

HELM

# HELM SULFENTRAZONE 4F

ACTIVE INGREDIENT:	(% by weight)
Sulfentrazone .....	39.6%
OTHER INGREDIENTS: .....	60.4%
TOTAL: .....	100.0%

\*Contains 4 lbs. Sulfentrazone per gallon

EPA Reg. No. 74530-63

**KEEP OUT OF REACH OF CHILDREN  
CAUTION**

See label booklet for First Aid, additional Precautionary Statements and Directions for Use

Manufactured For  
**HELM Agro US, Inc.**  
401 E. Jackson St., Suite 1400  
Tampa, FL 33602  
Phone: 813.621.8846  
Fax: 813.621.0763  
info@helmagro.com  
helmagro.com

<b>FIRST AID</b>	
<b>If Swallowed</b>	<ul style="list-style-type: none"> <li>• Call a poison control center or doctor immediately for treatment advice.</li> <li>• Have person sip a glass of water if able to swallow.</li> <li>• DO NOT induce vomiting unless told to do so by the poison control center or doctor.</li> <li>• DO NOT give anything by mouth to an unconscious person.</li> </ul>
<b>If Inhaled</b>	<ul style="list-style-type: none"> <li>• Move person to fresh air.</li> <li>• If person is not breathing, call 911 or an ambulance, then give artificial respiration, preferably by mouth-to-mouth, if possible.</li> <li>• Call a poison control center or doctor for further treatment advice.</li> </ul>
<b>If on Skin or Clothing</b>	<ul style="list-style-type: none"> <li>• Take off contaminated clothing.</li> <li>• Rinse skin immediately with plenty of water for 15-20 minutes.</li> <li>• Call a poison control center or doctor for treatment advice.</li> </ul>
<b>If in Eyes</b>	<ul style="list-style-type: none"> <li>• Hold eye open and rinse slowly and gently with water for 15- 20 minutes.</li> <li>• Remove contact lenses, if present, after the first 5 minutes.</li> <li>• Then continue rinsing eye.</li> <li>• Call a poison control center or doctor for treatment advice.</li> </ul>
<b>HOT LINE:</b> Have the product container or label with you when calling a poison control center or doctor, or going for treatment. For Chemical Emergency Assistance (Spill, Leak, Fire or Accident) call CHEMTREC at 1-800-424-9300.	
<b>NOTE TO PHYSICIAN:</b> HELM SULFENTRAZONE 4F is expected to have low oral and dermal toxicity, and moderate inhalation toxicity. It is expected to be slightly irritating to the skin and minimally irritating to the eyes. Treatment is otherwise controlled removal of exposure followed by symptomatic and supportive care.	

### PRECAUTIONARY STATEMENTS HAZARDS TO HUMANS AND DOMESTIC ANIMALS

CAUTION. Harmful if swallowed, inhaled or absorbed through skin. Causes moderate eye irritation. DO NOT breathe vapor or spray mist. DO NOT get on skin, in eyes or on clothing.

#### PERSONAL PROTECTIVE EQUIPMENT (PPE)

**Applicators and Other Handlers Must Wear:** A long-sleeved shirt & long pants; chemical-resistant gloves (Barrier laminate, Butyl rubber > 14 mils, Nitrile rubber > 14 mils, Neoprene rubber > 14 mils, Natural rubber > 14 mils, Polyvinyl chloride >14 mils or Viton > 14 mils), when mixing and loading and also when using hand-held equipment; and shoes plus socks. Follow manufacturer's instructions for cleaning and maintaining PPE. If no such instructions for washables, use detergent and hot water. Keep and wash PPE separately from other laundry. Remove and wash contaminated clothing before reuse. If clothing and other absorbent materials have been drenched or heavily contaminated with this product DISCARD and **DO NOT** reuse them.

#### USER SAFETY RECOMMENDATIONS

Users should:

- Wash hands before eating, drinking, chewing gum, using tobacco, or using the toilet.
- Remove clothing immediately if pesticide gets inside. Then wash thoroughly and put on clean clothing.
- 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 pesticide is toxic to marine /estuarine invertebrates. **DO NOT** apply directly to water or to areas where surface water is present or to intertidal areas below the mean high water mark. Drift and runoff may be hazardous to terrestrial and aquatic plants adjacent to treated areas. **DO NOT** contaminate water when disposing of equipment washwaters or rinsate.

**DO NOT use on coarse soils classified as sand, which have less than 1% organic matter.**

##### Surface water advisory:

HELM SULFENTRAZONE 4F can contaminate surface water through spray drift and under some conditions, may have a high potential for runoff into surface water (primarily via dissolution in runoff water), for several to many months post-application. Areas prone to contamination include:

- Poorly draining or wet soils with readily visible slopes toward adjacent surface waters
- Frequently flooded areas
- Areas overlying extremely shallow groundwater
- Areas with in-field canals or ditches that drain to surface water
- Areas not separated from adjacent surface waters with vegetated filter strips
- Areas over-lying tile drainage systems that drain to surface waters.

##### Groundwater advisory:

HELM SULFENTRAZONE 4F is known to leach through soil into groundwater under certain conditions as a result of label use. Use in areas where soils are permeable, especially where the water table is shallow, may result in groundwater contamination.

#### CALIFORNIA ONLY SPECIFIC RESTRICTIONS ON APPLICATIONS OF HELM SULFENTRAZONE 4F

##### Runoff Groundwater Protection Areas

DO NOT use in areas identified by the California Department of Pesticide Regulation as a runoff groundwater protection areas\* unless one of the following management practices can be met:

- 1) **Soil disturbance.** Within 7 days before this product is applied, the soil to be treated shall be disturbed by using a disc, harrow, rotary tiller, or other mechanical method. This subsection does not apply to the area treated that is immediately adjacent to the crop row and that does not exceed 33% of the distance between crop rows or, in citrus, to the band from the tree row to the dripline; or

- 2) **Incorporation of the pesticide.** Incorporate within **48 hours** after the day this product is applied on at least 90% of the area treated, using a disc, harrow, rotary tiller or other mechanical method, or by sprinkler or low flow irrigation, including chemigation where allowed by the label, using a minimum of ¼ inch of irrigation water and a maximum of one inch as described under general product application instructions, at application rates that **DO NOT** cause surface water runoff from the treated property or to wells on the treated property; or
- 3) **Band treatment.** This product is applied as a band treatment immediately adjacent to the crop row so that not more than 33% of the distance between rows is treated or, in citrus, not more than the area from the tree row to the dripline is treated; or
- 4) **Timing of application.** This product is applied between April 1 and July 31; or
- 5) **Retention of runoff on field.** Retain all irrigation runoff and all precipitation on, and drainage through the field for **six months** following the application. The field shall be designed, by berms, levees, or non-draining circulation systems. The retention area on the field shall not have a percolation rate of more than 0.2 inches per hour (5 inches per 24 hours); or
- 6) **Retention of runoff in a holding area off the field.** For **six months** following the applications, all runoff shall be channeled to a holding area off the application site, under the control of the property operator, that is designed to retain all irrigation runoff and all precipitation on, and drainage through, the treated field and all other areas draining into that holding area. The holding area shall not have a percolation rate of more than 0.2 inches per hour (5 inches per 24 hours); or
- 7) **Runoff onto a fallow field.** For six months following application, runoff shall be managed so that it runs off onto an adjacent unenclosed fallow field at least 300 feet long that is not irrigated for six months after the application with the exception of the addition of adequate moisture that is required for herbicidal activation following application as described under the product application instructions, with full consideration of any plant-back restrictions.

#### Leaching Ground Water Protection Areas

**DO NOT** use in areas designated by the California Department of Pesticide Regulation as leaching ground water protection areas\* unless either:

- 1) The user does not apply any irrigation water for six months following application of this product; or
- 2) The user applies this product to the planting bed or the berm above the level of irrigation water in the furrow or basin and the water level shall remain at or below that level for six months following the application of the pesticide with the exception of the additional of adequate moisture that is required for herbicidal activation following application as described under the product application instructions; or
- 3) Irrigation is managed so that the ratio of the amount of irrigation water applied divided by the net irrigation requirement is 1.25 or less for six months following application of this product.

\*Consult with your County Agricultural Commissioner to determine whether the application will be within an area designated by the California Department of Pesticide Regulation as either a Runoff Ground Water Protection Area or a Leaching Ground Water Protection Area. Details regarding locations of these Areas are also available via the internet at [www.cdpr.ca.gov/docs/emon/grndwtr/gwp\\_regs.htm](http://www.cdpr.ca.gov/docs/emon/grndwtr/gwp_regs.htm)

#### CHEMICAL/PHYSICAL HAZARDS

**DO NOT** store or use near heat or open flame.

### DIRECTIONS FOR USE

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

**DO NOT** apply this product in a way that will contact workers or other persons, either directly or through drift. Only protected handlers may be in the area during application.

For any requirements specific to your State or Tribe, consult the agency responsible for pesticide regulation.

**This product may only be used to control weeds listed on this label in use sites on this label.**

**DO NOT** apply more than the labeled amount of HELM SULFENTRAZONE 4F per acre per twelve-month period as stated in this label. The twelve-month period begins at the time of initial HELM SULFENTRAZONE 4F application.

### AGRICULTURAL USE REQUIREMENTS

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

**DO NOT enter or allow worker entry into treated areas during the restricted entry interval (REI) of 12 hours.** Exception: if the product is soil-injected or soil incorporated, the Worker Protection Standard, under certain circumstances, allows workers to enter the treated area if there will be no contact with anything that has been treated.

PPE required for early entry to treated areas that is permitted under the Worker Protection Standard and that involves contact with anything that has been treated, such as plants, soil, or water, is:

- coveralls over long-sleeved shirt and long pants
- chemical-resistant gloves made of any waterproof material such as polyethylene or polyvinyl chloride.
- shoes plus socks.

### RESISTANCE MANAGEMENT

The development of herbicide resistance is well understood, however it is not easily predicted. When herbicides that affect the same biological site of action are used repeatedly over several years to control the same weed species in the same field, naturally-occurring resistant biotypes may survive a correctly applied herbicide treatment, propagate, and become dominant in that field. Adequate control of these resistant weed biotypes cannot be expected. If weed control is unsatisfactory, it may be necessary to retreat the problem area using a product affecting a different site of action.

Herbicides should be used in conjunction with the resistance management strategies in the area to better manage herbicide resistance through delaying the proliferation and possible dominance of herbicide resistant weed biotypes. It may be necessary to change cultural practices within and between crop seasons such as using a combination of tillage, retreatment, tank-mix partners and/or sequential herbicide applications that have a different site of action. Weed escapes that are allowed to go to seed will promote the spread of resistant biotypes. It is advisable to keep accurate records of pesticides applied to individual fields to help obtain information on the spread and dispersal of resistant biotypes. Consult your agricultural dealer, consultant, applicator, and/or appropriate state agricultural extension service representative for specific alternative cultural practices or herbicide recommendations available in your area.

