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## UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

WASHINGTON, D.C. 20460

OFFICE OF  
PREVENTION, PESTICIDES  
AND TOXIC SUBSTANCES

MAR 12 2009

Ms. Nancy Hilton  
FMC Corporation  
1735 Market Street  
Philadelphia, PA 19103

Dear Ms. Hilton:

Subject: Amendment- update spray drift language for pyrethroid agricultural use products  
Z- Cype 0.8EC Insecticide  
EPA Registration Number 279-3249  
Your submission dated March 8, 2009

The amendment referred to above, submitted in connection with registration under the FIFRA section 3(c) (7)(a), is acceptable provided you:

1. Submit and/or cite all data or other material required for registration/reregistration of your product under FIFRA sec. 3(c) (5) or FIFRA section 4 when the Agency requires all registrants of similar products to submit such data.

2. Make the label change listed below before you release the product for shipment bearing the amended labeling:

a. On page 2 directly under the heading Directions for Use, add RESTRICTED USE PESTICIDE in bold type.

b. On page 2 move "Do not apply this product in a way... pesticide regulation." to directly above the Agricultural Use Requirements Box.

c. On page 4 under Chemigation delete the precaution, "Do not apply when wind speed favors drift beyond the area intended for treatment.". The appropriate spray drift precautions are now listed on page 4.

d. For each crop grouping you may delete "Follow appropriate spray drift precautions listed on the label." The appropriate spray drift precautions are now listed on page 4.

e. For all crops, under Insects Control, Rate of Application and Method of Application in the "Comments" box give rates in both ounces of product and pounds of active ingredient per acre.

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f. Wherever "Use higher recommended dosage for increased pest pressure or for increased residual pest control.", "Apply as required by scouting...economic threshold levels." or other similar statements appear add "Do not exceed maximum allowable rate."

g. On page 22 change "Dealers Should Sell in Original Packages" to Dealers Must Sell in Original Packages".

3. You agree that the subject registrations are conditional under the same terms and conditions for data generation as stipulated in the Agency's November 15, 1993 and November 15, 2004 letters for use of these products on cotton.

4. You agree that the current synthetic pyrethroid mitigation measures are interim in nature and may be reconsidered or modified after review and evaluation of the Spray drift Task Force data.

5. FMC understands that it is the US EPA intent to complete the reviews of all relevant data and other information that are available to the agency, and to make FIFRA 3(c)(5) or other appropriate regulatory decisions for cotton- use synthetic pyrethroids and other crops conditionally registered based on the Agency's review of such data/information and considering statutory and regulatory criteria for such decisions.

A stamped copy of the label is enclosed for your records. Please submit three (3) copies of the amended labeling bearing the above revisions before you release the product for shipment.

Please note that acceptance of this letter does not constitute reregistration of this product.

If you have any questions you may contact Linda A. DeLuise at 703.305.5428.

Sincerely yours,

*Linda A De Luise*

*for*  
Richard Gebken  
Product Manager (13)  
Insecticide Branch  
Registration Division (7505P)

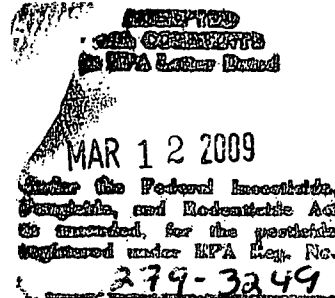
Enclosure

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**RESTRICTED USE PESTICIDE**  
Toxic to fish and aquatic organisms  
For retail sale to and use only by certified applicators, or persons under their direct supervision and only for those uses covered by the certified applicator's certification.

# Z-Cype

## 0.8EC Insecticide



EPA Reg. No. 279-3249

EPA Est. 279-FL-1

Active Ingredient:	By Wt.
* S-Cyano (3-phenoxyphenyl)methyl (+) cis/trans 3-(2,2-dichloroethenyl)-2,2 dimethylcyclopropane carboxylate**	9.6%
Inert Ingredients***	90.4%
	100.0%

\* Contains 0.8 pounds active ingredient per gallon.  
 \*\* Cis/trans ratio: Max. 55% (±) cis and min. 45% (±) trans  
 \*\*\* Contains Petroleum Distillates  
 U.S. Patent No. Pending

### KEEP OUT OF REACH OF CHILDREN WARNING AVISO

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.)

#### FIRST AID

**If Swallowed:** Call a poison control center or doctor immediately for treatment advice. Have person sip a glass of water if able to swallow. Do not induce vomiting unless told to do so by the poison control center or doctor. Do not give anything by mouth to an unconscious person.

**If on Skin or Clothing:** Take off contaminated clothing. Rinse skin immediately with plenty of water for 15-20 minutes. Call a poison control center or doctor for treatment advice.

**If in Eyes:** Hold eye open and rinse slowly and gently with water for 15-20 minutes. Remove contact lenses, if present, after the first 5 minutes, then continue rinsing eye. Call a poison control center or doctor for treatment advice.

#### Note to Physician

Vomiting should be supervised by a physician or the professional staff because of the possible pulmonary damages by aspiration of the solvent.

**For Emergency Assistance Call (800) 331-3148.**

**See other panels for additional precautionary information.**



FMC Corporation  
Agricultural Products Group  
Philadelphia PA 19103

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## 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 1-800-331-3148 for emergency medical treatment information.

## PRECAUTIONARY STATEMENTS

### Hazards to Humans (and Domestic Animals)

#### Warning

May be fatal if swallowed. Causes moderate eye irritation. Avoid contact with skin, eyes or clothing. Wash hands thoroughly with soap and water after handling and before eating, drinking, chewing gum, or using tobacco.

#### Personal Protective Equipment:

Some materials that are chemical-resistant to this product are listed below. If you want more options, follow the instructions for category G on an EPA chemical resistance category selection chart.

**Handlers who may be exposed to the dilute through application or other tasks must wear:** Long-sleeved shirt and long pants, Chemical-resistant gloves, such as Nitrile, Butyl, Neoprene, and/or Barrier Laminate, and Shoes plus socks.

**Handlers who may be exposed to the concentrate through mixing, loading, application or other tasks must wear:** Long-sleeved shirt and long pants, Chemical-resistant gloves, such as Nitrile, Butyl, Neoprene, and/or Barrier Laminate, Shoes plus socks, and Protective eyewear.

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

**User Safety Recommendations**  
**Users should:**  
Wash hands before eating, drinking, chewing gum, using tobacco or using the toilet.  
Remove clothing immediately if pesticide gets inside. Then wash thoroughly and put on clean clothing.

### Environmental Hazards

This pesticide is extremely toxic to fish, aquatic invertebrates, oysters and shrimp. 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 apply when weather conditions favor drift from treated areas. Drift and runoff from treated areas may be hazardous to aquatic organisms in neighboring areas. Do not contaminate water when disposing of equipment wash waters.

This product is highly toxic to bees exposed to direct treatment or residues on blooming crops or weeds. Do not apply this product or allow it to drift to blooming crops if bees are visiting the treatment area.

### Physical/Chemical Hazards

Do not use or store near heat or open flame.

## DIRECTIONS FOR USE

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

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

**Resistance.** Some insects are known to develop resistance to products used repeatedly for control. Because the development of resistance cannot be predicted, the use of this product should conform to resistance management strategies established for the use area. Consult your local or state agricultural authorities for details.

If resistance to this product develops in your area, this product, or other products with a similar mode of action, may not provide adequate

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control. If poor performance cannot be attributed to improper application or extreme weather conditions, a resistant strain of insect may be present. If you experience difficulty with control and resistance is a reasonable cause, immediately consult your local company representative or agricultural advisor for the best alternative method of control for your area.

### AGRICULTURAL USE REQUIREMENTS

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

Do not enter or allow worker entry into treated areas during the restricted entry interval (REI) of 12 hours.

PPE required for early entry to treated areas that is permitted under the Worker Protection Standard and that involves contact with anything that has been treated, such as plants, soil, or water, is: Coveralls, Chemical-resistant gloves, such as Barrier Laminate or Viton, and Shoes plus socks.

### STORAGE AND DISPOSAL

#### Pesticide Storage

Store in a cool, dry, well-ventilated place. Do not store below -6.6 C (20 F). If solids are observed warm to above 4.4 C (40 F) and roll or shake containers to redissolve. Do not use near heat, open flame or hot surfaces. Store in original containers only. Carefully open containers. After partial use, replace lids and close tightly. Do not put concentrate or dilute material into food or drink containers. Do not contaminate other pesticides, fertilizers, water, food, or feed by storage or disposal.

Keep out of reach of children and animals.

In case of spill, avoid contact, isolate area and keep out animals and unprotected persons. Confine spills. Call FMC: (800) 331-3148.

