matter</b>	<b>Soil Type</b>	<b>Application Rate</b>
Spotted Spurge	<i>Euphorbia maculate</i>	Up to 5%	All Soil Types	4 fl oz/A
Spurred Anoda	<i>Anoda cristata</i>			
Tropic Croton	<i>Croton glandulosus</i>			
Velvetleaf	<i>Abutilon theophrasti</i>			
Venice Mallow	<i>Hibiscus trionum</i>			
Waterhemp				
Common	<i>Amaranthus rudis</i>			
Tall	<i>Amaranthus tuberculatus</i>			
White Cockle[*]	<i>Silene latifolia</i>			
Wild Poinsettia	<i>Euphorbia heterophylla</i>			
Wormwood, Biennial	<i>Artemisia biennis</i>			
Yellow Rocket[*]	<i>Barbarea vulgaris</i>			
<b>Grass Weed Species</b>				
Barnyardgrass	<i>Echinochloa crus-galli</i>	Up to 5%	All Soil Types	4 fl oz/A
Bluegrass, Annual	<i>Poa annua</i>			
Crabgrass, Large	<i>Digitaria sanguinalis</i>			
Foxtail, Giant	<i>Setaria faberi</i>			
Goosegrass	<i>Eleusine indica</i>			
Lovegrass, California	<i>Eragrostis diffusa</i>			
Panicums				
Fall	<i>Panicum dichotomiflorum</i>			
Texas	<i>Panicum texanum</i>			
Ryegrass, Italian[*]	<i>Lolium multiflorum</i>			
Signalgrass, Broadleaf	<i>Brachiaria platyphylla</i>			

[\*Not for use in California.]

### **DIRECTIONS FOR USE IN ONION (DRY BULB)**

[For Use in Michigan, New York, North Dakota and Wisconsin Only]

### **RESTRICTIONS AND LIMITATIONS**

- **DO NOT** apply more than 2 fl oz of Helena Flumioxazin 4 SC per acre per application.
- **DO NOT** make more than 6 applications of Helena Flumioxazin 4 SC per acre per year at the 0.5 fl oz rate.
- **DO NOT** apply more than 3 fl oz of Helena Flumioxazin 4 SC per acre per year.
- **DO NOT** make sequential application within 14 days of the first application.
- **DO NOT** apply more than 1 fl oz of Helena Flumioxazin 4 SC per year on soils that contain greater than 90% sand plus gravel.
- **DO NOT** apply as part of a tank mix, other than Prowl® H2O Herbicide, or unacceptable injury may result. **DO NOT** tank mix other formulations of pendimethalin with Helena Flumioxazin 4 SC for use in onions.
- **DO NOT** apply with any type of adjuvant.

- **DO NOT** apply within 45 days of harvest.

**Use of Helena Flumioxazin 4 SC may result in necrotic spotting of onion leaves that come in contact with the spray. Understand and accept this risk before using Helena Flumioxazin 4 SC.**

**[Microrate Application]**

[Sequential applications of Helena Flumioxazin 4 SC may be applied to onions (dry bulb), between the 2-leaf and 6- leaf stage, at rates of 0.5 to 1 fl oz/A, on a 7 day interval.]

**TIMING TO ONIONS (dry bulb)**

Apply Helena Flumioxazin 4 SC to transplanted onions (dry bulb) between the 2-leaf and 6-leaf stage and on direct seed onions (dry bulb) between the 3-leaf and 6-leaf stage.

**TIMING TO WEEDS**

**Preemergence – Emerged Onions (dry bulb), Preemergence To Weeds**

Apply Helena Flumioxazin 4 SC to weed free onions (dry bulb) for preemergence control of the weeds listed in Table 1, Section A, Broadleaf Weeds Controlled by Residual Activity to Helena Flumioxazin 4 SC.

**DIRECTIONS FOR USE IN PEANUT**

**RESTRICTIONS AND LIMITATIONS**

- **DO NOT** apply more than 3 fl oz of Helena Flumioxazin 4 SC per acre per application.
- **DO NOT** apply more than 1 application of Helena Flumioxazin 4 SC per acre per year.
- **DO NOT** apply more than 3 fl oz of Helena Flumioxazin 4 SC per acre per year.
- **DO NOT** irrigate when peanuts are cracking.
- **DO NOT** graze treated fields or feed treated hay to livestock.

Many weather related factors, including high wind, splashing or heavy rains or cool conditions at or near peanut emergence, may result in peanut injury in fields treated with Helena Flumioxazin 4 SC . On occasion this has resulted in a delay in maturity or even a slight decrease in yield.

**WIND MANAGEMENT**

In areas where shallow cultivation is used between rows to reduce wind-borne sand damage to peanuts, weed control from Helena Flumioxazin 4 SC may be reduced.

**TIMING TO PEANUTS**

Helena Flumioxazin 4 SC may be applied to peanuts prior to planting or preemergence (after planting). Preemergence applications of Helena Flumioxazin 4 SC must be made within 2 days after planting and prior to peanut emergence. Application after the peanuts have begun to crack, or are emerged, will result in severe crop injury. Apply before peanuts have begun to crack. Select Helena Flumioxazin 4 SC rate from Table 1 according to anticipated weed spectrum.

**TIMING TO WEEDS**

**Burndown – Preemergence to Peanuts, Postemergence to Weeds**

Helena Flumioxazin 4 SC, applied as part of a burndown program, may be used for residual weed control, as well as to assist in postemergence burndown of many annual and perennial weeds where

peanuts will be planted directly into a stale seedbed, cover crop or in previous crop residues. Apply Helena Flumioxazin 4 SC before planting, during planting or after planting, but before the crop emerges. For control of emerged weeds, tank mix Helena Flumioxazin 4 SC with glyphosate. Refer to glyphosate label for rates and application pressure. To ensure thorough coverage, use a minimum of 15 gals of spray solution per acre. Helena Flumioxazin 4 SC tank mixes applied to assist in the control of emerged weeds must be applied with an adjuvant, including a non-ionic surfactant at 0.25% v/v or a crop oil concentrate or a methylated seed oil at 1 to 2 pt/A. A spray grade nitrogen source (either ammonium sulfate at 2 to 2.5 lb/A or 28 to 32% nitrogen solution at 1 to 2 qt/A) may be added to increase herbicidal activity.

Preemergence (conventional tillage) applications of Helena Flumioxazin 4 SC must be applied prior to weed emergence.

#### **ADDITIONAL RESIDUAL GRASS CONTROL: SEQUENTIAL**

Helena Flumioxazin 4 SC may be applied sequentially following a preplant incorporated application of trifluralin (states of New Mexico, Oklahoma and Texas only), Sonalan<sup>®</sup>, Dual<sup>®</sup> (metolachlor), pendimethalin or Frontier<sup>®</sup>.

#### **ADDITIONAL RESIDUAL GRASS CONTROL: TANK MIXED**

Helena Flumioxazin 4 SC can be tank mixed with alachlor, metolachlor or Frontier for additional grass and broadleaf weed control. Helena Flumioxazin 4 SC can also be tank mixed with pendimethalin or Sonalan in states where they are labeled, provided overhead irrigation guidelines on the pendimethalin and/or Sonalan labels are followed.

#### **DIRECTIONS FOR USE IN POTATO**

[For Use in Arizona, California, Colorado, Delaware, Florida, Hawaii, Idaho, Maryland, Minnesota, Montana, Nebraska, Nevada, New Jersey, New Mexico, North Carolina, North Dakota, Oregon, South Carolina, South Dakota, Texas, Utah, Virginia, Washington, Washington DC and Wyoming only.]

#### **RESTRICTIONS AND LIMITATIONS**

- **DO NOT** apply more than 1.5 fl oz of Helena Flumioxazin 4 SC per acre per application.
- **DO NOT** apply more than 1 application of Helena Flumioxazin 4 SC per acre per year.
- **DO NOT** apply more than 1.5 fl oz of Helena Flumioxazin 4 SC per acre per year.
- **DO NOT** apply to Rill (furrow) irrigated potatoes

**Many weather related factors, including high wind, splashing or heavy rains or cool conditions at or near potato emergence, may result in potato injury in fields treated with Helena Flumioxazin 4 SC . On occasion this has resulted in a delay in maturity. Understand and accept these risks before using Helena Flumioxazin 4 SC.**

#### **TIMING TO POTATOES**

Helena Flumioxazin 4 SC may be applied to potatoes after hilling for the preemergence suppression of the weeds listed in Table 8, Weeds Suppressed by Residual Activity of Helena Flumioxazin 4 SC at 1.5 fl oz/A. Tank mix Helena Flumioxazin 4 SC with other labeled herbicides for broad spectrum weed control. A minimum of 2 inches of settled soil must cover the vegetative portion of the potato plant at the time of Helena Flumioxazin 4 SC application. Application to potatoes with less than 2 inches of soil covering



the vegetative portion of the potato may result in crop injury. In areas with historically higher amounts of rainfall during the time of preemergence herbicide applications, including the Red River Valley, Minnesota and North Dakota, the requirement for 2 inches of settled soil is critical to avoid crop injury. Mechanical incorporation of Helena Flumioxazin 4 SC will result in decreased weed control. In areas with sprinkler irrigation, incorporate Helena Flumioxazin 4 SC with 1/4 to 3/4 inches of irrigation, after application and before any sprouts are within 2 inches of the settled soil surface if a rainfall event has not yet occurred.

