SULFENTRAZONE	GROUP	14	HERBICIDE
FLUMIOXAZIN	GROUP	14	HERBICIDE

HELM

ZONE DEFENSE

FOR CONTROL AND/OR SUPPRESSION OF CERTAIN WEEDS IN SOYBEAN.
ALSO FOR MAINTAINING BARE-GROUND IN NON-CROP AREAS

ACTIVE INGREDIENTS:	**% BY WT.**
Sulfentrazone	62.2%
Flumioxazin	15.0%
OTHER INGREDIENTS:	22.8%
TOTAL	100.0%

Contains 0.62 lb. sulfentrazone per lb. of product.
Contains 0.15 lb. flumioxazin per lb. of product.

EPA Reg. No. 74530-91

KEEP OUT OF REACH OF CHILDREN
CAUTION

See label booklet for First Aid, Precautionary Statements and Directions for Use including Storage and Disposal.

Manufactured For
HELM Agro US, Inc.
401 E. Jackson St., Suite 1600
Tampa, FL 33602

FIRST AID	
If Swallowed:	• Call a poison control center or doctor immediately for treatment advice. • Have person sip a glass of water if able to swallow. • **DO NOT** induce vomiting unless told to do so by the poison control center or doctor. • **DO NOT** give anything by mouth to an unconscious person.
If in Eyes:	• Hold eye open and rinse slowly and gently with water for 15 to 20 minutes. • Remove contact lenses, if present, after the first 5 minutes, then continue rinsing eye. • Call a poison control center or doctor for treatment advice.
HOT LINE: Have the product container or label with you when calling a poison control center, such as 1-800-222-1222 or doctor or going for treatment. For Chemical Emergency Assistance (Spill, Leak, Fire or Accident) call CHEMTREC at 1-800-424-9300.	

PRECAUTIONARY STATEMENTS
HAZARDS TO HUMANS AND DOMESTIC ANIMALS
CAUTION

Harmful if swallowed. Causes moderate eye irritation. Avoid contact with eyes or clothing. Wash thoroughly with soap and water after handling and before eating, drinking, chewing gum, using tobacco, or using the toilet.

PERSONAL PROTECTIVE EQUIPMENT (PPE)

Applicators and other handlers must wear:

- long-sleeved shirt and long pants
- chemical-resistant gloves made of barrier laminate, butyl rubber ≥14 mils, nitrile rubber ≥14 mils, neoprene rubber ≥14 mils, polyvinyl chloride ≥14 mils, or Viton ≥14 mils
- shoes and socks
- protective eyewear

Follow manufacturer's instructions for cleaning and maintaining PPE. If no such instructions for washables exist, 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:

- Always wash hands thoroughly with soap and water after handling and 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 pesticide is toxic to non-target plants and marine/estuarine invertebrates and should be used strictly in accordance with the drift and run-off pre- cautions on this label in order to minimize off-site exposures. **DO NOT** apply directly to water, 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 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.

Surface Water Advisory: This product can contaminate surface water through spray drift. Under some conditions, this product may have a high potential for runoff into surface water (primarily via dissolution in runoff water) or adjacent land, for several too many months post-application. These include poorly draining or wet soils with readily visible slopes toward adjacent surface waters, frequently flooded areas, and 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, and areas over-lying tile drainage systems that drain to surface waters.

Ground Water Advisory: This product is known to leach through soil into groundwater under certain conditions as a result of label use. Use of this product in areas where soils are permeable, particularly where the water table is shallow, may result in groundwater contamination. **DO NOT** use on coarse soils classified as sand which have less than 1% organic matter.

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, such as 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 runoff could occur will minimize water run-off and is recommended.

NON-TARGET ORGANISM ADVISORY: This product is toxic to plants and may adversely impact the forage and habitat of non-target organisms, including pollinators, in areas adjacent to the treated site. Protect the forage and habitat of non-target organisms by following label directions intended to minimize off target movement.

PHYSICAL/CHEMICAL HAZARDS

DO NOT mix or allow coming in contact with oxidizing agents. 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 at the time of application. For any requirements specific to your State or Tribe, consult the agency responsible for pesticide regulations.

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 barrier laminate, butyl rubber ≥14 mils, nitrile rubber ≥14 mils, neoprene rubber ≥14 mils, polyvinyl chloride ≥14 mils, or Viton ≥14 mils
- shoes plus socks.

STORAGE AND DISPOSAL

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

Pesticide Storage

Store product in original container only. Keep container closed when not in use, away from food or feed, fertilizer and other pesticides. **DO NOT** put formulation or dilute spray solution in food or drink containers. Store in a cool dry place and avoid excess heat. **DO NOT** store below 30°F degrees.

Pesticide Disposal

Wastes resulting from the use of this product that cannot be used must 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. 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 or by incineration or by other procedures allowed by State and local authorities.

PRODUCT INFORMATION

Zone Defense is a dispersible granule formulated to easily mix with water, to be sprayed for selected pre-emergent and pre-plant incorporated weed control in soybeans and in non-crop areas of farms. Control of many broadleaf weeds and partial control of annual grasses will be attained when applied according to label instructions.

Rainfall or sprinkler irrigation is required to activate Pre-emergence and Pre-plant incorporated applications of Zone Defense. The control and duration of effect depend on the following: Use rate, growing conditions at and following time of treatment, weed spectrum, soil pH, moisture and precipitation and organic matter.

Zone Defense provides residual control of susceptible weeds.

Zone Defense provides additional burndown activity when used as part of a burndown program.

Zone Defense can be applied as part of a fall burndown program for control of susceptible winter annuals.

Zone Defense can be used on farms for non-selective vegetation control to maintain bare ground non-crop areas that must be kept weed free.

ROTATIONAL CROP GUIDELINES FOR ALL Zone Defense APPLICATIONS

Prior to using Zone Defense, consideration should be given to crop rotation plans. Crops other than soybeans may be extremely sensitive to low concentrations of Zone Defense remaining in the soil the next planting season. Choice of rotation crop is restricted following application of Zone Defense. (See "ROTATIONAL CROP TABLE")

TABLE: ROTATIONAL CROP describes the minimum length in months from the time of Zone Defense application until Zone Defense treated soil can be replanted to the crops listed in the table. When a specified tank mix is used, consult the tank mix partner labels for re-cropping instructions and follow the directions that are most restrictive.

For Full Use Rates

Refer to **IMPORTANCE OF SOIL PH** Section for additional information.