To confine spill: Dike surrounding area or absorb with sand, cat litter or commercial clay. Place damaged package in a holding container. Identify contents.

#### Pesticide Disposal

Pesticide wastes are toxic. Improper disposal of excess pesticide, spray mixture, or rinsate is a violation of Federal law. If these wastes cannot be disposed of by use according to label instructions, contact your State Pesticide or Environmental Control Agency, or the Hazardous Waste representative of the nearest EPA Regional Office for guidance.

#### Container Disposal

Metal Containers: Triple rinse (or equivalent). Then offer for recycling or reconditioning, or puncture and dispose of in a sanitary landfill, or by other procedures approved by state and local authorities. Do not cut or weld metal containers.

Plastic Containers: Triple rinse (or equivalent). Then offer for recycling or reconditioning, or puncture and dispose of in a sanitary landfill, or incineration, or, if allowed by State and local authorities, by burning. If burned, stay out of smoke.

Returnable/Refillable Sealed Containers: Do not rinse container. Do not empty remaining formulated product. Do not break seals. Return intact to point of purchase.

### Chemigation Use Directions

Apply this product only through sprinkler including center pivot, lateral move, end tow, side (wheel) roll, traveler, big gun, solid set, or hand move irrigation systems. Do not apply this product through any other type of irrigation system. Do not connect any irrigation system (including greenhouse systems) used for pesticide application to a public water system.

Crop injury, lack of effectiveness, or illegal residues in the crop can result from nonuniform distribution of treated water. If you have questions about calibration, you should contact State Extension Service specialists, equipment manufacturers, or other experts. A person knowledgeable of the chemigation system and responsible for its operation, or under the supervision of the responsible person, shall

shut the system down and make necessary adjustments should the need arise.

The system must contain a functional check valve, vacuum relief valve, and low pressure drain appropriately located on the irrigation pipeline to prevent water source contamination from backflow.

The pesticide injection pipeline must also contain a functional, automatic, quick-closing check valve to prevent the flow of fluid back toward the injection pump.

The pesticide injection pipeline must also contain a functional, normally closed, solenoid-operated valve located on the intake side of the injection pump and connected to the system interlock to prevent fluid from being withdrawn from the supply tank when the irrigation system is either automatically or manually shut down.

The system must contain functional interlocking controls to automatically shut off the pesticide injection pump when the water pump motor stops.

The irrigation line or water pump must include a functional pressure switch which will stop the water pump motor when the water pressure decreases to the point where pesticide distribution is adversely affected.

Systems must use a metering pump, such as a positive displacement injection pump (e.g., diaphragm pump) effectively designed and constructed of materials that are compatible with pesticides and capable of being fitted with a system interlock.

Do not apply when wind speed favors drift beyond the area intended for treatment

Z-Cype 0.8EC insecticide should be applied continuously for the duration of the water application. Z-Cype 0.8EC should be diluted in sufficient volume to insure accurate application over the area to be treated. Use the appropriate amount of water to carry the product to the target pest. Agitation is not required when a suitable diluent is used.

## **BUFFER ZONES**

### **Vegetative Buffer Zones**

Construct and maintain a minimum 10-foot-wide vegetative filter strip of grass or other permanent vegetation between the field edge and down gradient aquatic habitat (such as, but not limited to, lakes; reservoirs; rivers; permanent streams; marshes or natural ponds; estuaries; and commercial fish farm ponds).

Only apply products containing zeta-cypermethrin onto fields where a maintained vegetative buffer strip of at least 10 feet exists between the field and down gradient aquatic habitat.

For guidance, refer to the following publication for information on constructing and maintaining effective buffers: *Conservation Buffers to Reduce Pesticide Losses. Natural Resources Conservation Services. USDA, NRCS. 2000. Fort Worth, Texas. 21pp. <http://www.in.nrcs.usda.gov/technical/agronomy/newconbuf.pdf>*

**Buffer Zone for Ground Application (groundboom, overhead chemigation, or airblast)** – Do not apply within 25 feet of aquatic habitats (such as, but not limited to, lakes, reservoirs, rivers, permanent streams, marshes, natural ponds, estuaries, and commercial fish ponds).

**Buffer Zone for ULV Aerial Application** - Do not apply within 450 feet of aquatic habitats (such as, but not limited to, lakes, reservoirs, rivers, permanent streams, marshes, natural ponds, estuaries, and commercial fish ponds).

**Buffer Zone for Non-ULV Aerial Application** – Do not apply within 150 feet of aquatic habitats (such as, but not limited to, lakes, reservoirs, rivers, permanent streams, marshes, natural ponds, estuaries, and commercial fish ponds).

## **Spray Drift Requirements**

### **Wind Direction and Speed**

Only apply this product if the wind direction favors on-target deposition. Do not apply when the wind velocity exceeds 15 mph.

### **Temperature Inversion**

Do not make aerial or ground applications into temperature inversions. Inversions are characterized by stable air and increasing temperatures with height above the ground. Mist or fog may indicate the presence of an inversion in humid areas. The applicator may detect the presence of an inversion by producing smoke and observing a smoke layer near the ground surface.

### **Droplet Size**

Use only Medium or coarser spray nozzles (for ground and non-ULV aerial application) according to ASAE (S572) definition for standard nozzles. In conditions of low humidity and high temperatures, applicators should use a coarser droplet size.

### **Additional Requirements for Ground Applications**

Wind speed must be adjacent to the application site on the upwind side, immediately prior to application.

For ground boom applications, apply using a nozzle height of no more than 4 feet above the ground or crop canopy.

For airblast applications, turn off outward pointing nozzles at row ends and when spraying the outer two rows. To minimize spray loss over the top in orchard applications, spray must be directed into the canopy.

**Additional Requirements for Aerial Applications**

The spray boom should be mounted on the aircraft as to minimize drift caused by wingtip or rotor vortices. The minimum practical boom length should be used and must not exceed 75% of the wing span or 80% rotor diameter.

Flight speed and nozzle orientation must be considered in determining droplet size.

Spray must be released at the lowest height consistent with pest control and flight safety. Do not release spray at a height greater than 10 feet above the crop canopy unless a greater height is required for aircraft safety.

When applications are made with a cross-wind, the swath will be displaced downwind. The applicator must compensate for this displacement at the downwind edge of the application area by adjusting the path of the aircraft upwind.

**GENERAL INSTRUCTIONS**

Use low rate under light to moderate infestation. Higher rates should be used under heavy insect pressure. The rate of application is variable according to insect pressure, timing of spray and field scouting.

**Preventive Use**

For cutworm, armyworm, or stalk borer control, Z-Cype 0.8EC insecticide may be applied before, during, or after planting. For soil-incorporated applications, use higher rates for improved control.

**Rotational Crops**

With the exception of the crops listed below, rotational crops should not be planted within 30 days of last application.

**Tank-Mixture**

Z-Cype 0.8EC Insecticide may be applied in tank mixtures with other products approved for use on Alfalfa and Nongrass Animal Feeds; Berries; Brassica Vegetables; Bulb Vegetables; Canola (Rapeseed); Corn; Cotton; Cucurbit Vegetables; Fruiting Vegetables; Grapes; Grass Forage, Fodder and Hay and Grass Grown for Seed; Leafy Vegetables; Legume Vegetables; Peanut; Pome Fruits; Rice; Root and Tuber Vegetables; Sorghum; Soybeans; Stone Fruits; Sugarcane; Sunflower; Tree Nuts; and Wheat. Observe all restrictions and precautions which appear on the labels of these products. Test for compatibility of products before mixing.

**Maximum Usage When Applying Both Zeta-Cypermethrin and Cypermethrin Products to the Same Crop Within the Same Season.**

Do not apply more than the maximum seasonal total for either product when used alone, and do not apply more than the combined maximum seasonal total for both products as outlined in the table below.

Crop	Maximum Seasonal Total (lbs ai/acre)			Cypermethrin**	Maximum Seasonal Total (lbs ai/acre) When Applying Cypermethrin and Zeta- Cypermethrin Products to the Same Crop	Maximum Seasonal Total (lbs ai/acre) When Applying Zeta- cypermethrin Products to the Same Crop
	Zeta-cypermethrin*					
	Mustang	Z-Cype	HERO			
Cotton	0.3	0.15	0.1125	0.6	0.6	0.3
Field Corn	0.2	0.10	0.10	NA	NA	0.2
Sweet Corn	0.3	0.15	0.0675	NA	NA	0.3
Eggplant	0.3	0.15	0.0675	NA	NA	0.3
Pepper (Bell & Non-Bell)	0.3	0.15	0.0675	NA	NA	0.3
Tomato	0.3	0.15	0.105	NA	NA	0.3
Head Lettuce	0.3	0.15	0.1125	0.6	0.6	0.3
Head and Stem Brassica	0.3	0.15	0.1125	0.6	0.6	0.3
Succulent Peas and Beans	0.3	0.15	0.0675	NA	NA	0.3
Pecans	0.3	0.15	0.1125	0.6	0.6	0.3

\* Mustang or Fury (1.5 EW or 1.5 EC); Z-Cype (0.8 EC or 0.8 EW); HERO; or any zeta-cypermethrin product approved for crop use.  
 \*\* Any cypermethrin product approved for crop use including Ammo™.  
 NA = Not Applicable.