#### TIMING TO WEEDS

##### Preemergence – Soil Covered Potatoes, Preemergence To Weeds

Apply Helena Flumioxazin 4 SC to soil covered potatoes for the preemergence suppression of the weeds listed in Table 8. Harrowing, cultivation or corrigrating after Helena Flumioxazin 4 SC application will reduce weed control.

**Table 8. Weeds Suppressed by Residual Activity of Helena Flumioxazin 4 SC at 1.5 fl oz/A**

Common Name	Scientific Name	Organic Matter	Application Rate
Lambsquarters, Common	Chenopodium album	Up to 5%	1.5 fl oz/A
Mustard, Wild	Brassica kaber		
Nightshades			
Black	Solanum nigrum		
Eastern Black	Solanum ptycanthum		
Hairy	Solanum sarrachoides		
Pigweeds			
Palmer Amaranth	Amaranthus palmeri		
Redroot	Amaranthus retroflexus		
Smooth	Amaranthus hybridus		
Spiny Amaranth	Amaranthus spinosus		
Tumble	Amaranthus albus		
Prickly Lettuce (China Lettuce)	Lactuca serriola		
Radish, Wild	Raphanus raphanistrum		

#### DIRECTIONS FOR USE IN SOYBEAN

##### RESTRICTIONS AND LIMITATIONS

- **DO NOT** apply more than 3 fl oz of Helena Flumioxazin 4 SC per acre per application.
- **DO NOT** apply more than 1 application of Helena Flumioxazin 4 SC per acre per year.
- **DO NOT** apply more than 3 fl oz of Helena Flumioxazin 4 SC per acre per year.
- Graze treated fields or feed treated hay to livestock no sooner than 21 days after application.

##### PRECAUTIONS

- If Helena Flumioxazin 4 SC is tank mixed with flufenacet (Axiom<sup>®</sup>, Domain<sup>®</sup>), metolachlor (Dual Magnum, Dual II Magnum, Boundary<sup>®</sup>) or dimethenamid (Frontier or Outlook<sup>®</sup>) and applied within 14 days of planting soybeans, plant under no-till or minimum tillage conditions on wheat stubble or field corn stubble.

- Irrigation when soybeans are cracking may result in severe injury.

### TIMING TO SOYBEANS

Helena Flumioxazin 4 SC may be applied to soybeans prior to planting or preemergence (after planting). Preemergence application of Helena Flumioxazin 4 SC must be made within 3 days after planting and prior to soybean emergence. Application after the soybeans have begun to crack, or are emerged, will result in severe crop injury. Apply before soybeans have begun to crack. Select Helena Flumioxazin 4 SC rate from Table 1 according to anticipated weed spectrum.

### TIMING TO WEEDS

#### Burndown – Preemergence to Soybeans, Postemergence to Weeds

Helena Flumioxazin 4 SC, applied as part of a burndown program, may be used for residual weed control, as well as to assist in postemergence burndown of many annual and perennial weeds where soybeans will be planted directly into a stale seedbed, cover crop or in previous crop residues. For control of emerged weeds, choose the most appropriate tank mix partner from Table 9. Apply Helena Flumioxazin 4 SC with ground equipment before planting, during planting or within 3 days after planting, but before the crop emerges. To ensure thorough coverage, use a minimum of 15 gallons of spray solution per acre. Refer to tank mix partner’s label for rates and application pressures. All Helena Flumioxazin 4 SC tank mixes applied to assist in the control of emerged weeds must be applied with crop oil concentrate or methylated seed oil at 1 to 2 pt/A or a non-ionic surfactant at 0.25% v/v.

#### INCREASING SPEED OF GLYPHOSATE BURNDOWN ACTIVITY

Helena Flumioxazin 4 SC, at rates as low as 1 fl oz/A, may be tank mixed with glyphosate (Roundup) to increase the speed of burndown activity compared to glyphosate applied alone. Residual weed control will not be provided at rates lower than 2 fl oz/A; however, suppression of the weeds in Table 2, may occur at Helena Flumioxazin 4 SC rates as low as 1 fl oz/A.

### TANK MIXES

Helena Flumioxazin 4 SC may be tank mixed with the herbicides listed in Table 9 for increased burndown activity, additional residual broadleaf and/or additional grass control. Refer to tank mix partner’s label for adjuvant selection.

**Table 9. Tank Mix Partners for Control of Emerged Weeds in Reduced Tillage Soybeans**

Tank Mix Partner	Target Weeds <sup>(1)</sup>
2,4-D LVE	Marestail Giant Ragweed Dandelion
paraquat	Annual Grasses Henbit
glyphosate	General Burndown
Select Max <sup>®</sup>	Annual Grasses
Scepter <sup>®</sup> 70 DG	Cocklebur Common Sunflower
Weedmaster <sup>®</sup>	Marestail Giant Ragweed Dandelion

<sup>(1)</sup> Refer to tank mix product labels for specific use directions for control of emerged weeds present.

#### **ADDITIONAL RESIDUAL BROADLEAF CONTROL**

Helena Flumioxazin 4 SC can be tank mixed with metribuzin, Firstrate<sup>®</sup>, Lorox<sup>®</sup>, Pursuit Plus<sup>®</sup>, PYTHON<sup>®</sup>, Squadron<sup>®</sup>, Scepter or Steel<sup>®</sup> for additional broadleaf control.

#### **ADDITIONAL RESIDUAL GRASS CONTROL**

Helena Flumioxazin 4 SC can be tank mixed with pendimethalin or Command<sup>®</sup> for additional grass control. [In the states of (Note to EPA Reviewer: specific states will be listed here) Helena Flumioxazin 4 SC can be tank mixed with microencapsulated acetochlor (Warrant<sup>®</sup>) at 2 oz per acre.] [Tank mixes with flufenacet (Axiom or Domain), metolachlor (Dual products or Boundary) or dimethenamid (Frontier or Outlook) may result in severe injury to soybeans when application is followed by prolonged periods of cool wet weather.]

#### **ROUNDUP READY PROGRAM**

Helena Flumioxazin 4 SC may be applied as part of a burndown program or preemergence in conventional tillage programs, at 2 to 3 fl oz/A to reduce early season weed competition from waterhemp, velvetleaf, nightshade and morningglories as well as other weeds listed in Tables 2 and 3 in Roundup Ready programs. A sequential post emergence application of glyphosate will be required to control weeds not controlled by Helena Flumioxazin 4 SC.

### **DIRECTIONS FOR USE IN STRAWBERRY**

#### **RESTRICTIONS AND LIMITATIONS:**

- **DO NOT** apply more than 3 fl oz of Helena Flumioxazin 4 SC per acre per application.
- **DO NOT** apply more than 1 application of Helena Flumioxazin 4 SC per acre per year.
- **DO NOT** apply more than 3 fl oz of Helena Flumioxazin 4 SC per acre per year.

#### **PRECAUTIONS**

- Helena Flumioxazin 4 SC, at 3 fl oz per acre, can be applied to the soil a minimum of 30 days prior to transplanting strawberries provided the strawberries will be transplanted through a plastic mulch.
- Helena Flumioxazin 4 SC at 3 fl oz per acre can be applied to dormant (established or newly planted) strawberries for the preemergence control of the weeds listed in Table 1, Broadleaf Weeds Controlled by Residual Activity of Helena Flumioxazin 4 SC.
- Helena Flumioxazin 4 SC, at 3 fl oz per acre, can be applied in strawberry row middles with a shielded or hooded sprayer for the preemergence control of the weeds listed in Table 1, Broadleaf Weeds Controlled by Residual Activity of Helena Flumioxazin 4 SC.

