



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, DC 20460

OFFICE OF CHEMICAL SAFETY
AND POLLUTION PREVENTION

May 7, 2020

Craig D. Kleppe
Product Registration Manager
BASF Corporation
26 Davis Drive, PO Box 13528
Research Triangle Park, NC 27709

Subject: Label Amendment – Adding application via impregnated fertilizer on cotton
Product Name: Zidua Herbicide
EPA Registration Number: 7969-338
Application Date: 2/6/2020
Decision Number: 560416

Dear Mr. Kleppe:

The amended label referred to above, submitted in connection with registration under the Federal Insecticide, Fungicide and Rodenticide Act, as amended, is acceptable. This approval does not affect any conditions that were previously imposed on this registration. You continue to be subject to existing conditions on your registration and any deadlines connected with them.

A stamped copy of your labeling is enclosed for your records. This labeling supersedes all previously accepted labeling. You must submit one copy of the final printed labeling before you release the product for shipment with the new labeling. In accordance with 40 CFR 152.130(c), you may distribute or sell this product under the previously approved labeling for 18 months from the date of this letter. After 18 months, you may only distribute or sell this product if it bears this new revised labeling or subsequently approved labeling. "To distribute or sell" is defined under FIFRA section 2(gg) and its implementing regulation at 40 CFR 152.3.

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.

Your release for shipment of the product constitutes acceptance of these conditions. If these conditions are not complied with, the registration will be subject to cancellation in accordance

Page 2 of 2
EPA Reg. No. 7969-338
Decision No. 560416

with FIFRA section 6. If you have any questions, please contact Nathan Mellor by phone at 703-347-8562, or via email at mellor.nathan@epa.gov.

Sincerely,

A handwritten signature in black ink, appearing to read "Erik Kraft". The signature is fluid and cursive, with the first name "Erik" being more prominent than the last name "Kraft".

Erik Kraft, Product Manager 24
Fungicide and Herbicide Branch
Registration Division (7505P)
Office of Pesticide Programs

Enclosure



We create chemistry

Pyroxasulfone | Group 15 | Herbicide

ACCEPTED
05/07/2020
Under the Federal Insecticide, Fungicide and Rodenticide Act as amended, for the pesticide registered under EPA Reg. No. 7969-338



Zidua Herbicide

A selective residual herbicide for use in agricultural crops

Active Ingredient:

pyroxasulfone: 3-[[[5-(difluoromethoxy)-1-methyl-3-(trifluoromethyl)-1H-pyrazol-4-yl]methyl]sulfonyl]-4,5-dihydro-5,5-dimethylisoxazole 85.0%

Other Ingredients: 15.0%

Total: 100.0%

Contains 0.85 pound of pyroxasulfone 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 full label 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

FIRST AID

If on skin	<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 eye 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.• 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	
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).	

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. 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 any waterproof material for example 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

For aerial application, mixers and loaders must also wear a minimum of a NIOSH approved filtering face piece respirator with any N filter (TC-84A). You can also use other NIOSH approved particulate respirators that offer more protection, including a half face or full face respirator with any filter or a powered air purifying respirator with an HE filter. For more information about these options, see www.epa.gov/pesticide-respirators.

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

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:

- 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

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.

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.

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 washwater 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 groundwater. 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 including ponds, streams, and springs will reduce potential loading of pyrooxasulfone and its degradation product, [5-(difluoromethoxy)-1-methyl-3-(trifluoromethyl)-1H-pyrazol-4-yl]methanesulfonic acid (M1), from runoff water and sediment. Runoff of this product will be reduced by avoiding application when rainfall is forecast 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 washwater, 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 1-844-447-3813 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 be available from the above sources 6 months before 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 the 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, including plants, soil or water, is:

- Coveralls
- Chemical-resistant gloves made of any waterproof material for example 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 spill of 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 take if 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 residual preemergence herbicide for controlling annual grass weeds, sedges, and annual broadleaf weeds (including biotypes resistant to ACCase inhibitors, ALS inhibitors, and glyphosate) that infest celery, chickpea, corn, cotton, dry bulb onions, fallow, leek, mint, peanut, perennial cool-season grasses grown for seed production, potato, safflower, soybean, and sunflower listed in **Table 1** and wheat listed in **Table 2**. Refer to **Crop-specific Information** section for use directions specific to each labeled crop.

Periods of dry weather following application of **Zidua** may reduce herbicidal effectiveness. **Zidua** must be activated by at least 1/2 inch of rainfall or irrigation before 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. **Zidua** does not control emerged weeds.

Herbicidal activity of **Zidua** may be reduced if trash on the soil surface from the previous crop covers more than 25% of the application area. Manage trash levels if needed with combine straw shredder/spreaders, earlier burndown of emerged weeds, or light tillage.

Table 1. Weeds Controlled with a Residual Application of Zidua® herbicide in All Crops other than Wheat

Common Name	Scientific Name
Annual Grass Weeds	
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>
Crowfootgrass	<i>Dactyloctenium aegyptium</i>
Cupgrass, southwestern	<i>Eriochloa acuminata</i>
Cupgrass, woolly ¹	<i>Eriochloa villosa</i>
Foxtail, giant	<i>Setaria faberi</i>
Foxtail, green	<i>Setaria viridis</i>
Foxtail, yellow	<i>Setaria pumila</i>
Goosegrass	<i>Eleusine indica</i>
Johnsongrass, seedling	<i>Sorghum halepense</i>
Millet, Texas ¹	<i>Urochloa texana</i>
Millet, wild-proso ¹	<i>Panicum miliaceum</i>
Oat, wild ¹	<i>Avena fatua</i>
Panicum, fall	<i>Panicum dichotomiflorum</i>
Red rice	<i>Oryza sativa</i>
Ryegrass, Italian	<i>Lolium perenne</i> spp. <i>multiflorum</i>
Ryegrass, rigid	<i>Lolium rigidum</i>
Sandbur, longspine ¹	<i>Cenchrus longispinus</i>
Shattercane ¹	<i>Sorghum bicolor</i> spp. <i>arundinaceum</i>
Signalgrass, broadleaf	<i>Urochloa platyphylla</i>
Sedge	
Nutsedge, yellow ¹	<i>Cyperus esculentus</i>
Annual Broadleaf Weeds	
Amaranth, Palmer	<i>Amaranthus palmeri</i>
Amaranth, Powell	<i>Amaranthus powellii</i>
Buckwheat, wild ¹	<i>Polygonum convolvulus</i>
Carpetweed	<i>Mollugo verticillata</i>

(continued)

Common Name	Scientific Name
Annual Broadleaf Weeds (continued)	
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 nigrum</i>
Nightshade, Eastern black	<i>Solanum ptycanthum</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** may be used in tank mixes or sequential applications with other labeled herbicides that provide additional control of noted weeds.

Table 2. Weeds Controlled¹ or Suppressed² with a Residual Application of Zidua® herbicide in Wheat

Common Name	Scientific Name	C = Control (only at the maximum application rate per soil texture) S = Suppression See Crop-specific Information section for specific rates.
Annual Grass Weeds		
Barley, hare	<i>Hordeum murinum</i> spp. <i>leporinum</i>	S
Barnyardgrass	<i>Echinochloa crus-galli</i>	S
Bluegrass, annual	<i>Poa annua</i>	C
Brome, downy	<i>Bromus tectorum</i>	S
Brome, Japanese	<i>Bromus japonicus</i>	S
Canarygrass	<i>Phalaris canariensis</i>	C
Cheat	<i>Bromus secalinus</i>	S
Foxtail, giant	<i>Setaria faberi</i>	S
Foxtail, green	<i>Setaria viridis</i>	S
Foxtail, yellow	<i>Setaria pumila</i>	S
Oats, wild	<i>Avena fatua</i>	S
Rattail fescue	<i>Vulpia myuros</i>	C
Ryegrass, Italian	<i>Lolium perenne</i> spp. <i>multiflorum</i>	C
Ryegrass, rigid	<i>Lolium rigidum</i>	S
Annual Broadleaf Weeds		
Buckwheat, wild	<i>Polygonum convolvulus</i>	S
Carpetweed	<i>Mollugo verticillata</i>	S
Chickweed, common	<i>Stellaria media</i>	S
Flixweed	<i>Descurainia sophia</i>	S
Groundsel, common	<i>Senecio vulgaris</i>	S
Henbit	<i>Lamium amplexicaule</i>	S
Horseweed (Marestail)	<i>Conyza canadensis</i>	S
Kochia	<i>Kochia scoparia</i>	S
Lambsquarters, common	<i>Chenopodium album</i>	S
Mustard, wild	<i>Sinapis arvensis</i> L.	S
Pigweed spp.	<i>Amaranthus</i> spp.	S
Ragweed, common	<i>Ambrosia artemisiifolia</i>	S
Shepherdspurse	<i>Capsella bursa-pastoris</i>	S

¹ Weeds including annual bluegrass and Italian ryegrass have the ability to adapt to several different herbicide sites of action. Even though **Zidua** will control these species, some weed escapes are possible. Multiple herbicides with multiple different effective sites of action **MUST** be used in tank mixtures **or** sequentially to limit these weed escapes to prevent or delay the onset of herbicide-resistant weed biotypes.