**Maximum Seasonal Usage and PHI (Pre-Harvest Interval) for Z-Cype 0.8EC Labeled Crops**

Crop	Maximum Seasonal Total/Acre for Z-Cype 0.8 EC		PHI (days)
	Lbs AI	Fl oz	
Alfalfa and Nongrass Animal Feeds (Forage, Fodder, Straw and Hay) Group	0.025/cutting	4.0	3 (cutting or grazing) 7 (harvesting seed)
	0.075/season	12.0	
Berries	0.15	24.0	1
Brassica Vegetables	0.15	24.0	1
Bulb Vegetables	0.125	20.0	7
Citrus	0.1	16.0	1
Corn, sweet	0.15	24.0	3
Corn, field, seed, pop	0.10	16.0	30 (grain & stover) 60 (forage)
Cotton	0.15	24.0	14
Cucurbit Vegetables	0.15	24.0	1
Fruiting Vegetables	0.15	24.0	1
Grapes	0.15	24.0	1
Grass Forage, Fodder, and Hay Group and Grass Grown for Seed	0.025/cutting	4.0	0 (Forage and Hay) 7 (Straw and Seed Screenings)
	Hay 0.10/season	16.0	
	Forage, Straw & Seed Screenings 0.125/season	20.0	
Leafy Vegetables	0.15	24.0	1
Legume Vegetables	0.15	24.0	1 (succulent shelled or edible-podded)
			21 (dried shelled)
<b>Oilseed Commodities:</b>			
Canola (Rapeseed)	0.15	24.0	7
Safflower	0.075	12.0	14
Sunflower	0.125	20.0	30
Peanut	0.15	24.0	7
Pome Fruits	0.15	24.0	14
Rice and Wild Rice	0.10	16.0	14
Root and Tuber Vegetables (except Sugar Beet)	0.15	24.0	1
Sorghum	0.125	20.0	14 (grain & fodder (stover)) 45 (forage (silage))
Soybeans	0.15	24.0	21
Stone Fruits	0.15	24.0	14
Sugarcane	0.10	16.0	21
Tree Nuts	0.125	20.0	7
Wheat	0.125	20.0	14

The REI (Restricted Entry Interval) is 12 hours for all labeled crops. Refer to the crop specific use directions for detailed information on application timing and any use restrictions.

**Nongrass Animal Feeds (Forage, Fodder, Straw and Hay) Group including:** Alfalfa; Alfalfa grown for seed (Includes lucerne, sainfoin, holy clover, esparcet, birdsfoot trefoil and varieties and/or hybrids of these); Velvet Bean; Clover; Kudzu; Lespedeza; Lupin; Sainfoin; Trefoil; Vetch; Crown Vetch; and Milk Vetch.

Insects Controlled	Rate of Application	Method of Application
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Alfalfa Caterpillar Alfalfa Looper Alfalfa Weevil Cutworms Egyptian Alfalfa Weevil (larvae & adult) Flea Beetles Green Cloverworm Hornworms Meadow Spittlebug Potato Leafhopper Velvetbean Caterpillar Webworms Blue Alfalfa Aphid <sup>1</sup> Green Peach Aphid <sup>1</sup> Pea Aphid Spotted Alfalfa Aphid <sup>1</sup> Threecornered Alfalfa Hopper	2.24 to 4.0 ounces (0.014 to 0.025 pound active) per acre	Apply as insects appear in sufficient volume of water to ensure thorough coverage of foliage.  Use higher recommended dosage for increased pest pressure or for increased residual pest control.  Apply in a minimum of 2 gallons of finished spray per acre by aerial equipment or 10 gallons per acre by ground equipment. ULV oil spray application is prohibited. Higher volumes of finished spray may improve insect control under high temperatures, when foliage is dense and/or when insect pressure is high.
Armyworms Grasshoppers Plant Bugs (including Lygus spp. & Stink Bugs)	2.8 to 4.0 ounces (0.0175 to 0.025 pound active) per acre	Follow appropriate spray drift precautions on this label.

Do not make applications less than 7 days apart.  
 A maximum of 0.025 pounds active ingredient/acre may be applied per cutting and a maximum of 0.075 pounds active ingredient per acre per season.  
 Applications may be made up to 3 days of cutting or grazing or up to 7 days of harvesting seed.  
<sup>1</sup>Aphid control may be variable depending on species present and host-plant relationships.

**Berries Crop Group (1 Day PHI) including: blackberry; loganberry, red and black raspberry; blueberry, highbush and lowbush; currant; elderberry; gooseberry; huckleberry; and cultivars and/or hybrids of these.**

Insects Controlled	Rate of Application	Method of Application
Leafrollers Orange Tortrix Root Weevils	4.0 ounces (0.025 pounds active) per acre	Apply as required by scouting. Timing and frequency of applications should be based upon insect populations reaching locally determined economic threshold levels.  Apply by ground and air equipment using sufficient water to obtain full coverage of foliage (minimum of 20 gallons by ground and 2 gallons by air).  Follow appropriate spray drift precautions on this label.

Do not apply more than 0.15 pounds active ingredient per acre per season.  
 Do not make applications less than seven days apart.

**Head and Stem Brassica Vegetables (1 day phi) including: Broccoli; Chinese Broccoli (gai lan, white flowering broccoli); Brussels Sprouts; Cauliflower; Cavalo broccolo; Kohlrabi; Cabbage; Chinese Cabbage (napa); Chinese Mustard Cabbage (gai choy).  
 Leafy Brassica Greens (1 day phi) including: Broccoli Raab (rapini) ; Chinese cabbage (bok choy); Collards; Kale; Mizuna; Mustard Greens; Mustard Spinach; Rape Greens; and Turnip Greens.**

Insects Controlled	Rate of Application	Method of Application

Corn Earworm Cucumber Beetles Cutworm Diamondback Moth <sup>1</sup> Flea Beetles Imported Cabbageworm Leafhoppers Saltmarsh Caterpillar Southern Cabbageworm Tobacco Budworm	2.24 to 4.0 ounces (0.014 to 0.025 pound active) per acre	Apply in water as necessary for insect control using a minimum of 15 gallons of finished spray per acre with ground equipment and 5 gallons per acre by air.  Lower rates of Z-Cype 0.8EC should be used under light to moderate insect pressure. Higher rates should be used to control heavy to extremely heavy insect populations.
Alfalfa Looper Armyworms Cabbage Looper Cabbage Webworm Crickets Grasshoppers Ground Beetles Leafminers (adults) Lygus Bugs Onion Thrips Stinkbugs Wireworm (adults) Aphids <sup>2</sup> Whiteflies <sup>3</sup>	3.2 to 4.0 ounces (0.02 to 0.025 pound active) per acre	In areas where arid climatic conditions persist, such as California and Arizona, higher than minimum recommended rates may be required.  Follow appropriate spray drift precautions on this label.
Do not make applications less than 7 days apart. A maximum of 0.15 pounds active ingredient may be applied per acre per season. <sup>1</sup> See resistance statement under "Directions for Use" section. <sup>2</sup> Aphid control may be variable depending on species present and host-plant relationships. <sup>3</sup> Aids in control		

**Bulb Vegetables (Allium spp.) (7 day phi) including: Garlic; Garlic, Great-Headed (elephant); Green Eschalots; Japanese Bunching Onions; Leeks; Onion, Dry Bulb and Green; Onion, Welch; Shallots, Dry Bulb and Green; Spring Onion or Scallions**

Insects Controlled	Rate of Application	Method of Application
Armyworms Cutworms Leafminers (adults) Onion Maggot Adults Stink Bugs Aphids	2.24 to 4.0 ounces (0.014 to 0.025 pound active) per acre	Apply in a minimum of 20 gallons per acre with ground equipment or in a minimum of 3 gallons per acre by aircraft. Begin applications when pests appear and repeat as necessary to maintain control.
Onion Thrips	2.88 to 4.0 ounces (0.018 to 0.025 pound active) per acre	To control Onion Thrips: Use higher rates as population increases and avoid rescue situations. Use of a crop oil concentrate at 16 fluid ounces per acre is recommended.  Follow appropriate spray drift precautions on this label.
Do not make applications less than 7 days apart. Do not apply more than 0.125 pound active ingredient per acre per season. Do not graze livestock in treated areas or cut treated crops for feed. <sup>1</sup> Aphid control may be variable depending on species present and host-plant relationships.		