Application Method	Minimum Time From Application to Harvest (PHI)	Use Rate Per Acre Per Application (oz)	Use Rate Per Acre Per Year (oz)	Special Use Instructions
Pre-transplant	Not applicable	3	3	<p>Apply a minimum of 30 days prior to transplanting and prior to plastic mulch being laid.</p> <p>Apply as part of a tank mix to control emerged weeds.</p>
Preemergence to dormant strawberries	Not applicable	3	3	<p>Crop oil concentrate, at 1% v/v, or non-ionic surfactant, at 0.25% v/v, may be added to help control emerged broadleaf weeds.</p>
Hooded or shielded sprayer application to row middles	<b>DO NOT</b> apply after fruit set	3	3	<p><b>Apply only to row middles - DO NOT apply over strawberries.</b></p> <p>Apply prior to weed emergence.</p> <p>Crop spotting may occur if an adjuvant is added.</p> <p><b>DO NOT apply after fruit set or spotting of fruit may occur.</b></p> <p><b>DO NOT</b> allow spray drift to come in contact with fruit or foliage</p>

**Table 10. Weeds Controlled by Preemergence Application of Helena Flumioxazin 4 SC**

Broadleaf Weed Species					
Common Name	Scientific Name	Organic Matter	Soil Type	Application Rate	
Bristly Starbur	<i>Acanthospermum hispidum</i>	Up to 10% <sup>(1)</sup>	All Soil Types <sup>(2)</sup>	Asparagus, Caneberries, Garlic, Hops 6 fl oz/A	
Carpetweed	<i>Mollugo verticillata</i>				
Chickweeds					
Common	<i>Stellaria media</i>				
Mouseear	<i>Cerastium vulgatum</i>				
Coffee Senna	<i>Cassia occidentalis</i>				Sugarcane 6 to 8 fl oz/A
Copperleaf, Hophornbeam	<i>Acalypha ostryifolia</i>				
Dandelion	<i>Taraxacum officinale</i>				
Dodder (suppression only)[*] <sup>(1)</sup>	<i>Cuscuta spp.</i>				Bushberries, Cactus, Citrus Fruit, Grapes, Olive, Pome Fruit, Pomegranate, Stone Fruit, Tree Nuts and Non-Bearing Fruit Trees 6 to 12 fl oz/A <sup>(2)</sup>
Eclipta	<i>Eclipta prostrate</i>				
Evening Primrose, Cutleaf	<i>Oenothera laciniata</i>				
False Chamomile[*]	<i>Tripleurospermum maritima</i>				
Fiddleneck, Coast[*]	<i>Amsinckia menziesii</i>				
Field Pennycress[*]	<i>Thlaspi arvense</i>				
Fleabane, Hairy[*]	<i>Conyza bonariensis</i>				
Flixweed[*]	<i>Descurainia spophia</i>				
Florida Beggarweed	<i>Desmodium tortuosum</i>				
Florida Pusley	<i>Richardia scabra</i>			To Maintain Bare Ground on Non-Crop Areas of Farms, Orchards & Vineyards 6 to 12 fl oz/A.	
Golden Crownbeard	<i>Verbesina encelioides</i>				
Groundsel, Common	<i>Senecio vulgaris</i>				
Hairy Indigo	<i>Indigofera hirsuta</i>				
Hemp Sesbania	<i>Sesbania exaltata</i>				
Henbit	<i>Lamium amplexicaule</i>				
Jimsonweed	<i>Datura stramonium</i>				
Kochia	<i>Kochia scoparia</i>				
Lambsquarters, Common	<i>Chenopodium album</i>				
Little Mallow	<i>Malva parviflora</i>				
London Rocket[*]	<i>Sisymbrium irio</i>				
Marestail/Horseweed	<i>Conyza canadensis</i>				
Mayweed/ False Chamomile[*]	<i>Matricaria maritima</i>				

[\*Not for use in California.]

continued

<sup>(1)</sup> Helena Flumioxazin 4 SC can be used on soils with greater than 10% organic matter; however, length of residual control may be shorter than on soils with lower organic matter content.

<sup>(2)</sup> Use a maximum Helena Flumioxazin 4 SC rate of 6 fl oz/A per application on any soil that has a sand plus gravel content over 80% if bushes, trees or vines are under 3 years of age.

**Table 10. Weeds Controlled by Preemergence Application of Helena Flumioxazin 4 SC (continued)**

Broadleaf Weed Species				
Common Name	Scientific Name	Organic Matter	Soil Type	Application Rate
Morningglories		Up to 10% <sup>(1)</sup>	All Soil Types <sup>(2)</sup>	Asparagus, Caneberries, Garlic, Hops 6 fl oz/A
Entireleaf	<i>Ipomoea hederacea</i> var. <i>integriuscula</i>			
Ivyleaf	<i>Ipomoea hederacea</i>			
Red/Scarlet	<i>Ipomoea coccinea</i>			
Smallflower	<i>Jacquemontia tamnifolia</i>			
Tall	<i>Ipomoea purpurea</i>			
Mustard				
Tansy[*]	<i>Descurainia pinnata</i>			
Tumble[*]	<i>Sisymbrium altissimum</i>			
Wild	<i>Brassica kaber</i>			
Nettle, Burning[*]	<i>Urtica urens</i>			
Nightshades				
Black	<i>Solanum nigrum</i>			
Eastern Black	<i>Solanum ptycanthum</i>			
Hairy	<i>Solanum sarrachoides</i>			
Pigweeds				
Palmer Amaranth	<i>Amaranthus palmeri</i>			
Redroot	<i>Amaranthus retroflexus</i>			
Smooth	<i>Amaranthus hybridus</i>			
Spiny Amaranth	<i>Amaranthus spinosus</i>			
Tumble	<i>Amaranthus albus</i>			
Prickly Lettuce (China Lettuce)	<i>Lactuca serriola</i>			
Prickly Sida (Teaweed)	<i>Sida spinosa</i>			
Puncturevine	<i>Tribulus terrestris</i>			
Purslane				
Common	<i>Portulaca oleracea</i>			
Horse[*]	<i>Trianthema portulacastrum</i>			
Radish, Wild	<i>Raphanus raphanistrum</i>			
Ragweed, Common	<i>Ambrosia artemisiifolia</i>			
Redmaids	<i>Calandrinia ciliata</i> var. <i>menziesii</i>			
Russian Thistle	<i>Salsola iberica</i>			
Shepherd's-purse	<i>Capsella bursa-pastoris</i>			
Smartweeds				
Ladysthumb	<i>Polygonum persicaria</i>			
Pennsylvania	<i>Polygonum pennsylvanicum</i>			
Smellmelon[*]	<i>Cucumis melo</i>			
Sowthistle, Prickly[*]	<i>Sonchus asper</i>			
				To Maintain Bare Ground on Non-Crop Areas of Farms, Orchards & Vineyards 6 to 12 fl oz/A. <sup>(2)</sup>

[\*Not for use in California.]

continued

<b>Broadleaf Weed Species</b>						
<b>Common Name</b>	<b>Scientific Name</b>	<b>Organic Matter</b>	<b>Soil Type</b>	<b>Application Rate</b>		
Spotted Spurge	<i>Euphorbia maculate</i>					
Spurred Anoda	<i>Anoda cristata</i>					
Tropic Croton	<i>Croton glandulosus</i>					
Velvetleaf	<i>Abutilon theophrasti</i>					
Venice Mallow	<i>Hibiscus trionum</i>					
Waterhemp						
Common	<i>Amaranthus rudis</i>					
Tall	<i>Amaranthus tuberculatus</i>					
White Cockle[*]	<i>Silene latifolia</i>					
Wild Poinsettia	<i>Euphorbia heterophylla</i>					
Wormwood, Biennial	<i>Artemisia biennis</i>					
Yellow Rocket[*]	<i>Barbarea vulgaris</i>					
<b>Grass Weed Species</b>						
Barnyardgrass	<i>Echinochloa crus-galli</i>	Up to 10% (1)	All Soil Types (2)	Asparagus, Caneberries, Garlic, Hops 6 fl oz/A		
Bluegrass, Annual	<i>Poa annua</i>					
Crabgrass						
Large	<i>Digitaria sanguinalis</i>					
Smooth	<i>Digitaria ischaemum</i>					Sugarcane 6 to 8 fl oz/A
Foxtails						
Bristly	<i>Setaria verticillata</i>					
Giant	<i>Setaria faberi</i>					
Green	<i>Setaria viridis</i>					
Yellow	<i>Setaria glauca</i>					
Goosegrass	<i>Eleusine indica</i>					
Guineagrass	<i>Panicum maximum</i>					
Johnsongrass, Seedling	<i>Sorghum halepense</i>					
Lovegrass, California	<i>Eragrostis diffusa</i>					
Panicums						
Fall	<i>Panicum dichotomiflorum</i>					
Texas	<i>Panicum texanum</i>					
Ryegrass, Italian[*]	<i>Lolium multiflorum</i>					
Signalgrass, Broadleaf	<i>Brachiaria platyphylla</i>					To Maintain Bare Ground on Non-Crop Areas of Farms, Orchards & Vineyards 6 to 12 fl oz/A.

[\*Not for use in California.]

<sup>(1)</sup> Helena Flumioxazin 4 SC can be used on soils with greater than 10%; however, length of residual control may be shorter than on soils with lower organic matter content.

<sup>(2)</sup> Use a maximum Helena Flumioxazin 4 SC rate of 6 fl oz/A per application on any soil that has a sand plus gravel content over 80% if bushes, trees or vines are under 3 years of age.