TABLE: ROTATIONAL CROP

Crop	Interval in Months	
	Tilled	No-Till
Alfalfa	12	12
Asparagus	4	8
Barley	4	4
Berries	4	8
Brassica head and stem (Broccoli and Cabbage)	4	8
Brassica leafy greens	4	8
Canola	24	24
Cereal Grains (Buckwheat, Oats, Pearl Millet, Proso Millet, Teosinte, Wild Rice)	12	12
Citrus	4	8

(continued)

TABLE: ROTATIONAL CROP *(continued)*

Crop	Interval in Months	
	Tilled	No-Till
Clover	4	8
Corn, Field*	10	10
Corn, Pop	18	18
Corn, Sweet	18	18
Cotton	18	18
Cowpea, succulent (TN only)	4	8
Dry Shelled Beans and Peas	3	3
Flax	3	3
Fruiting Vegetables (except cucurbits)	4	8
Grapes	4	8
Horseradish	4	8
Lentils	6	6
Lima, beans succulent	4	8
Melons	4	8
Mint	4	8
Peanuts	Anytime	Anytime
Potatoes	4	8
Rhubarb	4	8
Rice	10	10
Rye	4	4
Safflower	3	3
Sorghum	10	10
Soybeans	Anytime	Anytime
Strawberry	4	8
Succulent peas	4	8
Sugar Beets	36	36
Sugarcane	Anytime	Anytime
Sunflower subgroup 20B, except Safflower	30 days	30 days
Sweet Potatoes	12	12
Tobacco	30 days	30 days
Tomato (Transplanted Only)	4	8
Tree Nuts	4	8
Triticale	4	4
Turf	4	8
Turnips	4	8
Wheat	4	4
Wheat, spring (Pacific NW States ID, OR, WA only)	4	8
All Other Crops	12	12

Crops that have rotational intervals greater than 12 months after a Zone Defense application are the result of crop injury concerns. Crops with greater than 12-month rotation intervals should only be planted with a successful bioassay. For specifications on a successful bioassay please contact your HELM Agro US, Inc. representative, Agriculture Extension Agency or laboratory undertaking assay.

*Field corn includes corn grown for grain, silage, and seed corn.

WEEDS CONTROLLED OR SUPPRESSED

Zone Defense 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.

TABLE: WEEDS CONTROLLED OR SUPPRESSED BY ZONE DEFENSE APPLICATION.

Common Name	Scientific Name
Amaranth, livid	*Amaranthus lividus*
Amaranth, Palmer	*Amaranthus palmeri*
Amaranth, Powell	*Amaranthus Powell II*
Amaranth, spiny	*Amaranthus spinosus*
Amaranth, spleen	*Amaranthus dubius*
Anoda, spurred	*Anoda cristata*
Bedstraw, catchweed	*Galium aparine*
Carpetweed	*Mollugo verticillata*
Chickweed, common	*Stellaria media*
Copperleaf, hophornbeam	*Acalypha ostryeafolia*
Copperleaf, Virginia	*Acalypha virginica*
Crabgrass, large	*Digitaria sanguinalis*
Crabgrass, smooth	*Digitaria ischaemum*
Crabgrass, Southern	*Digitaria ciliaris*
Croton, tropic	*Croton glandulosus*
Crownbeard, golden	*Verbesina encelioides*
Cupgrass, wooly	*Erichloa villosa*
Cyperus, hedgehog	*Cyperus compressus*
Daisy, American	*Eclipta alba*
Devilsclaw	*Proboscidea louisiana*
Dock, curly	*Rumex crispus*
Eclipta	*Eclipta prostrata*
Filaree, redstem	*Erodium cicutarium*
Flixweed	*Descurainia sophia*
Galinsoga, hairy	*Galinsoga ciliata*
Goosegrass	*Eleusine indica*
Groundcherry, clammy (seedling)	*Physalis heterophylla*
Groundcherry, cutleaf	*Physalis angulata*
Jimsonweed	*Datura stramonium*
Kochia (ALS and Triazine Resistant)	*Kochia scoparia*
Ladysthumb	*Polygonum persicaria*
Lambsquarters, common	*Chenopodium album*
Lettuce, miners	*Montia perfoliata*
Mallow, common	*Malva neglecta wall r.*
Mayweed, Chamomile	*Anthemis cotula l*
Milkweed, honeyvine	*Ampelamus albidus*
Morningglory, entireleaf	*Ipomoea hederacea integriuscula*
Morningglory, ivyleaf	*Ipomoea hederacea hederacea*
Morningglory, palmleaf	*Ipomoea wrightii*
Morningglory, purple	*Ipomoea turbinata*
Morningglory, red	*Ipomoea, coccinea L.*
Morningglory, scarlet	*Ipomoea coccinea*
Morningglory, smallflower	*Jacquemontia tamnifolia*

(continued)

TABLE: WEEDS CONTROLLED OR SUPPRESSED BY ZONE DEFENSE APPLICATION. *(continued)*

Common Name	Scientific Name
Morningglory, tall	*Ipomoea, purpurea*
Mustard, tumble	*Sisybrium altissimum*
Nightshade, black	*Solanum nigrum*
Nightshade, Eastern black	*Solanum ptycanthum*
Nutsedge, purple	*Cyperus rotundus*
Nutsedge, yellow	*Cyperus esculentus*
Orchardgrass	*Dactylis glomerata*
Panicum, fall	*Panicum dichotomiflorum*
Pigweed, redroot	*Amaranthus retroflexus*
Pigweed, smooth	*Amaranthus hybridus*
Plantain, blackseed	*Plantago rugelii decne*
Plantain, narrow-leaved	*Plantago lanceolata*
Poorjoe	*Diodia teres*
Porophyllum	*Porophyllum rederale*
Poinsettia, wild	*Euphorbia heterophylla*
Purslane, common	*Portulaca oleracea*
Redmaids	*Calandrinia ciliata*
Redweed	*Melochia corchorifolia*
Sedge, annual	*Carex spp.*
Senna, coffee	*Cassia occidentalis*
Sheperdspurse	*Capsella bursa-pastoris*
Sida, prickly	*Sida spinosa*
Sida, Southern	*Sida acuta*
Smartweed, PA (seedling)	*Polygonum pensylvanicum*
Smellmellon	*Cucumis melo*
Starbur, bristly	*Acanthospermum hispidum*
Stinkgrass	*Eragrostis cilianensis*
Toadflax, yellow	*Linaria vulgaris*
Tassleflower, red	*Emilio sonchifolia*
Thistle, Russian	*Salsola kali*
Waterhemp, common	*Amaranthus rudis*
Waterhemp, tall	*Amaranthus tuberculatos*
Waterprimrose, winged	*Ludwigia decurrens*
Witchgrass	*Panicum capillare*

ENVIRONMENTAL CONDITIONS AND BIOLOGICAL PERFORMANCE

Burndown Application

For best results, Zone Defense should be applied as part of a burndown program to actively growing weeds. Applying Zone Defense under conditions that **DO NOT** promote active weed growth will reduce herbicide effectiveness. **DO NOT** apply Zone Defense 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. Zone Defense 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.

Preemergence Application (Conventional Tillage) Important: Crop injury may occur from applications made to poorly drained soils and/or applications made under cool, wet conditions. Minimize risk of crop injury by using on well drained soils, planting at least 1.5 inches deep, with high quality seed. Completely cover 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 Zone Defense in soil for residual weed control. Dry weather following applications of Zone Defense may reduce effectiveness. However, when adequate moisture is received after dry conditions, Zone Defense will control susceptible germinating weeds. Zone Defense 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 Zone Defense application, weed control may be improved by irrigation with ½ to 1 inch of water. If emerged weeds are controlled by cultivation, residual weed control will be reduced.