² For control of these weeds, a tank mix partner or a sequentially applied herbicide partner is needed.

Mode of Action

Zidua® herbicide 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.

Herbicide Resistance Management

Zidua 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 mixes 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.
- Identify weeds present in the field through scouting and field history and understand their biology. The weed-control program needs to consider all of the weeds present.
- Scout fields prior to application to identify the weed species present and their growth stage to determine if the intended application will be effective.
- Scout fields after application to verify the treatment was effective.
- Suspected herbicide-resistance weeds may be identified by these indicators:
 1. Failure to control a weed species normally controlled by the herbicide at the dose applied, especially if control is achieved on adjacent weeds;
 2. A spreading patch of non-controlled plants of a particular weed species; and
 3. Surviving plants mixed with controlled individuals of the same species.

- If resistance is suspected, treat weed escapes with an herbicide with a different MOA and/or use non-chemical methods to remove escapes, as practical, with the goal of preventing further seed production.
- Report any incidence of non-performance of this product against a particular weed species to your local BASF representative.
- Contacting your local extension specialist, certified crop advisors, and/or manufacturer for herbicide resistance management and/or integrated weed management directions for specific crops and resistant weed biotypes.

Crop Response

No crop injury is expected when **Zidua** is applied according to label directions and under normal environmental conditions. Application to crops under stress because of 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

Application rates of **Zidua** may vary depending on soil texture. Refer to **Table 3** for soil texture groups used in this label unless a specific soil texture is mentioned. When use rates are in ranges, apply the low rate for soils with coarse texture or low organic matter; apply the high rates for fine soil textures, high organic matter, heavy soil surface plant residue, or heavy weed pressure.

Table 3. 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

Zidua may be used on **peat soils** and **muck soils**, and **mineral soils with 10% or more organic matter**, but weed control may be inconsistent and/or reduced. Use maximum labeled use rate allowed in the specific crop.

Use **Table 4** to determine the corresponding amounts of active ingredient (pyroxasulfone) from **Zidua** product use rates.

Table 4. Use Rate Equivalency

Amount of Zidua® herbicide (ozs/A)	Amount of Pyroxasulfone (lb ai/A)
0.5	0.026
0.7	0.037
0.75	0.040
1.0	0.053
1.25	0.066
1.5	0.080
1.75	0.093
1.85	0.098
2.0	0.106
2.1	0.112
2.5	0.133
2.75	0.146
3.0	0.159
3.5	0.186
4.0	0.213
5.0	0.266

Application Timing

Zidua may be applied preplant surface, preplant incorporated, preemergence, early postemergence, postemergence-directed (layby), or in the fall. Refer to the **Crop-specific Information** section for specific application instructions (timings, rates, restrictions and precautions) by crop.

Preplant Surface Application. Apply **Zidua** alone or in tank mix within 45 days of planting. If weeds are present at the time of application, use additional weed control methods, for example a tank mix with an appropriate postemergence herbicide(s), to control emerged weeds.

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

Preemergence Surface Application. After planting and before crop emergence, apply a uniform broadcast treatment to the soil surface. Apply **Zidua** only to a uniform seedbed which is firm and free of clods, cracks, excess trash (previous crop residue), and weed growth. If weeds are present, apply **Zidua** in a tank mix with an appropriate postemergence herbicide, for example a glyphosate-containing product.

Early Postemergence Application. **Zidua** must be applied and activated before weed seedling emergence or in a tank mixture that controls emerged weeds. **Zidua** will not control emerged weeds. Weeds that are already

emerged at the time of application must be controlled with cultivation, tank mix or sequential application of another herbicide labeled for postemergence control of the target weeds in the crop.

Postemergence-directed (Layby) Application. **Zidua** must be applied as a directed spray between crop rows and activated before weed seedling emergence or in a tank mix that controls emerged weeds. **Zidua** will not control emerged weeds. Weeds that are already emerged at the time of application must be controlled with cultivation, tank mix or sequential application of another herbicide labeled for postemergence control of the target weeds in the crop.

Fall/Winter Application for controlling weeds germinating in the fall, or winter weeds. **Zidua** 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 must be shallow (no more than 2-inches deep) to uniformly incorporate the herbicide into the upper soil surface.

Application Methods and Equipment

Zidua may be applied by aerial or ground application or by chemigation application via sprinkler or drip irrigation.

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. Adjust equipment 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 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.

Spray Mix Preparation Advisory

Always pre-dissolve **Zidua** before adding it into the spray tank. When dissolving **Zidua** for a spray mix, use a minimum of 4 gallons water per container of **Zidua** (80 ounces) in an external container (e.g. 5-gallon bucket) or in the sprayer induction system with constant agitation. **DO NOT** pour **Zidua** straight into the sprayer inductor system without minimum water and agitation.

Aerial Spray Carrier Volume. Use 3 or more gallons of water per acre. The actual minimum spray volume per acre is determined by the spray equipment used. Use adequate spray volume to provide accurate and uniform distribution of spray particles over the treated area.

Ground Spray Carrier Volume. Use 5 or more gallons of water per treated acre or 15 or more gallons of sprayable fluid nitrogen fertilizer per treated acre for weed control application.

Mandatory Spray Drift Management

Aerial Applications

- **DO NOT** release spray at a height greater than 10 ft above the vegetative canopy, unless a greater application height is necessary for pilot safety.
- For all applications, applicators are required to use a medium to ultra coarse spray droplet size (ASABE S572.1).
- The boom length must not exceed 65% of the wing-span for airplanes or 75% of the rotor blade diameter for helicopters.
- Applicators must use 1/2 swath displacement upwind at the downwind edge of the field.
- Nozzles must be oriented so the spray is directed toward the back of the aircraft.
- **DO NOT** apply when wind speeds exceed 10 miles per hour at the application site.
- **DO NOT** apply during temperature inversions.

Ground Applications

- Apply with the nozzle height recommended by the manufacturer, but no more than 3 feet above the ground or crop canopy.
- For all applications, applicators are required to use a medium to ultra coarse spray droplet size (ASABE S572.1).
- **DO NOT** apply when wind speeds exceed 10 miles per hour at the application site.
- **DO NOT** apply during temperature inversions.

Spray Drift Advisories

The applicator is responsible for avoiding off-site spray drift. Be aware of nearby non-target sites 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

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

Use the lowest boom height that is compatible with the spray nozzles that will provide uniform coverage. 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. When applying aerially to crops, **DO NOT** release spray at a height greater than 10 feet above the crop canopy, unless a greater application height is necessary for pilot safety.

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 Inversion

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.

Chemigation Application via Sprinkler and Drip Irrigation Systems

Zidua® herbicide may be applied as a chemigation treatment through sprinkler irrigation systems. Apply this product **ONLY** through a sprinkler irrigation system of the following type: center pivot, end tow, hand move, lateral move, side (wheel) roll, or solid set. **DO NOT** apply this product through any other type of sprinkler irrigation system.

Zidua may also be applied as a chemigation treatment through drip irrigation systems. All chemigation precautions mentioned in this label for sprinkler irrigation systems also apply for drip irrigation systems.

Application may be made alone or in tank mixtures with other herbicides on this label registered for use in specified sprinkler or drip irrigation systems. Application must be made within specific crop stage timings and product use rates given in the container label **Directions For Use**.

Uniform distribution of **Zidua**[®] herbicide-treated irrigation water is the sole responsibility of the applicator and is required to avoid crop injury, lack of herbicide effectiveness, or illegal pesticide residue in the crop. If you have questions about calibration, contact State Extension Service specialists, equipment manufacturers, or other experts.

Proper calibration is the responsibility of the applicator. The system must be properly calibrated (with water only) to ensure the amount of **Zidua** applied corresponds to the specified rate. Apply **Zidua** in volume minimums of 0.33 to 0.67 inch of water using the lower volume for coarse-texture soils and the higher volume for fine-texture soils. Application made in high volumes of water (more than 1 inch) may result in reduced weed control.

Meter herbicide dilution into irrigation water through the entire time of water application for center pivot and lateral move sprinkler systems. For solid-set and hand-move sprinkler irrigation systems and drip irrigation systems, apply **Zidua** through the system at the beginning of the set; then follow with additional water to reach volume minimums as listed by soil type. To increase calibration accuracy of injection metering equipment, dilute **Zidua** in a minimum of 3 parts water to 1 part **Zidua**. Maintain agitation in injection nurse tanks to keep a uniform herbicide suspension during application.