## DIRECTIONS FOR USE IN SUGARCANE

### RESTRICTIONS AND LIMITATIONS

- **DO NOT** apply more than 8 fl oz of Helena Flumioxazin 4 SC per acre per application.
- **DO NOT** make a sequential application within 14 days of the first application.
- **DO NOT** apply more than 4 applications of Helena Flumioxazin 4 SC per acre per year at the 3 fl oz rate.
- **DO NOT** apply more than 12 fl oz of Helena Flumioxazin 4 SC per acre per year.
- **DO NOT** apply within 90 days of harvest.

### TIMING TO SUGARCANE

Helena Flumioxazin 4 SC may be applied from 2 weeks prior to planting to before the sugarcane emerges, post directed or at layby. Select the proper Helena Flumioxazin 4 SC rate from Table 10 according to anticipated weed spectrum and soil organic matter content for preemergence applications. Select Helena Flumioxazin 4 SC rate from Table 11 according to emerged weed spectrum and weed heights for post-directed and layby applications.

### TIMING TO WEEDS

#### **Burndown – Preemergence to Sugarcane, Postemergence to Weeds**

Helena Flumioxazin 4 SC may be used for preemergence control, and to assist in postemergence burndown, of many annual broadleaf weeds in sugarcane. For control of emerged weeds, choose the most appropriate tank mix partner from Table 12. Apply Helena Flumioxazin 4 SC before the crop emerges. To ensure thorough coverage, use a minimum of 15 gallons of spray solution per acre. All Helena Flumioxazin 4 SC tank mixes applied to assist in the control of emerged weeds must be applied with crop oil concentrate or methylated seed oil at 1 qt/A or a non-ionic surfactant at 0.25% v/v. Some tank mix products, for example Roundup Original Max (glyphosate), may be formulated with a suitable adjuvant and **DO NOT** require additional adjuvant.

#### **Preemergence – Preemergence to Sugarcane, Preemergence to Weeds**

Helena Flumioxazin 4 SC may be used for preemergence control of many annual broadleaf and grassy weeds in sugarcane. Select rate based on anticipated weed spectrum and soil organic matter content from Table 10. Apply Helena Flumioxazin 4 SC before the crop emerges.

#### **Post-Directed – Postemergence to Sugarcane, Postemergence to Weeds**

Make post-directed applications to upright sugarcane varieties after the sugarcane has exceeded 24 inches in height and has begun to joint. Post-directed applications to “PINEAPPLE” varieties or to upright varieties that are less than 24 inches in height and have not begun to joint, may result in unacceptable crop injury. To ensure thorough coverage, use a minimum of 15 gals of spray solution per acre. Post-directed applications of Helena Flumioxazin 4 SC1 must include a crop oil concentrate or methylated seed oil at 1 qt/A or a non-ionic surfactant at 0.25% v/v. Select the proper Helena Flumioxazin 4 SC rate based on weed spectrum and weed height from Table 11.



### Layby – Postemergence to Sugarcane, Postemergence to Weeds

Layby applications can be made to upright and “PINEAPPLE” varieties after the sugarcane has exceeded 30 inches in height and the spray solution will not contact foliage above 6 inches from the base of the sugarcane. To ensure thorough coverage, use a minimum of 15 gallons of spray solution per acre. Layby applications of Helena Flumioxazin 4 SC must be applied with crop oil concentrate or methylated seed oil at 1 qt/A or a non-ionic surfactant at 0.25% v/v. Select the proper Helena Flumioxazin 4 SC rate based on weed spectrum and weed height from Table 11.

**Table 11. Broadleaf Weeds Controlled by Post-Directed or Layby Application of Helena Flumioxazin 4 SC in Sugarcane**

Broadleaf Weed Species		Weed Height (inches)	
Common Name	Scientific Name	3 fl oz/A	4 fl oz/A
Bindweed, Field <sup>(1)</sup>	<i>Convolvulus arvensis</i>	4	8
Carpetweed	<i>Mollugo verticillata</i>	4	4
Cocklebur, Common	<i>Xanthium strumarium</i>	4	4
Florida Beggarweed	<i>Desmodium tortuosum</i>	2	2
Hemp Sesbania	<i>Sesbania exaltata</i>	6	8
Jimsonweed	<i>Datura stramonium</i>	4	4
Lambsquarters, Common	<i>Chenopodium album</i>	4	4
Morningglories			
Entireleaf	<i>Ipomoea hederacea</i> var. <i>integruscula</i>	-	4
Ivyleaf	<i>Ipomoea hederacea</i>	4	4
Pitted	<i>Ipomoea lacunose</i>	4	6
Red	<i>Ipomoea coccinea</i>	-	4
Tall	<i>Ipomoea purpurea</i>	2	4
Mustard, Wild	<i>Brassica kaber</i>	6	6
Pigweeds			
Palmer Amaranth	<i>Amaranthus palmeri</i>	4	6
Redroot	<i>Amaranthus retroflexus</i>	4	6
Smooth	<i>Amaranthus hybridus</i>	4	6
Plantain, Broadleaf	<i>Plantago major</i>	6	6
Prickly Sida	<i>Sida spinosa</i>	4	6
Purslanes			
Common	<i>Portulaca oleracea</i>	2	4
Rock	<i>Calandrinia</i> spp.	-	2
Ragweeds			
Common	<i>Ambrosia artemisiifolia</i>	2	2
Giant	<i>Ambrosia trifida</i>	4	4
Rice Flatsedge	<i>Cyperus iria</i>	2	4
Sicklepod	<i>Senna obtusifolia</i>	4	4

(1) Helena Flumioxazin 4 SC tank mixes will only control the above ground portion of field bindweed. Repeated applications will be needed to control regrowth.

(continued)

**Table 11. Broadleaf Weeds Controlled by Post-Directed or Layby Application of Helena Flumioxazin 4 SC in Sugarcane continued**

Broadleaf Weed Species		Weed Height (inches)	
Common Name	Scientific Name	3 fl oz/A	4 fl oz/A
Smartweeds			
Ladysthumb	<i>Polygonum persicaria</i>	4	4
Pale	<i>Polygonum lapathifolium</i>	4	4
Pennsylvania	<i>Polygonum pensylvanicum</i>	4	4
Spotted Spurge	<i>Euphorbia maculata</i>	4	4
Velvetleaf	<i>Abutilon theophrasti</i>	4	6
Venice Mallow	<i>Hibiscus trionum</i>	2	2
Waterhemp			
Common	<i>Amaranthus rudis</i>	2	2
Tall	<i>Amaranthus tuberculatus</i>	2	2

<sup>(1)</sup> Helena Flumioxazin 4 SC tank mixes will only control the above ground portion of field bindweed. Repeated applications will be needed to control regrowth.

**TANK MIXES**

Helena Flumioxazin 4 SC may be tank mixed with the herbicides listed in Table 12 for additional weed control in burndown, preemergence, post-directed and layby applications. Refer to tank mix partner’s label for adjuvants.

**Table 12. Tank Mixes with Helena Flumioxazin 4 SC for Post-Directed or Layby Use in Sugarcane**

Tank Mix Partner <sup>(1)</sup>	Target Weeds	Burndown	Post-Directed <sup>(2)</sup>	Layby
2,4-D amine	Annual and Perennial Broadleaf Weeds	X		
atrazine	Pigweeds Cocklebur	X	X	X
Asulox <sup>(3)</sup>	Annual Grasses		X	X
Evik <sup>(4)</sup>	Annual Grasses		X	X
glyphosate <sup>(5)</sup>	Annual and Perennial Weeds	X		X
metribuzin <sup>(6)</sup>	Broadleaf Panicum Goosegrass		X	X
Sempra	Purple Nutsedge Yellow Nutsedge	X	X	X
Weedmaster	Annual and Perennial Broadleaf Weeds	X		

<sup>(1)</sup> Refer to tank mix product labels for specific use directions for control of emerged weeds present not listed in Table 11.

<sup>(2)</sup> Make post-directed applications to upright sugarcane varieties after the sugarcane has exceeded 24 inches in height. Post-directed applications to “PINEAPPLE” varieties or to upright varieties that are less than 24 inches in height may result in unacceptable crop injury.

<sup>(3)</sup> Apply to sugarcane at least 24 inches tall.

<sup>(4)</sup> Apply before weeds are greater than 6 inches tall.

<sup>(5)</sup> Glyphosate applications must be made with a hooded sprayer. Sugarcane must be at least 3 feet tall. Contact with the sugarcane foliage by either the spray mixture or the treated weed foliage will result in sugarcane injury.

<sup>(6)</sup> Refer to metribuzin label for restrictions based on soil type.

#### **ADDITIONAL PREEMERGENCE BROADLEAF CONTROL**

Helena Flumioxazin 4 SC can be tank mixed with atrazine or diuron for additional preemergence broadleaf control.

#### **ADDITIONAL PREEMERGENCE GRASS CONTROL**

Helena Flumioxazin 4 SC can be tank mixed with Prowl (or other pendimethalin products) for additional preemergence grass control provided sugarcane has not emerged.

