

This information is for promotional purposes only. Space considerations may require information to be omitted. Always refer to the actual package for complete label verbiage. This product may not yet be available or approved for sale or use in your area.

**RESTRICTED USE PESTICIDE**  
**DUE TO TOXICITY 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.



# SERPENT™

## 1 EC

GROUP 3 INSECTICIDE



Contains lambda-cyhalothrin, the active ingredient used in Karate®.

**ACTIVE INGREDIENT:** Lambda-cyhalothrin<sup>1</sup>

[1 $\alpha$ (S\*),3 $\alpha$ (Z)]-( $\pm$ )-cyano-(3-phenoxyphenyl)methyl-3-(2-chloro-3,3,3-trifluoro-1-propenyl)-2,2-dimethylcyclopropanecarboxylate ..... 13.1%

**OTHER INGREDIENTS:** ..... 86.9%

**TOTAL:** ..... 100.0%

<sup>1</sup>Synthetic pyrethroid Contains petroleum distillates. Contains 1 pound of active ingredient per gallon.

EPA Reg. No.: 91234-55

**KEEP OUT OF REACH OF CHILDREN**  
**DANGER/PELIGRO**

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 BELOW FOR ADDITIONAL PRECAUTIONARY STATEMENTS.

FIRST AID	
<b>If on skin or clothing:</b>	<ul style="list-style-type: none"> <li>Take off contaminated clothing.</li> <li>Rinse skin immediately with plenty of water for 15-20 minutes.</li> <li>Call a poison control center or doctor for treatment advice.</li> </ul>
<b>If in eyes:</b>	<ul style="list-style-type: none"> <li>Hold eye open and rinse slowly and gently with water for 15-20 minutes.</li> <li>Remove contact lenses, if present, after the first 5 minutes, then continue rinsing eye.</li> <li>Call a poison control center or doctor for treatment advice.</li> </ul>
<b>If swallowed:</b>	<ul style="list-style-type: none"> <li>Call a poison control center or doctor immediately for treatment advice.</li> <li>Do not give any liquid to the person.</li> <li>Do not induce vomiting unless told to do so by a poison control center or doctor.</li> <li>Do not give anything by mouth to an unconscious person.</li> </ul>
<b>If inhaled:</b>	<ul style="list-style-type: none"> <li>Move person to fresh air.</li> <li>If person is not breathing, call 911 or an ambulance, then give artificial respiration, preferably by mouth-to-mouth, if possible.</li> <li>Call a poison control center or doctor for treatment advice.</li> </ul>
NOTE TO PHYSICIAN	
Contains petroleum distillate - vomiting may cause aspiration pneumonia.	
HOT LINE NUMBER	
Have the product container or label with you when calling a poison control center or doctor, or going for treatment. For emergency medical assistance, call SafetyCall: 1-844-685-9173. For chemical emergency: spill, leak, fire, exposure or accident, call CHEMTREC: 1-800-424-9300.	

**For Chemical Emergency: Spill, Leak, Fire, Exposure, or Accident,**  
Call CHEMTREC Day or Night Within USA and Canada: 1-800-424-9300 or +1 703-527-3887 (collect calls accepted)

Serpent™ 1 EC is not manufactured, or distributed by Syngenta Crop Protection, LLC, seller of Karate®.



Manufactured for:  
**Atticus, LLC**  
940 NW Cary Parkway, Suite 200  
Cary, NC 27513

**PRECAUTIONARY STATEMENTS  
HAZARDS TO HUMANS AND DOMESTIC ANIMALS  
DANGER/PELIGRO**

Corrosive. Causes skin burns. May be fatal if swallowed or inhaled. Causes substantial but temporary eye injury. Do not get in eyes on skin or clothing. Do not breathe vapor or spray mist. Harmful if absorbed through skin. Wear protective clothing, gloves, eye-wear (goggles, face shield, or safety glasses) and respirator as indicated under **PERSONAL PROTECTIVE EQUIPMENT (PPE)**. Wash thoroughly with soap and water after handling and before eating, drinking, chewing gum, using tobacco, or using the toilet. Remove and wash contaminated clothing before reuse. Prolonged or frequently repeated skin contact may cause allergic reactions in some individuals.