Special Restrictions for Chemigation:

1. **DO NOT** apply when wind speed favors drift beyond the area intended for treatment.
2. **DO NOT** connect an irrigation system used for pesticide application to a public water system unless the pesticide label-prescribed safety devices for public water systems are in place.
3. A person knowledgeable of the chemigation system and responsible for its operation, or under the supervision of the responsible person, shall shut the system down and make necessary adjustments if the need arises.
4. Tail water (runoff water) from chemigation that contains **Zidua** needs be recirculated and/or contained in the field in a cistern or holding reservoir from the initial application and/or used only on adjacent, approved crops for which **Zidua** is registered for this type of application.
5. The pesticide injection pipeline must contain a functional, automatic, quick-closing check valve to prevent the flow of fluid back toward the injection pump. It must also contain a functional, normally closed, solenoid-operated valve located on the intake side of the injection pump and connected to the system interlock to prevent fluid from being withdrawn from the supply tank when the irrigation system is either automatically or manually shut down.
6. The sprinkler chemigation system must contain a functional check valve, vacuum-relief valve, and

low-pressure drain appropriately located on the irrigation pipeline to prevent water-source contamination from backflow. In addition, systems must use a metering pump, for example a positive displacement injection pump (e.g. diaphragm pump) effectively designed and constructed of materials that are compatible with pesticides and capable of being fitted with a system interlock.

7. The sprinkler chemigation system must contain functional interlocking controls to automatically shut off the pesticide injection pump when the water pump motor stops, or in cases where there is no water pump, when the water pressure decreases to the point where pesticide distribution is adversely affected.
8. The irrigation line or water pump must include a functional pressure switch that will stop the water pump motor when the water pressure decreases to the point where pesticide distribution is adversely affected.

Chemigation systems connected to public water systems:

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

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 or for residual weed control from postemergence over-the-top of cotton applications. Impregnation or coating may be conducted by 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.

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® herbicide** 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 offers a more uniform distribution. A shallow (less than 2 inches) incorporation is desirable for improved weed control. Deeper incorporation dilutes the herbicide layer near the soil surface and may result in unsatisfactory weed control.

To calculate the herbicide rate when using dry bulk fertilizer applications:

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

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 intended 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, keep mixture heated or agitated before 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**.

Additives

Zidua is formulated to provide optimal residual pre-emergence weed control. However, several tank mixes with **Zidua** may require an adjuvant to improve burndown of emerged weeds. Therefore, an adjuvant may be used with **Zidua** tank mixes that are applied fall, preplant, preemergence, or early postemergence. Follow the adjuvant directions for the tank mix partner of **Zidua**.

Tank Mixing Information

It is the pesticide user's responsibility to ensure that all products in the mixtures are registered for the intended use. Read and follow the applicable restrictions and limitations and directions for use on all product labels involved in tank mixing. Users must follow the most restrictive directions for use and precautionary statements of each product in the tank mixture.

Zidua may be tank mixed or applied sequentially with other herbicide products registered for use in any labeled crop found in this label for a broader spectrum of residual weed control and/or control of emerged weeds. Refer to the tank mix product labels to confirm that the respective tank mix products are registered for use on the labeled crop. Follow the adjuvant directions for the tank mix partner of **Zidua**. Read and follow tank mix product labels for application instructions, use restrictions and precautions, and rotational cropping guidance.

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 must 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

Maintain agitation throughout mixing and application until spraying is completed.

1. **Water** - Fill tank 1/2 to 3/4 full with clean water and start agitation.
2. **Inductor** - If an inductor is used, rinse it thoroughly after each component has been added.
3. **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.
4. **Water-soluble additives** (dry and liquid fertilizers including ammonium sulfate or urea ammonium nitrate)
5. **Water-dispersible products** (including dry flowables, wettable powders, suspension concentrates, or suspo-emulsions) - Add **Zidua® herbicide** at this point in the mixing process.
6. **Water-soluble products**
7. **Emulsifiable concentrates** (including methylated seed oil adjuvants)
8. **Remaining quantity of water**

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 Restrictions

- **Maximum use rate** - Refer to **Crop-specific Information** section for maximum application use rates of **Zidua** in each crop and use pattern.
- Refer to **Crop-specific Information** for additional crop use restrictions.
- **DO NOT** contaminate irrigation ditches or water used for domestic purposes.
- **Irrigation** - **DO NOT** use flood irrigation to apply, activate, or incorporate **Zidua**.
- **Zidua is not for sale, distribution, or use in Nassau and Suffolk counties in New York State.**
- **Emergency replanting intervals** - If a labeled crop treated with **Zidua** is lost to crop failure (because of environmental factors including 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 year is not exceeded.

Use Precautions

- **Crop rotation intervals** - Use **Table 5** to determine the proper interval between **Zidua** application and the planting of rotational crops. Determine the crop rotation interval for tank mix products, and use the most restrictive interval of all products applied.

Table 5. Rotational Crop Planting Intervals by Zidua Application Rate

Crop	Zidua Use Rate (ozs/A)			
	1.0	2.0	3.0	4.0
	Rotational Crop Interval (months after application)			
Alfalfa	10	10	10	10
Beans, edible dry	11	11	11	11
Beans, edible-podded and succulent shelled	11	11	11	11
Bulb onion	2	4	4	4
Canola (Rapeseed)	12	12	15	18
Chickpea	1	1	1	2
Corn	0	0	0	0
Cotton	1	2	4	4
Flax	2	4	6	8
Garlic	0	0	4	4
Grain sorghum	6	6	10	12
Cool-season Grasses grown for seed*	11**	11**	18	18
Warm-season Grasses grown for seed	18	18	18	18
Green onion	4	6	8	12
Lentil	1	1	2	4
Peanut	1	2	4	4
Peas, edible-podded and succulent shelled	9	9	11	11
Peas, field (dry)	1	1	1	2
Potato	1	2	3	3
Rice	10	12	18	24
Safflower	1	2	3	3
Small grains (other than wheat)	11	11	11	18
Soybean	0	0	0	4
Sugar beet	12	12	15	15
Sugarcane	4	4	4	4
Sunflower	1	2	3	3
Sweet potato	4	4	4	9
Wheat	1	1	4	6
Other Crops	18	18	18	18

* Only when grown in states of Idaho, Oregon and Washington, for all other states see rotational crop intervals for "Other Crops".

** An 11 month rotational crop interval only when greater than 15 inches of precipitation (rainfall/irrigation) has occurred from time of application to planting of grass grown for seed. If less than 15 inches of precipitation has occurred, the rotational crop interval is 18 months.

Crop-specific Information

Read product information, mixing, application, weeds controlled, and additive instructions in preceding sections of the label.

Celery

Zidua® herbicide may be applied to transplanted celery as an early post-transplant application for residual pre-emergence control of listed weeds (**Table 1**). Use **Zidua** as part of a weed control program in celery either in combination or sequentially with other herbicides for a broader spectrum of weed control and/or control of emerged weeds. Before applying to celery, verify with your local seed company (supplier) the selectivity of **Zidua** on your variety to avoid potential injury.

Application Rate

Apply **Zidua** in transplanted celery at the residual rates provided in **Table 6**.

Table 6. Residual Rates of Zidua in transplanted Celery

Application Timing	Use Rate (ozs/A)
	Muck or Peaty Muck Soils (greater than 20% organic matter)
Early Post-transplant	2.0

Application Timing

Zidua may only be applied in a single application.

Early Post-transplant Application (1 to 6 days after transplanting)

Apply **Zidua** at the use rates specified in **Table 6** as a broadcast spray to the soil surface 1 to 6 days after transplanting. Apply **Zidua** only to a uniform transplant bed which is firm and free of clods and cracks. The transplant bed must be prepared to ensure good transplant row closure.

Crop-specific Restrictions

- **DO NOT** apply more than 2.0 ozs/A of **Zidua** (0.106 lb ai/A of pyroxasulfone) in a single yearly application.
- There is no required preharvest interval for **Zidua** when applied after transplanting.
- **DO NOT** apply **Zidua** seven or more days after transplanting.
- Only apply **Zidua** to transplanted celery.
- Only apply **Zidua** to celery grown on muck or peaty muck soils with greater than 20% organic matter.

Crop-specific Precautions

- The use of **Zidua** may result in temporary growth suppression, leaf burn, and/or other injury or stand reduction in transplanted celery under stressful conditions including inadequate or excessive moisture, extended periods of water-saturated soil occur during early transplant growth and development, cool and hot temperatures, compacted soils, injury from other pesticides, disease or other pest damage, mechanical injury, nutrient imbalances, or other conditions known to cause plant stress.