### **DIRECTIONS FOR USE IN SUNFLOWER AND SAFFLOWER**

#### **HARVEST AID**

##### **RESTRICTIONS AND LIMITATIONS**

- **DO NOT** apply more than 3 fl oz of Helena Flumioxazin 4 SC per acre per application.
- **DO NOT** apply more than 1 application of Helena Flumioxazin 4 SC per acre per year.
- **DO NOT** apply more than 3 fl oz of Helena Flumioxazin 4 SC per acre per year.
- **DO NOT** harvest within 5 days of application.

Desiccation from Helena Flumioxazin 4 SC requires the addition of an agronomically approved adjuvant to the spray mixture. Use a methylated seed oil which contains at least 15% emulsifiers and 80% oil at 1 qt/A. A spray grade nitrogen source (either ammonium sulfate at 2 to 2.5 lb/A or a 28 to 32% nitrogen solution at 1 to 2 qt/A) may be added to the spray mixture along with methylated seed oil to enhance desiccation. The addition of a nitrogen source does not replace the need for methylated seed oil. Tank mixing Helena Flumioxazin 4 SC with glyphosate or paraquat will increase control of emerged weeds and aid in harvest for sunflowers. Tank mixing Helena Flumioxazin 4 SC with glyphosate will increase control of emerged weeds and aid in harvest for safflower.

#### **TIMING TO SUNFLOWER AND SAFFLOWER**

Apply Helena Flumioxazin 4 SC, at 1.5 to 2 fl oz/A, when crop is mature (when seed is 35% moisture or less). For many varieties, this is when the backs of the heads are turning yellow and the bracts are turning brown. Sunflower and safflower can be harvested 5 days after application. To ensure thorough coverage, use 15 to 30 gallons of spray solution per acre and select nozzle type using manufacturer's gallonage and pressure guidelines for postemergence application.

**DIRECTIONS FOR USE IN SWEET POTATO**  
[For Use in Arizona, California and Hawaii Only]

**RESTRICTIONS AND LIMITATIONS**

- **DO NOT** apply more than 3 fl oz of Helena Flumioxazin 4 SC per acre per application.
- **DO NOT** apply more than 1 application of Helena Flumioxazin 4 SC per acre per year.
- **DO NOT** apply more than 3 fl oz of Helena Flumioxazin 4 SC per acre per year.
- **DO NOT** apply postemergence to sweet potatoes.
- **DO NOT** use greenhouse grown transplants.
- **DO NOT** use transplants harvested more than 2 days prior to transplanting.
- **DO NOT** use on any sweet potato variety other than “BEAUREGARD”, unless user has tested Helena Flumioxazin 4 SC on other variety and has found crop tolerance to be acceptable.
- **DO NOT** apply as a part of any tank mix, except with labeled rates of Command, if tank mix is applied prior to transplanting.

**TIMING TO SWEET POTATOES**

Helena Flumioxazin 4 SC must be applied prior to transplanting sweet potatoes.

**TIMING TO WEEDS**

**Preemergence To Weeds**

Apply Helena Flumioxazin 4 SC to soil prior to transplanting sweet potato slips for the preemergence control of the weeds listed in Table 1.

**DIRECTIONS FOR USE IN WHEAT**

**RESTRICTIONS AND LIMITATIONS**

- **DO NOT** apply more than 2 fl oz of Helena Flumioxazin 4 SC per acre per application.
- **DO NOT** apply more than 1 application of Helena Flumioxazin 4 SC per acre per year.
- **DO NOT** apply more than 2 fl oz of Helena Flumioxazin 4 SC per acre per year.

**PRE-PLANT APPLICATIONS, PRE-EMERGENCE WEED CONTROL**

[For Use in Delaware, Idaho, Kentucky, Maryland, Minnesota, Montana, North Carolina, North Dakota, New Jersey, Oregon, Pennsylvania, South Carolina, South Dakota, Tennessee, Virginia, Washington and Wisconsin Only]

**RESTRICTIONS AND LIMITATIONS**

- For pre-plant weed control, use only on no-till or minimum tillage fields where the previous year’s crop residue has not been incorporated into the soil.
- [Plant wheat no sooner than 7 days after Helena Flumioxazin 4 SC application in the states of DE, ID, KY, MD, MN, MT, NC, ND, NJ, OR, PA, SC, SD, TN, VA, WA or WI]
- [Plant wheat no sooner than 14 days after Helena Flumioxazin 4 SC application in the states of DE, ID, KY, MD, MN, MT, NC, ND, NJ, OR, PA, SC, SD, TN, VA, WA or WI]
- [**DO NOT** use on Durum wheat.]
- **DO NOT** irrigate between emergence and spike.
- Wheat must be planted a minimum of 1” deep.

- **DO NOT** graze until wheat has reached 5 inches in height.

### **Burndown Use Directions**

#### **[All states]**

Helena Flumioxazin 4 SC, applied as part of a burndown program, at 2 fl oz/A, may be used for residual weed control, as well as to assist in postemergence burndown of many weeds where wheat will be planted directly into the residue of the previous crop. See Directions for Use in Fall Burndown Programs in Fields to be Planted to Barley, Field Pea, Flax, Lentil, Safflower, Sunflower and Spring Wheat for rates and timing of applications. For control of emerged weeds, Helena Flumioxazin 4 SC must be applied with an appropriate burndown tank mix partner. To ensure thorough coverage, use a minimum of 15 gallons of spray solution per acre. Refer to tank mix partner's label for application pressure and adjuvant systems.

### **POST-PLANT, PRE-EMERGENCE WEED CONTROL**

[For Use in Delaware, Idaho, Kentucky, Maryland, Minnesota, Montana, North Carolina, North Dakota, New Jersey, Oregon, Pennsylvania, South Carolina, South Dakota, Tennessee, Virginia, Washington and Wisconsin Only]

### **RESTRICTIONS AND LIMITATIONS**

- For post-plant, pre-emergence weed control, use only on no-till or minimum tillage fields where the previous crop residue has not been incorporated into the soil.
- Apply Helena Flumioxazin 4 SC up to 2 days after planting.
- **[DO NOT** use on Durum wheat.]
- **DO NOT** irrigate between emergence and spike.
- Wheat must be planted a minimum of 1" deep.
- **DO NOT** graze until wheat has reached 5 inches in height.

### **Use Directions**

Helena Flumioxazin 4 SC, applied at 2 fl oz/A, may be used for residual weed control, where wheat has been planted directly into the residue of the previous year. Application must be made no later than 2 days after planting.

### **HARVEST AID**

#### **[All states]**

### **RESTRICTIONS AND LIMITATIONS**

- **DO NOT** harvest within 10 days of application.

### **Use Directions**

Helena Flumioxazin 4 SC, applied at 2 fl oz/A for desiccation requires the addition of an agronomically approved adjuvant to the spray mixture. Use a methylated seed oil which contains at least 15% emulsifiers and 80% oil at 1 qt/A. A spray grade nitrogen source (either ammonium sulfate at 2 to 2.5 lb/A or a 28 to 32% nitrogen solution at 1 to 2 qt/A) may be added to the spray mixture along with methylated seed oil to enhance desiccation. The addition of a nitrogen source does not replace the need for methylated seed oil. Tank mixing Helena Flumioxazin 4 SC with glyphosate will increase control of emerged weeds and aid in harvest.

To ensure thorough coverage, use a minimum of 10 gallons spray solution per acre by ground application and a minimum of 5 gallons per acre by aerial application. Select nozzle based on manufacturer's gallonage and pressure guidelines for postemergence application.

#### **TIMING TO WHEAT**

Apply Helena Flumioxazin 4 SC, at 1.5 to 2 fl oz/A, after wheat reaches the hard dough stage and grain has no more than 30% moisture. Wheat can be harvested 10 days after application. Helena recommends tank mixing with glyphosate.

#### **DIRECTIONS FOR USE IN BUSHBERRIES, CANEBERRIES, CITRUS FRUIT, GRAPE, OLIVE, POME FRUIT, POMEGRANATE, STONE FRUIT, TREE NUTS AND NON-BEARING FRUIT TREES**

Bushberries (Subgroup 13-07B): Aronia Berry; Blueberry, Highbush; Blueberry, Lowbush; Buffalo Currant; Chilean Guava; Cranberry, Highbush; Currant, Black; Currant, Red; Elderberry, European; Barberry, Gooseberry, Honeysuckle, edible; Huckleberry; Jostaberry; Juneberry (Saskatoon Berry); Lingonberry; Native Currant; Salal; Sea Buckthorn; cultivars, varieties, and/or hybrids of these.

Caneberries (Subgroup 13-07A): Blackberry, Loganberry, Black Raspberry, Red Raspberry, Wild Raspberry cultivars, varieties and/or hybrids of these.