Citrus Fruits Crop Group (1 Day PHI) including: Calamondin (*Citrus mitis*; *Citrofortunella mitis*); Citrus citron (*Citrus medica*); Citrus hybrids (*Citrus* spp.) (includes chironja, tangelo, tangor); Grapefruit (*Citrus paradisi*); Kumquat (*Fortunella* spp.); Lemon (*Citrus jambhiri*, *Citrus limon*); Lime (*Citrus aurantiifolia*); Mandarin (tangerine) (*Citrus reticulata*); Orange, sour (*Citrus aurantium*); Orange, sweet (*Citrus sinensis*); Pummelo (*Citrus grandis*, *Citrus maxima*); and Satsuma mandarin (*Citrus unshiu*).

Insects Controlled	Rate of Application	Method of Application
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Asian Cockroach Beet Armyworm Blue-Green Citrus Root Weevils Cutworms Diaprepes Root Weevil Fire Ants Fuller Rose Beetle Glassy-Winged Sharpshooter Grasshopper Katydid Leafhoppers Leafrollers Leafminers* Little Leaf Notcher Loopers Orange Tortrix Orangedog Caterpillars Plantbugs Psyllids Thrips Whiteflies	4.0 ounces (0.025 pound active) per acre	Apply by ground equipment using sufficient water to obtain full coverage of foliage in a minimum of 20 gallons for concentrate spray or a minimum of 100 gallons for dilute spray. Apply by air in a minimum of 10 gallons per acre.  Begin applications when pest activity is noted.  Follow appropriate spray drift precautions on this label.
Do not apply more than 0.10 pounds active ingredient per acre per season. Do not make applications less than fourteen days apart.		

**Corn, Sweet (3 day phi)**

Insects Controlled	Rate of Application	Method of Application
Chinch Bug Corn Rootworm (Adult) Corn Silkfly Cutworms Flea Beetle Leafhoppers Japanese Beetle (Adult) Sap Beetle (adults) Tarnished Plant Bug	2.24 to 4.0 ounces (0.014 to 0.025 pound active) per acre	Apply with ground or air equipment using sufficient water and application methods to insure thorough coverage of foliage. Apply in water using a minimum of 20 gallons of finished spray per acre with ground equipment and a minimum of 2 gallons per acre by air.  Follow appropriate spray drift precautions on this label.
Armyworms Corn Borers Corn Earworm Grasshoppers Aphids	2.8 to 4.0 ounces (0.0175 to 0.025 pound active) per acre	
Apply at minimum 3 to 5 day intervals or as needed for control. A maximum of 0.15 pounds active ingredient per acre per season may be applied. Do not apply within 3 days of harvest of ears or forage or livestock grazing. *Aphid control may be variable depending on species present and host-plant relationships.		

**Corn (Field), Field Corn Grown for Seed, Popcorn (At Plant Use)**

Insects Controlled	Rate of Application	Method of Application
Cutworms	0.16 fluid ounces per 1,000 linear feet of row (0.001 pound active) per 1,000 linear feet of row	Apply as an in-furrow, band or T-band treatment using a minimum 4" band. Use table below to determine the Z-Cyte 0.8EC needs for each acre.
Row Spacings (inches)	40	30      20
Z-Cyte 0.8EC (pounds ai per acre)	0.012	0.018      0.024
Z-Cyte 0.8EC (formulated ounces per acre)	1.92	2.88      3.84
Do not apply more than 0.10 pound active ingredient per acre per season including at-plant plus foliar applications of Z-Cyte 0.8EC. Do not apply within 30 days of harvest for grain and stover and 60 days for forage.		

**Corn (Field), Field Corn Grown for Seed, Popcorn**

Insects Controlled	Rate of Application	Method of Application
Cutworms	1.28 to 2.8 ounces (0.008 to 0.0175 pound active) per acre	Make applications when insect populations reach economic thresholds. Refer to local Cooperative Extension Pest Management Guidelines and/or scouting results.
Corn Earworm Green Cloverworm Meadow Spittlebug Western Bean Cutworm <sup>1</sup>	1.76 to 4.0 ounces (0.011 to 0.025 pound active) per acre	Apply by air or by ground

Bean Leaf Beetle Cereal Leaf Beetle Corn Borer, European Corn Borer, Southwestern Corn Rootworm Beetle Flea Beetle Grasshoppers Hop Vine Borer Hornworms Japanese Beetle (adult) Sap Beetle (adult) Southern Corn Leaf Beetle Stalk Borer Stink Bug Spp. Tobacco Budworm <sup>2</sup> Webworms Aphids <sup>3</sup>	2.72 to 4.0 ounces (0.017 to 0.025 pound active) per acre	equipment using sufficient water to obtain full coverage of foliage (minimum of 2 gallons per acre by air and 10 gallons per acre by ground).  For chinch bug control, scout corn fields and make applications when bugs migrate from small grains or wild grasses to small corn. Direct spray to the base of plant. Repeat applications at 3 to 5 day intervals if needed. Z- Cype 0.8EC may only suppress heavy infestations and/or subsequent migrations.
Armyworms (including Fall Armyworms) Chinch Bug	3.2 to 4.0 ounces (0.02 to 0.025 pound active) per acre	Follow appropriate spray drift precautions on this label.
Do not apply more than 0.10 pound active ingredient per acre per season including At-Planting plus foliar applications of Z-Cype 0.8EC Insecticide. Do not apply within 30 days of harvest for grain and stover and 60 days for forage. <sup>1</sup> For control before the larva bores into the plant stalk or ear. <sup>2</sup> See resistance statement under "Directions for Use" section. <sup>3</sup> Control may be variable depending on species present and host-plant relationships.		

**Cotton (14 day phi)**

Insects Controlled	Rate of Application	Method of Application
<b>Preemergent Use:</b> Cutworms	1.28 to 1.92 ounces (0.008 to 0.012 pound active) per acre	Use Z-Cype 0.8EC in the time period from 14 days prior to planting up to emergence of the crop. Apply as a broadcast spray by ground or air, banded (including T-band) or in- furrow spray using sufficient spray volume to achieve adequate coverage. Reduced volumes of water may be used with specialized equipment. Use the higher rates of Z-Cype 0.8EC when incorporating into the soil.
Cutworms Tobacco Thrips Soybean (banded) Thrips	1.28 to 1.92 ounces (0.008 to 0.012 pound active) per acre	Z-Cype 0.8EC may be applied in water or refined vegetable oil. When water is used, apply a minimum of one gallon of finished spray per acre by air or five gallons of finished spray with ground equipment. When applying in water by air, one quart of emulsified oil may be substituted for one quart of water in the finished spray. When using oil, use a minimum of one quart per acre in the finished spray. Control of lepidopteran eggs may be achieved with proper timing of applications.
Armyworm, Fall Armyworm, Yellow Striped Boll Weevil Cabbage Looper Corn Borer, European Cotton Bollworm Cotton Fleahopper Cotton Leaf Perforator Pink Bollworm Saltmarsh Caterpillar Stink Bugs Tarnished Plant Bug Other Plant Bugs Tobacco Budworm <sup>1</sup>	2.64 to 3.6 ounces (0.0165 to 0.0225 pound active) per acre	For boll weevil control, apply Z-Cype 0.8EC at a 3 to 4 day interval until pest numbers are reduced to
Armyworm, Beet <sup>2</sup> Cotton Aphid <sup>3</sup> Lygus Bugs Whiteflies	2.8 to 4.0 ounces (0.0175 to 0.025 pound active) per acre	

Grasshoppers	3.0 to 4.0 ounces (0.01875 to 0.025 pound active) per acre	<p>acceptable levels.</p> <p>Follow appropriate spray drift precautions on this label.</p> <p>For control of grasshoppers, applications should be made based on careful field scouting. Treatment decisions should be made based on evidence of feeding damage and presence of grasshoppers in cotton. Loss of cotyledon leaves in seedling cotton should be considered more important than leaf loss in older cotton. Applications should be made on a broadcast basis since grasshopper are highly mobile.</p> <p>Adjust rates based on populations of grasshopper found in fields. Applications should be made on a three to five day schedule until grasshopper populations are under control or until foliage loss subsides.</p> <p>Increase application rates as grasshopper size and population density increases.</p>
<p>A maximum of 0.15 active pound ingredient may be applied per acre per season.</p> <p>Do not graze or feed cotton for forage.</p> <p><sup>1</sup> See resistance statement under "Directions for Use" section.</p> <p><sup>2</sup> For control of beet armyworms only in the high plains of Texas, Arizona, and California.</p> <p><sup>3</sup> Aphid control may be variable depending on species present and host-plant relationships.</p> <p><sup>4</sup> Aids in control.</p>		