Chickpea

Zidua may be applied preplant surface or preemergence to chickpea (garbanzo bean) for residual preemergence control of listed weeds (**Table 1**). Use **Zidua** as part of a weed control program in chickpea either in combination or sequentially with other herbicides for a broader spectrum of weed control and/or control of emerged weeds. Before applying to chickpea, verify with your local seed company (supplier) the selectivity of **Zidua** on your variety to avoid potential injury.

Application Rate

Apply **Zidua** in chickpea at the residual rates provided in **Table 7**.

Table 7. Residual Rates of Zidua in Chickpea

Application Timing	Use Rate by Soil Texture ¹ (ozs/A)		
	Coarse	Medium	Fine
Preplant surface	DO NOT USE	1.5	1.5 to 2.0
Preemergence	DO NOT USE	1.5	1.5 to 2.0

¹ Refer to **Table 3** for definition of soil-texture groups.

Application Timing

Zidua may only be applied in a single application.

Preplant Surface Application

Apply **Zidua** at the use rates specified in **Table 7** as a broadcast spray to the soil surface within 30 days of planting.

Preemergence Surface Application

Apply **Zidua** at use rates specified in **Table 7** as a broadcast spray to the soil surface after planting and before crop emergence.

Crop-specific Restrictions

- **On medium soils - DO NOT** apply more than 1.5 ozs/A of **Zidua** (0.08 lb ai/A of pyroxasulfone) in a single yearly application.
- **On fine soils - DO NOT** apply more than 2.0 ozs/A of **Zidua** (0.106 lb ai/A of pyroxasulfone) in a single yearly application.

- **DO NOT** apply **Zidua**[®] herbicide in combination with other pyroxasulfone-containing products in chickpea.
- **DO NOT** apply **Zidua** to emerging or emerged chickpea as severe crop injury will occur.
- **DO NOT** apply **Zidua** to chickpea grown on coarse soils.
- There is no required (preharvest) interval between a preplant or preemergence application of **Zidua** and the harvest of chickpea.
- Legume vegetable forage and hay may be fed to or grazed by livestock.

Corn

Zidua may be applied preplant surface, preplant incorporated, preemergence, or early postemergence to corn for residual preemergence control of listed weeds (**Table 1**). Use **Zidua** as part of a weed control program in corn either in combination or sequentially with other herbicides for a broader spectrum of weed control and/or control of emerged weeds. 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 Rate

Apply **Zidua** in corn at the residual rates provided in **Table 8**.

Table 8. Residual Rates of Zidua in 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 3** for definition of soil-texture groups.

Application Timing

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

Fall/Winter Application 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 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 year. See the main **Application Timing** section of this label for further application instructions.

Early Preplant Surface Application (within 15 to 45 days of planting)

Use application rates in **Table 8** when making preplant surface applications, using the highest application rate for a given soil texture. Preplant surface applications are not advised on coarse soils, in areas where average annual rainfall (or rainfall plus irrigation) typically exceeds 40 inches, or for popcorn or sweet corn.

Preplant Surface or Preplant Incorporated Application (within 14 days of planting)

Apply **Zidua** at the use rates specified in **Table 8** as a broadcast spray to the soil surface or incorporated before planting on all soil types.

Preemergence Surface Application

Apply **Zidua** at use rates specified in **Table 8** 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 8** as a broadcast spray to corn at spiking up to the V4 stage (visible fourth leaf collar).

Sequential Application

If a sequential application program of **Zidua** is used (e.g. fall application followed by spring application, or sequential applications in the spring), the maximum combined rate of **Zidua** that may be applied in corn per year is 2.75 ozs/A (0.146 lb ai/A of pyroxasulfone) on coarse soils or 5.0 ozs/A (0.266 lb ai/A of pyroxasulfone) on all medium-to-fine soils.

Crop-specific Restrictions

- **On coarse soil - DO NOT** apply more than 2.75 ozs/A of **Zidua** (0.146 lb ai/A of pyroxasulfone) in a single application or as a maximum cumulative amount from sequential applications in corn per year.
- **On medium soil:**
 - **DO NOT** apply more than 3.0 ozs/A of **Zidua** (0.159 lb ai/A of pyroxasulfone) in a single application.
 - **DO NOT** apply more than a maximum cumulative amount of 5.0 ozs/A of **Zidua** (0.266 lb ai/A pyroxasulfone) from sequential applications in corn per year.
- **On fine soil:**
 - **DO NOT** apply more than 4.0 ozs/A of **Zidua** (0.213 lb ai/A of pyroxasulfone) in a single application.
 - **DO NOT** apply more than a maximum cumulative amount of 5.0 ozs/A of **Zidua** (0.266 lb ai/A pyroxasulfone) from sequential applications in corn per year.
- Maximum number of applications per year: 2
- Separate sequential applications by at least 14 days.

- **DO NOT** harvest sweet corn ears for human consumption less than 37 days after application of **Zidua**[®] herbicide.

Crop-specific Precautions

- **Seeding depth** - Corn seed must be planted a minimum 1-inch deep.

Cotton

Zidua can be applied postemergence-directed (layby) to cotton for residual preemergence control of listed weeds (**Table 1**), or applied postemergence to cotton prior to weed emergence when impregnated onto dry bulk fertilizer and spread for residual preemergence weed control. Use **Zidua** as part of a weed control program in cotton either in combination or sequentially with other herbicides for a broader spectrum of weed control and/or control of emerged weeds. Before applying to cotton, verify with your local seed company (supplier) the selectivity of **Zidua** on your variety to avoid potential injury.

No crop injury is expected when **Zidua** is applied postemergence-directed (layby) or when applied postemergence impregnated onto dry bulk fertilizer. However, some visual cotton response is possible when **Zidua** is applied under stressful conditions including inadequate or excessive moisture, cool or hot temperatures, compacted soils, injury from other pesticides, disease or other pest damage, mechanical injury, nutrient imbalances, or other conditions known to cause plant stress.

Application Rate

Apply **Zidua** in cotton at the residual rates in **Table 9**.

Table 9. Residual Rates of Zidua in Cotton

Application Timing	Use Rate by Soil Texture ¹ (ozs/A)		
	Coarse	Medium	Fine
Postemergence-directed (Layby) or Postemergence (via impregnated dry bulk fertilizer)	0.75 to 1.5	0.75 to 1.5	1.5 to 2.1

¹ Refer to **Table 3** for definition of soil-texture groups.

Application Timing

Zidua may only be applied in a single application.

Postemergence-directed (Layby) Application

Apply **Zidua** at use rates specified in **Table 9** as a broadcast-directed spray between cotton rows from 5-leaf stage to beginning bloom stage. The use of hooded or shielded sprayers is advised when applying **Zidua** as postemergence-directed (layby) spray. Avoid contacting cotton leaves with **Zidua** spray solution or injury may occur.

Early Postemergence Application

Apply **Zidua** at use rates specified in **Table 9** as a broadcast spread of impregnated dry bulk fertilizer to cotton from five-leaf stage to beginning bloom stage.

Apply a minimum of 200 pounds of dry bulk fertilizer per acre to ensure sufficient broadcast coverage for effective weed control. Activate **Zidua** with minimum of 0.75 inches of rainfall or irrigation soon after fertilizer spreading.

See the **Ground Application (Dry Bulk Fertilizer)** section on this label for further information about this application.

Crop-specific Restrictions

- **DO NOT** apply **Zidua** as a preplant or preemergence treatment, or as a postemergence over-the-top spray treatment in cotton.
- **DO NOT** apply more than 2.1 ozs/A of **Zidua** (0.112 lb ai/A of pyroxasulfone) in a single yearly application.
- **DO NOT** apply **Zidua** to wet leaves (from recent rainfall or irrigation, dew) where the treated fertilizer is retained on cotton leaves.
- **DO NOT** apply **Zidua** impregnated onto ammonium nitrate, potassium nitrate, sodium nitrate or powdered limestone fertilizers.
- There is no required (preharvest) interval between a postemergence application of **Zidua** and the harvest of cotton.
- Cotton gin byproducts may be fed to livestock.

Crop-specific Precautions

- The use of **Zidua** may result in temporary growth suppression in cotton if extreme conditions of high rainfall and extended periods of water-saturated soil occur during cotton germination or early seedling development.

Fallow

Zidua may be used as a residual treatment to control listed weeds at any time of the year during the fallow period following crop harvest and before the following crop is planted (see paragraph below pertaining to rotational crop planting intervals).

Application Rate and Timing

Apply **Zidua** as a broadcast spray at 1.0 to 4.0 ozs/A. Sequential applications may be made with a minimum of 30 days between applications. Best product performance is obtained when weeds are not emerged before application.

Specific rotational crop planting intervals must be observed between an application of **Zidua** and planting of the following crops (see **Table 5** for rotational crop planting intervals).

Crop-specific Restrictions

- **DO NOT** apply more than 4.0 ozs/A of **Zidua**[®] herbicide (0.213 lb ai/A pyroxasulfone) in a single application.
- **DO NOT** apply more than a maximum cumulative amount of 5.0 ozs/A of **Zidua** (0.266 lb ai/A of pyroxasulfone) from sequential applications per year.
- Maximum number of applications per year: 3
- Separate sequential applications by at least 30 days.