Skin exposure may also result in a sensation described as a tingling, itching, burning, or prickly feeling. Onset may occur immediately to 4 hours after exposure and may last 2 to 30 hours, without damage. Wash exposed areas once with soap and water. Relief from the skin sensation may be obtained by applying an oil-based cream.

**PERSONAL PROTECTIVE EQUIPMENT (PPE):**

Applicators and other handlers must wear:

- Coveralls over long-sleeved shirt and long pants,
- Chemical-resistant gloves including barrier laminate, nitrile rubber, neoprene rubber or viton >14 mils,
- Chemical-resistant footwear plus socks,
- Protective eyewear,
- Chemical-resistant headgear for overhead exposure,
- Chemical-resistant apron when cleaning equipment, mixing, or loading,
- For exposures in enclosed areas, use a NIOSH approved respirator with an organic vapor (OV) cartridge or canister with any R, P or HE prefilter.
- For exposures outdoors, use a NIOSH approved respirator with any R, P or HE filter.

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.

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

**USER SAFETY RECOMMENDATIONS**

**Users should:**

- Wash hands before eating, drinking, chewing gum, using tobacco or using the toilet.
- Remove clothing immediately if pesticide gets inside. Then wash thoroughly and put on clean clothing.
- Remove PPE immediately after handling this product. Wash the outside of gloves before removing. As soon as possible, wash thoroughly and change into clean clothing.

**ENVIRONMENTAL HAZARDS:**

This pesticide is extremely toxic to fish and aquatic organisms and toxic to wildlife.

For terrestrial use: do not apply directly to water or 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 washwaters.

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 or weeds if bees are foraging the treatment area.

**PHYSICAL OR CHEMICAL HAZARDS**

Combustible liquid. Do not use or store near heat or open flame. Do not mix or allow contact with oxidizing agents. Hazardous chemical reaction may occur.

**DIRECTIONS FOR USE – RESTRICTED USE PESTICIDE**

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 State or Tribal agency responsible for pesticide regulation.

This labeling must be in the possession of the user at the time of application.

**AGRICULTURAL USE REQUIREMENTS**

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

**Do not enter or allow worker entry into treated areas during the restricted entry interval (REI) of 24 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 over long-sleeved shirt and long pants,
- Chemical-resistant gloves including barrier laminate, nitrile rubber, neoprene rubber or viton >14 mils,
- Chemical-resistant footwear plus socks,
- Protective eyewear,
- Chemical-resistant headgear for overhead exposure.

**FAILURE TO FOLLOW DIRECTIONS AND PRECAUTIONS ON THIS LABEL MAY RESULT IN CROP INJURY, POOR PEST CONTROL, AND/OR ILLEGAL RESIDUES.**

**Use Directions:**

Initial and residual control are contingent upon thorough crop coverage. Apply with ground or air equipment using sufficient water to obtain full coverage of foliage. Apply in a minimum of 2 gallons per acre by air or 10 gallons per acre by ground unless otherwise specified in this label. When foliage is dense or pest pressure is high (heavier insect or egg pressure, larger larval stages), use of higher application volumes and/or higher use rates may improve initial and residual control.

For cutworm control, **Serpent 1 EC** may be applied before, during or after planting. For soil incorporated applications, use higher rates for improved control.

**Resistance Management:**

**Serpent 1 EC** is a Group 3 Insecticide (contains the active ingredient lambda-cyhalothrin). 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 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.

**SPRAY DRIFT PRECAUTIONS**

**Buffer Zones:**

**Vegetative Buffer Strip**

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 **Serpent 1 EC** 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. 21 pp. www.in.nrcs.usda.gov/technical/agronomy/newconbuf.pdf*

#### **Buffer Zone for Ground Application (groundboom, overhead chemigation, or airstblast):**

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 measured 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 airstblast 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 wing-tip 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 drop 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 downward. The applicator must compensate for this displacement at the downwind edge of the application area by adjusting the path of the aircraft upwind.