FOR HERBICIDE ACTIVATION RAINFALL REQUIREMENT

Best results are obtained if Zone Defense is followed by rainfall or irrigation before weeds germinate. Several small rainfalls of less than 1/4" each are not as beneficial as one large rainfall of 1/2-1". If moisture is not sufficient to activate the herbicide, a rotary hoeing or shallow cultivation should be made after emergence of the crop while weeds are small enough to be controlled by mechanical means.

BIOLOGICAL ACTIVITY

Zone Defense quickly inhibits growth of susceptible weeds. Susceptible weeds may germinate and emerge following an application of pre-plant incorporation or pre-emergence treatment, but leaves become yellow soon after emergence and growth ceases. Death of growing points and leaf tissue will occur in some species while others will remain green, stunted and non-competitive. Zone Defense will provide partial control of some annual grasses applied correctly but an additional product(s) may be warranted to provide best grass control.

Seedling vigor may be impacted if poor growing conditions prevail. If poor growing conditions are present Zone Defense (like other soil applied herbicides) may injure soybeans. In the event injury symptoms appear they will disappear rapidly and will not result in reductions of yield. Poor growing conditions, such as cool temperatures, presence of disease pathogens, excessive moisture and soil compaction may cause this temporary injury to soybeans.

Rainfastness

Zone Defense is rainfast one hour after application. Applications should not be made if rain is expected within one hour of application or postemergence burndown efficacy may be reduced.

USE RESTRICTIONS

- **DO NOT** apply or drain or flush equipment on or near desirable trees or other plants, or on areas where their roots may extend, or in locations where the chemical may be washed or moved into contact with their roots. Injury or loss of desirable trees or vegetation may result.
- **DO NOT** allow spray drift to contact desirable plants.
- **DO NOT** allow to contact with fertilizers, insecticides, fungicides and seeds during storage.
- **DO NOT** contaminate any body of water.
- **DO NOT** apply this product when weather conditions favor spray drift from treated areas.
- **DO NOT** apply during low-level inversion conditions, including fog.
- **DO NOT** apply to frozen or snow covered soil.
- **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.
- **DO NOT** apply to powdery soils or soils that are susceptible to wind displacement unless irrigation can be applied immediately after application.
- **DO NOT use spray equipment used to apply Zone Defense to apply other materials to any crop foliage, unless the proper cleanout procedures are followed. See "SPRAYER CLEANUP" for more information.**
- **DO NOT** apply more than the labeled amount of Zone Defense per acre per twelve-month period as stated in this label.

SPRAYER CLEANOUT

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

1) Drain the spray tank completely, 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.
3) Then flush all hoses, booms, screens and nozzles.
4) Top the tank off then add 1 gal of 3% household ammonia (or equivalent) for every 100 gallons of water, circulate through sprayer for 5 minutes.
5) Flush all hoses, booms, screens and nozzles for a minimum of 15 minutes.
6) 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.
7) If spray lines have any end caps, loosen them before flushing the system, allowing cleaning solution to spray through the loosened caps.
8) To enhance removal of Zone Defense from the spray system, add a tank cleaner containing sodium hydroxide (15 – 30%) plus surfactants 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.
9) Drain tank completely.
10) Add enough clean water to the spray tank to allow all hoses, booms, screens and nozzles to be flushed for 2 minutes.
11) Remove all nozzles and screens and rinse them in clean water.

DO NOT use spray equipment used to apply Zone Defense to apply other materials to any crop foliage, unless the proper cleanout procedures are followed. All tanks, hoses, booms, screens and nozzles, should be thoroughly cleaned before it is used to apply postemergence pesticides. Should small quantities of Zone Defense 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. Failure to follow these procedures can lead to injury to desirable crops. HELM Agro US, Inc. accepts no liability for any effects due to inadequately cleaned equipment.

APPLICATION INSTRUCTIONS

Proper Handling Instructions: DO NOT mix or load this product within 50 feet of any well to include abandoned and drainage wells, streams and rivers, lakes and reservoirs. This 50 foot perimeter does not apply to capped or plugged wells. It does not apply to dikes that are properly constructed around mixing or 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. Any such pad used for this purpose must be constructed to be able to contain: Product spills – Equipment leaks – equipment rinsate or wash – container leaks – rain water that collects on the pad. This pad must be self-contained. Pads that are constructed with roofs must be able to provide a minimum containment capacity of 100%. Pads without roofs must have a capacity to contain a minimum of 110% capacity of the largest container or application equipment that may be on the pad. The above mentioned minimum containment capacities **DO NOT** apply to equipment/vehicles that are delivering pesticide shipments to the loading or mixing site. Always check with your state regulatory official since each state may have different or additional well set-backs and or containment operation guidelines.

This product must be used in a way to prevent any back siphoning into wells. It must be used in a manner to prevent spills, improper disposal of pesticide, rinsates and or spray mixtures into wells or any water source.

APPLICATION EQUIPMENT

Application equipment should be clean and in good repair. Nozzles should be uniformly spaced on boom and frequently checked for accuracy.

BROADCAST APPLICATION

Ground Application: Apply Zone Defense alone and in tankmixes, with ground equipment with a properly calibrated sprayer equipped with flat fan or flood nozzles (preemergence applications only) designed to deliver the desired spray pressure and spray volume. Adjust spray pressures to recommendations that are appropriate for the nozzle type being utilized. Do not apply as spray droplets smaller than medium to coarse. 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 American Society for Agricultural and Biological Engineers (ASABE) Standard S-572. Select coarse to very coarse droplet size when Zone Defense is used as a preemergent/preplant application. Select medium to very coarse droplet size when Zone Defense is used postemergence with a contact burndown herbicide.

Use nozzles that require screens no finer than 50 mesh. Use 10 to 40 gallons of water per acre for preemergence applications. Use 15 to 60 gallons of water per acre for burndown applications. Use 20 to 60 gallons per acre if dense vegetation or heavy crop residue is present.

Nozzle selection should meet manufacturer's gallonage and pressure recommendations for preemergence or postemergence herbicide application. **DO NOT** use flood jet nozzles.

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.

Applicators may spray only when wind speed is between 3 and 10 mph.

Aerial Application:

When applying by air, observe all precautions listed under SPRAY DRIFT and restrictions listed under SPRAY DRIFT RESTRICTIONS.

Aerial application is allowed only when environmental conditions prohibit ground application.

Zone Defense may be applied by air using properly calibrated nozzle types and arrangements that will provide optimum coverage while producing minimal amounts of fine droplets. When this product is allowed to be applied by air, applicator must use a minimum finished spray volume of 5 gallons per acre. Apply sufficient spray volume to achieve adequate coverage. For burndown, apply in 7 to 10 gallons of finished spray water per acre. Application at less than 7 gallons per acre may provide inadequate control. When used for preemergence weed control, apply Zone Defense in 5 to 10 gallons of water per acre. Higher gallonage applications generally afford more consistent weed control. **DO NOT** exceed the nozzle manufacturer's recommended 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, such as 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.

Spray drift away from the site of application may cause damage to non-target vegetation. Minimize drift by applying 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:

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

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 feet of non-target plants including non-target crops.

