

7969-338

04-26-2012

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U.S. ENVIRONMENTAL PROTECTION AGENCY

**Office of Pesticide Programs
Registration Division (7505P)
Ariel Rios Building
1200 Pennsylvania Ave., NW
Washington, D.C. 20460**

EPA Reg. Number:

Date of Issuance:

7969-338

APR 26 2012

Term of Issuance:

Unconditional

Name of Pesticide Product:

Zidua Herbicide

NOTICE OF PESTICIDE:

Registration
 Reregistration
(under FIFRA, as amended)

Name and Address of Registrant (include ZIP Code):

BASF Corporation
26 Davis Drive
Research Triangle Park, NC 27709

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

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

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

- 1) Submit and/or cite all data required for registration/reregistration review of your product when the Agency requires all registrants of similar products to submit data. If required, failure to submit acceptable data to fulfill these requirements may result in registration cancellation in accordance with FIFRA section 6(e).
- 2) Assure that the EPA Establishment Number and Net Contents are on the label.
- 3) NOTE: The Confidential Statements of Formula Alternates dated February 22, 2012 is acceptable.
- 4) NOTE: Should you wish to add/retain a reference to the company's website on your label, then please be aware that the website becomes labeling under the Federal Insecticide Fungicide and Rodenticide Act and is subject to review by the Agency. If the website is false or misleading, the product would be misbranded and unlawful to sell or distribute under FIFRA section 12(a)(1)(E). 40 CFR 156.10(a)(5) list examples of statements EPA may consider false or misleading. In addition, regardless of whether a website is referenced on your product's label, claims made on the website may not substantially differ from those claims approved through the registration process. Therefore, should the Agency find or if it is brought to our attention that a website contains false or misleading statements or claims substantially differing from the EPA approved registration, the website will be referred to the EPA's Office of Enforcement and Compliance.

SEE NEXT PAGE FOR ADDITIONAL COMMENTS

Signature of Approving Official:

Kathryn V. Montague
Product Manager 23
Herbicide Branch
Registration Division (7505P)

Date:

APR 26 2012

5) NOTE: While no additional data is being requested at this time, marketing claims made on the pesticide label must be substantiated by data maintained in your files. If data supporting marketing claims made on the product label is not available then those claims must be removed.

6) Submit one (1) copy of the revised final printed label before the product is released for shipment.

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

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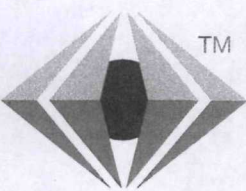
The Chemical Company

Group 15 Herbicide

ACCEPTED
APR 26 2012
Under the Federal Insecticide,
Fungicide, and Rodenticide Act,
as amended, for the pesticide
registered under
EPA Reg. No. 7969-338

Zidua[®]

HERBICIDE



For weed control in corn

Active Ingredient:

pyoxasulfone: 3-[[[5-(difluoromethoxy)-1-methyl-3-(trifluoromethyl)-1H-pyrazol-4-yl]methyl]sulfonyl]-4,5-dihydro-5,5-dimethylisoxazole 85.00%

Other Ingredients: 15.00%

Total: 100.00%

Contains 0.85 pound of pyoxasulfone per pound formulated as a water-dispersible granule (WG)

EPA Reg. No. 7969-338

EPA Est. No.

KEEP OUT OF REACH OF CHILDREN CAUTION/PRECAUCION

Si usted no entiende la etiqueta, busque a alguien para que se la explique a usted en detalle. (If you do not understand the label, find someone to explain it to you in detail.)

See inside for complete **First Aid, Precautionary Statements, Directions For Use, Conditions of Sale and Warranty**, and state-specific crop and/or use site restrictions.

In case of an emergency endangering life or property involving this product, call day or night 1-800-832-HELP (4357).

Net Contents:

Manufactured for:
BASF Corporation
26 Davis Drive, Research Triangle Park, NC 27709

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| FIRST AID | |
|--|--|
| If on skin or clothing | <ul style="list-style-type: none"> • Take off contaminated clothing. • Rinse skin immediately with plenty of water for 15 to 20 minutes. • Call a poison control center or doctor for treatment advice. |
| If swallowed | <ul style="list-style-type: none"> • 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 | <ul style="list-style-type: none"> • Hold eyes open and rinse slowly and gently with water for 15 to 20 minutes. • Remove contact lenses, if present, after first 5 minutes; then continue rinsing eyes. • Call a poison control center or doctor for treatment advice. |
| If inhaled | <ul style="list-style-type: none"> • Move person to fresh air. • If person is not breathing, call 911 or an ambulance; then give artificial respiration, preferably by mouth to mouth if possible. • Call a poison control center or doctor for further treatment advice. |
| HOTLINE NUMBER | |
| <p>Have the product container or label with you when calling a poison control center or doctor or going for treatment. You may also contact BASF Corporation for emergency medical treatment information at 1-800-832-HELP (4357).</p> | |

Precautionary Statements

Hazards to Humans and Domestic Animals

CAUTION. Harmful if absorbed through skin. Harmful if swallowed. Avoid contact with skin, eyes or clothing. Prolonged or frequently repeated skin contact may cause allergic reactions in some individuals.

Personal Protective Equipment (PPE)

Some materials that are chemically resistant to this product are listed below. For more options, refer to **Category A** on an EPA chemical-resistance category selection chart.