**Canola, Crambe, Rapeseed, Borage, Cuphea, Echium, Flax, Gold of Pleasure, Hare's-Ear Mustard, Lesquerella, Lunaria, Meadowfoam, Milkweed, Mustard, Oil Radish, Poppy Seed, Sesame, and Sweet Rocket (7 Day PHI).**

Insects Controlled	Rate of Application	Method of Application
Aphids Cutworms Diamondback Moth Loopers Lepidopterous Larvae Flea Beetle Fleahoppers Grasshopper Plant Bug Stink Bugs Seedpod Weevil Thrips Whitefly Armyworms	4.0 ounces (0.025 pounds active) per acre	<p>Apply as required by scouting. Timing and frequency of applications should be based upon insect populations reaching locally determined economic threshold levels.</p> <p>Apply by ground or air equipment using sufficient water to obtain full coverage of foliage (minimum of 10 gallons by ground and 2 gallons by air).</p> <p>Follow appropriate spray drift precautions on this label.</p>
<p>Do not apply more than 0.15 pounds active ingredient per acre per season.</p>		
<p>Do not make applications less than seven days apart.</p>		

**Cucurbit Vegetables Group (1 day PHI) including: Chayote (fruit); Chinese Waxgourd (Chinese Preserving Melon); Citron Melon; Cucumber; Gherkin; Gourd (edible) (including hyotan, cucuzza, hechima, Chinese orkra); *Mormordica* spp. (includes balsam apple, balsam pear, bitter melon, Chinese cucumber); Muskmelon (hybrids and/or cultivars of *Cucumis melo*) (includes true cantaloupe, cantaloupe, casaba, crenshaw melon, golden pershaw melon,**

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honeydew melon, honey balls, mango melon, Persian melon, pineapple melon, Santa Claus melon, and snake melon); **Pumpkin**; **Summer Squash** (includes crookneck squash, scallop squash, straightneck squash, vegetable marrow, **zucchini**); **Winter Squash** (includes butternut squash, calabaza, hubbard squash, acorn squash, and spaghetti squash); **Watermelon** (includes hybrids and varieties).

Insects Controlled	Rate of Application	Method of Application
Cutworm spp.	1.28 to 4.0 ounces (0.008 to 0.025 pounds active) per acre	Apply as required by scouting. Timing and frequency of applications should be based upon insect populations reaching locally determined economic threshold levels.
Cabbage Looper Cucumber Beetle spp. (adult) Leafhopper spp. Melonworm Pickleworm Rindworm Squash Bug Squash Vine Borer	2.8 to 4.0 ounces (0.0175 to 0.025 pounds active) per acre	Apply by ground or air equipment using sufficient water to obtain full coverage of foliage (minimum of 10 gallons by ground and 2 gallons by air).
Aphid spp. <sup>1,2</sup> Armyworm, Beet <sup>1,2</sup> Corn Earworm Leafminer Plant Bug spp. Stinkbug spp.	3.2 to 4.0 ounces (0.02 to 0.025 pound active) per acre	Do not make applications less than 7 days apart.  Follow appropriate spray drift precautions on this label.
Do not apply more than 0.15 pounds active ingredient per acre per season. <sup>1</sup> Aids in control. <sup>2</sup> See resistance statement under "Directions For Use" section.		

**Fruiting Vegetables (except Cucurbits) (1 day phi) including: Eggplant; groundcherry (Physalis spp.); okra; pepino (Melon pear); pepper (includes bell pepper, chili pepper, cooking pepper, pimento, sweet pepper); tomatillo; tomato.**

Insects Controlled	Rate of Application	Method of Application
Armyworm, Southern Armyworm, True Armyworm, Yellow-striped Celery Leaf Tier Colorado Potato Beetle Corn Borer, European Corn Borer, Southwestern Corn Earworm Cucumber Beetle Cutworm spp. Flea Beetle Garden Webworm Green Stink Bug Hornworms Leafminers (adults) Leafhopper spp. Meadow Spittlebug Pepper Maggot (adults) Pepper Weevil Plant Bug spp. Tobacco Budworm <sup>2</sup> Tomato Fruitworm Tomato Pinworm	2.24 to 4.0 ounces (0.014 to 0.025 pound active) per acre	Apply as required by scouting. Timing and frequency of applications should be based upon insect populations reaching locally determined economic thresholds.  Apply by ground or air equipment using sufficient water to obtain full coverage of foliage (minimum of 10 gallons by ground and 2 gallons by air).  Follow appropriate spray drift precautions on this label.
Aphid spp. <sup>2,3</sup> Armyworm, Beet <sup>2</sup> Armyworm, Fall Cabbage Looper Grasshoppers Lygus Bugs Brown Stink Bug Tomato Psyllid Thrips spp. <sup>1,2</sup> Whitefly spp. <sup>1,2</sup>	3.2 to 4.0 ounces (0.020 to 0.025 pound active) per acre	
Do not make applications less than 7 days apart. Do not apply more than 0.15 pounds active ingredient per acre per season. <sup>1</sup> Aids in control <sup>2</sup> See resistance statement under "Directions for Use" section. <sup>3</sup> Aphid control may be variable depending on species present and host-plant relationships.		

**Grape (1 Day PHI).**

Insects	Rate of	Method of
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Controlled	Application	Application
Asian Lady Bird Beetle Lady Bird Beetle Cutworm species	2.0 to 4.0 ounces (0.0125 to 0.025 pound active) per acre	Apply as required by scouting. Timing and frequency of applications should be based upon insect populations reaching locally determined economic threshold levels.
Eastern Grape Leafhopper Variegated Leafhopper Western Grape Leafhopper Grape Berry Moth Japanese Beetle (adult)	4.0 ounces (0.025 pounds active) per acre	Apply by ground or air equipment using sufficient water to obtain full coverage of foliage (minimum of 10 gallons by ground and 2 gallons by air).  Follow appropriate spray drift precautions on this label.
Do not apply more than 0.15 pounds active ingredient per acre per season.		
Do not make applications less than seven days apart.		

**Grass Forage, Fodder, and Hay Group and Grass Grown for Seed and Pasture and Rangeland (0 day PHI for forage and hay; 7 day PHI for straw and seed screenings) including:** bahiagrass, barnyardgrass, bentgrass, Bermudagrass, Kentucky bluegrass, big bluestem, smooth bromegrass, buffalograss, reed canarygrass, centipedegrass, crabgrass, cupgrass, dallisgrass, sand dropseed, Kentucky fescue, meadow foxtail, eastern gramagrass, side-oats grama, guinea grass, Indian grass, Johnsongrass, lovegrass, napiergrass, oatgrass, orchardgrass, pangolagrass, paspalum, redtop, Italian ryegrass, St. Augustine grass, sprangletop, squirreltailgrass, stargrass, switchgrass, timothy, crested wheatgrass, wildrye grass and zoysia grass. Also included are sudangrass and sorghum forages and their hybrids.

Insects Controlled	Rate of Application	Method of Application
Alfalfa Caterpillar Alfalfa Looper Alfalfa Weevil Cutworms Egyptian Alfalfa Weevil (larvae & adult) Flea Beetles Green Cloverworm Hornworms Meadow Spittlebug Potato Leafhopper Velvetbean Caterpillar Webworms Blue Alfalfa Aphid <sup>1</sup> Green Peach Aphid <sup>1</sup> Pea Aphid <sup>1</sup> Spotted Alfalfa Aphid <sup>1</sup> Threecornered Alfalfa Hopper	2.24 to 4.0 ounces (0.014 to 0.025 pound active) per acre	Apply as insects appear in sufficient volume of water to ensure thorough coverage of foliage. Use higher recommended dosage for increased pest pressure or for increased residual pest control.  Apply in a minimum of 2 gallons of finished spray per acre by aerial equipment or 10 gallons per acre by ground equipment.  ULV oil spray application is prohibited. Higher volumes of finished spray may improve insect control under high temperatures, when foliage is dense and/or when insect pressure is high.  Follow appropriate spray drift precautions on this label.
Amyworms Cereal Leaf Beetle Chinch Bug Grass Mealybug Grasshoppers Plant Bugs (including Lygus spp. & Stink Bugs)	2.8 to 4.0 ounces (0.0175 to 0.025 pound active) per acre	

Do not make applications less than 7 days apart for forage and hay; not less than 17 days for straw and seed screenings.

Do not spray livestock. Allow application to dry before letting livestock graze on treated area.

A maximum of 0.025 pounds active ingredient per acre may be applied per cutting.  
 For hay, a maximum of 0.10 pounds active ingredient per acre per season may be applied.  
 For forage, straw, and seed screenings, a maximum of 0.125 pounds active ingredient per acre per season may be applied.