DO NOT apply this product by air within 100 feet of emerged cotton crop.

DO NOT apply this product by air within 40 feet of streams, wetlands, marshes, ponds, lakes and reservoirs.

When this product is allowed to be applied by air, applicator must use a minimum finished spray volume of 5 gallons per acre.

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.

Adjuvants and Drift Control Additives: Refer to tank mix partner's label for adjuvant recommendation. 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 adjuvant or drift control additive.

ADDITIVES

Burndown Application (Prior to Crop Emergence)

Postemergence control of weeds from Zone Defense tank mixes will require the addition of an agronomically approved adjuvant to the spray mixture. When an adjuvant is to be used with Zone Defense, HELM Agro US, Inc. recommends the use of a Chemical Producers and Distributors Association certified adjuvant. Use either a crop oil concentrate (COC) or methylated seed oil (MSO) which contains at least 15% emulsifiers and 80% oil or a non-ionic surfactant (NIS) at 0.25% v/v, may be used when applying Zone Defense as part of a burndown program. Some tank mix partners, such as Roundup Power Max®, are formulated with sufficient adjuvants and **DO NOT** require the addition of a COC, MSO or NIS when tank mixed with Zone Defense. The addition of a COC or MSO may increase the burndown activity on certain weeds such as cutleaf eveningprimrose and Carolina geranium. Mixing compatibility qualities should be verified by a jar test.

A spray grade nitrogen source (either ammonium sulfate at 2 to 2.5 pounds per acre or a 28 to 32% nitrogen solution at 1 to 2 quarts per acre) may be added to the spray mixture along with either a COC, MSO or NIS to enhance weed control. The addition of a nitrogen source does not replace the need for a COC, a MSO or a NIS.

JAR TEST TO DETERMINE COMPATIBILITY OF ADJUVANTS AND Zone Defense

When using Zone Defense and an adjuvant in burndown situations, a jar test should be performed before mixing commercial quantities of Zone Defense with the adjuvant if using Zone Defense for the first time, with a new adjuvant or a new water source. Use the following procedure:

1. Add 1 pint of the water to a quart jar. Make sure the water is from the same source and temperature as will be used in the spray tank mixing operation.
2. Add 1 gram of Zone Defense to the quart jar for every 3 ounces of Zone Defense per acre being applied (4 grams if 12 ounces per acre is the desired Zone Defense rate), gently mix until product goes into suspension.
3. Add 60 milliliters (4 tablespoons or 2 fluid ounces) of the COC or MSO to the quart jar or 1 milliliter of NIS if it is being used in place of oil, gently mix.
4. If nitrogen is being used, add 16 milliliters (1 tablespoon or 0.5 fluid ounces) 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. If any of the following conditions are observed the choice of adjuvant should be questioned:
   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 cottage cheese or gelatin.

MANDATORY SPRAY DRIFT

Ground Boom Applications:

-Applicators must select nozzle and pressure that deliver Medium or coarser droplets in accordance with American Society of Agricultural & Biological Engineers Standard 572 (ASABE S572).
-Select coarse to very coarse droplet size when sulfentrazone is used as a preemergent/preplant application.
-Select medium to very coarse droplet size when Zone Defense is used postemergence with a contact burndown herbicide.
-Do not apply as spray droplets smaller than medium to coarse, defined by the ASABE standard.
-Ground applicators must use a minimum finished spray volume of 10 gallons per acre.
-When Zone Defense is tank mixed with a contact burndown herbicide, ground applicators must use a minimum spray volume of 15 gallons per acre.
-User must only apply with the release height recommended by the manufacturer, but no more than 3 feet above the ground or crop canopy.
-Do not apply when wind speeds exceed 15 miles per hour at the application site.
-Do not apply during temperature inversions.

Aerial Applications:

-Aerial application is allowed only when environmental conditions prohibit ground application.
-When this product is allowed to be applied by air, applicator must use a minimum finished spray volume of 5 gallons per acre.
-Do not release spray at a height greater than 10 ft above the ground or vegetative canopy, unless a greater application height is necessary for pilot safety.
-Applicators must select nozzle and pressure that deliver Medium or coarser droplets in accordance with American Society of Agricultural & Biological Engineers Standard 641 (ASABE S641).
-If the windspeed is 10 miles per hour or less, applicators must use 1/2 swath displacement upwind at the downwind edge of the field. When the windspeed is between 11-15 miles per hour, applicators must use % swath displacement upwind at the downwind edge of the field.
-Do not apply when wind speeds exceed 15 mph at the application site. If the windspeed is greater than 10 mph, the boom length must be 65% or less of the wingspan for fixed wing aircraft and 75% or less of the rotor diameter for helicopters. Otherwise, the boom length must be 75% or less of the wingspan for fixed-wing aircraft and 90% or less of the rotor diameter for helicopters.
-Do not apply during temperature inversions.

Boomless Ground Applications:

-Applicators must select nozzle and pressure that deliver Medium or coarser droplets in accordance with American Society of Agricultural & Biological Engineers Standard 572 (ASABE S572).
-Do not apply when wind speeds exceed 15 miles per hour at the application site.

SPRAY DRIFT ADVISORIES

THE APPLICATOR IS RESPONSIBLE FOR AVOIDING OFF-SITE SPRAY DRIFT.

BE AWARE OF NEARBY NON-TARGET AND ENVIRONMENTAL CONDITIONS.

Importance of Droplet Size

An effective way to reduce spray drift is to apply large droplets. Use the largest droplets that provide target pest control. While applying larger droplets will reduce spray drift, the potential for drift will be greater if applications are made improperly or under unfavorable environmental conditions.

Controlling Droplet Size- Ground Boom

Volume - Increasing the spray volume so that larger droplets are produced will reduce spray drift. Use the highest practical spray volume for the application. If a greater spray volume is needed, consider using a nozzle with a higher flow rate.
Pressure - Use the lowest spray pressure recommended for the nozzle to produce the target spray volume and droplet size.
Spray Nozzle - Use a spray nozzle that is designed for the intended application. Consider using nozzles designed to reduce drift.

Controlling Droplet Size- Aircraft

Adjust Nozzles - Follow nozzle manufacturers' recommendations for setting up nozzles. Generally, to reduce fine droplets, nozzles should be oriented parallel with the airflow in flight.

BOOM HEIGHT — Ground Boom

For ground equipment, the boom should remain level with the crop and have minimal bounce.

RELEASE HEIGHT – Aircraft

Higher release heights increase the potential for spray drift.

SHIELDED SPRAYERS

Shielding the boom or individual nozzles can reduce spray drift. Consider using shielded sprayers. Verify that the shields are not interfering with the uniform deposition of the spray on the target area.

TEMPERATURE AND HUMIDITY

When making applications in hot and dry conditions, use larger droplets to reduce effects of evaporation.

TEMPERATURE INVERSIONS

Drift potential is high during a temperature inversion. Temperature inversions are characterized by increasing temperature with altitude and are common on nights with limited cloud cover and light to no wind. The presence of an inversion can be indicated by ground fog or 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. Avoid applications during temperature inversions.