Applicators and other handlers must wear:

- Long-sleeved shirt and long pants
- Chemical-resistant gloves made of any waterproof material such as barrier laminate, butyl rubber ≥ 14 mils, nitrile rubber ≥ 14 mils, neoprene rubber ≥ 14 mils, natural rubber ≥ 14 mils, polyethylene, polyvinyl chloride ≥ 14 mils, or viton ≥ 14 mils
- Shoes plus socks

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

Engineering Controls Statement

When handlers use closed systems or enclosed cabs that meet the requirements listed in the Worker Protection Standards (WPS) for agricultural pesticides [40 CFR 170.240(d)(4-6)], the handler PPE requirements may be reduced or modified as specified in the WPS.

USER SAFETY RECOMMENDATIONS

Users should:

- Wash thoroughly with soap and water after handling and 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

DO NOT apply directly to water, to areas where surface water is present, or to intertidal areas below the mean high water mark. **DO NOT** contaminate water when disposing of equipment washwater or rinsate.

DO NOT discharge effluent containing this product into lakes, streams, ponds, estuaries, oceans, or other waters unless in accordance with the requirements of a National Pollutant Discharge Elimination System (NPDES) permit and the permitting authority has been notified in writing prior to discharge. **DO NOT** discharge effluent containing this product to sewer systems without previously notifying the local sewage treatment plant authority. For guidance, contact your State Water Board or Regional Office of the EPA.

Drift and runoff may be hazardous to aquatic organisms in water adjacent to treated areas.

Groundwater Advisory

This chemical has properties and characteristics associated with chemicals detected in groundwater. This chemical may leach into groundwater if used in areas where soils are permeable, particularly where the water table is shallow.

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Surface Water Advisory

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 aquatic organisms in water adjacent to treated areas. Do not contaminate water when disposing of equipment wash waters or rinsate. This product may impact surface water quality due to runoff or rainwater. This is especially true for poorly draining soils and soils with shallow ground water. This product is classified as having a high potential for reaching surface water via runoff for several months or more after application. A level, well-maintained vegetative buffer strip between areas to which this product is applied and surface water features such as ponds, streams, and springs will reduce potential loading of pyroxasulfone and its degradation product, 5-difluoromethoxy-1H-pyrazol-4-yl)methanesulfonic acid (M1), from runoff water and sediment. Runoff of this product will be reduced by avoiding applications when rainfall is forecasted to occur within 48 hours.

Point-source Contamination. To prevent point-source contamination, **DO NOT** mix or load this or any other pesticide within 50 feet of wells (including abandoned wells and drainage wells, sinkholes, perennial or intermittent streams and rivers, and natural or impounded lakes and reservoirs). This setback does not apply to properly capped or plugged abandoned wells and does not apply to impervious pad or dike mixing/loading areas as described below. Mixing, loading, rinsing, or washing operations performed within 50 feet of a well are allowed only when conducted on an impervious pad constructed to withstand the weight of the heaviest load that may be on or move across the pad. The pad must be self-contained to prevent surface water flow over or from the pad. The pad capacity must be maintained at 110% of that of the largest pesticide container or application equipment used on the pad and have sufficient capacity to contain all product spills, equipment or container leaks, equipment washwaters and rainwater that may fall on the pad. The containment capacity does not apply to vehicles delivering pesticide shipments to the mixing/loading site. States may have in effect additional requirements regarding wellhead setbacks and operational containment.

Care must be taken when using this product to prevent back-siphoning into wells, spills, or improper disposal of excess pesticide, spray mixes, or rinsates. Check valves or anti-siphoning devices must be used on all mixing equipment.

Endangered Species Protection Requirements

This product may have effects on federally listed threatened or endangered plant species or their critical habitat. When using this product, you must follow the measures contained in the Endangered Species Protection Bulletin for the county or parish in which you are applying the pesticide. To determine whether your county or parish has a Bulletin, and to obtain that Bulletin, consult

<http://www.epa.gov/espp/>, or call 1-800-447-3813 no more than 6 months before using this product. Applicators must use Bulletins that are in effect in the month in which the pesticide will be applied. New Bulletins will generally be available from the above sources 6 months prior to their effective dates.

Directions For Use

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

Read entire label. Use strictly in accordance with precautionary statements and directions, and with applicable state and federal regulations.

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

Failure to follow directions and precautions on this label may result in crop injury, poor weed control, and/or illegal residues.

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, greenhouses and handlers of agricultural insecticides. 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**.

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

- Coveralls
- Chemical-resistant gloves made of any waterproof material such as barrier laminate, butyl rubber ≥ 14 mils, nitrile rubber ≥ 14 mils, neoprene rubber ≥ 14 mils, natural rubber ≥ 14 mils, polyethylene, 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. Open dumping is prohibited.

Pesticide Storage

DO NOT use or store near heat or open flame. Store in original container only, in cool, dry, and well-ventilated area, separately from fertilizer, feed, or foodstuffs and away from other pesticides. **DO NOT** store this product under wet conditions. Avoid cross-contamination with other pesticides.

Pesticide Disposal

Wastes resulting from the use of this product may be disposed of on site or at an approved waste disposal facility. Improper disposal of excess pesticide, spray mix, or rinsate is a violation of federal law. If these wastes cannot be disposed of according to label instructions, contact the state agency responsible for pesticide regulation or the Hazardous Waste representative at the nearest EPA Regional Office for guidance.