Citrus Fruit (Crop Group 10-10): Australian Desert Lime; Australian Finger-lime; Australian Round Lime; Brown River Finger Lime; Calamondin; Citron; Citrus hybrids; Grapefruit; Japanese Summer Grapefruit; Kumquat; Lemon; Lime; Mediterranean Mandarin; Mount White Lime; New Guinea Wild Lime; Orange, Sour; Orange, Sweet; Pummelo; Russell River Lime; Satsuma Mandarin; Sweet Lime; Tachibana Orange; Tahiti Lime; Tangelo; Tangerine (mandarin); Tangor; Trifoliate Orange; UniQ Fruit; cultivars, varieties and/or hybrids of these.

Tree Nuts (Crop Group 14-12): African Nut-tree; Almond, Beechnut; Brazil Nut; Brazilian Pine; Bunya; Bur Oak; Butternut; Cajou Nut; Candlernut; Cashew; Chestnut; Chinquapin; Coconut; Coquito Nut; Dika Nut; Ginkgo; Guiana Chestnut; Hazelnut (Filbert); Heartnut; Hickory Nut; Japanese Horsechestnut; Macadamia Nut; Mongongo Nut; Monkey-pot; Monkey Puzzle Nut; Okari Nut; Pachira Nut; Peach Palm Nut; Pecan; Pequi; Pili Nut; Pine Nut; Pistachio; Sapucaia Nut; Tropical Almond; Walnut, Black; Walnut, English; Yellowhorn, cultivars, varieties and/or hybrids of these.

Pome Fruit (Crop Group 11-10): Apple; Azarole; Crabapple; Loquat; Mayhaw; Medlar; Pear; Pear, Asian; Quince; Quince, Chinese; Quince, Japanese; Tejocote; cultivars, varieties and/or hybrids of these.

Stone Fruit (Crop Group 12-12): Apricot; Apricot, Japanese; Capulin; Cherry, Black; Cherry, Nanking; Cherry, Sweet; Cherry, Tart; Jujube, Chinese; Nectarine; Peach; Plum; Plum, American; Plum, Beach; Plum, Canada; Plum, Cherry; Plum, Chickasaw; Plum, Damson; Plum, Japanese; Plum, Klamath; Plum, Prune; Plumcot; Sloe and cultivars, varieties and/or hybrids of these.

#### **RESTRICTIONS AND LIMITATIONS**

- **DO NOT** apply more than 12 fl oz of Helena Flumioxazin 4 SC per acre per application, except Caneberries do not apply more than 6 oz Helena Flumioxazin 4 SC per acre per application.
- **DO NOT** apply more than 24 fl oz of Helena Flumioxazin 4 SC per acre per year, except Bushberries; for Bushberries **DO NOT** apply more than 12 fl oz of Helena Flumioxazin 4 SC per acre per year.
- **DO NOT** make a sequential application within 30 days of the first application, except tree nuts, do not make a sequential application within 60 days of the first application.

- **DO NOT** apply to farm alleys or roads where traffic may result in treated dust settling onto crops or other desirable vegetation.
- **DO NOT** apply within 300 yards of non-dormant pears.
- Raise mower height during all mowing to reduce dust. Dust created by mowing can drift onto desirable vegetation resulting in injury.
- **DO NOT** apply to powdery soils or soils that are susceptible to wind displacement unless irrigation can be applied immediately after application.
- **DO NOT** mow treated areas between bud break and final harvest. Dust created by mowing may drift onto desirable vegetation resulting in injury.
- Follow the most restrictive label limitations and precautions of the tank mix product(s) being used. x Avoid direct or indirect spray contact to foliage and green bark (non-barked trunk and non-barked vines with the exception of undesirable suckers).
- **DO NOT** apply to tree nuts established less than one year, unless protected from spray contact by nonporous wraps, grow tubes, or waxed containers.
- For non-bearing fruit trees (avocado and fig), **DO NOT** harvest fruit from treated trees within one year of application.
- Preharvest Interval (PHI)
  - Citrus Fruit: 3 days
  - Bushberries: 7 days
  - Caneberries: 7 days
  - Grape: 60 days
  - Tree Nuts: 60 days
  - Olive: 60 days
  - Pome Fruit: 60 days
  - Pomegranate: 60 days
  - Stone Fruit: 60 days

## PRECAUTIONS

- Use a maximum Helena Flumioxazin 4 SC rate of 6 fl oz/A per application on any soil that has a sand plus gravel content over 80% if bushes, trees or vines are less than 3 years of age. (Two applications of 6 fl oz/A in a 12 month period can still be made as long as there have been 60 days between applications).
- Raise mower height during all mowing to reduce dust. Dust created by mowing can drift onto desirable vegetation resulting in injury.
- Follow the most restrictive label limitations and precautions of the tank mix product(s) being used.
- Avoid direct or indirect spray contact to foliage and green bark or canes (non-barked trunk and nonbarked vines with the exception of undesirable suckers).
- Irrigate after application with minimum of 1/4 inch of water to activate the herbicide and to reduce wind displacement of soil.

## USE PRECAUTIONS FOR BUSHBERRIES

- If bushberries are established less than 2 years ensure that they are protected from spray contact by nonporous wrap, grow tubes or waxed containers.

## USE PRECAUTIONS FOR GRAPES

- If grapes are established less than 2 years ensure that they are trellised at least 3 ft from the soil surface or are protected from spray contact by non-porous wrap, grow tubes or waxed containers.
- Apply only to grapes that are trellised, staked or are free standing.
- Avoid direct or indirect spray contact to foliage and green bark (non-barked vines, with the exception of undesirable suckers).
- Plant new plantings of “own-rooted varieties”, for example Concord, so that all roots are a minimum 8 inches below the soil surface to be treated. In some situations, this may require hilling soil around newly planted vines so that the settled depth of the hill will be 4 to 5 inches above the vineyard floor.

## Juice, Raisin and Wine Grapes

- If applied during the period after bud break through final harvest, use shielded application equipment and applicator can ensure spray drift will not come in contact with crop fruit or foliage.

## Table Grapes

- Apply Helena Flumioxazin 4 SC between final harvest up to bud break.

## USE PRECAUTIONS FOR CITRUS FRUIT, OLIVE, POME FRUIT, POMEGRANATE, STONE FRUIT AND TREE NUTS

- For pome fruit and stone fruit, Helena Flumioxazin 4 SC can only be applied as a uniform band directed at the base of the trunk prior to silver tip in apples and bud break in stone fruit.
- For pome fruit and stone fruit make applications only to berms
- For olive, pomegranate and tree nuts apply after bud break through final harvest using shielded application equipment if the applicator can ensure the spray drift will not come into contact with nontarget vegetation, crop fruit and/or foliage. Shielded application equipment is not required if the following application parameters are followed:
  - Application pressure (at boom) < 30 PSI.
  - Application speed < 5 MPH.
  - Applicator can ensure the spray drift will not come into contact with non-target vegetation, crop fruit and/or foliage.
- If application is made to trees established less than one year, ensure they are protected from spray contact by non-porous wraps, grow tubes, paint or waxed containers.
  - For apples east of the Cascade Mountains in Washington, follow the restrictions above plus:
    - Apply between final harvest and January 1.
    - Apply only to apple blocks with an established (2 years or older) permanent cover crop that covers a minimum of 60% of the surface area in the block.
    - Application must be incorporated with a minimum of one half inch of water within 48 hours after application.
    - Apply only to orchard berms.
    - **California only:** See use precautions and stone fruit in the counties of Merced, San Joaquin and Stanislaus section of this label. [For almonds and stone fruit in the counties of Merced, San Joaquin and Stanislaus, follow supplemental labeling provided by Helena Agri-Enterprises, LLC]



## USE PRECAUTIONS ON ALMOND AND STONE FRUIT IN DEFINED AREAS OF MERCED, SAN JOAQUIN AND STANISLAUS COUNTIES OF CALIFORNIA

The use of Helena Flumioxazin 4 SC in soils common in parts of Merced, San Joaquin and Stanislaus counties in California is known to have resulted in injury to almonds under drought stress conditions. These soils are characterized by having been cut or filled, high sand content, low clay content and shallow profiles. Growers in the Defined Area must be aware and assume the risk of using Helena Flumioxazin 4 SC on almond or stone fruit crops. The Defined Area can be seen on the Map or by the description that follows:

- Intersection of Highway 4 and Escalon-Bellota Road at Farmington in San Joaquin County;
- Directly South on Escalon-Bellota to the Santa Fe Avenue and railroad tracks at Escalon
- Southeast on Santa Fe Avenue down to the Merced River;
- East following the Merced River to the Merced/Mariposa County line;
- Northwest following the Merced County line through the intersection of Merced and Stanislaus County line following the Stanislaus/Tuolumne County and Calaveras County line to Highway 4;
- West on Highway 4 back to the Farmington intersection of Escalon – Bellota Road.



## USE PRECAUTIONS FOR NON-BEARING FRUIT TREES

Non-Bearing Avocado and Fig

- trees are established less than one year, protected from spray contact by non-porous wraps, grow tubes or waxed containers.
- If applied after flowering through leaf drop, use shielded application equipment and ensure that spray drift will not come in contact with the crop foliage.