WIND

Drift potential generally increases with wind speed. AVOID APPLICATIONS DURING GUSTY WIND CONDITIONS.

Applicators need to be familiar with local wind patterns and terrain that could affect spray drift.

Boomless Ground Applications:

Setting nozzles at the lowest effective height will help to reduce the potential for spray drift.

Handheld Technology Applications:
Take precautions to minimize spray drift.

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

Wind

Applicators may spray only when wind speed is between 3 and 10 mph. 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.

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.

WEED RESISTANCE MANAGEMENT

Sulfentrazone and flumioxazin, the active ingredients in this product, are both Group 14 herbicides, based on the mechanism of action classification system of the Weed Science Society of America. Any weed population can contain plants naturally resistant to Group 14 herbicides. Weed species resistant to Group 14 herbicides may be effectively managed utilizing another herbicide from a different Group, (either alone or in a mixture according to label directions), by using other cultural or mechanical methods of weed control, or by a combination of the two.

Consult your local company representative, state cooperative extension agent, professional consultant or other qualified authority to determine appropriate actions for controlling specific resistant weeds.

Weed Management Practices

Resistant populations arise when rare individual plants are uncontrolled by a normal dose of a given herbicide under normal environmental conditions. In the absence of other control measures these individuals survive, produce seed, and eventually become the dominant biotype in the field through continuous selection. The best means of reducing this selection is to use diverse weed control practices such as multiple herbicides with different mechanisms of action for the target weed, and often in combination with various mechanical and cultural practices.

To minimize the occurrence of herbicide-resistant biotypes, including those resistant to Group 14 herbicides, implement the following weed management practice options that are practical to your situation. These management practices are applicable to reduce the spread of confirmed resistant biotypes (managing existing resistant biotypes) and to reduce the potential for selecting for resistance in new species (proactive resistance management).

- Use a diversified approach toward weed management focused on preventing weed seed production and reducing the number of weed seeds in the soil.
- Plant crops into fields that are as weed-free as possible and then keep them as weed-free as possible.
- Plant crop seed that is as weed-free as possible.
- Scout fields routinely, before and after herbicide application.
- Use multiple herbicide mechanisms of action that are effective against the most troublesome weeds in your field and against those with known resistance.
- Apply herbicides at application rates listed on the label when weeds are within the size range indicated on the label.
- Emphasize cultural practices that suppress weeds by using crop competitiveness.
- Use mechanical and biological weed management practices where appropriate.
- Prevent field-to-field and within-field movement of weed seed or vegetative propagules.
- Manage weed seed at harvest and after harvest to prevent a buildup of the weed seedbank.

Management of Herbicide-Resistant Biotypes

Appropriate testing is needed to determine if a weed is resistant Group 14 herbicides. Contact your HELM Agro US, Inc. representative or your local State Cooperative Extension Agency to determine if resistance in any particular weed biotype has been confirmed in your area or visit on the Internet <www.weedresistancemanagement.com> or www.weedscience.org.

Specifically, glyphosate resistant weeds can be controlled or managed by applying this product in combination with herbicides labeled for control of the targeted weed in the crops specified on this label. For more information, see **TABLE: WEEDS CONTROLLED OR SUPPRESSED BY ZONE DEFENSE APPLICATION.**

Since the occurrence of resistant weeds is difficult to detect prior to use, HELM Agro US, Inc. accepts no liability for any losses that result from the failure of Zone Defense to control resistant weeds.

Report any incidence of repeated non-performance of this product on a particular weed to your HELM Agro US, Inc. representative, local retailer, or county extension agent.

SOIL CHARACTERISTICS

Application of Zone Defense 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.

TABLE: 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	

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 to 8 inch depth may not reflect the elevated pH near the surface. In these cases shallow sampling, the upper 3 inches, is advised.

Follow all label restrictions regarding soil type, soil pH, organic matter, rotational crop intervals, geographic location, and weed pressure, in selecting the rate of Zone Defense.

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.

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 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.

Zone Defense, 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.

MAXIMUM ALLOWABLE SULFENTRAZONE AND FLUMIOXAZIN USE PER ACRE PER TWELVE MONTHS

Crop	Sulfentrazone Lbs AI / A	Flumioxazin Lbs AI / A
Fallow	0.25	0.128
Soybeans	0.375	0.096

ZONE DEFENSE RATE CONVERSION
ZONE DEFENSE RATES TO SULFENTRAZONE AND FLUMIOXAZIN LBS AI

Rate Zone Defense Ounces	Sulfentrazone Lbs AI / A	Flumioxazin Lbs AI / A
9.6	0.375	0.090
6.6	0.255	0.062
3.6	0.140	0.034

DIRECTIONS FOR USE IN FALL AND SPRING PREPLANT BURNDOWN AND FALLOW SEEDBED PROGRAMS IN SOYBEAN– PREEMERGENCE TO CROP

RESTRICTIONS

- **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 **TABLE: ROTATIONAL CROP**.
- **DO NOT** apply more than 9.6 ounces (0.375 lb sulfentrazone) (0.09 lb flumioxazin) of Zone Defense per acre per application.
- **DO NOT** apply more than 9.6 ounces (0.375 lb sulfentrazone) (0.09 lb flumioxazin) of Zone Defense per acre per twelve-month period.
- **DO NOT** make more than 2 applications of Zone Defense per acre per year and do not exceed the maximum amount of Zone Defense per twelve-month period. The twelve-month period is considered to begin upon the initial Zone Defense treatment.
- **DO NOT** use on soils classified as sand which have less than 1% organic matter.
- **DO NOT** apply after crop seed germination.

TIMING TO WEEDS

Burndown – Postemergence to Weeds

Zone Defense, 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: BURNDOWN TANK MIXES**. Apply Zone Defense 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 recommended application pressure. All Zone Defense 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 pints per acre or a non-ionic surfactant at 0.25% v/v.

FALL BURNDOWN AND FALLOW SEEDBED PROGRAMS

Apply Zone Defense at 5.0 ounces per acre as a fall treatment to the stubble of harvested crops for the burndown of existing vegetation and pre-emergence control of labeled weeds the following spring in no-till and conservation tillage production systems where soybean will be planted. If weeds have emerged at the time of application, use Zone Defense in combination with a labeled

burndown herbicide such as glyphosate, or glufosinate at labeled rates. Zone Defense can be used in a fall burndown or fallow seedbed program, however the length of residual control may be variable.

Fall applied burndown treatments should be made with a minimum of 10 gallons per acre to achieve adequate coverage of the weeds being treated. Applications volume should be increased to 15-20 gallons per acre or more where weed density is high or heavy crop residue levels are present. When making burndown applications to emerged weeds, the addition of adjuvants such as COC, NIS, or MSO to the spray mixture can be used to enhance the burndown activity of the application. Use higher rates for longer spring residual.

Use Crop Oil Concentrate (COC) or Methylated Seed Oil (MSO) at 1 gallon per 100 gallons of spray solution (1% v/v), or Non-ionic surfactant (NIS) at 1 qt./100 gallon of spray solution.