Container Handling

Nonrefillable Container. DO NOT reuse or refill this container. Triple rinse or pressure rinse container (or equivalent) promptly after emptying; then offer for recycling, if available, or reconditioning, if appropriate, or puncture and dispose of in a sanitary landfill, or by incineration, or by other procedures approved by state and local authorities.

Triple rinse containers small enough to shake (capacity ≤ 50 pounds) as follows: Empty the remaining contents into application equipment or a mix tank. 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.

Pressure rinse as follows: Empty the remaining contents into application equipment or mix tank. Hold container upside down over application equipment or mix tank, or collect rinsate for later use or disposal. Insert pressure rinsing nozzle in the side of the container and rinse at about 40 PSI for at least 30 seconds. Drain for 10 seconds after the flow begins to drip.

In Case of Emergency

In case of large-scale spillage regarding this product, call:

- CHEMTREC 1-800-424-9300
- BASF Corporation 1-800-832-HELP (4357)

In case of medical emergency regarding this product, call:

- Your local doctor for immediate treatment
- Your local poison control center (hospital)
- BASF Corporation 1-800-832-HELP (4357)

Steps to be taken in case material is released or spilled:

- Dike and contain the spill with inert material (sand, earth, etc.) and transfer liquid and solid diking material to separate containers for disposal.
- Remove contaminated clothing and wash affected skin areas with soap and water.
- Wash clothing before reuse.
- Keep the spill out of all sewers and open bodies of water.

Product Information

Zidua® herbicide is a selective rate-dependent preemergence herbicide for controlling annual grasses, sedges and annual broadleaf weeds listed in **Table 1**. Refer to **Crop-specific Information** section for recommendations on herbicide tank mixtures or sequential programs.

Dry weather following applications of **Zidua** may reduce effectiveness. **Zidua** must be applied and be activated by at least 1/2 inch of rainfall or irrigation prior to weed germination and emergence. When **Zidua** is not activated and weeds emerge, a labeled postemergence herbicide or shallow cultivation may be needed to control weed escapes.

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Table 1. Weeds Controlled with a Residual Preemergence Application of Zidua® herbicide

| Common Name | Scientific Name |
|---------------------------------|---|
| Annual Grasses | |
| Barley, hare | <i>Hordeum murinum</i> spp. <i>leporinum</i> |
| Barnyardgrass | <i>Echinochloa crus-galli</i> |
| Bluegrass, annual | <i>Poa annua</i> |
| Brome, downy ¹ | <i>Bromus tectorum</i> |
| Brome, Japanese ¹ | <i>Bromus japonicus</i> |
| Canarygrass | <i>Phalaris canariensis</i> |
| Cheat ¹ | <i>Bromus secalinus</i> |
| Crabgrass, large | <i>Digitaria sanguinalis</i> |
| Crabgrass, smooth | <i>Digitaria ischaemum</i> |
| Crowfoot grass | <i>Dactyloctenium aegyptium</i> |
| Cupgrass, southwestern | <i>Eriochloa gracilis</i> |
| Cupgrass, woolly ¹ | <i>Eriochloa villosa</i> |
| Foxtail, giant | <i>Setaria faberi</i> |
| Foxtail, green | <i>Setaria viridis</i> |
| Foxtail, yellow | <i>Setaria glauca</i> |
| Goosegrass | <i>Eleusine indica</i> |
| Johnsongrass, seedling | <i>Sorghum halepense</i> |
| Millet, wild proso ¹ | <i>Panicum miliaceum</i> |
| Oat, wild ¹ | <i>Avena fatua</i> |
| Panicum, fall | <i>Panicum dichotomiflorum</i> |
| Panicum, Texas ¹ | <i>Panicum texanum</i> |
| Red rice | <i>Oryza sativa</i> |
| Ryegrass, Italian | <i>Lolium multiflorum</i> |
| Ryegrass, rigid | <i>Lolium rigidum</i> |
| Sandbur, longspine ¹ | <i>Cenchrus longispinus</i> |
| Shattercane ¹ | <i>Sorghum vulgare</i> |
| Signalgrass, broadleaf | <i>Brachiaria platyphylla</i> |
| Sedge | |
| Nutsedge, yellow ¹ | <i>Cyperus esculentus</i> |

(continued)

Table 1. Weeds Controlled with a Residual Preemergence Application of Zidua (continued)