If herbicide resistance should develop in the area to Group 14 Herbicides, this product used alone may not continue to provide sufficient levels of weed control. If the reduced levels of control cannot be attributed to improper application techniques, improper use rates, improper application timing, unfavorable weather conditions or abnormally high weed pressure, a resistant strain of weeds may have developed. To reduce the potential for weed resistance use this product in a rotation program with other classes of chemistry and modes of action.

Always apply this product at the recommended rates and in accordance with the use directions. **DO NOT** use less than recommended label rates alone or in tank mixtures. **DO NOT** use reduced rates of the tank mix partner. For optimum performance, scout fields carefully before sulfentrazone application for weed identification and growth stage. Begin applications before weeds emerge or when weeds are small. It is recommended that fields be scouted after sulfentrazone application to look for poor performance or possible resistance. If resistance is suspected, report herbicide failure to local extension specialists, certified crop advisors, and/or sulfentrazone registrants.

#### **Mode of Action**

The active ingredient in HELM SULFENTRAZONE 4F is a potent inhibitor of the enzyme Protoporphyrinogen Oxidase IX (PPO IX) which is essential for the formation of chlorophyll. Inhibition of PPO IX enzyme results in the liberation of singlet oxygen (O) that, in turn, disrupts cellular membranes and causes cellular injury and leakage. The ultimate manifestation of the process is cell death leading to plant death. The selective herbicidal activity of HELM SULFENTRAZONE 4F is based on its greater affinity for the PPO IX enzyme in weed species versus crop plants.

#### **Mechanism of Action**

Following the application of HELM SULFENTRAZONE 4F to soil, germinating seeds and seedlings take up HELM SULFENTRAZONE 4F from the soil solution. The amount of HELM SULFENTRAZONE 4F in soil solution, and available for weed uptake, is determined primarily by soil type, organic matter and soil pH. See information in Application Instruction section for more details on soil type and pH effects.

## **INSTRUCTIONS AND INFORMATION**

### **PRODUCT INFORMATION**

HELM SULFENTRAZONE 4F is a liquid flowable formulation. The product is a selective, soil-applied herbicide for the control of numerous susceptible broadleaf, grass and sedge weeds formulated as a 4 pounds per gallon flowable containing the active ingredient, sulfentrazone. Adequate rainfall/irrigation (1/2" to 1") is required for activation of HELM SULFENTRAZONE 4F. If adequate moisture is not received within 7 to 10 days after the HELM SULFENTRAZONE 4F treatment, a shallow incorporation may be needed to obtain desired weed control. When activating moisture is received after dry conditions, HELM SULFENTRAZONE 4F will provide a reduced level of control of susceptible germinating weeds. Soil applications of HELM SULFENTRAZONE 4F must be made before crop seed germination to prevent injury to the emerging crop seedlings. When applications after planting are delayed, injury may occur if seeds are germinating or if they are located near the soil surface.

Observe all instructions, crop restrictions, mixing directions, application precautions, replanting directions, rotational crop guidelines and other label information of each product when tank mixing with HELM SULFENTRAZONE 4F. Users must follow the most restrictive directions for use and precautionary statements of each product in the tank mixture.

### **MIXING AND APPLICATION GUIDELINES**

#### **SPRAY VOLUMES**

##### **Ground Application:**

- Optimize spray distribution and coverage by utilizing properly calibrated sprayer equipped with appropriate nozzles, spray tips and screens.
- Adjust spray pressures to recommendations that are appropriate for the nozzle type being utilized.
- Sprayer and spray nozzles should be set to minimize the risk of fine droplets, yet achieve adequate coverage of soil or foliage coverage.
- Use nozzles that require screens no finer than 50 mesh.
- Use 10 to 40 gallons of water per acre.

When tank mixed with a contact burndown herbicide, ground applicators must use a minimum spray volume of 15 gallons per acre.

- Continuous agitation in the spray tank is required to keep the product in suspension.
- Avoid overlap and shut off spray booms while starting, turning, slowing or stopping, as injury to the crop may result.

##### **Aerial Application:**

- Aerial application is allowed only when environmental conditions prohibit ground application.
- HELM SULFENTRAZONE 4F may be applied by air using properly calibrated nozzle types and arrangements that will provide optimum coverage while producing minimal amounts of fine droplets.

For aerial applications, the maximum release height must be 10 feet from the top of the crop canopy, unless a greater application height is required for pilot safety.

- Apply sufficient spray volume to achieve adequate coverage.
- Apply a minimum of five (5) gallons of finished spray per acre.
- **DO NOT** apply when wind speed favors drift beyond the area intended for treatment.
- Continuous agitation in the spray tank is required to keep the product in suspension.
- Avoid overlap, as injury to the crop may result.

##### **Chemigation Application:**

- HELM SULFENTRAZONE 4F may be applied using sprinkler irrigation systems. Acceptable sprinkler irrigation systems include center pivot, lateral move, end tow, solid set or hand move irrigation.
- **DO NOT** apply this product through any other type of irrigation system.
- **DO NOT** connect any irrigation system (including greenhouse systems) used for pesticide application to a public water system.
- Crop injury, lack of effectiveness, or illegal pesticide residues in the crop can result from non-uniform distribution of treated water. If you have questions about calibration, you should contact State Extension Service specialists, equipment manufacturers, or other experts.
- A person knowledgeable of the chemigation system and responsible for its operation or under the supervision of the responsible person shall shut the system down and make necessary adjustments should the need arise.

**IMPORTANT NOTE:** Chemigation/Irrigation with highly alkaline water (high pH) following a HELM SULFENTRAZONE 4F soil application can also significantly increase the amount of HELM SULFENTRAZONE 4F available in soil solution. Irrigation with water having a pH greater than 7.5 may result in adverse crop response. Crop response will depend on initial product application rate, application timing, amount and pH of the irrigation water as well as the sensitivity of the crop and the growth stage when irrigated. The risk of adverse crop response will lessen with advancing growth stages of most crops.

The system must contain a functional check valve, vacuum relief valve, and low pressure drain appropriately located on the irrigation pipeline to prevent water source contamination from backflow. The pesticide injection pipeline must contain a functional, automatic, quick-closing check valve to prevent the flow of fluid back toward the injection pump. The pesticide injection pipeline must also contain a functional, normally closed, solenoid-operated valve located on the intake side of the injection pump and connected to the system interlock to prevent fluid from being withdrawn from the supply tank when the irrigation system is either automatically or manually shut down. The system must contain functional interlocking controls to automatically shut off the pesticide injection pump when the water pump motor stops. The irrigation line or water pump must include a functional pressure switch which will stop the water pump motor when the water pressure decreases to the point where pesticide distribution is adversely affected. Systems must use a metering pump such as a positive displacement injection pump (e.g., diaphragm pump) effectively designed and constructed of materials that are compatible with pesticides and capable of being fitted with a system interlock.

HELM SULFENTRAZONE 4F should be metered into the irrigation system continuously for the duration of the water application. HELM SULFENTRAZONE 4F should be diluted in sufficient volume to insure accurate application over the area to be treated. Use the appropriate amount of water to carry the product to the soil surface. **Continuous agitation** is required to maintain product suspension in the solution tank. A jar test should be conducted to ensure that phase separation would not occur during dilution and application. Failure to achieve a uniform dilution throughout the time of application may result in undesirable residues or less than desirable weed control. Flush the lines at the completion of the application and then turn the water off.

When using water from public water systems; **DO NOT** APPLY HELM SULFENTRAZONE 4F through any irrigation system **PHYSICALLY CONNECTED** to a public water system. Public water system means a system for the provision to the public of piped water for human consumption if such system has at least 15 service connections or regularly serves an average of at least 25 individuals daily at least 60 days of the year. HELM SULFENTRAZONE 4F may be applied through irrigation systems, which may be supplied by a public water system only if water from the water system is discharged 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 to top or overflow rim of the reservoir tank of at least twice the inside diameter of the fill pipe. Before beginning chemigation, always make sure that the air gap exists and that there is no blockage of the overflow of the reservoir tank.

**DO NOT** apply when wind speed favors drift beyond the area intended for treatment.

**Application with Fertilizer:**

HELM SULFENTRAZONE 4F may be applied impregnated on dry fertilizers or with liquid fertilizer solutions by following the instructions below.

**Impregnated Dry Fertilizer Application (Ground Application Only):** HELM SULFENTRAZONE 4F may be applied impregnated on dry fertilizers. HELM SULFENTRAZONE 4F impregnated on dry fertilizer will provide satisfactory weed control when applied as directed with adequate soil coverage.

Follow all HELM SULFENTRAZONE 4F label directions regarding product use rates per acre, registered crops, incorporation, special instructions and precautions. All individual state regulations relating to dry bulk fertilizer blending, registration, labeling, and application are the responsibility of the individual and/or company preparing, storing, transporting, selling or applying the HELM SULFENTRAZONE 4F dry fertilizer mixture.

**Impregnation Directions**

Impregnate this product on dry bulk fertilizer, using a closed rotary-drum mixer or other commonly used dry bulk fertilizer blender equipped with suitable spray equipment. Pre-slurry this product in a clean container using clear water. Slowly add the HELM SULFENTRAZONE 4F water slurry to the impregnation spray tank and finish filling as needed with clear water. Place spray nozzles in an appropriate arrangement that will provide uniform coverage of HELM SULFENTRAZONE 4F onto the fertilizer during mixing.

Refer to the SPRAYER EQUIPMENT CLEAN-OUT section for directions for cleaning impregnation equipment, transport equipment, loading equipment and application equipment.

Apply the HELM SULFENTRAZONE 4F dry bulk fertilizer mixture with an accurately calibrated dry fertilizer spreader. The mixture must be spread uniformly on the soil surface. Uneven spreading leaving untreated areas will cause poor weed control or overlapping areas with potential increased HELM SULFENTRAZONE 4F use rates could result in possible crop damage. A minimum of 200 pounds of dry bulk fertilizer impregnated with the recommended amount of this product must be applied per acre to achieve adequate soil coverage for satisfactory weed control.

**DO NOT** impregnate HELM SULFENTRAZONE 4F onto coated ammonium nitrate or limestone because these materials will not absorb the herbicide. Refer to the crop section of the HELM SULFENTRAZONE 4F label to determine the rate of this product to be applied per acre. Use the following table to determine the amount of product to be impregnated on a ton (2,000 pounds) of dry bulk fertilizer based on the rate of fertilizer that will be applied per acre.