In addition to the specific adjuvants above, other adjuvants may be used if they provide the same or similar functions as those previously mentioned. The addition of other adjuvants or fertilizers such as ammonium sulfate (AMS) may aid in control of weeds when used with appropriate companion herbicides. Consult specific companion herbicides for additional adjuvant, and fertilizer recommendations when applying for burndown of existing vegetation.

INCREASING SPEED OF GLYPHOSATE BURNDOWN ACTIVITY: Zone Defense, at 3.3 ounces per acre may be tank mixed with glyphosate to increase the speed of burndown activity compared to glyphosate applied alone. Residual weed control will not be provided at rates lower than 5 ounces per acre; however, suppression of the weeds may occur at Zone Defense rates as low as 3.33 ounces per acre. Observe all rotational intervals prior to planting as listed in the **TABLE: ROTATIONAL CROP**.

For ground applications, use flat fan nozzles or other appropriate nozzle types and a 15 – 60 gallons of water per acre. Where dense vegetation or heavy crop residues are present, increasing the spray volume to 20 - 60 gallons per acre may improve spray coverage and weed control.

When an adjuvant is to be used with Zone Defense, HELM Agro US, Inc. recommends the use of a Chemical Producers and Distributors Association certified adjuvant.

To select the proper tank mix product, identify the weeds which need to be controlled and consult the product labels to determine which product is needed. Consult the companion tank mix herbicide label for use instructions, rates, precautions, restrictions, and other use information.

For instructions on how to prevent spray drift see section on **SPRAY DRIFT**.

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

Zone Defense may be used as part of burndown program to provide control or suppression of the following broadleaf weeds. For complete control of emerged weeds follow specific directions under the list of weeds below:

Chickweed[1]	Nightshade species
Dandelion	Pennycress
Garlic, wild	Pigweeds
Henbit	Ragweed, common
Lambsquarters	Ragweed, giant
Lettuce, prickly	Shepherd's-purse
Marestail	Smartweeds, annual
Mustard, tansy	Sunflower
Mustard, wild	Waterhemp species

[1] For chickweed control add glyphosate or Express or Dicamba.

For Burndown control, pick the specified and appropriate rate from **TABLE: SOYBEAN RATE** and apply with:

- For complete burndown of emerged annual grasses or broadleaf weeds or for burndown of weeds not listed above, Zone Defense must be tank mixed with: glyphosate, glufosinate, paraquat, 2,4-D or other appropriate burndown herbicides.
- Crop Oil Concentrate (COC) or Methylated Seed Oil (MSO) at 1% v/v 1 gallon per 100 gallons of spray solution, or Non-ionic surfactant (NIS) at 1 qt./100 gallon of spray solution.
- In addition to the specific adjuvants above, other adjuvants may be used if they provide the same or similar functions as those previously mentioned. The addition of other adjuvants or fertilizers such as ammonium sulfate (AMS) may aid in control of weeds when used with appropriate companion herbicides. Consult specific companion herbicides for additional adjuvant, and fertilizer recommendations when applying for burndown of existing vegetation.
- Use flat fan nozzles or other appropriate nozzle types and a minimum of 10 gallons of water per acre. Where dense vegetation or heavy crop residues are present, increasing the spray volume to 15-20 gallons per acre or more may improve spray coverage and weed control.

To select the proper tank mix product, identify the weeds which need to be controlled and consult the product labels to determine which product is needed. Consult the companion tank mix herbicide label for use instructions, rates, precautions, restrictions, and other use information.

BURNDOWN TANK MIXES

Zone Defense may be tank mixed with the herbicides listed in **TABLE: BURNDOWN TANK MIXES** for increased burndown activity, additional residual broadleaf and/or additional grass control. Refer to tank mix partner's label for adjuvant recommendations.

TABLE: BURNDOWN TANK MIXES

TANK MIX PARTNER	TARGET WEEDS*
2,4-D LVE	Marestail Giant Ragweed Dandelion
paraquat	Annual Grasses Henbit
glyphosate	General Burndown
quizalofop	Annual Grasses
imazaquin	Cocklebur, Common Sunflower
dicamba and 2,4-D dimethylamine	Marestail Giant Ragweed Dandelion

*Refer to tank mix product labels for specific recommendations for control of emerged weeds present.

ADDITIONAL RESIDUAL BROADLEAF CONTROL

Zone Defense can be tank mixed with metribuzin, chloransulam-methyl, linuron, imazethapyr, flumetsulam, pendimethalin or imazaquin for additional broadleaf control.

ADDITIONAL RESIDUAL GRASS CONTROL

Zone Defense can be tank mixed with pendimethalin or clomozone for additional grass control. In the states of Alabama, Arkansas, Delaware, Georgia, Louisiana, Maryland, Mississippi, North Carolina, Oklahoma, South Carolina, Tennessee, Texas, and Virginia, Zone Defense can be tank mixed with microencapsulated acetochlor at 2 ounces per acre. Tank mixes with flufenacet or dimethenamid may result in severe injury to soybeans when application is followed by prolonged periods of cool wet weather and should not be used with Zone Defense. Zone Defense at 5.0 ounces per acre or less may be tankmixed with metolachlor products.

GLYPHOSATE TOLERANT PROGRAM

Zone Defense may be applied as part of a burndown program or preemergence in conventional tillage programs, at 5.0 ounces per acre to reduce early season weed competition from waterhemp, velvetleaf, nightshade and morninglories as well as other weeds listed in **TABLE: WEEDS CONTROLLED – FALL AND SPRING PREPLANT BURNDOWN PROGRAMS** in Roundup Ready programs. A sequential post emergence application of glyphosate will be required to control weeds not controlled by Zone Defense.

TABLE: WEEDS CONTROLLED – FALL AND SPRING PREPLANT BURNDOWN PROGRAMS

When used as directed Zone Defense will provide control of the following weed species:

Weeds 3 inches or less	
Chamomile, False	Cheatgrass
Chickweed, Common	Chickweed, Mouseear
Cockle, White	Dandelion
Deadnettle, Purple	Groundsel, Crossleaf
Henbit	Kochia
Marestail/Horseweed	Mallow, Common
Prickly Lettuce	Wormwood, Biennial
Canola, Volunteer	Carolina Geranium
Eveningprimrose, Cutleaf	Flixweed
Weeds 4 inches or less	
Mustard, Tansy	Mustard, Wild
Shepherd's Purse	

SPRING BURNDOWN PROGRAMS

Zone Defense may 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 or partially controlled by preemergence/residual activity are listed in **TABLE: WEEDS CONTROLLED OR SUPPRESSED BY ZONE DEFENSE APPLICATION**.

No-till planters that incorporate the soil during planting may result in decreased weed control in the row. Apply Zone Defense after planting soybeans when these types of planters are used (within 3 days after planting soybeans before the crop emerges).

Zone Defense can be used at 3.3 to 6.6 ounces per acre with labeled preplant burndown herbicides to enhance the speed of burndown and increase weed spectrum. See **DIRECTIONS FOR USE IN SOYBEAN** for more information.