| Common Name | Scientific Name |
|---------------------------------------|--------------------------------|
| Annual Broadleaves | |
| Amaranth, Palmer | <i>Amaranthus palmeri</i> |
| Amaranth, Powell | <i>Amaranthus powellii</i> |
| Buckwheat, wild ¹ | <i>Polygonum convolvulus</i> |
| Carpetweed | <i>Mollugo verticillata</i> |
| Chickweed, common ¹ | <i>Stellaria media</i> |
| Fleabane, hairy ¹ | <i>Conyza bonariensis</i> |
| Groundsel, common ¹ | <i>Senecio vulgaris</i> |
| Henbit ¹ | <i>Lamium amplexicaule</i> |
| Horseweed (marestail) ¹ | <i>Conyza canadensis</i> |
| Jimsonweed ¹ | <i>Datura stramonium</i> |
| Kochia ¹ | <i>Kochia scoparia</i> |
| Lambsquarters, common ¹ | <i>Chenopodium album</i> |
| Morningglory, entireleaf ¹ | <i>Ipomoea hederacea</i> |
| Morningglory, pitted ¹ | <i>Ipomoea lacunosa</i> |
| Nightshade, black | <i>Solanum sarrachoides</i> |
| Nightshade, Eastern black | <i>Solanum ptychanthum</i> |
| Pigweed | <i>Amaranthus</i> spp. |
| Pigweed, redroot | <i>Amaranthus retroflexus</i> |
| Pigweed, smooth | <i>Amaranthus hybridus</i> |
| Pigweed, tumble | <i>Amaranthus albus</i> |
| Purslane, common | <i>Portulaca oleracea</i> |
| Pusley, Florida | <i>Richardia scabra</i> |
| Ragweed, common ¹ | <i>Ambrosia artemisiifolia</i> |
| Shepherdspurse ¹ | <i>Capsella bursa-pastoris</i> |
| Sida, prickly (teaweed) | <i>Sida spinosa</i> |
| Velvetleaf ¹ | <i>Abutilon theophrasti</i> |
| Waterhemp | <i>Amaranthus tuberculatus</i> |

¹ Partial control or suppression only. **Zidua** should be used in tank mixes or sequential applications with other labeled herbicides that provide additional control of noted weeds.

Mode of Action

Zidua acts to inhibit very long chain fatty acid synthesis as a **Group 15 (WSSA)/Group K₃ (HRAC)** herbicide. It is a root-and-shoot growth inhibitor that controls susceptible germinating seedlings before or soon after they emerge from the soil.

Resistance Management

Zidua® herbicide is a **Group 15/Group K₃** herbicide. Any weed population may contain or develop plants naturally resistant to **Zidua** and other **Group 15** herbicides. Weed species with resistance to **Group 15** may eventually dominate the weed population if **Group 15** herbicides are used repeatedly in the same field or in successive years as the primary method of control for targeted species. This may result in partial or total loss of control of those species by **Zidua** or other **Group 15** herbicides.

To delay herbicide resistance consider:

- Avoiding the consecutive use of **Zidua** or other target site of action **Group 15** herbicides that have a similar target site of action on the same weed species
- Using tank mixtures or premixes with herbicides from different target-site-of-action groups as long as the involved products are all registered for the same use, have different sites of action, and are both effective at the tank mix or prepack rate on the weed(s) of concern
- Basing herbicide use on a comprehensive IPM (Integrated Pest Management) program including cultural and mechanical methods
- Monitoring treated weed populations for loss of field efficacy, and control of escapes with effective alternative herbicides or mechanical methods
- Contacting your local extension specialist, certified crop advisors, and/or manufacturer for herbicide resistance management and/or integrated weed management recommendations for specific crops and resistant weed biotypes

Crop Tolerance

Corn is are tolerant to **Zidua** when applied according to label directions and under normal environmental conditions. Applications to corn under stress due to either inadequate or excess of moisture for normal crop development, cool and hot temperatures, sodic soils, poorly drained soils, hail damage, flooding, pesticide injury, mechanical injury, or widely fluctuating temperatures may result in crop injury.

Application Instructions

Soil Categories

Application rates of **Zidua** may vary depending on soil texture. Refer to **Table 2** for soil texture groups used in this label unless a specific soil texture is mentioned. When use rates are in ranges, apply the lower rate for soils with coarser texture or lower organic matter; apply the higher rates for finer soil textures, higher organic matter, heavy soil surface plant residue, or heavy weed pressure.

Table 2. Soil Texture Groups

| Coarse | Medium | Fine |
|------------|-----------------|-----------------|
| Sand | Loam | Sandy clay |
| Loamy sand | Silt loam | Silty clay loam |
| Sandy loam | Silt | Silty clay |
| | Sandy clay loam | Clay loam |
| | | Clay |

DO NOT use on peat or muck soils or mineral soils with 10% or more organic matter content unless described within the **Crop-specific Information** section for a particular crop.

Refer to the **Crop-specific Information** section for specific application rates, timings, and the restrictions and limitations by crop and use pattern.

Application Timings

Zidua may be applied preplant surface, preplant incorporated, preemergence, early postemergence, or in the fall.

Preplant Surface Applications. Apply **Zidua** alone or in tank mixes up to 45 days before planting. If weeds are present at the time of application, use additional weed control methods such as tank mixes with an appropriate postemergence herbicide(s) to control emerged weeds.

Preplant Incorporated (PPI) Applications. Incorporate **Zidua** into the upper (1 to 2 inches) soil surface up to 14 days before planting. Deeper incorporation may increase the potential for crop injury and also may result in reduced weed control. Use appropriate equipment that provides uniform shallow incorporation, such as a field cultivator, harrow, rolling cultivator, or finishing disc.

Preemergence Surface Applications. After planting and before crop emergence, apply a uniform broadcast treatment to the soil surface. If weeds are present, apply **Zidua** in tank mixture with an appropriate postemergence herbicide, such as a glyphosate-containing product.

Early Postemergence Applications. **Zidua** must be applied and activated prior to weed seedling emergence or in a tank mixture that controls the emerged weeds. Refer to **Crop-specific Information** for postemergence application instructions by crop.