## USE DIRECTIONS

For bushberries, caneberries, citrus fruit, grape, olive, pomegranate, tree nuts, and non-bearing fruit trees, Helena Flumioxazin 4 SC as a uniform broadcast application to the orchard or vineyard floor or as a uniform band directed at the base of the bush, cane, trunk or vine. For stone fruit and pear, Helena Flumioxazin 4 SC can only be applied as a uniform band directed at the base of the trunk prior to “bud break”. For apple, Helena Flumioxazin 4 SC can only be applied as a uniform band directed at the base of the trunk prior to “silver tip”. For other pome fruit, check with Helena personnel for application timing. The preferred application timing for Helena Flumioxazin 4 SC is in the fall to maximize the potential for rainfall to activate and set the herbicide. **DO NOT** apply over the top of crop or allow spray to come in contact with crop as a result of application or drift.

## Preemergence Application

Apply 6 to 12 fl oz (maximum 6 oz/A for caneberries) of Helena Flumioxazin 4 SC per broadcast acre as a preemergence application. Make preemergence (to weed emergence) applications of Helena Flumioxazin 4 SC to a weed-free soil surface. Preemergence applications of Helena Flumioxazin 4 SC

must be completed prior to weed emergence. Moisture is necessary to activate Helena Flumioxazin 4 SC on soil for residual weed control. Dry weather following application of Helena Flumioxazin 4 SC may reduce effectiveness. However, when adequate moisture is received after dry conditions, Helena Flumioxazin 4 SC will control susceptible germinating weeds.

### **Postemergence Application**

Apply 6 to 12 fl oz (maximum 6 oz/A for caneberries) of Helena Flumioxazin 4 SC per broadcast acre plus an adjuvant (0.25% v/v non-ionic surfactant or 1 qt/A crop oil concentrate). The addition of an adjuvant enhances Helena Flumioxazin 4 SC activity on emerged weeds. Thorough spray coverage is necessary to maximize the postemergence activity of Helena Flumioxazin 4 SC.

Refer to Table 10 for weeds controlled by the residual activity of Helena Flumioxazin 4 SC. Helena Flumioxazin 4 SC should be tank mixed with a labeled burndown herbicide for control of the emerged weeds listed in Table 13. Refer to tank mix partner's label for additional weed species and increased weed heights claimed. Refer to tank mix partner's label for additional restrictions, including minimum carrier volume and crops in which tank mix partner may be used. Burndown tank mix partners include glyphosate, paraquat, 2,4-D and Rely®. Tank mixes with glyphosate or 2,4-D containing products are not recommended during the period after bloom through final harvest to ensure crop safety from drift.

Residual weed control will be reduced if vegetation prevents the Helena Flumioxazin 4 SC from reaching the soil surface. If vegetation is heavy, it is recommended to use a burndown herbicide with Helena Flumioxazin 4 SC and make a sequential Helena Flumioxazin 4 SC application prior to the emergence of new weeds.

### **Carrier Volume and Spray Pressure**

To ensure thorough coverage in burndown applications, use a minimum of 15 gallons of spray solution per acre. Use higher gallonage if dense vegetation or heavy crop residue is present.

Nozzle selection must meet manufacturer's gallonage and pressure guidelines.

### **Banded Application**

Rates listed in Table 13, Weeds Controlled by Postemergence Activity of Helena Flumioxazin 4 SC Tank Mixes, refer to a broadcast application covering the entire acre. Refer to the Band Application table in Use Information section to calculate amount needed per acre when making a banded application. 68

**Table 13. Weeds Controlled by Postemergence Activity of Helena Flumioxazin 4 SC Tank mixes**

<b>Broadleaf Weed Species</b>			
<b>Common Name</b>	<b>Scientific Name</b>	<b>Weed Height/Length (inches)</b>	<b>Application Rates</b>
Bindweed, Field <sup>(1)</sup>	<i>Convolvulus arvensis</i>	8	6 to 12 fl oz/A
Carpetweed	<i>Mollugo verticillata</i>	4	
Chickweeds			
Common	<i>Stellaria media</i>	4	
Mouseear	<i>Cerastium vulgatum</i>	4	
Cocklebur, Common	<i>Xanthium strumarium</i>	4	
Eveningprimrose, Cutleaf <sup>(2)</sup>	<i>Oenothera laciniata</i>	12	
Filaree			
Broadleaf	<i>Erodium botrys</i>	4	
Redstem	<i>Erodium cicutarium</i>	4	
Florida Beggarweed	<i>Desmodium tortuosum</i>	2	
Hemp Sesbania	<i>Sesbania exaltata</i>	8	
Jimsonweed	<i>Datura stramonium</i>	4	
Lambsquarters, Common	<i>Chenopodium album</i>	4	
Morningglories			
Entireleaf	<i>Ipomoea hederacea</i> var. <i>integriuscula</i>	4	
Ivyleaf	<i>Ipomoea hederacea</i>	4	
Pitted	<i>Ipomoea lacunose</i>	6	
Red	<i>Ipomoea coccinea</i>	4	
Tall	<i>Ipomoea purpurea</i>	4	
Mustard, Wild	<i>Brassica kaber</i>	6	
Pigweeds			
Palmer Amaranth	<i>Amaranthus palmeri</i>	6	
Redroot	<i>Amaranthus retroflexus</i>	6	
Smooth	<i>Amaranthus hybridus</i>	6	
Plantain, Broadleaf	<i>Plantago major</i>	6	
Prickly Sida (Teaweed)	<i>Sida spinosa</i>	6	
Purslanes			
Common	<i>Portulaca oleracea</i>	4	
Rock	<i>Calandrinia</i> spp.	2	
Ragweeds			
Common	<i>Ambrosia artemisiifolia</i>	2	
Giant	<i>Ambrosia trifida</i>	4	
Rice Flatsedge	<i>Cyperus iria</i>	4	
Sicklepod	<i>Senna obtusifolia</i>	4	
Smartweeds			
Ladysthumb	<i>Polygonum persicaria</i>	4	
Pale	<i>Polygonum lapathifolium</i>	4	

(continued)

Broadleaf Weed Species			
Common Name	Scientific Name	Weed Height/Length (inches)	Application Rates
Pennsylvania	<i>Polygonum pensylvanicum</i>	4	6 to 12 fl oz/A
Spotted Spurge	<i>Euphorbia maculata</i>	4	
Velvetleaf	<i>Abutilon theophrasti</i>	4	
Venice Mallow	<i>Hibiscus trionum</i>	4	
Waterhemp			
Common	<i>Amaranthus rudis</i>	2	
Tall	<i>Amaranthus tuberculatus</i>	2	

<sup>(1)</sup> Helena Flumioxazin 4 SC will only provide control of the above ground portion of bindweed. Repeated applications will be needed to control regrowth.

<sup>(2)</sup> For acceptable control, cutleaf eveningprimrose must be 12 inches or less and in the rosette stage. Add crop oil concentrate, at 1 pt/A, or non-ionic surfactant at 0.25% v/v, to glyphosate tank mixes for cutleaf eveningprimrose control, including glyphosate formulations that contain a built-in adjuvant system.

#### ADDITIONAL RESIDUAL WEED CONTROL

Helena Flumioxazin 4 SC maybe tank mixed with oryzalin (Surflan<sup>®</sup>), simazine or diuron for additional residual weed control. Always read and follow label use directions for all products being used.

#### FALLOWBED USE ON TRANSPLANTED MELON, PEPPER AND TOMATO BEDS

[For Use in Arizona, California and Hawaii only]

#### RESTRICTIONS AND LIMITATIONS

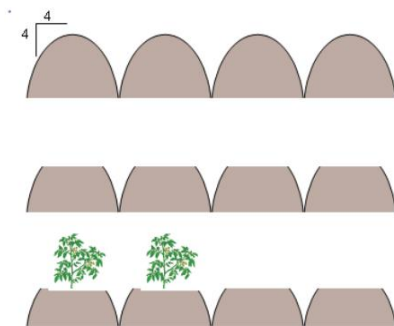
- **DO NOT** apply more than 4 fl oz of Helena Flumioxazin 4 SC per acre per application.
- **DO NOT** make more than 2 applications of Helena Flumioxazin 4 SC per acre per year.
- **DO NOT** apply more than 8 fl oz of Helena Flumioxazin 4 SC per acre per year.

Many weather related factors, including high wind or heavy rains or cool conditions at or near crop transplanting, may result in crop injury in fields treated with Helena Flumioxazin 4 SC. On occasion this has resulted in a delay in maturity. Understand and accept these risks before using Helena Flumioxazin 4 SC.

Application Rate	Adjuvant	GPA	Transplanting Interval
4 fl oz/A	Required by burndown tank mix partner	Ground – 20 to 40	2 Months
<b>Application Method:</b> Apply with a burndown herbicide labeled for the control of emerged weeds. Helena Flumioxazin 4 SC, when used alone, will not provide satisfactory control of emerged weeds.			