DIRECTIONS FOR USE IN SOYBEAN

RESTRICTIONS

- **DO NOT** apply more than 6.6 ounces (0.25 lb sulfentrazone) (0.062 lb flumioxazin) per acre of Zone Defense per application.
- **DO NOT** apply more than 9.6 ounces (0.375 lb sulfentrazone) (0.090 lb flumioxazin) per acre of Zone Defense per twelve-month period. The twelve-month period is considered to begin upon the initial Zone Defense application.
- **DO NOT** make more than 2 applications per acre per year and do not exceed the maximum amount of Zone Defense per twelve-month period.
- **DO NOT** graze treated fields or feed treated hay to livestock.
- **DO NOT** irrigate when soybeans are cracking.
- **DO NOT** apply Zone Defense if there are visible signs of cracking due to soybean emergence, or serious crop injury may result.
- **DO NOT** apply after crop seed germination.
- **DO NOT** tank mix Zone Defense with flufenacet or dimethenamid within 14 days of planting soybeans, unless soybeans are planted under no-till or minimum tillage conditions on wheat stubble or no-till field corn stubble.
- **DO NOT** tank mix Zone Defense at rates higher than 5.0 ounces per acre with metolachlor products.

PRECAUTIONS

- Tank mixes of Zone Defense at rates higher than 5.0 ounces per acre with metolachlor based products may result in severe injury to soybeans when application is followed by prolonged periods of cool wet weather and should not be used.
- **Use of Zone Defense on soils which exceed pH 6.8 may result in unacceptable injury to the following crop. Zone Defense may be used on fields which are generally pH 6.8 or less, but which may contain isolated areas where the pH exceeds 6.8 only if the following rotational crop is soybeans.**
- Use higher rates for soils with pH less than 7.0 and lower rates for soils with pH greater than 7.0 within the given rate ranges in the **TABLE: SOYBEAN RATE**. See **IMPORTANCE OF SOIL PH** section for details.
- All direct or indirect contact (such as spray drift) to other crops or to land scheduled to be planted to crops other than soybeans should be avoided.
- Soybean stunting may occur if excessive rainfall occurs after application but before soybeans emerge. Injury is more prevalent under poor drainage or compacted conditions or when soil is saturated for long periods of time. Soybeans rapidly outgrow stunting once favorable growing conditions return.
- Seedling disease, nematodes, cold weather, deep planting (more than 2"), excessive moisture, high salt concentration, or drought may weaken soybean seedlings and increase the possibility of crop injury.
- Thoroughly clean Zone Defense from application equipment immediately after use and prior to spraying crops other than soybeans. Failure to remove even small amounts of Zone Defense from application equipment may result in injury to subsequently sprayed crops. See **SPRAYER CLEANOUT** for more information.

TABLE: SOYBEAN RATE

Zone Defense Use Rates for Soybeans			
Broadcast rate	**Ounces of Zone Defense per Acre**		
	Soil Texture		
% Organic Matter	**Coarse**	**Medium**	**Fine**
0.5 – 2.0 %	3.5 – 4.0	4.5 – 5.0	5.0
2.0 – 4.0 %	4.0 – 5.0	5.0	–
Refer to the use rate information on **TABLE: SOIL CLASSIFICATION CHART** for soil categories.			
Use higher rates for soils with pH less than 7.0 and lower rates for soils with pH greater than 7.0 within the given rate ranges in this table.			
Zone Defense may be tank mixed with other herbicides registered for use in soybeans. Observe all precautions, instructions and rotational cropping guidelines of each product's label when tank mixing, including all references to potential carryover and crop injury warnings or restrictions.			

TABLE: WEEDS CONTROLLED - PREEMERGE

When used as directed Zone Defense will provide control of the following weed species:

Anoda, Spurred	Nightshade, Black
Bedstraw, Catchweed	Nightshade, Eastern Black
Carpetweed	Nutsedge, Purple
Chickweed, Common	Nutsedge, Yellow
Copperleaf, Hophornbeam	Orchardgrass
Copperleaf, Virginia	Pigweed, Livid
Croton, Tropic	Pigweed, Palmer amaranth
Crownbeard, Golden	Pigweed, Powel
Cupgrass, Wooly	Pigweed, Redroot
Daisy, American	Pigweed, Smooth
Devilsclaw	Pigweed, Spiny amaranth
Eclipta	Pigweed, Spleen
Filaree, Redstem	Plantain, Blackseed
Flixweed	Plantain, Narrowleaved
Galinsoga, Hairy	Poinsettia, wild
Jimsonweed	Poorjoe
Ladysthumb	Purslane, Common
Lambsquarters, Common	Redsmaid
Lettuce, Miners	Redweed
Mallow, Common	Sedge, Annual
Mayweed/False Chamomile	Senna, Coffee
Milkweed, Honeyvine	Shepherd's Purse
Morningglory, Entireleaf	Sida, Prickly
Morningglory, Ivyleaf	Stinkgrass
Morningglory, Palmleaf	Tasselflower, Red
Morningglory, Purple	Thistle, Russian
Morningglory, Red/Scarlet	Toadflax, Yellow
Morningglory, Smallflower	Waterhemp, Common
Morningglory, Tall	Waterhemp, Tall
Morningglory. Annual	Witchgrass
Mustard, Tumble	

Weed species which can germinate deep in the soil such as morningglory or other weeds; such as nutsedge, which may emerge at various times during the growing season may require a cultivation or a follow up application of postemergence herbicides for season-long control.

TABLE: Zone Defense will provide partial control of the following weeds when used as directed:

Barnyardgrass	Ragweed, Common
Bluegrass, Annual	Ragweed, Giant*
Bristly Starbur	Russian Thistle
Burcucumber	Ryegrass, Italian
Crabgrass	Sesbania, Hemp
Foxtail, species	Sicklepod
Goosegrass	Signalgrass, broadleaf
Hophornbean Copperleaf	Smartweed, Ladysthumb
Johnsongrass, seedling	Smartweed, Pennsylvania
Kochia	Smellmelon
Mexicanweed	Velvetleaf
Panicum, Fall	Wild Buckwheat
Panicum, Texas	Wormwood, Biennial

For information on other weeds not listed above, refer to **TABLE: WEEDS CONTROLLED OR SUPPRESSED BY ZONE DEFENSE APPLICATION**.

TIMING TO SOYBEANS

Zone Defense may be applied to soybeans prior to planting or preemergence (after planting). Preemergence application of Zone Defense 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. Application should not be made when soybeans have begun to crack. Select Zone Defense rate from **TABLE: SOYBEAN RATE** according to anticipated weed spectrum.

APPLICATION METHODS

DO NOT apply Zone Defense after the soybean crop has emerged or severe injury or death of the crop may occur. Zone Defense may be applied by any of the methods listed below.

CONSERVATION TILLAGE

Early Pre-Plant in No-Till, Minimum Till, or Stale Seedbed

Zone Defense applied Early Pre-plant must be applied in combination with the appropriate burndown herbicide such as glyphosate, glufosinate, paraquat, and/or 2,4-D to achieve acceptable control of existing weeds during application. Zone Defense is rainfast after one hour when applied as a burndown treatment. For burndown or control of existing vegetation, an appropriate burndown herbicide at labeled rates is recommended such as glyphosate etc. Follow all label directions for the burndown herbicide including application timing, spray volume, adjuvants to achieve control of targeted weeds. For applications of Zone Defense made from 30 - 60 days before planting apply the higher rate in the appropriate soil range from **TABLE: SOYBEAN RATE** depending on the soybean system being grown.