Dry Fertilizer Rate (lbs/acre)	Ounces HELM SULFENTRAZONE 4F per ton of fertilizer		
	HELM SULFENTRAZONE 4F Use Rate Per Acre		
	8.0 Fluid Ounces per Acre	10.1 Fluid Ounces per Acre	12.0 Fluid Ounces per Acre
200	80	101	120
250	64	80.8	96
300	53.3	67.3	80
350	45.7	57.7	68.6
400	40	50.5	60
450	35.6	44.9	53.3

For rates not listed in the table above, calculate the amount of HELM SULFENTRAZONE 4F to be impregnated on a ton of dry bulk fertilizer using the following formula:

$$\frac{2000}{\text{Pounds of dry fertilizer}} \times \text{HELM SULFENTRAZONE 4F use rate in fluid ounces per acre} = \text{Ounces of HELM SULFENTRAZONE 4F to be applied per ton of fertilizer}$$

**Liquid Fertilizer Solution Application (Ground Application Only):** HELM SULFENTRAZONE 4F may be applied using liquid fertilizer solutions as the carrier. Fertilizer solutions may either be concentrate formulations as blended or diluted with water. When applied in fertilizer solution mixtures as directed with adequate soil coverage, HELM SULFENTRAZONE 4F will provide satisfactory weed control. Adequate soil coverage is mandatory to achieve acceptable levels of weed control.

HELM SULFENTRAZONE 4F mixing, solution stability and/or compatibility problems can occur when liquid fertilizers are used as a carrier. Compatibility tests must be conducted prior to mixing to insure tank mixture compatibility and stability. Compatibility agents may be beneficial to achieve and maintain a homogenous solution.

### Liquid Fertilizer Mixing Directions

Fill the clean spray tank to one half of the total volume with the fertilizer solution. Start the spray tank agitation system. Pre-slurry HELM SULFENTRAZONE 4F in a clean container with clean water using equal volumes of HELM SULFENTRAZONE 4F and clean water. Slowly add the HELM SULFENTRAZONE 4F/water slurry to the spray tank. Rinse the slurry container, adding the rinsate to the spray tank. Better mixing of the HELM SULFENTRAZONE 4F/water slurry may be achieved if the slurry is added using induction systems on the sprayer fill plumbing system.

Fill the spray tank to the desired level using continuous agitation. Sufficient spray tank agitation is required at all times to maintain a homogenous spray solution. The spray system must be designed such that there is sufficient flow capacity to uniformly apply the spray mixture and maintain adequate tank agitation. Separate pumps may require to simultaneously supply the spray system and the spray tank agitation system. Insure the HELM SULFENTRAZONE 4F slurry is thoroughly mixed before application.

Conduct a compatibility test for tank mixtures with other herbicide(s) to insure product compatibility before mixing. Read and follow all the directions, precautions and restrictions of the tank mixture products prior to mixing.

Apply the HELM SULFENTRAZONE 4F spray mixture immediately after mixing. **DO NOT** store the sprayer overnight or for any extended period of time with the HELM SULFENTRAZONE 4F spray mixture remaining in the tank. **DO NOT** premix HELM SULFENTRAZONE 4F spray solutions in nurse tanks. Follow all HELM SULFENTRAZONE 4F label directions regarding product use rates per acre, registered crops, application instructions, incorporation directions, special instructions and all precautions.

All individual state regulations including those relating to liquid fertilizer blending, storage, transportation, registration, labeling, and application are the responsibility of the individual and/or company preparing, selling or applying the HELM SULFENTRAZONE 4F and fertilizer mixture.

## MIXING AND LOADING INSTRUCTIONS

### Mixing with Water

For best results, fill spray tank with one half of the volume of clean water needed for the area to be treated. Start the agitation system and add HELM SULFENTRAZONE 4F to the tank. Make sure HELM SULFENTRAZONE 4F is thoroughly mixed before application or before adding another product to the spray tank.

### Use of Appropriate Surfactants

Temporary discoloration of some plants may result from use of surfactants or adjuvants with HELM SULFENTRAZONE 4F. High temperatures and high relative humidity may increase the risk of temporary discoloration. Surfactants are recommended for some crops and not recommended for others. See surfactant recommendations in crop or site details below.

HELM SULFENTRAZONE 4F may be applied alone, or in tank mixtures with other herbicides to increase the spectrum of weed control. Helm Agro has not tested all mixtures. HELM SULFENTRAZONE 4F is believed to be compatible with most other crop protection products - fungicides, insecticides, growth regulators and spray adjuvants. Conduct appropriate compatibility tests and crop safety evaluations prior to tank mixing with other pesticides. Follow all precautions and restrictions on the tank mix partner label. It is the pesticide user's responsibility to ensure that all products in the listed mixtures are registered for the intended use. Users must follow the most restrictive directions for use and precautionary statements of each product in the tank mixture.

When preparing a new tank mix conduct an appropriate compatibility test by mixing proportional amounts of all spray ingredients in a jar prior to tank mixing with other products. Shake the mixture vigorously and allow it to stand for five to ten minutes. Rapid precipitation of the ingredients and failure to re-suspend when shaken indicates that the mixture is incompatible and should not be applied. Provided the jar test indicates the mixture to be compatible, prepare the tank mixture using the mixing instructions below.

Before using HELM SULFENTRAZONE 4F it is very important the spray equipment is clean and free of any previous pesticide deposits in the tank. Use the previous product's label that was used and follow Tank Cleanout procedures that are on the label. If no procedure is provided use the cleanout procedure on the HELM SULFENTRAZONE 4F label marked SPRAYER CLEANOUT.

### Mixing Instructions

1. Fill the tank 1/2 full of water.
2. Start sprayer agitation system.
3. Pre-slurry HELM SULFENTRAZONE 4F in a clean container using clean water.
4. Slowly add the HELM SULFENTRAZONE 4F water slurry to the spray tank.
5. Rinse the slurry container, adding the rinsate to the spray tank.
6. Continue filling the spray tank to the desired level.
7. Maintain agitation at all times to maintain a uniform spray solution.
8. Before adding any other material HELM SULFENTRAZONE 4F should be thoroughly mixed with water in the spray tank.
9. Mixing order should be as follows: Fill tank half-full and add HELM SULFENTRAZONE 4F water slurry – while continue filling with water add other herbicide(s), recommended spray adjuvant and liquid nitrogen fertilizer if recommended.
10. Use the HELM SULFENTRAZONE 4F spray mixture immediately after mixing.
11. **DO NOT** store the sprayer overnight or for any extended period of time with the HELM SULFENTRAZONE 4F spray mixture remaining in the tank.
12. **DO NOT** premix HELM SULFENTRAZONE 4F spray solutions in nurse tanks.
13. If HELM SULFENTRAZONE 4F is tank mixed with other herbicides, all additional directions, restrictions and precautions for the tank mixture herbicides must be followed.

In addition, users must take appropriate steps to ensure proper equipment clean-out for any other products mixed with HELM SULFENTRAZONE 4F as required on the other product labels. More complete cleaning can be achieved if the spray system is cleaned immediately following the application.

### SPRAYER CLEANOUT

Residues left in mixing equipment, spray tanks, hoses, spray booms and nozzles can cause crop effects if they are not properly cleaned. Additionally, appropriate steps should be taken to ensure proper equipment clean-out for any other products mixed with HELM SULFENTRAZONE 4F as required on the other product labels.

To avoid injury to desirable crops, thoroughly clean all mixing and spray equipment immediately following applications of HELM SULFENTRAZONE 4F as follows:

1. Drain system completely including the tank, hoses, spray boom and spray nozzles/tips.
2. Thoroughly wash the interior surfaces of the tank with a high pressure washer.
3. Thoroughly flush tank, spray boom and hoses with clean water.
4. Remove the nozzles/tips and screens (tank, spray hose and spray tips) and clean separately in a bucket containing a 3% ammonia solution. Replace nozzles/tips and screens once cleaned.
5. Prepare a sprayer cleaning solution by adding three gallons of ammonia (containing at least 3% active) per 100 gallons of clean water. Prepare sufficient cleaning solution to allow the operation of the spray system for a minimum of 15 minutes to thoroughly flush hoses, spray boom and spray nozzles.

6. Cleaning of the sprayer will be more thorough if the ammonia solution or fresh water is left in the spray tank, hoses, spray booms and spray nozzles overnight or during storage.
7. Completely drain the sprayer system before using the sprayer.
8. Rinse the tank with clean water and flush through the hoses, spray boom, and spray nozzles with clean water.
9. After rinsing, once again remove and clean spray tips and all filters and screens (tank, spray hose and spray tip) separately in an ammonia solution.
10. Properly dispose of all cleaning solution and rinsate in accordance with Federal, State, and local regulations and guidelines.

**DO NOT** apply sprayer cleaning solutions or rinsate to sensitive crops. **DO NOT** drain or flush equipment on or near desirable trees or plants.

**DO NOT** store the sprayer overnight or for any extended period of time with HELM SULFENTRAZONE 4F spray solution remaining in the tank, spray lines, spray boom plumbing, spray nozzles or strainers. If the sprayer has been stored or idle, purge the spray boom and nozzles with clean water before beginning any application.

**DO NOT** contaminate any body of water including irrigation water that may be used on other crops.

Should small quantities of HELM SULFENTRAZONE 4F remain in inadequately cleaned mixing, loading, and/or spray equipment, they may be released during subsequent applications potentially causing effects to certain crops and other vegetation. Helm Agro accepts no liability for any effects due to inadequately cleaned equipment.

#### HANDLING INSTRUCTIONS AT MIXING SITE

HELM SULFENTRAZONE 4F must not be mixed or loaded within 50 feet of wells - including abandoned wells and drainage wells, perennial or intermittent streams and rivers, natural or impounded lakes and reservoirs, and sinkholes. This setback does not apply to properly capped or plugged abandoned wells and does not apply to impervious pads or properly diked mixing/loading areas.

Operations that involve mixing, loading, rinsing, or washing of this product into or from pesticide handling or application equipment or containers within 50 feet of any well are prohibited unless conducted on an impervious pad constructed to withstand the weight of the heaviest load that may be positioned on or moved across the pad. The impervious pad shall be designed and maintained to contain any product spills or equipment leaks, container or equipment rinse or washwater, and rainwater that may fall on the pad. The impervious pad must be self-contained and surface water must not be allowed to either flow over or from the pad. The pad shall be sloped to facilitate material removal. An unroofed pad shall be of sufficient capacity to contain at a minimum 110% of the capacity of the largest pesticide container or application equipment on the pad. A pad that is covered by a roof of sufficient size to completely exclude precipitation from contact with the pad shall have a minimum containment capacity of 100% of the capacity of the largest pesticide container or application equipment on the pad. Containment capacities as described above shall be maintained at all times. The above specific minimum containment capacities **DO NOT** apply to vehicles when delivering pesticide shipments to the mixing/loading site. States may have in effect additional requirements regarding wellhead setbacks and operational containment.