Fall Applications for controlling weeds germinating the following spring. **Zidua** may be broadcast surface applied in the fall after crop harvest when soil temperatures at the 4-inch depth are sustained at less than 55° F and before the ground freezes to control weeds in minimum or no tillage fields planted the following spring. Fall applications must be made after October 1. **DO NOT** apply to frozen or snow-covered soil. Tillage operations may be conducted before or after applying **Zidua**. If tillage is used following an application, tillage should be shallow and no more than 2-inches deep to uniformly incorporate the herbicide into the upper soil surface. Refer to **Crop-specific Information** for fall application instructions by crop for state and/or geographic restrictions.

Fall/Winter Applications for controlling weeds germinating in the fall or winter weeds. Zidua® herbicide may be broadcast surface applied in the fall or winter after crop harvest. **DO NOT** apply to frozen or snow-covered soil. Tillage operations may be conducted before or after applying Zidua. If tillage is used following an application, tillage should be shallow and no more than 2-inches deep to uniformly incorporate the herbicide into the upper soil surface.

Application Methods and Equipment

Zidua may only be applied by ground application. **DO NOT** apply by aerial equipment or through any type of irrigation system.

Thorough spray coverage is required for optimum weed control and can be improved with proper nozzle and spray volume selection. Use and configure application equipment to provide an adequate spray volume, an accurate and uniform distribution of spray droplets over the treated area, and to avoid spray drift to nontarget areas. Equipment should be adjusted to maintain continuous agitation during spraying with good mechanical or bypass agitation. Avoid overlaps that will increase rates above the use rates specified in this label.

Zidua may be applied using either water or sprayable fluid nitrogen fertilizer solutions as the spray carrier. **DO NOT** apply this product without dilution in a spray carrier. Additionally, Zidua may be impregnated on and applied with dry bulk fertilizer.

Ground Application Requirements

Spray Carrier Volume. Use 5 or more gallons of water per treated acre or 20 or more gallons of sprayable fluid nitrogen fertilizer per treated acre for weed control applications.

The following measures must be followed to reduce the potential of spray drift to nontarget areas from ground applications:

1. Apply this product using nozzles which deliver **medium-to-ultra-coarse spray droplets** as defined by ASABE standard S-572.1 and as shown in nozzle manufacturer's catalogs. Flood-jet or Air Induction-type nozzles are recommended for residual soil surface applications. Nozzles that deliver coarse spray droplets may be used to reduce spray drift provided spray volume per acre (GPA) is increased to maintain coverage of target (i.e. soil surface). **DO NOT** use nozzles that produce fine (e.g. cone) spray droplets.
2. Apply this product only when the potential for drift to adjacent nontarget areas is minimal (e.g. when the wind is **10 MPH or less and is blowing away** from sensitive areas). **DO NOT** apply during periods of temperature inversions or stable atmospheric conditions.
3. Avoid potential adverse effects to nontarget areas by maintaining a 10-foot buffer between the application area and the **closest downwind edge** of sensitive terrestrial habitats (such as grasslands, forested areas, shelter belts, woodlots, hedgerows, riparian areas, shrub lands, and crop lands).

Ground Application (Dry Bulk Fertilizer)

Zidua may be impregnated or coated onto dry bulk granular fertilizer carriers for residual soil surface (fall, preplant surface, preplant incorporated) applications. Impregnation or coating may be conducted by either in-plant bulk or on-board systems. Perform the mixing operation in well-ventilated areas.

All individual state regulations relating to dry bulk granular fertilizer blending, registration, labeling, and application are the responsibility of the individual and/or company selling the herbicide/fertilizer mixture.

Zidua may be impregnated on many commonly used dry fertilizers. **DO NOT** impregnate on ammonium nitrate, fertilizers containing ammonium nitrate, potassium nitrate, sodium nitrate, or powdered limestone.

Generally, fertilizer application rates of at least 200 lbs to 700 lbs per acre of herbicide and fertilizer blend will provide adequate distribution or coverage of Zidua across the soil surface. Application of impregnated fertilizer must be made uniformly to the soil to prevent possible crop injury and offer satisfactory weed control. Impregnated fertilizer spread at half rate and overlapped to obtain a full rate will offer a more uniform distribution. A shallow (< 2 inches) incorporation is desirable for improved weed control. Deeper incorporation will dilute the herbicide layer near the soil surface and may result in unsatisfactory weed control.

Use the following formula to determine the herbicide rate when using dry bulk fertilizer applications:

$$\frac{[\text{ozs of Zidua per acre} \times 2000]}{\text{pounds fertilizer per acre}} = \frac{\text{ozs of Zidua for}}{1 \text{ ton of fertilizer}}$$

To impregnate Zidua on bulk fertilizer, use a closed rotary-drum mixer or other commonly used dry bulk fertilizer blender equipped with suitable spray equipment. Mix Zidua with sufficient water to form a sprayable slurry mixture. Spray nozzles must be directed to provide uniform fertilizer coverage while avoiding spray contact with mixing equipment. Nonuniform impregnation can cause crop injury or unsatisfactory performance. Spray herbicide mixture onto fertilizer after blending has started. Addition of a suitable drying agent may be necessary if the fertilizer and herbicide blend is too wet for uniform application due to high humidity, high urea concentration, or low fertilizer use rate. Slowly add the drying agent to the blend until a flowable mixture is obtained. Drying agents are not recommended for use with on-board impregnation systems.