Leek

Zidua may be applied to leek (transplanted only) as a postemergence application for residual preemergence weed control. Use **Zidua** as part of a weed control program in leek either in combination or sequentially with other herbicides for a broader spectrum of weed control and/or control of emerged weeds.

Application Rate

Apply **Zidua** in leek at the residual rates provided in **Table 10**.

Table 10. Residual Rates of Zidua in Leek

Application Timing	Use Rate by Soil Texture (ozs/A)		
	Coarse	Medium to Fine	Muck (greater than 20% organic matter)
Postemergence	DO NOT USE	1.3 to 1.7	1.7

Application Method and Timing

Zidua may only be applied in a single application.

Postemergence Application

Apply **Zidua** at the use rates specified in **Table 10** as a broadcast spray to leek that have 2 to 6 true leaves.

Crop-specific Restrictions

- **DO NOT** apply more than 1.7 ozs/A of **Zidua** (0.09 lb ai/A of pyroxasulfone) in a single yearly application.
- **DO NOT** apply **Zidua** within 60 days of harvest of leek.
- **DO NOT** apply **Zidua** to directed-seeded leek.

Crop-specific Precautions

- **Crop response** - The use of **Zidua** may result in temporary growth suppression, leaf burn, and/or other injury or stand reduction to leek under stressful conditions including inadequate or excessive moisture, extended periods of water-saturated soil occur during early transplant growth and development, cool and hot temperatures, compacted soils, injury from other

pesticides, disease or other pest damage, mechanical injury, nutrient imbalances, or other conditions known to cause plant stress.

Mint* (Peppermint and Spearmint)

* Mint (peppermint and spearmint tops) includes peppermint and spearmint harvested for fresh mint leaves or for stems and leaves processed into mint oil. Peppermint and spearmint tops hereafter referred to as mint.

For use only in Idaho, Indiana, Michigan, Montana, Oregon, Washington, and Wisconsin.

Zidua may be applied to dormant established mint for residual preemergence control of listed weeds (**Table 1**).

Use **Zidua** as part of a weed control program in mint either in combination or sequentially with other herbicides for a broader spectrum of weed control and/or control of emerged weeds.

Application Rate and Timing

Zidua may only be applied in a single application.

Apply **Zidua** at 1.85 ozs/A (on medium and fine texture soils only) as a broadcast spray to dormant established mint before target-weed germination.

Crop-specific Restrictions

- **DO NOT** apply more than 1.85 ozs/A of **Zidua** (0.098 lb ai/A of pyroxasulfone) in a single yearly application.
- **DO NOT** apply **Zidua** to mint in the first year of growth and establishment.
- **DO NOT** apply **Zidua** to mint that has broken dormancy. Application to mint that is near dormancy break can result in crop injury. Risk of crop injury increases the closer application is to mint dormancy break.
- **DO NOT** apply **Zidua** to mint stands that have been weakened by age, disease, cold weather, excessive moisture, or other factors that reduce crop vigor. Mint growing under stress is more susceptible to herbicide damage.
- **DO NOT** apply **Zidua** to mint grown on soils with less than 1% organic matter.
- **DO NOT** apply **Zidua** to mint grown on coarse soils.
- There is no required (preharvest) interval between a dormant application of **Zidua** and the harvest of mint.
- **DO NOT** use roots from **Zidua**-treated mint for human consumption. Roots treated with **Zidua** can be used for root propagation.

Crop-specific Precautions

- After **Zidua** application, temporary crop injury may be observed in the growing season as mint breaks dormancy and begins to grow.
- The use of **Zidua** may result in growth suppression of mint if extreme conditions of high rainfall, high winds,

and/or extended periods of water-saturated soil occur right before or soon after mint breaks dormancy.

Onion, Dry Bulb

Zidua® herbicide may be applied to dry bulb onions (direct seeded and transplanted) as a postemergence application for residual preemergence weed control. Use **Zidua** as part of a weed control program in dry bulb onions either in combination or sequentially with other herbicides for a broader spectrum of weed control and/or control of emerged weeds. See **Tank Mixtures** below.

Application Rate

Apply **Zidua** in dry bulb onions at the residual rates provided in **Table 11**.

Table 11. Residual Rates of Zidua in Dry Bulb Onions

Application Timing	Use Rate by Soil Texture (ozs/A)		
	Coarse	Medium to Fine	Muck (greater than 20% organic matter)
Postemergence	DO NOT USE	1.3 to 1.7	1.7

Application Method and Timing

Zidua may only be applied in a single application.

Postemergence Application

Apply **Zidua** at the use rates specified in **Table 11** as a broadcast spray to dry bulb onions that have 2 to 6 true leaves.

Crop-specific Restrictions

- **DO NOT** apply more than 1.7 ozs/A of **Zidua** (0.09 lb ai/A of pyroxasulfone) in a single yearly application.
- **DO NOT** apply **Zidua** within 60 days of harvest of dry bulb onions.

Crop-specific Precautions

- **Crop response** - The use of **Zidua** may result in temporary growth suppression, leaf burn, and/or other injury or stand reduction to dry bulb onions under stressful conditions including inadequate or excessive moisture, extended periods of water-saturated soil occur during early transplant growth and development, cool and hot temperatures, compacted soils, injury from other pesticides, disease or other pest damage, mechanical injury, nutrient imbalances, or other conditions known to cause plant stress.

Peanut

Zidua may be applied early postemergence to peanut for residual preemergence control of listed weeds (**Table 1**). Use **Zidua** as part of a weed control program in peanut either in combination or sequentially with other herbicides for a broader spectrum of weed control and/or control of emerged weeds. Before applying to peanut, verify with your local seed company (supplier) the selectivity of **Zidua** on your variety to avoid potential injury.

Application Rate

Apply **Zidua** in peanut at the residual rates provided in **Table 12**.

Table 12. Residual Rates of Zidua in Peanut

Application Timing	Use Rate by Soil Texture ¹ (ozs/A)		
	Coarse	Medium	Fine
Early postemergence	1.5 to 2.1	1.5 to 2.1	1.5 to 2.1

¹ Refer to **Table 3** for definition of soil-texture groups.

Application Timing

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

Early Postemergence Application

Apply **Zidua** at use rates specified in **Table 12** as a broadcast spray to peanut from “at-cracking” stage to first true leaf stage through beginning of pod development stage. **Zidua** applications to emerged peanut may result in temporary leaf burn and stunting, but a reduction in peanut yield is unexpected. Tank mixes of **Zidua** with other crop protection products or adjuvants may significantly enhance this effect. Depending upon growing conditions, recovery from this injury begins immediately but may take several weeks for the injury to dissipate entirely.

Adjuvants may be applied with **Zidua** when making early postemergence applications.

Sequential Applications

If a sequential application program of **Zidua** is used (e.g. consecutive postemergence applications), the maximum combined rate of **Zidua** that may be applied per year is 5.0 ozs/A (0.266 lb ai/A of pyroxasulfone) on all soils.

State-specific use in Texas in areas west of Interstate 35. Apply **Zidua** early postemergence at 1.5 ozs/A. Use of **Zidua** may result in growth suppression if heavy rainfall or irrigation (> 2 inches) occur after application. If a sequential application program of **Zidua** is used (e.g. consecutive postemergence applications), the maximum combined rate of **Zidua** that may be applied in peanut per year is 3.0 ozs/A on all soils. Separate sequential applications by at least 21 days.

Crop-specific Restrictions

- **DO NOT** apply more than 2.1 ozs/A of **Zidua**[®] herbicide (0.112 lb ai/A of pyroxasulfone) in a single application.
- **DO NOT** apply more than a maximum cumulative amount of 5.0 ozs/A of **Zidua** (0.266 lb ai/A of pyroxasulfone) from sequential applications in peanut per year.
- Maximum number of applications per year: 3
- Separate sequential applications by at least 14 days.
- There is no required (preharvest) interval between an early postemergence (preharvest) application of **Zidua** and the harvest of peanut.

Crop-specific Precautions

- **Zidua** applied early postemergence (at-cracking through first leaf stage) may result in temporary growth suppression in peanut if extreme conditions of high rainfall and extended periods of water-saturated soil occur during peanut germination or early seedling development.

Perennial Cool-season Grasses Grown for Seed Production

For use in Oregon and Washington, but only in areas west of the Cascade Mountains in both states.