Product must be used in a manner that will prevent back siphoning in wells, spill or improper disposal of excess pesticide, spray mixtures or rinsates.

#### WEEDS CONTROLLED

HELM SULFENTRAZONE 4F applied alone or in recommended tank mixtures will provide control of the following weeds when applied in accordance with the Application information and the specific crop use directions. Refer to the specific crop section for more detail.

Common Name	Scientific Name
Amaranth, livid	<i>Amaranthus lividus</i>
Amaranth, Palmer	<i>Amaranthus palmeri</i>
Amaranth, Powell	<i>Amaranthus Powell II</i>
Amaranth, spiny	<i>Amaranthus spinosus</i>
Amaranth, spleen	<i>Amaranthus dubius</i>
Anoda, spurred	<i>Anoda cristata</i>
Bedstraw, catchweed	<i>Galium aparine</i>
Carpetweed	<i>Mollugo verticillata</i>
Chickweed, common	<i>Stellaria media</i>
Copperleaf, hophornbeam	<i>Acalypha ostryeafolia</i>
Copperleaf, Virginia	<i>Acalypha virginica</i>
Crabgrass, large	<i>Digitaria sanguinalis</i>
Crabgrass, smooth	<i>Digitaria ischaemum</i>
Crabgrass, Southern	<i>Digitaria ciliaris</i>
Croton, tropic	<i>Croton glandulosus</i>
Crownbeard, golden	<i>Verbesina encelioides</i>
Cupgrass, woolly	<i>Eriochloa villosa</i>
Cyperus, hedgehog	<i>Cyperus compressus</i>
Daisy, American	<i>Eclipta alba</i>
Devilsclaw	<i>Proboscidea louisiana</i>
Dock, curly	<i>Rumex crispus</i>
Eclipta	<i>Eclipta prostrata</i>
Filaree, redstem	<i>Erodium cicutarium</i>
Flixweed	<i>Descurainia sophia</i>
Galinsoga, hairy	<i>Galinsoga ciliata</i>

(continued)

<b>Common Name</b> <i>(continued)</i>	<b>Scientific Name</b>
Goosegrass	<i>Eleusine indica</i>
Groundcherry, clammy (seedling)	<i>Physalis heterophylla</i>
Groundcherry, cutleaf	<i>Physalis angulata</i>
Jimsonweed	<i>Datura stramonium</i>
Kochia (ALS and Triazine Resistant)	<i>Kochia scoparia</i>
Ladysthumb	<i>Polygonum persicaria</i>
Lambsquarters, common	<i>Chenopodium album</i>
Lettuce, miners	<i>Montia perfoliata</i>
Mallow, common	<i>Malva neglecta wall r.</i>
Mayweed, Chamomile	<i>Anthemis cotula l</i>
Milkweed, honeyvine	<i>Ampelamus albidus</i>
Morningglory, entireleaf	<i>Ipomoea hederacea integriuscula</i>
Morningglory, ivyleaf	<i>Ipomoea hederacea hederacea</i>
Morningglory, palmleaf	<i>Ipomoea wrightii</i>
Morningglory, purple	<i>Ipomoea turbinata</i>
Morningglory, red	<i>Ipomoea, coccinea L.</i>
Morningglory, scarlet	<i>Ipomoea coccinea</i>
Morningglory, smallflower	<i>Jacquemontia tamnifolia</i>
Morningglory, tall	<i>Ipomoea, purpurea</i>
Mustard, tumble	<i>Sisymbrium altissimum</i>
Nightshade, black	<i>Solanum nigrum</i>
Nightshade, Eastern black	<i>Solanum ptycanthum</i>
Nutsedge, purple	<i>Cyperus rotundus</i>
Nutsedge, yellow	<i>Cyperus esculentus</i>
Orchardgrass	<i>Dactylis glomerata</i>
Panicum, fall	<i>Panicum dichotomiflorum</i>
Pigweed, redroot	<i>Amaranthus retroflexus</i>
Pigweed, smooth	<i>Amaranthus hybridus</i>
Plantain, blackseed	<i>Plantago rugelii decne</i>
Plantain, narrow-leaved	<i>Plantago lanceolata</i>
Poorjoe	<i>Diodia teres</i>
Porophyllum	<i>Porophyllum rederale</i>
Poinsettia, wild	<i>Euphorbia heterophylla</i>
Purslane, common	<i>Portulaca oleracea</i>
Redmaids	<i>Calandrinia ciliata</i>
Redweed	<i>Melochia corchorifolia</i>
Sedge, annual	<i>Carex spp.</i>
Senna, coffee	<i>Cassia occidentalis</i>
Sheperdspurse	<i>Capsella bursa-pastoris</i>
Sida, prickly	<i>Sida spinosa</i>
Sida, Southern	<i>Sida acuta</i>
Smartweed, PA (seedling)	<i>Polygonum pensylvanicum</i>
Smellmellon	<i>Cucumis melo</i>
Starbur, bristly	<i>Acanthospermum hispidum</i>
Stinkgrass	<i>Eragrostis cilianensis</i>
Toadflax, yellow	<i>Linaria vulgaris</i>

*(continued)*



Common Name <i>(continued)</i>	Scientific Name
Tassleflower, red	<i>Emilio sonchifolia</i>
Thistle, Russian	<i>Salsola kali</i>
Waterhemp, common	<i>Amaranthus rudis</i>
Waterhemp, tall	<i>Amaranthus tuberculatos</i>
Waterprimrose, winged	<i>Ludwigia decurrens</i>
Witchgrass	<i>Panicum capillare</i>

### IMPORTANCE OF SOIL PH

Always determine soil pH by laboratory analysis using a 1:1 ratio of soil to water suspension.

Variations of soil pH in the same field can vary as much as 2 pH units is not uncommon. Therefore, it is recommended that subsampling for pH values that may be higher than a field average. **DO NOT** depend on composite soil samples taken for analysis of soil fertility since they may not detect areas of high pH.

The following is a non-inclusive list of potential high pH areas where sub-sampling is recommended:

- Where different soil types are evident within a field, sample soil types separately.
- Where conditions vary within a field, sample areas separately, such as:
  - areas bordered by limestone gravel roads,
  - river bottoms subject to flooding,
  - low areas in hardpan soils where evaporative ponds may occur,
  - eroded hillsides,
  - along drain tile lines, and
  - areas where drainage ditch spoil has been spread.
- Where lime has not been deeply incorporated, soil may exhibit significantly higher pH values in the upper 3 inches of soil. Composite soil samples taken at a 6-8 inch depth may not reflect the elevated pH near the surface. In these cases shallow sampling, the upper 3 inches, is advised.

### MANAGEMENT OF SPRAY DRIFT

AVOIDING SPRAY DRIFT IS THE RESPONSIBILITY OF THE APPLICATOR. Factors relating to the potential for spray drift are many. The most common is the interaction of many equipment and weather-related factors that can determine potential spray drift. The applicator and the grower are responsible for considering all these factors when making decisions. Ultimately it is the applicator that is responsible for taking all these factors into consideration when making decisions on applications. To avoid drift, **DO NOT** apply when wind speeds exceed 10 mph. **DO NOT** exceed spray pressures of 40 psi unless specified by the manufacturer of drift reducing spray tips and nozzles.

The following drift management requirements must be followed to avoid off-target movement from aerial applications. These requirements **DO NOT** apply to forestry applications, public health uses or to applications of dry materials.

1. The distance of the outermost nozzles on the boom must not exceed  $\frac{3}{4}$  the length of the wingspan or rotor.
2. Nozzles must always point backward parallel with the air stream and never be pointed downwards more than 45 degrees.
3. Observe the regulations of the State where applications are made.
4. Applicators must observe and abide by the requirements of the Aerial Drift Reduction Advisory.

### IMPORTANCE OF DROPLET SIZE

APPLYING LARGER DROPLETS REDUCES SPRAY DRIFT POTENTIAL, BUT IT WILL NOT PREVENT DRIFT IF APPLICATIONS ARE MADE IMPROPERLY OR MADE UNDER UNFAVORABLE ENVIRONMENTAL CONDITIONS. This is the best strategy to manage the potential for spray drift and is based upon larger droplets to provide better coverage and control. Factors that also can affect an applicator's decision on balancing drift control and coverage are: the presence of non-targeted crops nearby – environmental conditions – and pest pressures.

#### Controlling Droplet Size- General Techniques

- Select nozzles and application pressure that deliver medium to coarse or larger spray droplets as indicated in the nozzle manufacturer's recommendations and in accordance with ASABE\* Standard S-572.
- Select coarse to very coarse droplet size when sulfentrazone is used as a preemergent/preplant application.
- Select medium to very coarse droplet size when sulfentrazone is used postemergence with a contact burndown herbicide.
- Applicators may spray only when wind speed is between 3 and 10 mph.
- Do not apply as spray droplets smaller than medium to coarse (defined by the ASABE\* standard).

**Volume** - Nozzles with higher rated flows produce larger droplets. Use high flow rate nozzles to apply the greatest practical spray volume.

**Pressure** - WHEN HIGHER FLOW RATES ARE NEEDED, USE A HIGHER-CAPACITY NOZZLE INSTEAD OF INCREASING PRESSURE. Use the lower spray pressures recommended for the nozzle. Higher pressure reduces droplet size and does not improve canopy penetration and deposition.

**Number of Nozzles** – Use the minimum number of nozzles that provide uniform coverage.

**Nozzle Orientation** – For aerial application, the recommended practice is to orient nozzles so that the spray is released parallel to the airstream. This orientation usually produces larger droplets as compared to other nozzle orientations. Significant nozzle deflection from horizontal will reduce droplet size and increase drift potential.

**Nozzle Type** - With most nozzle types, narrower spray angles produce larger droplets. Consider using low-drift nozzles. Use a nozzle type that is designed for the intended application. Solid stream nozzles oriented straight back usually produce the largest droplets and the lowest drift potential in aerial applications.

**Boom Length** – For some aerial use patterns, reducing the effective boom length to less than  $\frac{3}{4}$  of the wingspan or rotor length may further reduce drift without reducing swath width.

**Application Height** - Set the boom at the lowest labeled height (if specified) which provides uniform coverage reduces the exposure of droplets to evaporation and wind.

**Aerial:** Applications should not be made at a height greater than 10 feet above the top of the Target plant canopy unless a greater height is required for aircraft safety. Making applications at the lowest height that is safe reduces exposure of droplets to evaporation and wind.

**Ground:** For ground equipment, the boom should be set at a height that provides uniform Coverage. The boom should remain level with the crop and have minimal bounce.

**Swath Adjustment** – When aerial applications are made with a crosswind, the swath will be displaced downwind. Therefore, on the upwind and downwind edges of the field, the applicator must compensate for this displacement by the path of the aircraft upwind. Swath adjustment or offset distance should increase when conditions favor increased drift potential (higher winds, smaller droplets, etc.).