Applications may be made up to 0 days for forage and hay; 7 days for straw and seed screenings.

<sup>1</sup> Aphid control may be variable depending on species present and host-plant relationships.

**Leafy Vegetables (except Brassica) (1 day PHI):** Amaranth (leafy amaranth, Chinese spinach, tampala); Arugula (Roquette); Cardoon; Celery; Celery, Chinese; Celtuce; Chervil; Chrysanthemum, edible-leaved and garland; Cilantro (not for use on cilantro grown for seed or coriander); Corn salad; Cress, garden; Cress, upland (yellow rocket, winter cress); Dandelion; Dock (sorrel); Endive (escarole); Fennel, Florence (finocchio); Lettuce, head and leaf; Orach; Parsley; Purslane, garden; Purslane, winter; Radicchio (red chicory); Rhubarb; Spinach (including New Zealand and vine, Malabar spinach, Indian spinach); Swiss chard.

Insects Controlled	Rate of Application	Method of Application
Corn Earworm Cucumber Beetles Cutworms Diamondback Moth Flea Beetles Imported Cabbageworm Leafhoppers Saltmarsh Caterpillar Tobacco Bygworm Aphid spp. <sup>1,2</sup> Whitefly spp. <sup>1,2</sup>	2.24 to 4.0 ounces (0.014 to 0.025 pound active) per acre	Apply in water as necessary for insect control using a minimum of 10 gallons of finished spray per acre with ground equipment and 5 gallons per acre by air.  Lower rates of Z-Cype should be used under light to moderate insect pressure. Higher rates should be used to control heavy to extremely heavy insect populations.
Amyworms Ground Beetles Crickets Loopers Lygus Bugs Onion Thrips Stink Bugs Wireworm (adults)	3.2 to 4.0 ounces (0.02 to 0.025 pound active) per acre	In areas where arid climatic conditions persist, such as California and Arizona, higher than minimum recommended rates may be required.  Follow appropriate spray drift precautions on this label.
Do not make applications less than 7 days apart. A maximum of 0.15 pound active ingredient may be applied per acre per season. <sup>1</sup> Aids in control <sup>2</sup> See resistance statement under "Directions For Use" section <sup>3</sup> Aphid control may be variable depending on species present and host-plant relationships.		

**Legume Vegetables - Succulent and Dried (except Soybeans)**

1 day phi for succulent shelled or edible-podded peas or beans  
 21 day phi for dried shelled peas or beans

**Succulent Edible-Podded Peas, Succulent Shelled Peas and Dried Shelled Peas (Pisum spp.) including:**

Dwarf Pea; Edible-pod Pea; Snow Pea; Sugar Snap Pea; Pigeon pea; English Pea; Garden Pea; Green Pea; Lentil.

**Succulent Edible-Podded Beans, Succulent Shelled Beans, and Dried Shelled Beans including:**

Runner Bean; Snap Bean; Wax Bean; Asparagus Bean; Chinese Longbean; Moth Bean; Yardlong Bean; Jackbean; Soybean (immature seed); Swordbean; Lima Bean; Broad Bean (Fava Bean); Blackeyed Pea; Southern Pea; Grain Lupin; Sweet Lupin; White Lupin; White Sweet Lupin; Field Bean; Kidney Bean; Navy Bean; Pinto Bean; Tepary Bean; Adzuki Bean; Catjang; Cowpea; Crowder Pea; Moth Bean; Mung Bean; Rice Bean; Urd Bean; Chickpea (Garbanzo Bean); Guar; Lablab bean.

Insects Controlled	Rate of Application	Method of Application
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Cutworm spp. Thistle Caterpillar (Painted Lady) Saltmarsh Caterpillar Silverspotted Skipper	1.28 to 4.0 ounces (0.008 to 0.025 pound active) per acre	Apply as required by scouting, usually at intervals of 5 or more days. Timing and frequency of applications should be based upon insect populations reaching locally determined economic thresholds.  Apply by ground or air equipment using sufficient water to obtain full coverage of foliage (minimum of 10 gallons by ground and 2 gallons by air).  Follow appropriate spray drift precautions on this label.
Alfalfa Caterpillar Armyworm, Southern Armyworm, True Armyworm, Yellow-Striped Bean Leaf Beetle Blister Beetle spp. Colorado Potato Beetle Corn Borer, European Corn Borer, Southwestern Corn Earworm Corn Rootworm Beetle (adult) Cowpea Curculio Cucumber Beetle Flea Beetle Green Cloverworm Ground Beetles Imported Cabbageworm Japanese Beetle Leaf Skeletonizer spp. Leafhopper spp. Leafminers (adults) Mexican Bean Beetle Pea Weevil Pea Leaf Weevil Plant Bug spp. Potato Leafhopper Seedcorn Beetle Seedcorn Maggot (adult) Spittlebug Three-Cornered Alfalfa Hopper Tobacco Budworm <sup>2</sup> Velvetbean Caterpillar Webworm spp. Woolly Bear Caterpillar	2.72 to 4.0 ounces (0.017 to 0.025 pound active) per acre	
Aphid spp. <sup>2,3</sup> Armyworm, Beet <sup>2</sup> Armyworm, Fall Grasshoppers Lesser Cornstalk Borer <sup>1</sup> Looper spp. Stink Bug spp. Thrips spp. <sup>1,2</sup> Whitefly spp. <sup>1,2</sup>	3.2 to 4.0 ounces (0.020 to 0.025 pound active) per acre	
Do not make applications less than 5 days apart. Do not apply more than 0.15 pound active ingredient per acre per season. <sup>1</sup> Aids in control <sup>2</sup> See resistance statement under "Directions For Use" section <sup>3</sup> Aphid control may be variable depending on species present and host-plant relationships.		

**Peanut (7 day PHI)**

Insects Controlled	Rate of Application	Method of Application
Cutworm spp. Green Cloverworm Velvetbean Caterpillar Red-necked Peanut Worm	1.28 to 4.0 ounces (0.008 to 0.025 pounds active) per acre	Apply as required by scouting. Timing and frequency of applications should be based upon insect populations reaching locally determined economic threshold levels.
Bean Leaf Beetle Leafhopper spp. Southern Corn Rootworm (adult) Vegetable Weevil Whitefringed Beetle (adult)	1.76 to 4.0 ounces (0.011 to 0.025 pounds active) per acre	Apply by ground or air equipment using sufficient water to obtain full coverage of foliage (minimum of 10 gallons by ground and 2 gallons by air).
Aphid spp. <sup>1,2</sup> Armyworm, Beet <sup>1,2</sup> Armyworm, Fall <sup>1,2</sup> Corn Earworm Grasshopper spp. Lesser Cornstalk Borer <sup>1,2</sup> Soybean Looper <sup>1,2</sup> Stink Bug spp. <sup>1,2</sup> Tobacco Thrips <sup>2</sup>	3.2 to 4.0 ounces (0.02 to 0.025 pound active) per acre	Do not make applications less than 14 days apart.  Follow appropriate spray drift precautions on this label.
Do not apply more than 0.15 pounds active ingredient per acre per season. Do not graze livestock in treated areas. Do not use treated vines or hay for animal feed. <sup>1</sup> Aids in control. <sup>2</sup> See resistance statement under "Directions For Use" section.		

**Pome Fruit Group (14 day PHI) including: Apple; Crabapple; Loquat; Mayhaw; Pear; Oriental Pear; and Quince.**

Insects Controlled	Rate of Application	Method of Application
Apple Maggot Codling Moth European Apple Sawfly Green Fruitworm Japanese Beetle Lesser Appleworm Oblique Banded Leafroller Oriental Fruit Moth Pandemis Leafroller Pear Psylla Plum Curculio Potato Leafhopper Redbanded Leafroller Rosy Apple Aphid Spirea Aphid Spotted Tentiform Leafminer Stink Bugs Tarnished Plant Bug Tufted Apple Bud Moth Variegated Leafroller White Apple Leafhopper	1.28 to 4.0 ounces (0.008-0.025 pounds active) per acre	Begin applications at delayed dormant through first cover as common to the production areas and the target pest species. Apply in a full season spray program.  Apply as required by scouting. Timing and frequency of applications should be based upon insect populations reaching locally determined economic threshold levels.  Apply by ground or air equipment using sufficient water to obtain full coverage of foliage (for ground application use a minimum of 20 gallons for concentrate spray or a minimum of 100 gallons for dilute spray; for air application use a minimum of 10 gallons).  Do not make applications less than 7 days apart.  Avoid applications when honey bees are actively foraging by applying during the early morning or evening hours.  Follow appropriate spray drift precautions on this label.
Do not apply more than 0.15 pounds active ingredient per acre per season. Do not apply as a ULV spray. Do not feed or allow livestock to graze on cover crops from treated orchards.		