Zidua may be applied to established (defined as planted in fall or spring which has gone through a first grass seed harvest) stands of perennial cool-season grasses (including fine fescue, orchardgrass, perennial ryegrass, and tall fescue) grown for seed production for residual preemergence control of listed weeds (**Table 1**). Use **Zidua** as part of a weed control program in perennial cool-season grasses grown for seed production either in combination or sequentially with other herbicides for a broader spectrum of weed control and/or control of emerged weeds. Before applying to perennial cool-season grass grown for seed production, verify with your local seed company (supplier), university extension specialist (e.g., weed scientist, county agent, etc.), or BASF representative the selectivity of **Zidua** on your variety to avoid potential injury.

Application Rate

Apply **Zidua** in perennial cool-season grasses grown for seed production at the residual rates provided in **Table 13**.

Table 13. Residual Rates of Zidua in Perennial Cool-season Grasses Grown for Seed Production

Application Timing	Use Rate by Soil Texture ¹ (ozs/A)		
	Coarse	Medium	Fine
Established Stands	DO NOT USE	1.85	1.85

¹ Refer to **Table 3** for definition of soil-texture groups.

Application Timing

Zidua may only be applied in a single application.

Application to Established Stands

Apply **Zidua** at the use rate specified in **Table 13** as a broadcast spray to the soil surface in postharvest grass during regrowth at the beginning of significant fall rains or in winter by January 31. Apply **Zidua** before target-weed germination.

Crop-specific Restrictions

- **DO NOT** apply more than 1.85 ozs/A of **Zidua** (0.098 lb ai/A of pyroxasulfone) in a single yearly application.
- **DO NOT** apply **Zidua** in combination with other pyroxasulfone-containing products in perennial cool-season grasses grown for seed production.
- **Preharvest Interval (PHI)** for seed of perennial grasses - 60 days
- **Pregrazing Interval (PGI)** to livestock for **Zidua**-treated grass forage and hay - 60 days
- **DO NOT** apply **Zidua** on coarse soils.

Crop-specific Precautions

- Application made in periods of cold temperatures that temporarily limit normal crop growth or in extended cold temperature periods that initiate winter dormancy in grass crops may result in injury.

Potato

Zidua may be applied preemergence to potato for residual preemergence control of listed weeds (**Table 1**). Use **Zidua** as part of a weed control program in potato either in combination or sequentially with other herbicides for a broader spectrum of weed control and/or control of emerged weeds. Before applying to potato, verify with your local seed company (supplier) the selectivity of **Zidua** on your variety to avoid potential injury.

Application Rate

Apply **Zidua** in potato at the residual rates provided in **Table 14**.

Table 14. Residual Rates of Zidua in Potato

Application Timing	Use Rate by Soil Texture ¹ (ozs/A)		
	Coarse	Medium	Fine
Preemergence	1.5	1.5 to 2.0	1.5 to 2.0

¹ Refer to **Table 3** for definition of soil-texture groups.

Application Timing

Zidua may only be applied in a single application.

Preemergence Surface Application

Apply **Zidua** at use rates specified in **Table 14** as a broadcast spray to the soil surface after planting or drag-off, but before crop emergence. Where “drag off” is practiced, **DO NOT** apply **Zidua** until the “drag off” process is complete and there is a minimum of 2 inches of soil covering

the vegetative portion of the potato plants, or **Zidua**[®] **herbicide** may be applied after hilling but prior to potato or weed emergence, or **Zidua** may be applied where potato hills are harrowed and re-hilled and sprayed, but application must be prior to potato and weed emergence. There must be 2 inches of soil covering the seed piece and/or sprout/vegetation. Care must be exercised so that “drag off” implements do not injure the plants. Efficacy will be reduced if later cultural practices expose untreated soil. Apply **Zidua** only to a uniform seedbed which is firm and free of clods and cracks. The seedbed must be prepared to ensure good seed piece row closure and soil coverage of the seed pieces.

Crop-specific Restrictions

- **On coarse soils - DO NOT** apply more than 1.5 ozs/A of **Zidua** (0.08 lb ai/A of pyroxasulfone) in a single yearly application.
- **On all soils other than coarse - DO NOT** apply more than 2.0 ozs/A of **Zidua** (0.106 lb ai/A of pyroxasulfone) in a single yearly application.
- **DO NOT** apply **Zidua** prior to planting potato seed pieces.
- **DO NOT** apply **Zidua** to emerging or emerged potato as severe crop injury will occur.
- There is no required (preharvest) interval between a preemergence application of **Zidua** and the harvest of potato.

Crop-specific Precautions

- The use of **Zidua** may result in temporary growth suppression in potato under stressful conditions, including inadequate or excessive moisture or rainfall, cool and hot temperatures, compacted or crusted soils, improper planting depth, injury from other pesticides, disease or other pest damage, mechanical injury, nutrient imbalances, or other conditions known to cause plant stress.

Safflower

Zidua may be applied preemergence to safflower for residual preemergence weed control. Use **Zidua** as part of a weed control program in safflower either in combination or sequentially with other herbicides for a broader spectrum of weed control and/or control of emerged weeds.

Before applying to safflower, verify with your local seed company (supplier), university extension specialist (e.g., weed scientist, county agent, etc.), or BASF representative the selectivity of **Zidua** on your hybrid/variety to avoid potential injury.

Application Rate

Apply **Zidua** in safflower at the residual rates provided in **Table 15**.

Table 15. Residual Rates of Zidua in Safflower

Application Timing	Use Rate by Soil Texture ¹ (ozs/A)		
	Coarse	Medium	Fine
Preemergence	DO NOT USE	1.0 to 1.5	1.0 to 1.5

¹ Refer to **Table 3** for definition of soil-texture groups.

Application Timing

Zidua may only be applied in a single application.

Preemergence Surface Application

Apply **Zidua** at use rates specified in **Table 15** as a broadcast spray to the soil surface after planting and before crop emergence.

Crop-specific Restrictions

- **DO NOT** apply more than 1.5 ozs/A of **Zidua** (0.08 lb ai/A of pyroxasulfone) in a single yearly application.
- **DO NOT** apply **Zidua** preplant or preplant incorporated to safflower.
- **DO NOT** apply **Zidua** to safflower at cracking or cotyledon stage.
- There is no required (preharvest) interval between a pre-emergence application of **Zidua** and safflower harvest.

Crop-specific Precautions

- **Safflower seed quality** - Plant high quality seed.
- **Seedbed preparation** - The seedbed **MUST** be prepared to ensure good seed row closure and soil coverage of the seed.
- The use of **Zidua** may result in temporary growth suppression or leaf burn in safflower under stressful conditions including inadequate or excessive soil moisture or rainfall, cool and hot temperatures, compacted or crusted soils, improper planting depth, injury from other pesticides, disease or other pest damage, mechanical injury, nutrient imbalances, or other conditions known to cause plant stress.
- If **Zidua** is tank mixed with another herbicide other than glyphosate or a graminicide, use a lower rate within the **Zidua** rate range for the application timing and soil texture (as specified in **Table 15**).

Soybean

Zidua® herbicide may be applied preplant surface, preplant incorporated, preemergence, early postemergence, or in the fall to soybean for residual preemergence control of listed weeds (**Table 1**). Use **Zidua** as part of a weed control program in soybean either in combination or sequentially with other herbicides for a broader spectrum of weed control and/or control of emerged weeds. Before applying to soybean, verify with your local seed company (supplier) the selectivity of **Zidua** on your variety to avoid potential injury.

Application Rate

Apply **Zidua** in soybean at the residual rates in **Table 16**.

Table 16. Residual Rates of Zidua in Soybean

Application Timing	Use Rate by Soil Texture ¹ (ozs/A)		
	Coarse	Medium	Fine
Preplant Surface	1.5 to 2.1	2.0 to 3.0	2.5 to 3.5
Preplant Incorporated	1.5 to 2.1	2.0 to 3.0	2.5 to 3.5
Preemergence	1.5 to 2.1	2.0 to 3.0	2.5 to 3.5
Early Postemergence	1.0 to 2.1	1.5 to 3.0	2.0 to 3.5

¹ Refer to **Table 3** for definition of soil-texture groups.

Application Timing

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

Fall/Winter Application 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. Sequential preemergence and/or postemergence applications can be made, but **DO NOT** exceed the maximum cumulative rate allowed by soil type per year. See the main **Application Timings** section of this label for further application instructions.

Early Preplant Surface Application (within 15 to 45 days of planting)

Use application rates in **Table 16** when making preplant surface applications, using the highest application rate for a given soil texture. Preplant surface applications are not advised on coarse soils or in areas where average annual rainfall (or rainfall plus irrigation) typically exceeds 40 inches.

Preplant Surface or Preplant Incorporated Application (within 14 days of planting)

Apply **Zidua** at the use rates specified in **Table 16** as a broadcast spray to the soil surface or incorporated before planting on all soil types.