## EFFECTS ON DRIFT POTENTIAL BY – WIND – TEMPERATURE AND HUMIDITY TEMPERATURE INVERSIONS

### Wind

Drift potential increases at wind speeds of more than 10 mph or less than 3 mph (due to inversion potential). However, many factors, including droplet size and equipment type determine drift potential at any given wind speed. AVOID GUSTY OR WINDLESS CONDITIONS. Application should be avoided below 3 mph due to variable wind direction and high inversion potential. Every applicator should be familiar with local wind patterns and how they may potentially affect spray drift.

### TEMPERATURE INVERSIONS

Temperature inversions restrict vertical air mixing, which causes small suspended droplets to remain close to the ground and move laterally in a concentrated cloud. Drift potential is high during a temperature inversion. Temperature inversions are common on nights with limited cloud cover and light to no wind and are characterized by increasing temperature with altitude. They begin to form as the sun sets and often continue into the morning. Their presence can be indicated by ground fog; however, if fog is not present, inversions can also be identified by the movement of smoke from a ground source or an aircraft smoke generator. Smoke that layers and moves laterally in a concentrated cloud (under low wind conditions) indicates an inversion, while smoke that moves upward and rapidly dissipates indicates good vertical air mixing.

### TEMPERATURE AND HUMIDITY

When making applications in hot and dry conditions, set up equipment to produce larger droplets to reduce effects of evaporation. Droplet evaporation is most severe when conditions are both hot and dry.

### SENSITIVE AREAS

The pesticide should only be applied when the wind is blowing away from sensitive areas (e.g. residential areas, bodies of water, known habitat for threatened or endangered species, non-target crops).

### OFF-TARGET MOVEMENT OF HELM SULFENTRAZONE 4F

Drift of dilute spray mixtures containing HELM SULFENTRAZONE 4F must be prevented. Observation of the preceding environmental conditions, correct application equipment design, calibration and application practices detailed in this label will significantly diminish the risk of off-target spray drift. HELM SULFENTRAZONE 4F can cause significant symptomatology by drift on to sensitive crops and other plants. This symptomatology may manifest initially as discreet, localized spots where contacted by HELM SULFENTRAZONE 4F drift mixtures. Depending on concentration of the spray solution and droplets size and also depending on the inherent sensitivity of the plants involved, these spots or lesions may or may not coalesce. These effects will usually not have lasting effects on plant growth, but will likely reduce the value of affected fruit or foliage where grade or quality is associated with appearance. In severe drift instances with particularly sensitive crops, defoliation of affected foliage could result. Failure to follow these guidelines and environmental prohibitions that then result in off-target movement or drift of HELM SULFENTRAZONE 4F on to unintended crops or plants, irrespective of severity, constitutes misapplication of this product. HELM AGRO accepts no responsibility or liability for potential crop effects that may result from such misapplication of HELM SULFENTRAZONE 4F.

## APPLICATION INSTRUCTIONS

HELM SULFENTRAZONE 4F may be applied to soil in the following use patterns:

- Preplant incorporated treatment
- Surface applied preemergence (prior to weed and/or crop emergence)
- Post-plant treatments - over-the-top and layby - in various crops.

Application methods are defined in the Crop Use Directions sections.

Pre-plant incorporated treatments require a uniform surface application followed by incorporation. Avoid incorporating to a depth greater than 2 inches or poor weed control may result. Application overlaps should be avoided or an excessive HELM SULFENTRAZONE 4F rate will result that may cause adverse crop response.

Adequate moisture is required for herbicidal activation for all soil applications and for residual activity of post-plant applications of HELM SULFENTRAZONE 4F. The optimum amount of moisture, whether supplied by rainfall or irrigation, is dependent on several factors. These factors include but are not limited to:

- existing soil moisture at application
- soil type
- organic matter
- and soil tilth

In crop situations dependent on rainfall, HELM SULFENTRAZONE 4F can await activating moisture for 10 to 14 days depending on the soil parameters described above. Once activated, HELM SULFENTRAZONE 4F will provide activity on existing weeds with the level of activity being dependent on the weed species and their size at time of activation. A shallow incorporation is recommended for destruction of any germinating weeds and to incorporate HELM SULFENTRAZONE 4F where irrigation is not available and rainfall has not provided activation, particularly for surface applications of HELM SULFENTRAZONE 4F. Herbicide incorporation will initiate the process of activation with existing soil moisture. In circumstances where prolonged periods without rainfall and/or irrigation is not possible, alternative or additional weed management practices (cultivation or post-applied herbicides) may be required.

In order to avoid adverse crop response, extreme care must be exercised and the Crop Specific Use Directions followed exactly in crops allowing post plant applications of HELM SULFENTRAZONE 4F. Over-the-top and lay-by applications will provide contact and residual weed control, depending on species. The addition of surfactants may increase contact weed control performance but may also increase the risk of adverse crop response.

### BAND TREATMENT APPLICATIONS

For band treatments, apply the broadcast equivalent rate and volume per acre. To determine these:

$\frac{\text{Band Width in Inches}}{\text{Broadcast Band Volume}} \times \text{Broadcast Rate Per Acre} = \text{Band Rate}$

$\frac{\text{Band Width in Inches}}{\text{Row Width in Inches}} \times \text{Broadcast Volume Per Acre} = \text{Band Volume}$

$\frac{\text{Band Width in Inches}}{\text{Row Width in Inches}} \times \text{Broadcast Rate Per Acre} = \text{Band Rate}$

$\frac{\text{Band Width in Inches}}{\text{Row Width in Inches}} \times \text{Broadcast Volume Per Acre} = \text{Band Volume}$

### HELM SULFENTRAZONE 4F Product Use Rates

The following directions for the selection of HELM SULFENTRAZONE 4F application rates are critical to achieve maximum weed control and maximum crop safety. The user must read and follow the specific HELM SULFENTRAZONE 4F use directions and restrictions for each crop as defined in subsequent sections of this label. The user is cautioned that some crops respond differently to HELM SULFENTRAZONE 4F. This response is tied to the HELM SULFENTRAZONE 4F application rate, various soil factors and inherent crop sensitivity. The Crop Specific Use Directions have been designed to minimize the risk of adverse crop response while maintaining optimum weed control.

Germinating seeds and seedlings pick up HELM SULFENTRAZONE 4F from the soil solution following the application of HELM SULFENTRAZONE 4F to soil. The amount of available HELM SULFENTRAZONE 4F in soil solution for weed uptake is determined primarily by soil type, organic matter and soil pH. Sulfentrazone adsorbs to clay and organic matter (OM) fractions of soils; effectively limiting the amount of active ingredient immediately available to control weeds. Soils typically increase in clay content through the series from coarse to fine as noted in the following Soil Classification Chart:

**Soil Classification Chart**

COARSE	MEDIUM	FINE
Sand	Sandy clay loam	Silty clay loam
Loamy sand	Sandy clay	Silty clay
Sandy loam	Loam	Clay loam
	Silt Loam	Clay
	Silt	

**Influence of Soil type, organic matter and pH on HELM SULFENTRAZONE 4F Use Rates and Crop Response.**

Soil organic matter content varies widely and independently of soil type and requires an accurate analysis of representative soil samples to determine its content. Soil pH also exerts a dramatic effect on HELM SULFENTRAZONE 4F availability in the soil solution - as soil pH increases, HELM SULFENTRAZONE 4F availability increases.

Accurate soil pH information will require an accurate analysis of representative soil samples. The total amount of HELM SULFENTRAZONE 4F available in solution, in any given soil, is determined by the complex interaction of soil type (clay content), % organic matter and pH. The application timing (relative to the emergence of the crop and weeds) and amount of rainfall and/or irrigation received will ultimately determine, in conjunction with the soil parameters and pH, the amount of HELM SULFENTRAZONE 4F in soil solution. It is important to note that HELM SULFENTRAZONE 4F can await activating moisture for 10 to 14 days. However, diminished weed control may result due to the successive increase in weed growth versus timing of activation.

Irrigation with highly alkaline water (high pH) following a HELM SULFENTRAZONE 4F soil application can significantly increase the amount of HELM SULFENTRAZONE 4F available in the soil solution. Irrigation with water having a pH greater than 7.5 may result in adverse crop response. This response will ultimately depend on numerous factors including initial HELM SULFENTRAZONE 4F application rate, timing, amount and pH of irrigation water and sensitivity of the crop and its growth stage when irrigated. The risk of adverse crop response will lessen with the advance in growth stage among most crops. The following Crop Specific Use Directions have been designed with specific HELM SULFENTRAZONE 4F recommendations for each crop based on the soil type, soil organic matter, and soil pH interactions described above. The user is cautioned that crop tolerance and weed control performance are based on strict adherence to these recommendations.

**TURF GRASSES AND SOD PRODUCTION**

Including Residential and Institutional Lawns, Athletic Fields, Golf Course Fairways and Roughs and Commercial Sod Farms

**Application/Turfgrass and Sod Safety**

Apply HELM SULFENTRAZONE 4F to established seeded, sodded or sprigged turf grasses after the second mowing for the control of key grass, sedge and broadleaf weeds. It is essential that the grass has a good/developed root system, a uniform stand with healthy root systems to fill in the exposed edges prior to application. Injury may result from application of this product to sod that is not well established or has been weakened by stresses such as unfavorable weather conditions, diseases, chemical, recent harvesting or mechanical influences. HELM SULFENTRAZONE 4F contains sulfentrazone which is a selective soil applied herbicide for the control of certain broadleaf weeds grasses and sedges. It will control numerous susceptible species when applied according to directions.

The mode of action of HELM SULFENTRAZONE 4F involves active ingredient uptake by weed roots and shoots. HELM SULFENTRAZONE 4F may be tank mixed with other herbicides labeled for use in turf. When tank mixing HELM SULFENTRAZONE 4F observe all instructions, mixing directions, application precautions and other label information of each product.

<b>Turf Grass Tolerance: When applied as directed, the following established turf grasses are tolerant to HELM SULFENTRAZONE 4F at the recommended use rates.</b>		
When applied as directed under the conditions described, the following established turf grasses are tolerant to HELM SULFENTRAZONE 4F at the recommended use rates in a range from 0.125 to 0.375 lb. a.i./acre (4 to 12 fl. oz./acre or 0.092 to 0.275 fl. oz./1,000 sq. ft).		
<b>Cool Season Grasses (see note below)</b>		
<b>Maximum Use Rate of a Single Application</b>		
	<b>Fluid ounces HELM SULFENTRAZONE 4F per Acre</b>	<b>Pound Active Ingredient per Acre</b>
Bentgrass, creeping	4	0.125
Fescue, fine * ( <i>Festuca rubra</i> ) Fescue, tall * ( <i>Festuca arundinacea</i> ) Ryegrass, perennial ( <i>Lolium perenne</i> ) Bluegrass, Kentucky ( <i>Poa pratensis</i> ) Bluegrass, Rough ( <i>Poa trivialis</i> )	4 - 8	0.125 – 0.25
*Applications of HELM SULFENTRAZONE 4F to certain varieties of Chewings Fine Fescue or Tall Fescue may result in undesirable plant response.		
<b>Restriction</b>		
Do not apply more than 12 fluid ounces (0.375 pound active) per acre of HELM SULFENTRAZONE 4F per twelve month period. The twelve month period is considered to begin upon the initial HELM SULFENTRAZONE 4F application.		