**Rice and Wild Rice (14 day phi)**

Insects Controlled	Rate of Application	Method of Application
Armyworm, Fall Armyworm, True Armyworm, Yellow Striped Grasshoppers Green Bug Leafhopper Spp. Rice Water Weevil (adult) Oat Birdcherry Aphid Wild Rice Worm	3.2 to 4.0 ounces (0.020 to 0.025 pound active) per acre	Apply as needed based on pest thresholds determined by scouting practices. Refer to Extension Scouting guidelines for scouting techniques, pest thresholds and treatment timing and treatment intervals. Determine the need for

<p>Chinch Bug Rice Stink Bug</p>	<p>2.64 to 4.0 ounces to (0.0165 to 0.025 pound active) per acre</p>	<p>repeat applications, usually at intervals of 7 days, by scouting.</p> <p>Z-Cype 0.8EC can be safely applied in conjunction with approved rice herbicides.</p> <p>Apply by air or ground equipment using sufficient water to obtain full coverage of foliage. When applying by air, apply in a minimum of 5 gallons of water per acre. For increased control, crop oil concentrate at 16 fluid ounces per acre may be used.</p> <p>For control of rice water weevil in <b>dry seeded rice</b>, make a foliar application as indicated by scouting for the presence of adults and/or feeding scars, usually within a time-frame of 0-5 days after permanent flood establishment. Do not exceed 10 days from starting permanent flood until insecticide application unless scouting indicates adult weevils are not present. Adults may also be treated at later stages of rice development to reduce overwintering populations.</p> <p>For control of rice water weevil in <b>water seeded rice</b>, make the first application after flooding when scouting indicates the presence of adults and/or feeding scars. Application should usually begin when rice has emerged 0.5 inch above the waterline. Under conditions of prolonged migration into the field, start field scouting for rice water weevil adults and/or feeding scars 3-5 days after the initial treatment and, if needed, apply a second application within 7-10 days of the first application. Adults may also be treated at later stages of rice development to reduce overwintering populations.</p> <p>Green bug is known to have many biotypes. Z-Cype 0.8EC may only provide suppression. If satisfactory control is not achieved with the first application of Z-Cype 0.8EC, a resistant biotype may be present. Use alternate chemistry for control.</p> <p>Follow appropriate spray drift precautions on this label.</p>
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Do not make applications less than 7 days apart.  
Do not release floodwater within 7 days of an application.  
A maximum of 0.10 pound active ingredient (1.0 pints) may be applied per acre per season.  
Do not use treated rice field for the aquaculture of edible fish and crustacea.  
Do not apply as an ultra-low volume (ULV) spray.  
<sup>1</sup> Aphid control may be variable depending on species present and host-plant relationships.

**Root and Tuber Vegetables Group 1 (except Sugar Beet) (1 day PHI) including:** Arracacha; Arrowroot; Artichoke (Chinese and Jerusalem); Garden Beet; Edible Burdock; Edible Canna; Carrot; Cassava (Bitter and Sweet); Celeriac (Celery Root); Chayote (Root); Turnip-Rooted Chervil; Chicory; Chufa; Dasheen (Taro); Ginger; Ginseng; Horseradish; Leren; Turnip-Rooted Parsley; Parsnip; Potato; Oriental Radish (Daikon); Radish; Rutabaga; Salsify (Oyster Plant); Black Salsify; Spanish Salsify; Skirret; Sweet Potato; Tanier (Cocoyam); Turmeric; Turnip; Yam Bean; and Yam (True).

Insects Controlled	Rate of Application	Method of Application
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Cutworm spp.	1.28 to 4.0 ounces (0.008 to 0.025 pounds active) per acre	Apply as required by scouting. Timing and frequency of applications should be based upon insect populations reaching locally determined economic thresholds levels.  Apply by ground or air equipment using sufficient water to obtain full coverage of foliage (minimum of 10 gallons by ground and 2 gallons by air).  Do not make applications less than 4 days apart.
Cabbage Looper Cucumber Beetle European Corn Borer Flea beetle spp. Leafhopper spp. Southern Corn Rootworm (adult) Vegetable Weevil Whitefringed Beetle (adult)	1.76 to 4.0 ounces (0.011 to 0.025 pounds active) per acre	
Aphid spp. Armyworm, Beet <sup>1, 2</sup> Armyworm, Yellowstriped Cabbage Maggot Colorado Potato Beetle <sup>2</sup> Grasshopper spp. Imported Cabbageworm Potato Leafhopper Tarnished Plant Bug	3.2 to 4.0 ounces (0.02 to 0.025 pound active) per acre	
Do not apply more than 0.15 pounds active ingredient per acre per season. Leaves of Root and Tuber Vegetables cannot be used for food or feed. Follow appropriate spray drift precautions on this label. <sup>1</sup> Aids in control. <sup>2</sup> See resistance statement under "Directions For Use" section.		

**Safflower (14 day phi)**

Insects Controlled	Rate of Application	Method of Application
Cutworms	4.0 ounces (0.025 pound active) per acre.	Apply as needed based on pest thresholds determined by scouting practices. Refer to Extension Scouting guidelines for scouting techniques, pest thresholds and treatment timing and treatment intervals. Determine the need for repeat applications, at a minimum of 14 day intervals, by scouting.  Apply with ground or air equipment using sufficient water and application methods to insure thorough coverage of foliage. Apply in water using a minimum of 15 gallons of finished spray per acre.
A maximum of 0.075 pounds active ingredient per acre per season may be applied.		

**Sorghum (Grain) and Millet (14 day phi for grain and stover; 45 day phi for forage):**

Insects Controlled	Rate of Application	Method of Application
Cutworm spp. Sorghum Midge	1.28 to 4.0 ounces (0.008 to 0.025 pound active) per acre	Apply as required by scouting. Timing and frequency of applications should be based upon insect populations reaching locally determined economic thresholds.  Apply by ground or air equipment using sufficient water to obtain full coverage of foliage (minimum of 10 gallons by ground and 2 gallons by air). The addition of one to two quarts of emulsified oil per acre to the spray
Armyworm, Fall Armyworm, Southern Armyworm, True Armyworm, Yellow-Striped Corn Borer, European <sup>1</sup> Corn Borer, Southwestern <sup>1</sup> Corn Earworm Flea Beetle spp. Hornworms Stink Bug spp. Webworm spp.	1.76 to 4.0 ounces (0.011 to 0.025 pound active) per acre	

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<p>Aphid spp.<sup>2,3</sup>          Armyworm, Beet<sup>3</sup>          Chinch Bug          False Chinch Bug          Grasshopper spp.          Lesser Cornstalk Borer<sup>1</sup>          Thrips spp.<sup>3,4</sup>          Whitefly spp.<sup>3,4</sup></p>	<p>3.2 to 4.0          ounces (0.02          to 0.025 pound          active) per          acre</p>	<p>solution may improve          spray deposition and          insect control.          For sorghum midge          control, begin applications          when 25% of the sorghum          heads have emerged and          are in tip bloom. Repeat          applications at 10-day          intervals if needed.          For chinch bug control,          begin applications when          bugs migrate from small          grains or grass weeds to          small sorghum. Direct          spray to the base of plants          with sufficient spray          volume to penetrate the          soil/stem interface, leaf          collars, and sheaths.          Follow appropriate spray          drift precautions on this          label.</p>
<p>Do not make applications less than 10 days apart.          Do not apply more than 0.125 pound active ingredient per acre per season.  <sup>1</sup> For control before the larva bores into the plant stalk.  <sup>2</sup> Aphid control may be variable depending on species present and host-plant relationships.  <sup>3</sup> See resistance statement under "Directions For Use" section  <sup>4</sup> Aids in Control</p>		