Under some conditions, fertilizer impregnated with Zidua may clog air tubes or deflector plates on pneumatic application systems. Mineral oil may be added to Zidua before blending with fertilizer to reduce plugging. **DO NOT** use drying agents when mineral oil is used. To avoid separation of Zidua and mineral oil mixes in cold temperatures, either keep mixture heated or agitated prior to blending with fertilizer. Mineral oil may be used with inplant blending stations or with on-board injection systems.

Uniformly apply the treated fertilizer with accurately calibrated and proper equipment immediately after impregnation to avoid lump formation and spreading difficulties.

Accurate calibration of fertilizer application equipment and uniform fertilizer distribution is essential for satisfactory weed control.

Cleaning Spray Equipment

Clean application equipment thoroughly by using a strong detergent or commercial sprayer cleaner according to the manufacturer's directions. Triple rinse the equipment before and after applying **Zidua® herbicide**.

Spray Drift Management

The interaction of many equipment-related and weather-related factors determines the potential for spray drift. The applicator and the grower are responsible for considering all factors involved in minimizing drift potential.

Importance of Droplet Size

The best drift management strategy is to apply the largest droplets that provide sufficient coverage and control. Use nozzle types and nozzle arrangements that will provide maximum coverage and minimize the potential for off target movement of spray particles. Droplet size for both ground and air applications must be in the "medium" size category as defined in the August 1999 ASAE S572 publication entitled "Spray Nozzle Classification by Drop Spectra". Refer to that publication for additional information. Regardless of droplet size, if applications are made improperly or under unfavorable environmental conditions off target movement will occur. (See Wind, Temperature and Humidity, and Temperature Inversion sections in this label.

Controlling Droplet Size

Volume. Use high flow rate nozzles that produce medium droplets to apply the highest practical spray volume.

Pressure. Use the lower spray pressures recommended for the nozzle and **DO NOT** exceed the nozzle manufacturer's recommended pressures. Higher pressure reduces droplet size and does not improve canopy penetration. When higher flow rates are needed, use higher flow rate nozzles instead of increasing pressure.

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

Nozzle Orientation. Orienting nozzles so that the spray is released backwards parallel to the airstream will produce larger droplets than other orientations. Significant deflection from the horizontal will reduce droplet size and increase drift potential.

Nozzle Type. Use a nozzle type that is designed for the intended application. Do not use air inducting or flood type nozzles.

Boom length. For some use patterns, reducing the effective boom length to less than 3/4 of the wingspan or rotor

length may further reduce drift without reducing swath width.

Ground Boom Application Height. Applications should not be made at a height greater than 4 feet above the top of the largest plants. Making applications at the lowest possible height reduces exposure of droplets to evaporation and wind.

Swath Adjustment

When 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 adjusting the path of the aircraft upwind. Swath adjustment distance should increase with increasing drift potential (higher wind, smaller droplets, etc.).

Wind

Variable winds speeds with changing directions may pose the largest potential for drift damage if crops other than rice are adjacent to the field to be sprayed. Drift potential is lowest between wind speeds of 2 to 8 mph. However, many factors, including droplet size and equipment type, determine drift potential at any given speed. Application must be avoided if wind speed is below 2 mph due to variable wind direction and high inversion potential.

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

Temperature and Humidity

When making applications in low relative humidity, set up equipment to produce larger droplets to compensate for evaporation, but they should remain within the medium droplet size category. Droplet evaporation is most severe when conditions are both hot and dry.

Temperature Inversions

Do not spray at times when spray particles may be entrained into a temperature inversion layer. If inversion conditions are suspected, consult with local weather services before making an application. Applications must not occur during temperature inversions, because drift potential is high. Temperature inversions restrict vertical air mixing, which causes small suspended, droplets to remain in a concentrated cloud. This cloud can move in unpredictable directions due to the light variable winds common during inversions. Temperature inversions are characterized by increasing temperatures with altitude and are common on nights with limited cloud cover and light-to-no wind. They begin to form as the sun sets and often continue into the morning. Their presence can be indicated by ground fog; however, if fog is not present, inversions can also be identified by the movement of smoke from a ground source or an aircraft smoke generator. Smoke that layers and moves laterally in a concentrated cloud (under low wind conditions) indicates an inversion, while smoke that moves upward and rapidly dissipates indicates good vertical air mixing.

Sensitive Areas

This pesticide must only be applied when the potential for drift to adjacent sensitive areas (e.g. residential areas, bodies of water, known habitat for threatened or endangered species, non-target crops) is minimal (e.g. when wind is blowing away from the sensitive areas).

Additives

Zidua® herbicide has been formulated to provide optimal preemergence weed control. However, several tank mixes with **Zidua** may require adjuvants to improve burndown of emerged weeds. Therefore, adjuvant may be used with **Zidua** tank mixes that are applied fall, preplant, preemergence, or early postemergence to the crop. Follow the adjuvant recommendation for the tank mix partner of **Zidua**.

Tank Mixing Information

Zidua can be mixed with one or more registered herbicide products according to the specific tank mixing instructions in this label and respective product labels. Read and follow the applicable restrictions and limitations and directions for use on all product labels involved in tank mixing. Always follow the most restrictive label use directions. Refer to **Crop-specific Information** section for tank mixing details for each crop.

Physical incompatibility, reduced weed control, or crop injury may result from mixing **Zidua** with other pesticides, additives, or fertilizers.

Compatibility Test for Tank Mix Products

Before mixing components, always perform a compatibility jar test.