Warm Season Grasses (see note below)		
	Maximum Use Rate of a Single Application	
	Fluid ounces HELM SULFENTRAZONE 4F per Acre	Pound Active Ingredient per Acre
Bahiagrass ( <i>Paspalum notatum</i> ) Buffalograss ( <i>Buchloe dactyloides</i> ) Carpetgrass ( <i>Axonopus affinis</i> ) Centipedegrass ( <i>Eremochloa ophioides</i> ) Kikuyugrass ( <i>Pennisetum clandestinum</i> ) Seashore Paspalum ( <i>Paspalum vaginatum</i> ) Zoysiagrass ( <i>Zoysia japonica</i> ) Bermudagrass ( <i>Cynodon dactylon</i> ) Bermudagrass Hybrids ( <i>Cyn Bluegrass</i> ) St. Augustinegrass ( <i>Stenotaphrum secundatum</i> )	8 - 12	0.25 – 0.375
NOTE: It is important to note that not all varieties or cultivars have been evaluated under treatment with HELM SULFENTRAZONE 4F. Consult university or extension weed management specialists for additional information on specific local varieties or cultivars and any other pertinent information on HELM SULFENTRAZONE 4F under specific local conditions.		
<b>Restriction</b> Do not apply more than 12 fluid ounces (0.375 pound active) per acre of HELM SULFENTRAZONE 4F per twelve month period. The twelve month period is considered to begin upon the initial HELM SULFENTRAZONE 4F application.		

#### Applications to Reseeded, Overseeded or Sprigged Areas

Turf grass treated with HELM SULFENTRAZONE 4F may be reseeded, overseeded or sprigged following application. However, if reseeding, overseeding or sprigging is done within 1 month following a HELM SULFENTRAZONE 4F treatment, the establishment of desirable grasses may be inhibited. Overseeding of bermudagrass with perennial ryegrass may be done 2 to 4 weeks following an application provided slight grass plant response can be tolerated. Optimum reseeding and overseeding results may be obtained with the use of mechanical or power seeding equipment, and where proper soil cultivation, irrigation and fertilization practices are followed.

#### Applications to Sod Production Areas

This product may be applied to established sod. Allow sod to establish a good root system, a uniform stand and to fill in the exposed edges. It is recommended that sod be established for at least three (3) months before an application of HELM SULFENTRAZONE 4F.

**DO NOT** apply this product within three (3) months of sod harvest.

**Adjuvant use and Sod discoloration:** Good spray coverage is required for optimum control of weeds. Temporary discoloration of some sod species may result from use of surfactant, thus use of surfactants is not recommended.

If Primo is either tank-mixed or applied within 7 days of an application HELM SULFENTRAZONE 4F temporary discoloration of turf grass has been observed. It is recommended that Primo applications be made 7 days prior to, or after a HELM SULFENTRAZONE 4F application to reduce risk of turf grass discoloration. It is the pesticide user's responsibility to ensure that all products in the listed mixtures are registered for the intended use. Users must follow the most restrictive directions for use and precautionary statements of each product in the tank mixture.

#### Restrictions

- **DO NOT** apply to golf course putting greens or tees.
- **DO NOT** use on turf grasses other than those listed on this label
- **DO NOT** apply more than 12.0 fluid ounces (0.375 lb active) per acre of HELM SULFENTRAZONE 4F in a single application.
- **DO NOT** apply more than 12 fluid ounces (0.375 lb active) per acre of HELM SULFENTRAZONE 4F per twelve month period. The twelve month period is considered to begin upon the initial HELM SULFENTRAZONE 4F application.
- **DO NOT** apply with surfactants unless previous experience has demonstrated combinations with surfactant to be physically compatible and non-injurious to the grass type in question.
- **DO NOT** graze or feed livestock forage cut from areas treated with HELM SULFENTRAZONE 4F.
- **DO NOT** apply directly to landscape ornamental foliage or ornamental beds containing dormant bulbs or non-woody perennials when applying to turf or sod.
- Sod production areas must be established three (3) months prior to the initial treatment of HELM SULFENTRAZONE 4F.

#### Postemergence Control of Sedges

HELM SULFENTRAZONE 4F may be applied at the rate of 4 to 12 fluid ounces per acre to established turf grasses for the control or suppression of sedges. Select the correct HELM SULFENTRAZONE 4F use rate from table above.

When applied as directed, HELM SULFENTRAZONE 4F will provide control or suppression of the following sedges.	
Common Name	Scientific Name
Kyllinga, green	<i>Kyllinga brevifolia</i>
Kyllinga, false green	<i>Kyllinga gracillima</i>
Nutsedge, purple*	<i>Cyperus rotundus</i>
Nutsedge, yellow	<i>Cyperus esculentus</i>
Sedge, cylindrical	<i>Cyperus retrorsus</i>
Sedge, globe	<i>Cyperus globulosus</i>
Sedge, Surinam	<i>Cyperus surinamensis</i>
Sedge, Texas	<i>Cyperus polystachyos</i>

\*Purple nutsedge: Split applications are recommended for optimum control of purple nutsedge. Apply 4 - 8 ounces per acre as an initial application followed by a second application when evidence of actively growing purple nutsedge is visible. **DO NOT** exceed the maximum rate per acre based on the turf variety as listed in table above on tolerant grasses.

Split Application Rates for Optimum Purple Nutsedge Control		
Grass Type	First Application	Second Application
Cool Season Grasses	2-4 fl. ounces	2-6 fl. ounces
Warm Season Grasses	4-6 fl. ounces	4-6 fl. ounces

Allow 35 days after first application for second application.

#### Postemergence Control of Grassy Weeds

Apply HELM SULFENTRAZONE 4F at a rate of 4 to 12 fl oz/acre for control or suppression of specific annual grasses. Apply the highest rate consistent with the rate needed from the turf grass tolerance table above. Rates lower than 12 fl oz/acre will generally control grasses for at least 60 days. HELM SULFENTRAZONE 4F works best if applied when the annual grasses are small (pre tiller stage) and actively growing.

Common Name	Scientific Name
Goosegrass	<i>Eleusine indica</i>

#### Postemergence Control of Broadleaf Weeds

HELM SULFENTRAZONE 4F will control or suppress the broadleaf weeds listed in the chart below if applied alone shortly after weeds have emerged. Apply at 4 to 12 fluid ounces per acre to established turf grasses for the control or suppression of broadleaf weeds. Select the correct HELM SULFENTRAZONE 4F use rate from turf grass tolerance table above. For optimum results, applications should be made shortly after weeds have emerged. HELM SULFENTRAZONE 4F may be tank mixed with other herbicides, insecticides and fungicides registered for use on turf grasses. Read and follow the label recommendations of the tank mix partner to determine turf grass species tolerance, use rates and application requirements. Follow all label restrictions, use directions and precautionary statements before use.

When applied as directed, HELM SULFENTRAZONE 4F will provide control or suppression of the following broadleaf weeds in Sod Production Fields.	
Broadleaves	Scientific Name
Bittercress	<i>Cardamine spp.</i>
Black Medic	<i>Medicago lupulina</i>
Buttercup	<i>Ranunculus spp.</i>
Carolina geranium	<i>Geranium carolinianum</i>
Carpetweed	<i>Mollugo verticillata</i>
Chickweed, common	<i>Stellaria media</i>
Chickweed, mouseear	<i>Cerastium vulgatum</i>
Cinquefoil	<i>Potentilla spp.</i>
Clover	<i>Trifolium spp.</i>
Cudweed	<i>Gnaphalium spp.</i>
Dandelion	<i>Taraxacum officinale</i>
Dock, curly	<i>Rumex crispus</i>
Evening primrose	<i>Oenothera biennis</i>
Fiddleneck	<i>Amsinckia spp.</i>
Filaree	<i>Erodium spp.</i>
Garlic, wild	<i>Allium vineale</i>
Goldenrod	<i>Solidago spp.</i>
Ground ivy	<i>Glechema hederacea</i>
Henbit	<i>Lamium amplexicaule</i>
Knotweed, prostrate	<i>Polygonum aviculare</i>
Kochia	<i>Kochia scoparia</i>
Lambsquarters, common	<i>Chenopodium album</i>
Lawn burweed	<i>Soliva pterosperma</i>
Lespedeza, common	<i>Lespedeza striata</i>
Mallow, common	<i>Malva neglecta</i>
Onion, wild	<i>Allium canadense</i>
Parsley piert	<i>Alchemilla arvensis</i>
Pigweed, redroot	<i>Amaranthus retroflexus</i>
Pigweed, tumble	<i>Amaranthus albus</i>

(continued)

<b>When applied as directed, HELM SULFENTRAZONE 4F will provide control or suppression of the following broadleaf weeds in Sod Production Fields. (continued)</b>	
Pineapple weed	<i>Matricaria matricariode</i>
Plantain, buckhorn	<i>Plantago lanceolata</i>
Puncture weed	<i>Tribulus terrestris</i>
Purslane, common	<i>Portulaca oleracea</i>
Pusley, Florida	<i>Richardia scabra</i>
Redweed	<i>Melochia corchorifolia</i>
Rocket, London	<i>Sisymbrium irio</i>
Smartweed, PA	<i>Polygonum pensylvanicum</i>
Sorrel, red	<i>Rumex acetosella</i>
Speedwell	<i>Veronica spp.</i>
Spurge, annual	<i>Euphorbia spp.</i>
Spurge, prostrate	<i>Euphorbia humistrata</i>
Spurge, spotted	<i>Euphorbia maculata</i>
Star of Bethlehem	<i>Omithogalum umbellatum</i>
Velvetleaf	<i>Abutilon theophrasti</i>
Violet, wild	<i>Viola pratincola</i>
Woodsorrel, creeping	<i>Oxalis corniculata</i>
Woodsorrel, yellow	<i>Oxalis stricta</i>

#### Precautions

The addition of surfactants may cause temporary undesirable effects to turf grasses.