**Soybeans (21 day phi):**

Insects Controlled	Rate of Application	Method of Application
<p>Cutworm spp.            Painted Lady (Thistle)            Caterpillar            Saltmarsh Caterpillar            Silverspotted Skipper</p>	<p>1.28 to 4.0            ounces (0.008            to 0.025 pound            active) per            acre</p>	<p>Apply as required by            scouting. Timing and            frequency of applications            should be based upon            insect populations</p>
<p>Alfalfa Caterpillar            Armyworm, Southern            Armyworm, True            Armyworm, Yellowstriped            Bean Leaf Beetle<sup>1</sup>            Blister Beetle spp.            Colorado Potato Beetle            Corn Borer, European            Corn Earworm            Corn Rootworm Beetle            (adult)            Cowpea Curculio            Cucumber Beetle            European Corn Borer            Flea Beetle            Green Cloverworm            Hornworms            Imported Cabbageworm            Japanese Beetle            Leaf Skeletonizer spp.            Leafhopper spp.            Leafminers (adults)            Mexican Bean Beetle            Pea Leaf Weevil            Plant Bug spp.            Potato Leafhopper            Seedcorn Maggot (adult)            Soybean Aphid            Spittlebug            Three-Cornered Alfalfa            Hopper            Tobacco Budworm<sup>2</sup>            Velvetbean Caterpillar            Webworm spp.            Woolly Bear Caterpillar</p>	<p>2.8 to 4.0            ounces            (0.0175 to            0.025 pound            active) per            acre</p>	<p>reaching locally            determined economic            thresholds.            Apply with either aerial or            ground equipment using            sufficient spray volume to            obtain full coverage of the            plant and foliage. Use a            minimum of 2 gallons of            finished spray per acre by            air or 10 gallons of finished            spray per acre by ground.            The addition of one to two            quarts of emulsified oil per            acre to the spray solution            may improve spray            deposition and insect            control.            Follow appropriate spray            drift precautions on this            label.</p>
<p>Armyworm, Beet            Armyworm, Fall            Grasshopper spp.            Lesser Cornstalk Borer<sup>3</sup>            Looper spp.<sup>2</sup>            Stink Bug spp.            Thrips spp.<sup>2,3</sup>            Whitefly spp.<sup>2,3</sup></p>	<p>3.2 to 4.0            ounces (0.02            to 0.025 pound            active) per            acre</p>	

Do not make applications less than 7 days apart.  
 Do not graze or harvest treated soybean forage, straw, or hay for livestock feed.  
 Do not apply more than 0.15 pound active ingredient per acre per season.  
<sup>1</sup> Use higher recommended dosage for increased pest pressure, increased residual pest control, or later-season applications.  
<sup>2</sup> See resistance statement under "Directions For Use" section  
<sup>3</sup> Aids in control

**Stone Fruit Group (14 day PHI) including: Apricot; Cherry (Sweet and Tart); Nectarine; Peach; Plum (including Chickasaw Plum, Damson Plum, and Japanese Plum); Plumcot; and Prune (fresh).**

Insects Controlled	Rate of Application	Method of Application
American Plum Borer Black Cherry Aphid Cherry Fruit Fly Green Fruitworm Leafrollers Leafhoppers Lesser Peach Tree Borer Peach Tree Borer Peach Twig Borer Plum Curculio Oriental Fruit Moth Rose Chafer Stink Bugs Tarnished Plant Bug Tufted Apple Budmoth Western Cherry Fruit Fly	1.28-4.0 ounces (0.008-0.025 pounds active) per acre	Apply as required by scouting. Timing and frequency of applications should be based upon insect populations reaching locally determined economic threshold levels.  Apply by ground or air equipment using sufficient water to obtain full coverage of foliage (for ground application use a minimum of 20 gallons for concentrate spray or a minimum of 100 gallons for dilute spray; for air application use a minimum of 10 gallons).  Do not make applications less than 7 days apart.  Follow appropriate spray drift precautions on this label.
Do not apply more than 0.15 pounds active ingredient per acre per season. Do not apply as a ULV spray. Do not feed or allow livestock to graze on cover crops from treated orchards.		

**Sugarcane (21 day phi)**

Insects Controlled	Rate of Application	Method of Application
Sugarcane Borer Mexican Rice Borer	3.0 to 4.0 ounces (0.01875 to 0.025 pound active) per acre	Make applications when insect populations reach economic thresholds. Refer to local Cooperative Extension Pest Management Guidelines and/or scouting results. Apply by air or ground equipment using sufficient water to obtain full coverage of foliage (minimum of 2 gallons per acre by air and 10 gallons per acre by ground). Follow appropriate spray drift precautions on this label.
Do not make applications less than 21 days apart. Do not apply more than 0.10 pound active ingredient per acre per season.		

**Sunflower, Castor Oil Plant, Chinese Tallowtree, Euphorbia, Evening Primrose, Jojoba, Niger Seed, Rose Hip, Stokes Aster, Tallowwood, Tea Oil Plant, and Vernonia (30 day PHI)**

Insects Controlled	Rate of Application	Method of Application
Thistle Caterpillar (Painted Lady) Cutworm species	1.28 to 4.0 ounces (0.008 to 0.025 pound active) per acre	Apply with ground or air equipment using sufficient water and application methods to insure thorough coverage of foliage. Apply in a minimum of 2 gallons of

Sunflower Beetle Sunflower Moth Sunflower Maggot Stem Weevil (adult) Grasshopper species Leafhopper species Head-Clipper Weevil (adult) Red Sunflower Seed Weevil (adult) Grey Sunflower Seed Weevil (adult) Saltmarsh Caterpillar Banded Sunflower Moth Armyworm Sunflower Butterfly Woolly Bear Caterpillar Japanese Beetle Webworm species	2.6 to 4.0 ounces (0.016 to 0.025 pound active) per acre	finished spray per acre by aerial equipment or 10 gallons per acre by ground equipment. Begin applications when pest appears and repeat as necessary to maintain control. Do not make applications less than 7 days apart.  Use higher recommended dosage for increased residual pest control.
Long-Horned Beetle (Dectes Stem Borer adult) Beet Armyworm Fall Armyworm Stink Bug Species Pale striped Flea Beetle	3.2 to 4.0 ounces (0.02 to 0.025 pound active) per acre	
<p>Do not apply more than 0.125 pound active ingredient per acre per season. Do not make more than five applications at the maximum application rate per season.</p> <p>Do not graze livestock in treated areas or cut treated crops for feed</p> <p>Avoid applications when honey bees are actively foraging by applying during the early morning or evening hours.</p> <p>Follow appropriate spray drift precautions (refer to the Spray Drift Precautions section).</p>		

**Tree Nuts Group (7 Day PHI) including: almond; beech nut; Brazil nut; butternut; cashew; chestnut; chinquapin; filbert (hazelnut); hickory nut; macadamia nut; pecan; and walnut (black and English).**

Insects Controlled	Rate of Application	Method of Application
Black Pecan Aphid Codling Moth Filbert Worm Hickory Shuckworm Leaffooted Bugs Navel Orangeworm Oblique-banded Leafroller Peach Twig Borer Pecan Leaf Casebearer Pecan Nut Casebearer Pecan Phylloxera Pecan Weevil Plant Bugs Stink Bugs Walnut Aphid Walnut Husk Fly Yellow Pecan Aphid	3.2 to 4.0 ounces (0.02 to 0.025 pounds active) per acre	Apply as required by scouting. Timing and frequency of applications should be based upon insect populations reaching locally determined economic threshold levels.  Apply by ground or air equipment using sufficient water to obtain full coverage of foliage (minimum of 10 gallons by ground and 2 gallons by air).  Follow appropriate spray drift precautions on this label.
<p>Do not apply more than 0.125 pounds active ingredient per acre per season.</p> <p>Do not make applications less than seven days apart.</p>		

**Wheat and Triticale (14 day phi for grain, forage, and hay):**

Insects Controlled	Rate of Application	Method of Application
Cutworm spp., including Army Cutworm Painted Lady (Thistle) Caterpillar	1.28 to 4.0 ounces (0.008 to 0.025 pound active) per acre	Apply as required by scouting. Timing and frequency of applications should be based upon insect populations

Armyworm, Southern Armyworm, True Armyworm, Yellowstriped Cereal Leaf Beetle Flea Beetle spp. Pale Wastem Cutworm Plant Bug spp. Spittlebug Webworm spp.	1.76 to 4.0 ounces (0.011 to 0.025 pound active) per acre	reaching locally determined economic thresholds. Apply by ground or air equipment using sufficient water to obtain full coverage of foliage (minimum of 10 gallons by ground and 2 gallons by air).
Aphid spp. <sup>1,2</sup> Armyworm, Beet <sup>2</sup> Armyworm, Fall Chinch Bug Grass Sawfly Grasshopper spp. Greenbug <sup>2,3</sup> Stink Bug spp. Thrips spp. Wheat Stem Sawfly (adult) <sup>3</sup> Whitefly spp. <sup>2,3</sup>	3.2 to 4.0 ounces (0.02 to 0.025 pound active) per acre	For chinch bug control, begin applications when bugs migrate from small grains or grass weeds. Apply sufficient spray volume to penetrate the soil/stem interface, leaf collars, and sheaths. Follow appropriate spray drift precautions on this label.
Do not make applications less than 14 days apart. Do not apply more than 0.125 pound active ingredient per acre per season. <sup>1</sup> Aphid control may be variable depending on species present and host-plant relationships. <sup>2</sup> See resistance statement under "Directions For Use" section <sup>3</sup> Aids in Control		

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