1. For 20 gallons per acre spray volume, use 3.3 cups (800 ml) of water. For other spray volumes, adjust rates accordingly. Only use water from the intended source at the source temperature.
2. Add components in the sequence indicated in the mixing order using 2 teaspoons for each pound or 1 teaspoon for each pint of label rate per acre.
3. Always cap the jar and invert 10 cycles between component additions.
4. When the components have all been added to the jar, let the solution stand for 15 minutes.
5. Evaluate the solution for uniformity and stability. The spray solution should not have free oil on the surface, or fine particles that precipitate to the bottom, or thick (clabbered) texture. If the spray solution is not compatible, repeat the compatibility test with the addition of a suitable compatibility agent. If the solution is then compatible, use the compatibility agent as directed on its label. If the solution is still incompatible, **DO NOT** mix the ingredients in the same tank.

Mixing Order

1. **Water** - Fill tank 1/2 to 3/4 full with clean water and start agitation.

2. **Agitation** - Maintain agitation throughout mixing.
3. **Inductor** - If an inductor is used, rinse it thoroughly after each component has been added.
4. **Products in PVA bags** - Place any product contained in water-soluble PVA bags into the mixing tank. Wait until all water-soluble PVA bags have fully dissolved and the product is evenly mixed in the spray tank before continuing.
5. **Water-soluble additives** (including dry and liquid fertilizers such as ammonium sulfate or urea ammonium nitrate).
6. **Water-dispersible products** (such as dry flowables, wettable powders, suspension concentrates, or suspensions) - Add **Zidua** at this point in the mixing process.
7. **Water-soluble products**
8. **Emulsifiable concentrates** (including methylated seed oil adjuvants)
9. **Remaining quantity of water**

Maintain agitation throughout application until spraying is completed. If the spray mixture is allowed to settle for any period of time, thorough agitation is essential to resuspend the mixture before spraying is resumed. Continue agitation while spraying.

Use Precautions and Restrictions

- **Maximum seasonal use rate** - A cropping season is defined as the period following harvest of the preceding crop through the harvest of the planned or current crop.
 - **On coarse soils - DO NOT** apply more than a maximum cumulative amount of 2.75 ozs/A of **Zidua** (0.146 lb ai/A of pyroxasulfone) per cropping season.
 - **On all soils other than coarse - DO NOT** apply more than a maximum cumulative amount of 5.0 ozs/A of **Zidua** (0.266 lb ai/A of pyroxasulfone) per cropping season.
- **DO NOT** apply more than one application to corn in the spring.
- **DO NOT** harvest sweet corn ears for human consumption less than 37 days after application of **Zidua**.
- **Crop rotation restriction** - Only crops listed on this label may be planted after **Zidua** application. Root crops may be planted after 12 months.
- **Emergency replanting intervals** - If a labeled crop treated with **Zidua** is lost to crop failure (because of environmental factors such as drought, frost, hail, etc.), the crop may be replanted immediately. However, **DO NOT** repeat application of **Zidua** after crop failure. A sequential application can be made as long as the maximum cumulative rate for the crop and soil per season is not exceeded.
- **Application - DO NOT** apply aerially or through any type of irrigation system.
- **DO NOT** contaminate irrigation ditches or water used for domestic purposes.
- **Irrigation - DO NOT** use flood irrigation to apply, activate, or incorporate **Zidua**.
- **Seeding Depth** - Crop seeds must be planted a minimum 1-inch deep.

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Crop-specific Information

This section provides use directions for **Zidua® herbicide** in specific crops. Be sure to read product information, mixing, application, weeds controlled, and additive instructions in preceding sections of the label. Read and follow tank mix product labels for restrictions, precautions, instructions, and rotational crop restrictions.

Corn

Zidua may be applied preplant surface, preplant incorporated, preemergence, or early postemergence to corn for residual preemergence weed control. Corn in this label refers to field corn (grown for grain, seed, or silage), popcorn, and sweet corn (grown for fresh, processing, or seed). Before applying to seed corn, sweet corn or popcorn, verify with your local seed company (supplier) the selectivity of **Zidua** on your inbred line or hybrid to avoid potential injury.

Application Rates

Zidua can be applied as part of a one-pass or planned sequential (two-pass) weed control program. A one-pass weed control program should be used where no cultivation or postemergence herbicide application is anticipated. One-pass application rates for **Zidua** when applied alone, in tank mix, or sequentially are provided in **Table 3** for field corn and **Table 4** for popcorn and sweet corn.

Table 3. Residual Rates of Zidua in Field Corn

| Application Timing | Use Rate by Soil Texture ¹ (ozs/A) | | |
|-----------------------|--|------------|------------|
| | Coarse | Medium | Fine |
| Preplant surface | 1.5 to 2.75 | 2.0 to 3.0 | 2.5 to 4.0 |
| Preplant incorporated | 1.5 to 2.75 | 2.0 to 3.0 | 2.5 to 4.0 |
| Preemergence | 1.5 to 2.75 | 2.0 to 3.0 | 2.5 to 4.0 |
| Early postemergence | 1.0 to 2.75 | 1.5 to 3.0 | 2.0 to 4.0 |

¹ Refer to **Table 2** for definitions of soil-texture groups.