PRE-EMERGENCE

Zone Defense may be applied at planting time or within 3 days after planting, but before seed emergence. Zone Defense may be applied alone or in tank mix combinations with other registered soybean herbicides. When applied in tank mix combinations, follow applicable use directions, including application rates, precautions and restrictions of each product in the mixture. The seed furrow should be completely closed and seed covered before any applications of Zone Defense.

PRE-PLANT INCORPORATED

Uniformly incorporate Zone Defense or Zone Defense tank mixes no deeper than 2" prior to planting soybeans. If tank-mixing Zone Defense with a companion herbicide, follow all label instructions for proper incorporation of the companion herbicide in the top 2" of soil. Improper incorporation can result in erratic weed control or potential crop injury.

NOTE: Not all soybean varieties or cultivars have been evaluated under treatment with Zone Defense. Consult university or extension weed management specialists for additional information on specific local varieties or cultivars and any other pertinent information on Zone Defense under specific local conditions.

DIRECTIONS FOR USE FOR MAINTAINING BAREGROUND IN NON-CROP SITES AND RIGHTS-OF WAYS - INCLUDING RAILROAD, HIGHWAY, ROADSIDE, PIPELINE, UTILITY, INDUSTRIAL AREAS, AND FENCE ROWS

RESTRICTIONS

- **DO NOT** apply more than 9.6 ounces (0.375 lb sulfentrazone) (0.090 flumioxazin) of Zone Defense per acre per application.
- **DO NOT** apply more than 9.6 ounces (0 375 pound active) (0.090 flumioxazin) per acre of Zone Defense per twelve-month period. The twelve-month period is considered to begin upon the initial Zone Defense application.
- **DO NOT** make more than 2 applications of Zone Defense per acre per year and do not exceed the maximum amount of Zone Defense per twelve-month period.
- **DO NOT** apply Zone Defense to soils classified as sand with less than 1% Organic Matter.
- **DO NOT** apply when weather conditions favor spray drift from treated areas.
- **DO NOT** incorporate into soil after application.
- **DO NOT** apply this product through any type of irrigation system.
- **DO NOT** apply to moist or wet desirable plant foliage.
- **DO NOT** re-apply this product within 30 days.

PRECAUTIONS

Treatment of powdery, dry soil or light sandy soil, or light sandy soil when there is little to no likelihood of rainfall soon after may result in off target movement and possible damage to actively growing susceptible crops when soil particles are moved by wind or water. **DO NOT** apply when these soil and environmental conditions are present.

RATES - RIGHTS-OF-WAYS / NON-CROP

Apply this product as a broadcast treatment at 6.6 to 9.6 ounces (0.25 to 0.375 lb sulfentrazone) (0.062 to 0.090 lb flumioxazin) 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.

TABLE: WEEDS CONTROLLED – RIGHTS-OF-WAYS / NON-CROP

When applied according to directions, Zone Defense will provide control of:

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

For information on other weeds not listed above, refer to **TABLE: WEEDS CONTROLLED OR SUPPRESSED BY ZONE DEFENSE APPLICATION**.

APPLICATION - RIGHTS-OF-WAYS / NON-CROP

Apply Zone Defense 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.

TANK MIXES

It is the pesticide user's responsibility to ensure that all products are registered for the intended use. Read and follow the applicable restrictions 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.

Use labeled rates of burndown herbicides such as glyphosate, diquat, 2,4-D, dicamba, etc. as tank mixtures with Zone Defense. Use recommended adjuvants for the herbicide tank mix partner.

DISCLAIMER, RISKS OF USING THIS PRODUCT, LIMITED WARRANTY AND LIMITATION OF LIABILITY

IMPORTANT: Read the entire Label including this Disclaimer, Risks of Using this Product, Limited Warranty, and Limitation of Liability before using this product. If the terms are not acceptable THEN DO NOT USE THE PRODUCT; rather, return the unopened product within 15 days of purchase for a refund of the purchase price.

RISKS OF USING THIS PRODUCT

The Buyer and User (referred to collectively herein as "Buyer") of this product should be aware that there are inherent unintended risks associated with the use of this product which are impossible to eliminate. These risks include, but are not limited to, injury to plants and crops to which this product is applied, lack of control of the target pests or weeds, resistance of the target pest or weeds to this product, injury caused by drift, and injury to rotational crops caused by carryover in the soil. Such risks of crop injury, non-performance, resistance or other unintended consequences are unavoidable and may result because of such factors as weather, soil conditions, disease, moisture conditions, irrigation practices, condition of the crop at the time of application, presence of other materials either applied in the tank mix with this product or prior to application of this product, cultural practices or the manner of use or application, (or a combination of such factors) all of which are factors beyond the control of HELM Agro US, Inc. The Buyer should be aware that these inherent unintended risks may reduce the harvested yield of the crop in all or a portion of the treated acreage, or otherwise affect the crop such that additional care, treatment and expense are required to take the crop to harvest. If the Buyer chooses not to accept these risks, THEN THIS PRODUCT SHOULD NOT BE APPLIED. By applying this product Buyer acknowledges and accepts these inherent unintended risks AND TO THE FULLEST EXTENT ALLOWED BY LAW, AGREES THAT ALL SUCH RISKS ASSOCIATED WITH THE APPLICATION AND USE ARE ASSUMED BY THE BUYER. HELM Agro US, Inc. shall not be responsible for losses or damages (including, but not limited to, loss of yield, increased expenses of farming the crop or such incidental, consequential or special damages that may be claimed) resulting from use of this product in any manner not set forth on the label. Buyer assumes all risks associated with the use of this product in any manner or under conditions not specifically directed or approved on the label.

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 of applicable law, all such risks shall be assumed by Buyer and User, and Buyer and User agree to hold HELM Agro US, Inc. and Seller harmless for any claims relating to such factors.

HELM Agro US, Inc. 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 Agro US, Inc., and Buyer and User assume the risk of any such use. **HELM AGRO US, INC. 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 Agro US, Inc. 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 AGRO US, INC. 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 AGRO US, INC. OR SELLER, THE REPLACEMENT OF THE PRODUCT**.

To the extent consistent with applicable law allowing such requirements HELM Agro US, Inc. must be provided notice as soon as Buyer has reason to believe it may have a claim, but in no event later than twenty-one days from date of planting, or twenty-one days from the date of application, whichever is later, so that an immediate inspection of the affected property and growing crops can be made.

To the extent consistent with applicable law if Buyer does not notify HELM Agro US, Inc. of any claims, in such period, it shall be barred from obtaining any remedy.

NO AMENDMENTS

HELM Agro US, Inc. 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 Agro US, Inc.

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HELM Agro US, Inc.
401 E. Jackson St., Suite 1600
Tampa, FL 33602

(RV040325)