Preemergence Surface Application

Apply **Zidua** at use rates specified in **Table 16** 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 16** as a postemergence broadcast spray to soybean from emergence (cracking stage) to sixth-trifoliolate leaf stage. **Zidua** applications to emerged soybeans may result in temporary leaf burn and stunting, but a reduction in soybean yield is unexpected. Tank mixes of **Zidua** with other crop protection products or adjuvants may significantly enhance this effect. Depending upon growing conditions, recovery from this injury begins immediately but may take several weeks for the injury to dissipate entirely.

Sequential Application

If a sequential application program of **Zidua** is used (e.g. fall application followed by spring application, or sequential applications in the spring), the maximum combined rate of **Zidua** that may be applied per year is 2.1 ozs/A (0.112 lb ai/A of pyroxasulfone) on coarse soils or 3.5 ozs/A (0.186 lb ai/A of pyroxasulfone) on medium-to-fine soils.

Crop-specific Restrictions

- **On coarse soil - DO NOT** apply more than 2.1 ozs/A of **Zidua** (0.112 lb ai/A of pyroxasulfone) in a single application or as a maximum cumulative amount from sequential applications in soybean per year.
- **On medium soil:**
 - **DO NOT** apply more than 3.0 ozs/A of **Zidua** (0.159 lb ai/A of pyroxasulfone) in a single application.
 - **DO NOT** apply more than a maximum cumulative amount of 3.5 ozs/A of **Zidua** (0.186 lb ai/A pyroxasulfone) from sequential applications in soybean per year.
- **On fine soil - DO NOT** apply more than 3.5 ozs/A of **Zidua** (0.186 lb ai/A of pyroxasulfone) in a single application or as a maximum cumulative amount from sequential applications in soybean per year.
- Maximum number of applications per year: 2
- Separate sequential applications by at least 14 days.
- There is no required (preharvest) interval between a preplant, preemergence, or early postemergence application of **Zidua** and the harvest of soybean grain.

Crop-specific Precautions

- **Seeding depth** - Soybean seed must be planted a minimum 1-inch deep.
- The use of **Zidua** may result in temporary growth suppression in soybean if extreme conditions of high rainfall and extended periods of water-saturated soil occur during soybean germination or early seedling development.

Sunflower

Zidua® herbicide may be applied preplant surface, pre-emergence, or early postemergence to sunflower for residual preemergence control of listed weeds (**Table 1**). Use **Zidua** as part of a weed control program in sunflower either in combination or sequentially with other herbicides for a broader spectrum of weed control and/or control of emerged weeds. Before applying to sunflower, verify with your local seed company (supplier), university extension specialist (e.g. weed scientist, county agent, etc.), or BASF representative the selectivity of **Zidua** on your hybrid/variety to avoid potential injury.

Application Rate

Apply **Zidua** in sunflower at the residual rates provided in **Table 17**.

Table 17. Residual Rates of Zidua in Sunflower

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

¹ Refer to **Table 3** for definition of soil-texture groups.

Application Timing

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

Fall/Winter Application 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. Sequential preemergence and/or postemergence applications can be made, but **DO NOT** exceed the maximum cumulative rate allowed by soil type per year. See the main **Application Timings** section of this label for further application instructions.

Early Preplant Surface Application (within 15 to 45 days of planting)

Use application rates in **Table 17** when making preplant surface applications, using the highest application rate within the rate range for a given soil texture. Preplant surface applications are not advised on coarse soils or in areas where average annual rainfall (or rainfall plus irrigation) typically exceeds 40 inches.

Preplant Surface Application (within 14 days of planting)

Apply **Zidua** at the use rates specified in **Table 17** as a broadcast spray to the soil surface before planting on all soil types.

Preemergence Surface Application

Apply **Zidua** at use rates specified in **Table 17** 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 17** as a broadcast spray to sunflower from first true leaf (leaf at least 1.5 inches long, V1 stage) through eight leaf stage (V8). **Zidua** applications to emerged sunflower may result in temporary leaf burn and stunting, but a reduction in sunflower yield is unexpected.

Adjuvants may be applied with **Zidua** when making early postemergence applications.

Sequential Applications

If a sequential application program of **Zidua** is used (e.g. fall application followed by spring application, or sequential spring applications including preplant surface or preemergence application followed by postemergence application or consecutive postemergence applications), the maximum combined rate of **Zidua** that may be applied per year is 1.5 ozs/A (0.08 lb ai/A of pyroxasulfone) on coarse soils and 5.0 ozs/A (0.266 lb ai/A of pyroxasulfone) on medium-to-fine soils.

Crop-specific Restrictions

- **On coarse soil - DO NOT** apply more than 1.5 ozs/A of **Zidua** (0.08 lb ai/A of pyroxasulfone) in a single application or as a maximum cumulative amount from sequential applications in sunflower per year.
- **On all soils other than coarse:**
 - **DO NOT** apply more than 4.0 ozs/A of **Zidua** (0.213 lb ai/A of pyroxasulfone) in a single application.
 - **DO NOT** apply more than a maximum cumulative amount of 5.0 ozs/A of **Zidua** (0.266 lb ai/A pyroxasulfone) from sequential applications in sunflower per year.
- Maximum number of applications per year: 3
- Separate sequential applications by at least 14 days.
- **DO NOT** apply **Zidua** preplant incorporated to sunflower.
- **DO NOT** apply **Zidua** to sunflower at cracking or cotyledon stage.
- **DO NOT** apply a tank mix of **Zidua** and **Beyond® herbicide** on **Clearfield®** sunflower hybrids/varieties.
- There is no required (preharvest) interval between a preplant and preemergence application of **Zidua** and sunflower harvest.

- **DO NOT** apply **Zidua® herbicide** postemergence less than 60 days before harvest of sunflower seed.

Crop-specific Precautions

- **Sunflower seed quality** - Plant high quality seed.
- **Seedbed preparation** - The seedbed **MUST** be prepared to ensure good seed row closure and soil coverage of the seed.
- The use of **Zidua** may result in temporary growth suppression or leaf burn in sunflower under stressful conditions including inadequate or excessive soil moisture or rainfall, cool and hot temperatures, compacted or crusted soils, improper planting depth, injury from other pesticides, disease or other pest damage, mechanical injury, nutrient imbalances, or other conditions known to cause plant stress.
- If **Zidua** is tank mixed with another herbicide other than glyphosate or a graminicide, use a lower rate within the **Zidua** rate range for the application timing and soil texture (as specified in **Table 17**).

Wheat

Zidua may be applied preplant surface, preemergence, delayed preemergence, or early postemergence in fall-seeded or spring-seeded wheat for residual pre-emergence control or suppression of listed weeds (**Table 2**) and suppression of other listed weeds (**Table 1**). Use **Zidua** as part of a weed control program in wheat either in combination or sequentially with other herbicides for a broader spectrum of weed control and/or control of emerged weeds.

Crop Response

Zidua applied preplant surface or preemergence can cause wheat injury. Under stressful conditions (including inadequate or excessive moisture, cool or hot temperatures, compacted soils, injury from other pesticides, disease or other pest damage, mechanical injury, nutrient imbalances, or other conditions known to cause plant stress), **Zidua** injury will be intensified.

No crop injury is expected when **Zidua** is applied delayed preemergence or early postemergence. However, some visual wheat response is possible when **Zidua** is applied to wheat under stressful conditions including inadequate or excessive moisture, cool or hot temperatures, compacted soils, injury from other pesticides, disease or other pest damage, mechanical injury, nutrient imbalances, or other conditions known to cause plant stress.

Wheat response is most often visible as stunting and/or discoloration of leaf tissue (e.g. chlorosis), but in its most severe form can result in stand loss and yield reduction. The greatest potential for wheat response occurs when **Zidua** concentrates in the crop row. Unacceptable wheat response may be caused by uneven application, soil clods or disturbances, an open/cracked seed furrow that allows herbicide to directly contact the seed, or a deep seed

furrow that allows herbicide concentration after a rain/irrigation event during wheat germination.

Certain wheat varieties can be more sensitive to **Zidua**. Before applying to wheat, verify sensitivity with your local seed company (supplier), university extension specialist (e.g. wheat breeder, weed scientist, county agent, etc.), or BASF representative.

Application Rate

Apply **Zidua** in wheat at the residual rates in **Table 18**.

Table 18. Residual Rates of Zidua in Wheat

Application Timing	Use Rate by Soil Texture ¹ (ozs/A)		
	Coarse	Medium	Fine
Preplant surface or Preemergence	0.5 to 1.25	1.0 to 1.5	1.0 to 1.75
Delayed preemergence	0.7 to 1.0	1.0 to 1.5	1.0 to 2.0
Early postemergence	1.0 to 2.5	1.0 to 2.5	1.0 to 2.5

¹ Refer to **Table 3** for definition of soil-texture groups.

Application Timing

Zidua may be applied in a single application or in sequential applications relative to the growth stage of wheat.