Table 4. Residual Rates of Zidua in Popcorn and Sweet Corn

| Application Timing | Use Rate by Soil Texture ¹ (ozs/A) | | |
|-----------------------|--|------------|------------|
| | Coarse | Medium | Fine |
| Preplant surface | 1.5 to 2.75 | 2.0 to 3.0 | 2.5 to 4.0 |
| Preplant incorporated | 1.5 to 2.75 | 2.0 to 3.0 | 2.5 to 4.0 |
| Preemergence | 1.5 to 2.75 | 2.0 to 3.0 | 2.5 to 4.0 |
| Early postemergence | 1.0 to 2.75 | 1.5 to 3.0 | 2.0 to 4.0 |

¹ Refer to **Table 2** for definitions of soil-texture groups.

Zidua use rates applied as the residual component of a planned sequential (two-pass) program (see **Table 5**) will provide control or suppression of listed weeds (**Table 1**) through early to mid-season. For full-season weed control, apply a labeled postemergence treatment such as **Status® herbicide** + glyphosate (in glyphosate-tolerant field corn) as the sequential component.

Table 5. Residual Rates of Zidua in a Planned Sequential Program in Corn

| Application Timing | Use Rate by Soil Texture ¹ (ozs/A) | | |
|-----------------------|--|------------|------------|
| | Coarse | Medium | Fine |
| Preplant surface | 1.0 to 2.0 | 1.5 to 3.0 | 2.0 to 4.0 |
| Preplant incorporated | 1.0 to 2.0 | 1.5 to 3.0 | 2.0 to 4.0 |
| Preemergence | 1.0 to 2.0 | 1.5 to 3.0 | 2.0 to 4.0 |

¹ Refer to **Table 2** for definitions of soil-texture groups.

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Application Timings

Zidua® herbicide may be applied in a single application or in sequential applications.

Fall Applications for controlling weeds germinating the following spring

For use only in Iowa, Minnesota, North Dakota, South Dakota, Wisconsin, north of Highway 136 in Illinois, and north of Highway 91 in Nebraska.

Zidua may be applied in the fall to control weeds in conventional, minimum tillage, or no-till corn production systems planted the following spring. This fall application program will typically need to be followed with a suitable in-season postemergence herbicide treatment to provide season-long control of the complete target weed spectrum. Use only on medium or fine soils at a use rate of 2.5 to 3.5 ounces (medium soil) and 3.5 to 4.0 ounces (fine soil) of **Zidua** per acre. See the main **Application Timings** section of this label for restrictions and recommendations.

Fall/Winter Applications for controlling weeds germinating in the fall or winter annual weeds

Zidua may be broadcast surface applied in the fall or winter to control winter annual weeds and other weeds germinating in the fall. Use on coarse, medium, or fine soils at rates listed for the preplant surface timing. A sequential preemergence or postemergence application can be made, but **DO NOT** exceed the maximum cumulative rate allowed by soil type per season. See the main **Application Timings** section of this label for restrictions and recommendations.

Preplant Surface Application (15 to 45 days prior to planting)

Application rates in **Table 3** should be used when making preplant surface applications, using the highest application rate for a given soil texture. Preplant surface applications are not recommended on coarse soils, in areas where average annual rainfall (or rainfall + irrigation) typically exceeds 40 inches, or for popcorn or sweet corn. Cultivation or a labeled postemergence herbicide application may still be required under certain conditions for complete weed control.

Preplant Surface and Preplant Incorporated Applications (up to 14 days prior to planting)

Apply **Zidua** at the use rates specified in **Table 3**, **Table 4**, or **Table 5** as a broadcast spray to the soil surface or incorporated up to 14 days before planting on all soil types.

Preemergence Surface Application

Apply **Zidua** at use rates specified in **Table 3**, **Table 4**, or **Table 5** as a broadcast spray to the soil surface after planting and before crop emergence.

Early Postemergence Application

Apply **Zidua** at use rates specified in **Table 3** or **Table 4** as a broadcast spray to corn at spiking up to the V4 stage (visible fourth leaf collar).

Sequential Applications

If a sequential application program of **Zidua** is used (e.g. fall application followed by spring application), the maximum combined rate of **Zidua** that may be applied in a cropping season is 2.75 ozs/A on coarse soils or 5.0 ozs/A on all medium-to-fine soils.

Crop-specific Restrictions and Limitations

- **DO NOT** apply more than one application to corn in the spring.
- **DO NOT** harvest sweet corn ears for human consumption less than 37 days after application of **Zidua**.

Tank Mixtures

Zidua may be tank mixed or applied sequentially with one or more of, but not limited to, the following herbicide products:

- Guardsman Max**® herbicide
- Lightning**® herbicide (for **Clearfield**® corn only)
- Outlook**® herbicide
- Prowl**® H₂O herbicide
- Sharpen**® powered by **Kixor**® herbicide
- Status**® herbicide
- Verdict**™ herbicide powered by **Kixor**® herbicide
- atrazine
- glyphosate¹

¹ Includes postemergence tank mixes on glyphosate-tolerant corn hybrids

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Conditions of Sale and Warranty

The **Directions For Use** of this product reflect the opinion of experts based on field use and tests. The directions are believed to be reliable and must be followed carefully. However, 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 weather conditions, presence of other materials, or use of the product in a manner inconsistent with its labeling, all of which are beyond the control of BASF CORPORATION ("BASF") or the Seller. To the extent consistent with applicable law, all such risks shall be assumed by the Buyer.

BASF warrants that this product conforms to the chemical description on the label and is reasonably fit for the purposes referred to in the **Directions For Use**, subject to the inherent risks, referred to above.

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