### Use for Preemergence Fallowbed Weed Control Prior To Transplanting

- Always read and follow all label directions when using any pesticide alone or in tank mix combinations.
- The top 4 inches of the bed, from a horizontal and vertical perspective, where the crop will be transplanted, must be removed prior to transplanting.
- Irrigate treated field after application and prior to transplanting with minimum of 1/4 inch of water if rainfall does not occur between application and transplanting.
- Use only healthy transplants. **DO NOT** use on direct seeded crops.
- [On flat beds (tomato only), the soil must be incorporated to a depth of at least 4 inches, twice, prior to transplanting. Failure to incorporate may result in stand reduction and/or crop injury.]
- This use pattern makes no claim for in-season weed control after the beds have been disturbed.



Beds are formed and Helena Flumioxazin 4 SC is applied with a burndown herbicide

A minimum of 2 months after Helena Flumioxazin 4 SC application. The tops of the beds are removed and the soil from the tops of the beds is placed in the areas between the beds.

Crops are transplanted into beds.

### DIRECTIONS FOR USE TO MAINTAIN BARE GROUND ON NON-CROP AREAS OF FARMS, ORCHARDS AND VINEYARDS

#### RESTRICTIONS AND LIMITATIONS

- **DO NOT** apply to farm alleys or roads where traffic may result in treated dust settling onto crops or other desirable vegetation.
- **DO NOT** apply to ditch banks.

Helena Flumioxazin 4 SC, when used as directed, can be used on farms, orchards and vineyards for non-selective vegetation control to maintain bare ground on non-crop areas that must be kept weed free. Follow all applicable directions as outlined above under "USE INFORMATION".

Helena Flumioxazin 4 SC offers residual and postemergence control of susceptible broadleaf and grass weeds as well as an additional mode of action to assist in the control of ALS (acetolactate synthase) resistant weeds. Helena Flumioxazin 4 SC can be tank mixed with the herbicides listed in Table 14 for increased residual or postemergence control. The length of residual control is dependent on the rate applied as well as on rainfall and temperature conditions. Length of residual control will decrease as temperature and precipitation increase. Helena Flumioxazin 4 SC rates of 6 to 12 fl oz/A are required to provide residual control of the weeds listed in Table 10.

### PREEMERGENCE APPLICATION

Apply 6 to 12 fl oz (0.188 to 0.38 lb ai/A) of Helena Flumioxazin 4 SC per broadcast acre as a preemergence application. Make preemergence (to weed emergence) applications of Helena Flumioxazin 4 SC to a weed-free soil surface. Preemergence applications of Helena Flumioxazin 4 SC must be completed prior to weed emergence. Moisture is necessary to activate Helena Flumioxazin 4 SC on soil for residual weed control. Dry weather following application of Helena Flumioxazin 4 SC may reduce effectiveness. However, when adequate moisture is received after dry conditions, Helena Flumioxazin 4 SC will control susceptible germinating weeds.

### POSTEMERGENCE APPLICATION

Apply 6 to 12 fl oz (0.188 to 0.38 lb ai/A) of Helena Flumioxazin 4 SC per broadcast acre plus an adjuvant (0.25% v/v non-ionic surfactant or 1 qt/A crop oil concentrate). The addition of an adjuvant enhances Helena Flumioxazin 4 SC activity on emerged weeds. Thorough spray coverage is necessary to maximize the postemergence activity of Helena Flumioxazin 4 SC. Emerged weeds are controlled postemergence with Helena Flumioxazin 4 SC, however, translocation of Helena Flumioxazin 4 SC within a weed is limited, and control is affected by spray coverage and by the addition of an adjuvant. The most effective postemergence weed control with Helena Flumioxazin 4 SC occurs when applied in combination with a surfactant to weeds less than 2 inches in height. Use a tank mix partner in combination with Helena Flumioxazin 4 SC for the postemergence control of weeds larger than 2 inches. Specified tank mix partners are listed in Table 14.

**IMPORTANT:** Completely read and follow the label of any potential tank mix partner with Helena Flumioxazin 4 SC. When using tank mixtures, use conditions must be in accordance with the most restrictive of the label limitations and precautions on either herbicide label.

**Table 14. Tank Mix Combinations to Maintain Bare Ground on Non-Crop Areas**

Glyphosate	2,4-D	Rely	Paraquat
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### STORAGE AND DISPOSAL

**DO NOT** contaminate water, food or feed by storage, disposal or cleaning of equipment.

#### PESTICIDE STORAGE

Keep pesticide in original container.

Store in a cool, dry, secure place.

**DO NOT** put formulation or dilute spray solution into food or drink containers.

**DO NOT** contaminate food or foodstuffs.

**DO NOT** store or transport near feed or food.

Not for use or storage in or around the home.

For help with any spill, leak, fire or exposure involving this material, call day or night (800) 892-0099.

#### PESTICIDE DISPOSAL

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

#### CONTAINER HANDLING

**Note to EPA reviewer: if this product is shipped in container small enough to shake, the following container handling statement will be added to the label:**

**[Nonrefillable Container:** Do not reuse or refill this container. Offer for recycling, if available. Clean container promptly after emptying. Triple rinse as follows: Empty the remaining contents into application equipment or a mix tank and drain for 10 seconds after the flow begins to drip. Fill the container 1/4 full with water and recap. Shake for 10 seconds. Pour rinsate into application equipment or a mix tank or store rinsate for later use or disposal. Drain for 10 seconds after the flow begins to drip. Repeat this procedure two more times.

Then offer for recycling, if available or puncture and dispose of in a sanitary landfill.]

**Note to EPA reviewer: if this product is shipped in containers greater than 50 lbs, the following container handling statement will be added to the label:**

**Container statement for nonrefillable container with liner**

**[Nonrefillable Bag: DO NOT** reuse or refill this bag. Completely empty bag by shaking and tapping sides and bottom to loosen clinging particles. Empty residue into equipment. **DO NOT** reuse bag. Dispose of bag in a sanitary landfill or by incineration if allowed by State and local authorities. Offer for recycling if available. **Liner:** Completely empty liner by shaking and tapping sides and bottom to loosen clinging particles. Empty residue into equipment. **DO NOT** reuse liner. Dispose of liner in a sanitary landfill or by incineration if allowed by State and local authorities.]

**Container statement for nonrefillable drum with liner**

**[Nonrefillable Container: DO NOT** reuse or refill this container. Offer for recycling if available. Clean container promptly after emptying. Triple rinse as follows: Empty the remaining contents into application equipment or a mix tank. Fill the container 1/4 full with water. Replace and tighten closures. Tip container on its side and roll it back and forth, ensuring at least one complete revolution, for 30 seconds. Stand the container on its end and tip it back and forth several times. Turn the container over onto its other end and tip it back and forth several times. Empty the rinsate into application equipment or a mix tank or store rinsate for later use or disposal. Repeat this procedure two more times. **Liner:** Completely empty liner by shaking and tapping sides and bottom to loosen

clinging particles. Empty residue into equipment. **DO NOT** reuse liner. Dispose of liner in a sanitary landfill or by incineration if allowed by State and local authorities.]

**Container statement for refillable container**

**[Refillable Container:** Refilling Container: Refill this container with Flumioxazin 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. When empty, return to point of sale.]

**CONDITIONS OF SALE - LIMITED WARRANTY AND LIMITATIONS OF LIABILITY AND REMEDIES**  
**Read the Conditions of Sale - Warranty and Limitations of Liability and Remedies before using this product. If the terms are not acceptable, return the product, unopened, and the full purchase price will be refunded.**

The directions on this label are believed to be reliable and must be followed carefully. Insufficient control of pests and/or injury to the crop to which the product is applied may result from the occurrence of extraordinary or unusual weather conditions or the failure to follow the label directions or good application practices, all of which are beyond the control of Helena Agri-Enterprises, LLC (the "Company") or seller. In addition, failure to follow label directions may cause injury to crops, animals, man or the environment. The Company warrants that this product conforms to the chemical description on the label and is reasonably fit for the purpose referred to in the directions for use subject to the factors noted above which are beyond the control of the Company. To the extent consistent with applicable law, The Company makes no other warranties or representations of any kind, express or implied, concerning the product, including no implied warranty of merchantability or fitness for any particular purpose, and no such warranty shall be implied by law.

The exclusive remedy against the Company for any cause of action relating to the handling or use of this product shall be limited to, at Helena Agri-Enterprises, LLC's election, one of the following:

1. Refund of the purchase price paid by buyer or user for product bought, or
2. Replacement of the product used

To the extent consistent with applicable law, the Company shall not be liable and any and all claims against the Company are waived for special, indirect, incidental, or consequential damages or expense of any nature, including, but not limited to, loss of profits or income. The Company and the seller offer this product and the buyer and user accept it, subject to the foregoing conditions of sale and limitation of warranty, liability and remedies.

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