Preplant Surface Application

Apply **Zidua** at the use rates specified in **Table 18** as a broadcast spray to the soil surface no more than 14 days before planting on all soil types. Soil disturbance after application from planters/drills may result in herbicide incorporation that can result in unacceptable crop injury, or displacement of **Zidua** that can result in inconsistent weed control. See **State-specific Use Instructions** for applications in Idaho, Montana, Oregon, and Washington.

Preemergence Surface Application

Apply **Zidua** at the use rates specified in **Table 18** after planting but before wheat spiking as a broadcast spray to the soil surface with uniform seedbed that is firm and free of clods. Ensure good seed row closure and soil coverage to avoid contact with **Zidua**. As the interval from planting to application increases, the potential for crop injury decreases. See **State-specific Use Instructions** for applications in Idaho, Montana, Oregon, and Washington.

Delayed Preemergence Surface Application

Apply **Zidua** at the use rates specified in **Table 18** as a broadcast spray to the soil surface following wheat planting when 80% of germinated wheat seeds have a shoot at least 1/2-inch long until wheat spiking.

Early Postemergence Application

Apply **Zidua** at the use rates specified in **Table 18** as a broadcast spray to wheat at spiking up to the 4th-tiller growth stage. **Zidua** will only suppress or control labeled

weeds that germinate after the early postemergence application and rainfall/irrigation activation. Apply **Zidua**[®] **herbicide** as early as possible after wheat emergence to prevent weed emergence.

Sequential Application

Zidua may be applied as a sequential or split application program where a preplant, preemergence, or delayed preemergence application is followed by an early postemergence application or where multiple early postemergence applications are made. **DO NOT** apply more than a maximum cumulative amount of 2.5 ozs/A (0.133 lb ai/A of pyroxasulfone) per year.

State-specific Use Instructions for Preplant and Preemergence Applications in Idaho, Montana, Oregon, and Washington.

Apply **Zidua** preplant surface or preemergence in fall-seeded winter wheat for residual weed control. **DO NOT** apply on spring wheat. Apply **Zidua** only to a uniform seedbed that is firm and free of clods, cracks, excess trash (previous crop residue), and weed growth. The seedbed **MUST** be prepared to ensure good seed row closure and soil coverage of the seed. Open furrows or poor furrow closure can result in crop injury. Use high quality seed. Plant seed at least 1-inch deep, but not greater than 1.5-inches deep to avoid crop injury. Avoid planting seed into loose, powdery soil because unacceptable crop injury may result if soil settles and final planting depth is less than 1-inch. Apply **Zidua** preplant surface or preemergence at 1.0 to 2.0 ozs/A on medium soils and at 1.25 to 2.0 ozs/A on fine soils.

DO NOT apply on coarse soils. Avoid application to soils with less than 2% organic matter and/or pH greater than 7.5 because unacceptable crop injury may occur. Follow all other application instructions and restrictions and limitations for preplant and preemergence applications of **Zidua** in wheat.

Crop-specific Restrictions

- **DO NOT** apply more than 2.5 ozs/A of **Zidua** (0.133 lb ai/A of pyroxasulfone) in a single application.
- **DO NOT** apply more than a maximum cumulative amount of 2.5 ozs/A of **Zidua** (0.133 lb ai/A of pyroxasulfone) from sequential applications in wheat per year.
- Maximum number of applications per year: 2
- Separate sequential applications by at least 14 days.
- **DO NOT** apply **Zidua** to durum wheat.
- **DO NOT** seed wheat deeper than 1.5 inches after a preplant application or before a preemergence or delayed preemergence application.
- **DO NOT** apply **Zidua** to flooded fields or saturated soils.
- **DO NOT** apply preemergence if 1/4 inch or more rain is expected within 48 hours after application.
- **DO NOT** irrigate fields after a preemergence or delayed preemergence application until wheat spiking.

- **DO NOT** apply preplant, preemergence, or delayed preemergence to broadcast-seeded wheat.
- **DO NOT** apply **Zidua** [*Alternate Text - preplant surface*], preplant incorporated, [*Alternate Text - preemergence*] in wheat.
- Wheat forage and hay can be fed or grazed 7 or more days after application.

Crop-specific Precautions

- Apply **Zidua** only to a uniform seedbed that is firm and free of clods, cracks, excess trash (previous crop residue), and weed growth. The seedbed **MUST** be prepared to ensure good seed row closure and soil coverage of the seed. Open furrows or poor furrow closure can result in crop injury. Use high quality seed. Plant seed at least 3/4-inch deep to avoid crop injury.
- The use of **Zidua** in wheat may result in temporary or sustained growth suppression and chlorosis if high rainfall or irrigation leads to extended periods of water-saturated soil during early seedling development. To reduce crop response, avoid applying **Zidua** if a long period of rain is expected before wheat emergence.

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.

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Beyond® herbicide (imazamox), EPA Reg. No. 241-441

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007969-00338.20200127c.**NVA 2020-04-388-0010**

Supersedes: NVA 2019-04-388-0198

Supplementals: NVA 2020-04-388-0011

Based on: 063588-00092.20190617KIH485-85WG-01-0065

BASF Corporation
26 Davis Drive
Research Triangle Park, NC 27709



We create chemistry

ACCEPTED

05/07/2020

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

Supplemental Label

Pyroxasulfone

Group

15

Herbicide



Zidua®

Herbicide

Postemergence application to cotton via dry bulk fertilizer

This supplemental label expires June 1, 2023, and must not be used or distributed after this date.

Active Ingredient:

pyroxasulfone: 3-[[[5-(difluoromethoxy)-1-methyl-3-(trifluoromethyl)-1H-pyrazol-4-yl]methyl]sulfonyl]-4,5-dihydro-5,5-dimethylisoxazole 85.0%

Other Ingredients: 15.0%

Total: 100.0%

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

EPA Reg. No. 7969-338

**KEEP OUT OF REACH OF CHILDREN
CAUTION/PRECAUCION**

Directions For Use

- It is a violation of federal law to use this product in a manner inconsistent with its labeling.
- The supplemental labeling and the entire **Zidua® herbicide** container label, EPA Reg. No. 7969-338, must be in possession of the user at the time of application.
- Read the label affixed to the container for **Zidua** before applying.
- Use of **Zidua** according to this labeling is subject to the use precautions and limitations imposed by the label affixed to the container for **Zidua**.

Application Information

Zidua can be applied postemergence to cotton prior to weed emergence when impregnated onto dry bulk fertilizer and spread for residual preemergence weed control. Use **Zidua** as part of a weed control program in cotton either in combination or sequentially with other herbicides for a broader spectrum of weed control and/or control of emerged weeds. Before applying to cotton, verify with your local seed company (supplier), university extension specialist (e.g., weed scientist, county agent, etc.) or BASF representative the selectivity of **Zidua** on your variety to avoid potential injury.

Product Information

Zidua is a selective rate-dependent residual preemergence herbicide for controlling annual grasses, sedges, and annual broadleaf weeds. Refer to the **Zidua** container label for a complete list of weeds controlled.

Application Rate

Apply **Zidua**® herbicide in cotton at the residual rates provided in **Table 1**.

Table 1. Residual Rates of Zidua in Cotton

Application Timing	Use Rate by Soil Texture ¹ (ozs/A)		
	Coarse	Medium	Fine
Postemergence	0.75 to 1.5	0.75 to 1.5	1.0 to 2.1

¹ Refer to container label for definition of soil-texture groups.

Application Timing

Zidua may only be applied in a single application.

Early Postemergence Application

Apply **Zidua** at use rates specified in **Table 1** as a broadcast spread of impregnated dry bulk fertilizer to cotton from five-leaf stage to beginning bloom stage.

Apply a minimum of 200 pounds of dry bulk fertilizer per acre to ensure sufficient broadcast coverage for effective weed control. Activate **Zidua** with minimum of 0.75 inches of rainfall or irrigation soon after fertilizer spreading.

See the **Ground Application (Dry Bulk Fertilizer)** section on the container label for further information about this application.

Crop-specific Restrictions

- **DO NOT** apply **Zidua** as a preplant or preemergence treatment, or as a postemergence over-the-top spray treatment in cotton.
- **DO NOT** apply more than 2.1 ozs/A of **Zidua** (0.112 lb ai/A of pyroxasulfone) in a single yearly application.
- **DO NOT** apply **Zidua** to wet leaves (from recent rainfall or irrigation, dew) where the treated fertilizer is retained on cotton leaves.
- **DO NOT** apply **Zidua** impregnated onto ammonium nitrate, potassium nitrate, sodium nitrate or powdered limestone fertilizers.
- There is no required (preharvest) interval between a postemergence application of **Zidua** and harvest of cotton.
- Cotton gin byproducts may be fed to livestock

Crop-specific Precautions

- The use of **Zidua** may result in temporary growth suppression in cotton if extreme conditions of high rainfall and extended periods of water-saturated soil occur during cotton germination or early seedling development.

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