#### Restrictions

- Sod production areas must be established three (3) months prior to the initial treatment of HELM SULFENTRAZONE 4F.
- **DO NOT** apply HELM SULFENTRAZONE 4F to golf course greens or tees.
- **DO NOT** apply HELM SULFENTRAZONE 4F to turf grasses not listed on this label.
- **DO NOT** apply with surfactants without on-site evaluations for spray mixture compatibility and physical effects to turf grasses.
- **DO NOT** graze or feed forage harvested from HELM SULFENTRAZONE 4F treated areas.
- **DO NOT** apply to landscape ornamental plants or ornamental beds.
- **DO NOT** harvest sod within three (3) months of HELM SULFENTRAZONE 4F application.
- **DO NOT** apply more than 12.0 fluid ounces (0.375 lb active) per acre of HELM SULFENTRAZONE 4F in a single application.
- **DO NOT** apply more than 12 fluid ounces (0.375 lb active) per acre of HELM SULFENTRAZONE 4F per twelve month period. The twelve month period is considered to begin upon the initial HELM SULFENTRAZONE 4F application.

### OTHER SPECIFIC USE DIRECTIONS

#### NON-CROP

#### COMMERCIAL CONTAINER AND FIELD GROWN ORNAMENTALS (NOT FOR USE IN CALIFORNIA)

##### Application/Plant Safety

Apply HELM SULFENTRAZONE 4F to container and field grown ornamentals for the control of key grass, sedge and broadleaf weeds. **DO NOT APPLY OVER-THE-TOP.**

##### USE PRECAUTIONS

- Direct application of HELM SULFENTRAZONE 4F to actively growing foliage can cause unacceptable injury to desirable plants. See Compatible Plants Table below for a list of compatible plants. To reduce injury, apply HELM SULFENTRAZONE 4F as a directed spray to the soil around the base of the plant. Avoid application directly to plant foliage. If foliage is contacted during application apply overhead irrigation to the foliage to wash HELM SULFENTRAZONE 4F from plant surfaces onto soil.
- **DO NOT** apply to areas where ornamental bulbs or dormant non-woody perennials are present. HELM SULFENTRAZONE 4F is soil active and may damage these plants upon emergence.
- **DO NOT APPLY OVER-THE-TOP.**

##### Method and Rate of Application

HELM SULFENTRAZONE 4F is most effective when applied to soil free of clods and debris such as leaves or mulch. When applied preemergence, the herbicide must be activated with moisture, thus treated area should receive at least 0.25 inches of irrigation or rainfall after application to optimize efficacy.

The addition of liquid fertilizers can increase the probability of superficial damage to green plant tissue inadvertently treated if applied with HELM SULFENTRAZONE 4F.

When plants are under stress - from various causes but not limited to heat, drought or frost – some cultivars of listed plants may be sensitive to HELM SULFENTRAZONE 4F.

HELM SULFENTRAZONE 4F Compatible Plants Table	
Common Name	Scientific Name
Abelia	<i>Abelia X grandiflora</i>
Arborvitae	<i>Thuja sp.</i>
Azalea and Rhododendron	<i>Rhododendron sp.</i>
Boxwood Species	<i>Buxus sp.</i>
Bridal - Wreath	<i>Spirea sp.</i>
Butterfly Bush	<i>Buddleia davidii</i>
Crape Myrtle	<i>Lagerstroemia indica</i>
Creeping Juniper	<i>Juniperus horizontalis</i>
Douglas Fir	<i>Pseudotsuga menziesii</i>
Dwarf Yaupon Holly	<i>ILex vomitora 'Nana'</i>
Fir Species (Fraser, Balsam, etc)	<i>Abies fraseri</i>
Juniper	<i>Juniperus sp.</i>
Meserve Holly	<i>ILex x meserveae</i>
Norway Spruce	<i>Abies picea</i>
Rose	<i>Rosa sp.</i>
Rotunda Holly	<i>ILex Rotunda</i>
Southern Magnolia	<i>Magnolia gradiflora</i>
Taxus sp.	<i>Yew</i>

**Application Sites/Instructions and Rates/Instructions for Container and Field Grown Ornamentals**

Application Sites and Instructions	
Sites	Application Instructions
Newly-Transplanted Container or Field Nursery Stock	<ul style="list-style-type: none"> <li>Apply after new transplant material has formed roots and is well established.</li> <li><b>DO NOT</b> apply until soil has settled around transplants.</li> <li>Direct application toward base of plant to avoid terminal and bud area of plant.</li> </ul>
Established Container, Field Nursery Stock Plants, or Landscape Plants	<ul style="list-style-type: none"> <li>Apply at any time as a directed spray toward the base of the plant.</li> </ul>
Application Rate for Container and Field Grown Ornamentals	
Amount to Apply (Broadcast)*	Instructions
4 -12 fl oz/A 0.092 – 0.275 fl oz/1000 sq ft	<ul style="list-style-type: none"> <li>Use 8-12 fl oz/A for sedges and perennial weeds.</li> <li>Multiple applications may be made if needed as long as total amount applied in one year does not exceed 12 fl oz/A.</li> <li>Direct application toward base of plants.</li> </ul>
* <b>DO NOT</b> use on food producing trees, vines, or plants.	

**Preemergence control of annual broadleaf weeds and sedges**

HELM SULFENTRAZONE 4F will control or suppress the weeds listed in the table below. Apply prior to weed germination, at a rate of 4 to 12 fluid ounces per acre (0.092 to 0.275 fl. ounces/1,000 square feet). To broaden the weed spectrum and increase effectiveness for certain weeds listed in table below, HELM SULFENTRAZONE 4F may be tank mixed with other registered preemergence this label to determine compatibility of tank mixtures. Consult the label for application instructions for each of the tank mix products. Follow all label restrictions, use directions and precautionary statements before using these tank mixtures. Control of emerged annual grass weeds may be improved by combining HELM SULFENTRAZONE 4F with other post emergence herbicides.

**Restrictions**

- DO NOT** apply more than 12.0 fluid ounces (0.375 lb active) per acre of HELM SULFENTRAZONE 4F in a single application.
- DO NOT** apply more than 12 fluid ounces (0.375 lb active) per acre of HELM SULFENTRAZONE 4F per twelve month period. The twelve month period is considered to begin upon the initial HELM SULFENTRAZONE 4F application.

**Postemergence Control of Broadleaf Weeds**

HELM SULFENTRAZONE 4F will control or suppress the broadleaf weeds listed in the table below if applied alone shortly after weeds have emerged. Apply at 4 to 12 fluid ounces per acre (0.092 to 0.275 fl. ounces/1,000 square feet) to established turf grasses for the control or suppression of broadleaf weeds. Select the correct HELM SULFENTRAZONE 4F use rate from turf grass tolerance table above. For optimum results, applications should be made shortly after weeds have emerged. To broaden the weed spectrum and increase effectiveness for certain weeds listed in the table below, HELM SULFENTRAZONE 4F may be tank mixed with other herbicides, insecticides and fungicides registered for use on turf grasses. Read and follow the label recommendations of the tank mix partner to determine turf grass species tolerance, use rates and application requirements. Control of emerged annual grass weeds may be improved by combining HELM SULFENTRAZONE 4F with other registered post emergence herbicides. Follow all label restrictions, use directions and precautionary statements before use.

**When applied as directed, HELM SULFENTRAZONE 4F will provide control or suppression of the following broadleaf weeds in Container and Field Grown Ornamentals**

<b>Broadleaves</b>	<b>Scientific Name</b>
Bedstraw, catchweed	<i>Galium aparine</i>
Beggarweed, Florida	<i>Desmodium tortuosum</i>
Bittercress	<i>Cardamine spp.</i>
Black Medic	<i>Medicago lupulina</i>
Buttercups	<i>Ranunculus spp.</i>
Carolina geranium	<i>Geranium carolinianum</i>
Carpetweed	<i>Mollugo verticillata</i>
Chickweed, common	<i>Stellaria media</i>
Chickweed, mouseear	<i>Cerastium vulgatum</i>
Cinquefoil	<i>Potentilla spp.</i>
Clover	<i>Trifolium spp.</i>
Copperleaf	<i>Ascalypha spp.</i>
Cudweed	<i>Gnaphalium spp.</i>
Dandelion	<i>Taraxacum officinale</i>
Dock, curly	<i>Rumex crispus</i>
Evening primrose	<i>Oenothera biennis</i>
Dollarweed	<i>Hydrocotyl umbellata</i>
Eclipta	<i>Eclipta prostrata</i>
Evening primrose	<i>Oenothera biennis</i>
Fiddleneck	<i>Amsinckia spp.</i>
Filaree	<i>Erodium spp.</i>
Galinsoga	<i>Galinsoga ciliate</i>
Goldenrod	<i>Solidago spp.</i>
Ground ivy	<i>Glechema hederasea</i>
Groundsel, common	<i>Senecio vulgaris</i>
Henbit	<i>Lamium amplexicaule</i>
Knawel	<i>Scleranthus annuus</i>
Knotweed, prostrate	<i>Polygonum aviculare</i>
Kochia	<i>Kochia scoparia</i>
Lawn burweed (spurweed)	<i>Soliva pterosperma</i>
Lambsquarters, common	<i>Chenopodium album</i>
Lawn burweed	<i>Soliva pterosperma</i>
Lespedeza, common	<i>Lespedeza striata</i>
Mallow, common	<i>Malva neglecta</i>
Parsley piert	<i>Alchemilla arvensis</i>
Pigweed, redroot	<i>Amaranthus retroflexus</i>
Pigweed, smooth	<i>Amaranthus hybridus</i>
Pigweed, tumble	<i>Amaranthus albus</i>
Pineapple weed	<i>Matricaria matricariode</i>
Plantain, buckhorn	<i>Plantago lanceolata</i>
Puncture weed	<i>Tribulus terrestris</i>
Purslane, common	<i>Portulaca oleracea</i>
Pusley, Florida	<i>Richardia scabra</i>
Redweed	<i>Melochia corchorifolia</i>
Rocket, London	<i>Sisymbrium irio</i>

(continued)



<b>When applied as directed, HELM SULFENTRAZONE 4F will provide control or suppression of the following broadleaf weeds in Container and Field Grown Ornamentals</b> (continued)	
Shepherd's purse	<i>Capsella bursa-pastoris</i>
Smartweed, Pennsylvania	<i>Polygonum pennsylvanicum</i>
Sorrel, red	<i>Rumex acetosella</i>
Speedwell	<i>Veronica spp.</i>
Spurge, annual	<i>Euphorbia spp.</i>
Spurge, prostrate	<i>Euphorbia humistrata</i>
Spurge, spotted	<i>Euphorbia maculata</i>
Star of Bethlehem	<i>Omithogalum umbellatum</i>
Velvetleaf	<i>Abutilon theophrasti</i>
Violet, wild	<i>Viola pratincola</i>
Violet, Johnny-jump-up	<i>Viola rafeinesquii</i>
Wild garlic	<i>Allium vineale</i>
Wild onion	<i>Allium canadense</i>
Woodsorrel, creeping	<i>Oxalis corniculata</i>
Woodsorrel, yellow	<i>Oxalis stricta</i>

#### Postemergence Control of Sedges

HELM SULFENTRAZONE 4F may be applied at the rate of 4 to 12 fluid ounces per acre (0.092 to 0.275 fluid ounces/1,000 square feet) to established ornamentals for the control or suppression of sedges. Select the correct HELM SULFENTRAZONE 4F use rate from table above and apply the highest rate consistent with the rate needed for ornamental safety. Rates lower than 12 fl oz/acre (0.275 fl. oz/1,000 sq. ft.) will generally control/suppress sedges for at least 60 days. A rate of 12 fl oz/acre (0.275 fl. oz/1,000 sq. ft.) will provide approximately 75% control for at least 60 days. Good spray coverage is needed for optimum control of sedges. Temporary discoloration of some ornamental species may result from use of surfactant. Use of surfactants is not recommended.

<b>When applied as directed, HELM SULFENTRAZONE 4F will provide control or suppression of the following sedges.</b>	
<b>Common Name</b>	<b>Scientific Name</b>
Kyllinga, green	<i>Kyllinga brevifolia</i>
Kyllinga, false green	<i>Kyllinga gracillima</i>
Nutsedge, purple*	<i>Cyperus rotundus</i>
Nutsedge, yellow	<i>Cyperus esculentus</i>
Sedge, cylindrical	<i>Cyperus retrorsus</i>
Sedge, globe	<i>Cyperus globulosus</i>
Sedge, Surinam	<i>Cyperus surinamensis</i>
Sedge, Texas	<i>Cyperus polystachyos</i>

\*Purple nutsedge: Split applications are recommended for optimum control of purple nutsedge. Apply 4 - 8 ounces per acre as an initial application followed by a second application when evidence of actively growing purple nutsedge is visible. **DO NOT** exceed the maximum rate per acre based on the ornamental variety as listed in table above on tolerant grasses.

## **RIGHTS-OF WAYS - INCLUDING RAILROAD, HIGHWAY, ROADSIDE, PIPELINE, UTILITY, INDUSTRIAL AREAS, FENCE ROWS AND OTHER LISTED NON-CROP SITES**

### Application

Apply HELM SULFENTRAZONE 4F to the following sites:

- Railroad rights-of-way, including railroad yards, railroad crossings and railroad bridge abutments to control weeds and maintain bare ground.
- Highway, roadside, pipeline and utility rights-of-way. Such areas would include, but are not limited to, guard rails, road shoulders, electric utility substations, pipeline pumping stations, around electric transmission towers, around distribution line poles and in other areas where complete vegetation control is desired.
- Industrial areas including production facilities, tank farms, storage areas, parking areas, lumber yards, airports, military installations, along fence rows, and in similar non-crop sites where complete vegetation control is needed.
- Apply alone or in combination with other herbicides for residual control of weeds in early Spring, late Summer or Fall, or early Spring to insure adequate moisture for soil activation.

### Method and Rate of Application

Apply this product as a broadcast treatment at 8 to 12 fluid ounces (0.25 to 0.375 lb active ingredient) per acre by ground in a minimum of 10 gallons of spray solution per acre for residual control of germinating weeds in non-crop land. Applications may be made by helicopter on railroad rights-of-way only.

Use labeled rates of burndown herbicides such as glyphosate, diquat, 2,4-D, dicamba, etc. as tank mixtures with HELM SULFENTRAZONE 4F. Use recommended adjuvants for the herbicide tank mix partner. Refer to the specific product labels for all restrictions on tank mixing and observe all label precautions, instructions and rotational cropping restrictions for all products used in tank mixes.

- **DO NOT** apply more than 12.0 fluid ounces (0.375 lb active) per acre of HELM SULFENTRAZONE 4F in a single application.
- **DO NOT** apply more than 12 fluid ounces (0.375 lb active) per acre of HELM SULFENTRAZONE 4F per twelve month period. The twelve month period is considered to begin upon the initial HELM SULFENTRAZONE 4F application.

Railroads Right-Of-Way Crop Weed List	
Amaranth, Palmer	<i>Amaranthus palmeri</i>
Beggarweed, Florida	<i>Desmodium tortuosum</i>
Carpeweed	<i>Mollugo verticillata</i>
Chickweed, common	<i>Stellaria media</i>
Copperleaf, hophornbeam	<i>Acalypha ostryeafolia</i>
Crabgrass species	<i>Digitaria spp.</i>
Croton, tropic	<i>Croton glandulosus</i>
Daisy, American	<i>Coreopsis grandiflora</i>
Dayflower, common	<i>Commelina communis</i>
Dayflower, Virginia	<i>Commelina virginica</i>
Dock, curly	<i>Rumex crispus</i>
Flixweed	<i>Descurainia sophia</i>
Galinsoga, hairy	<i>Galinsoga ciliata</i>
Groundcherry, clammy (seedling)	<i>Physalis heterophylla</i>
Groundcherry, cutleaf	<i>Physalis angulata</i>
Jimsonweed	<i>Datura stramonium</i>
Kochia (ALS and Triazine Resistant)	<i>Kochia scoparia</i>
Lambsquarters, common	<i>Chenopodium album</i>
Lettuce, wild	<i>Lactuca virosa</i>
Mallow, common	<i>Malva neglecta wall r.</i>
Mayweed, Chamomile	<i>Anthemis cotula l.</i>
Mexicanweed	<i>Caperonia castanifolia</i>
Milkweed, honeyvine	<i>Ampelamus albidus</i>
Morningglory species	<i>Ipomoea spp.</i>
Mustard, species	<i>Brassica spp.</i>
Nightshade species	<i>Solanum spp.</i>
Nutsedge speices	<i>Cyperus spp.</i>
Pigweed, redroot	<i>Amaranthus retroflexus</i>
Pigweed, smooth	<i>Amaranthus hybridus</i>
Texasweed	<i>Caperonia palustrus</i>
Thistle, Russian	<i>Salsola iberica</i>
Waterhemp, common	<i>Amaranthus rudis</i>
Waterhemp, tall	<i>Amaranthus tuberculatos</i>

**Restrictions**

- **DO NOT** apply Crossing 4F to soils classified as sand with less than 1% Organic Matter.
- **DO NOT** apply more than 12 fluid ounces (0.375 lb active) per acre of HELM SULFENTRAZONE 4F per twelve month period. The twelve month period is considered to begin upon the initial HELM SULFENTRAZONE 4F application.
- Application by helicopter can only be made to railroad rights of way.

## STORAGE AND DISPOSAL

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

### Pesticide Storage and Disposal

Store product in original container only. Keep container closed when not in use, away from food or feed, fertilizer and other pesticides. Store in a cool dry place and avoid excess heat. **DO NOT** store below 30°F degrees. Wastes resulting from the use of this product that cannot be used should be disposed of in a landfill approved for pesticide disposal or in accordance with applicable Federal, State or local procedures. For more information contact your State Pesticide or Environmental Control Agency or the Hazardous Waste representative of the nearest EPA Regional Office for guidance.

### Container Handling

**Nonrefillable container - DO NOT** reuse or refill this container. Triple rinse container (or equivalent) promptly after emptying. Triple rinse as follows: (For containers greater than 5 gallons) 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. Empty the rinsate into application equipment or a mix tank or store rinsate for later use or disposal. Repeat this procedure two more times. (For containers 5 gallons or less) 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. Triple rinse (or equivalent). Then offer for recycling if available, or reconditioning, or puncture and dispose of in a sanitary landfill, or incineration, or, if allowed by state and local authorities, by burning. If burned, stay out of smoke.

**Returnable/Refillable Containers** - Refill this container with HELM SULFENTRAZONE 4F 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 into application equipment or mix tank. Fill the container about 10% 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.

## CONDITIONS OF SALE AND LIMITATION OF WARRANTY AND LIABILITY

**NOTICE:** Read the entire Directions for Use and Conditions of Sale and Limitation of Warranty and Liability before buying or using this product. If the terms are not acceptable, return the product at once, unopened, and the purchase price will be refunded.

Follow Directions for Use of this product carefully. It is impossible to eliminate all risks inherently associated with the use of this product. Crop injury, ineffectiveness or other unintended consequences may result because of such factors as manner of use or application, weather or crop conditions, presence of other materials or other influencing factors in the use of the product, which are beyond the control of Helm Agro US, Inc. or Seller. To the extent consistent with applicable law, all such risks shall be assumed by Buyer and User, and Buyer and User agree to hold Helm and Seller harmless for any claims relating to such factors.

Helm warrants that this product conforms to the chemical description on the label and is reasonably fit for the purposes stated in the Directions for Use, subject to the inherent risks referred to above, when used in accordance with directions under normal use conditions. This warranty does not extend to the use of this product contrary to label instructions, or under abnormal conditions or under conditions not reasonably foreseeable to or beyond the control of Seller or Helm, and Buyer and User assume the risk of any such use. **HELM MAKES NO WARRANTIES OF MERCHANTABILITY OR OF FITNESS FOR A PARTICULAR PURPOSE NOR ANY OTHER EXPRESS OR IMPLIED WARRANTY EXCEPT AS STATED ABOVE.**

To the extent consistent with applicable law, in no event shall Helm or Seller be liable for any incidental, consequential or special damages resulting from the use or handling of this product. **TO THE EXTENT CONSISTENT WITH APPLICABLE LAW, THE EXCLUSIVE REMEDY OF THE USER OR BUYER, AND THE EXCLUSIVE LIABILITY OF HELM AND SELLER FOR ANY AND ALL CLAIMS, LOSSES, INJURIES OR DAMAGES (INCLUDING CLAIMS BASED ON BREACH OF WARRANTY, CONTRACT, NEGLIGENCE, TORT, STRICT LIABILITY OR OTHERWISE) RESULTING FROM THE USE OR HANDLING OF THIS PRODUCT, SHALL BE THE RETURN OF THE PURCHASE PRICE OF THE PRODUCT OR, AT THE ELECTION OF HELM OR SELLER, THE REPLACEMENT OF THE PRODUCT.**

Helm and Seller offer this product, and Buyer and User accept it, subject to the foregoing conditions of sale and limitations of warranty and of liability, which may not be modified except by written agreement signed by a duly authorized representative of Helm.



207085-91

**HELM Agro US, Inc.**  
401 E. Jackson St., Suite 1400  
Tampa, FL 33602  
Phone: 813.621.8846  
Fax: 813.621.0763  
info@helmagro.com  
helmagro.com

10/10/2018-E  
(RV102619)  
Supersedes Rev 08/06/2014

file: 73173-2\_specimen\_art  
folder: 73173-2\_helm\_207085-91  
colors: Black, 485, 7462  
 dp proofed \_\_\_\_\_

created by: 4-18-16 ek  
alt: 11-22-19 jw  
size: 8.5" (w) x 11" (h)

SPECIMEN