### **CHEMIGATION**

#### **Sprinkler Irrigation Application:**

Apply **Serpent 1 EC** at rates and timing described elsewhere in this label. As local recommendations differ, consult your local State Extension Service or other local

experts for recommendations on adjuvant or diluent types, rates and mixing instructions. These recommendations should be proven, through university and extension field trials, to be effective with **Serpent 1 EC** applied by chemigation.

Check the irrigation system to insure uniform application of water to all areas. Thorough coverage of foliage is required for good control. Good agitation in the pesticide supply tank should be maintained prior to and during the entire application period.

Apply by injecting the specified rate of **Serpent 1 EC** into the irrigation system using a metering device that will introduce a constant flow and by distributing the product to the target area in 0.1 - 0.2 acre-inch of water. In general; use the least amount of water required for proper distribution and coverage. It is recommended that the product be injected into the main irrigation line ahead of a right angle turn in the line to insure adequate dispersion or mixing in the irrigation water. Once the application is completed, flush the entire irrigation and injection system with clean water before stopping the system.

In addition to the above recommendations, if application is being made during a normal irrigation set of a stationary sprinkler, the recommended rate of **Serpent 1 EC** for the area covered should be injected into the system only during the end of the irrigation set for sufficient time to provide adequate coverage and product distribution.

It is not recommended that **Serpent 1 EC** be applied through an irrigation system connected to a public water system. Public water system means a system for the provision to the public of piped water for human consumption, if such system has at least 15 service connections or regularly serves an average of at least 25 individuals daily at least 60 days out of the year.

#### **Use Precautions: Sprinkler Irrigation Application:**

- 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 system(s). Do not apply this product through any other type of irrigation system.
- Crop injury, lack of effectiveness, or illegal pesticide 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.
- Do not connect an irrigation system (including greenhouse systems) used for pesticide application to a public water system unless the pesticide label-prescribed safety devices for public water systems are in place.
- 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 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.
- Any alternatives to the above required safety devices must conform to the list of EPA-approved alternative devices.
- Do not apply when wind speed favors drift beyond the area intended for treatment or non-uniform distribution of treated water.
- Do not apply through chemigation systems connected to public water systems.

## SPECIFIC USE DIRECTIONS

### AGRICULTURAL USES

#### ALFALFA AND ALFALFA GROWN FOR SEED

Target Pests		Rate	
		lb. a.i./A	fl. oz./A
Alfalfa Caterpillar	Looper species	0.015 - 0.025	1.92 - 3.20
Army Cutworm	Threecornered Alfalfa Hopper		
Cutworm species	Velvetbean Caterpillar		
Green Cloverworm	Webworm species		
Leafhopper species			
Alfalfa Seed Chalcid (Adult)	Grasshopper species	0.02 - 0.03	2.56 - 3.84
Alfalfa Weevil	Green June Beetle (Adult)		
Armyworm	Green Peach Aphid <sup>3</sup>		
Bean Leaf Beetle (Adult)	Japanese Beetle (Adult)		
Blister Beetle species	Meadow Spittlebug		
Blue Alfalfa Aphid	Mexican Bean Beetle		
Clover Leaf Weevil species	Pea Aphid		
Clover Root Borer (Adult)	Pea Weevil (Adult)		
Clover Root Curculio species (Adult)	Plant Bug species including <i>Lygus</i> species <sup>3</sup>		
Clover Stem Borer (Adult)	Spotted Alfalfa Aphid		
Corn Earworm	Stink Bug species		
Cowpea Aphid	Sweet Clover Weevil (Adult)		
Cowpea Curculio (Adult)	Thrips species <sup>4</sup>		
Cowpea Weevil (Adult)	Western Yellowstriped Armyworm		
Cucumber Beetle species (Adult)	Whitefringed Beetle species (Adult)		
Egyptian Alfalfa Weevil	Yellowstriped Armyworm		
Fall Armyworm <sup>1</sup>			
Grape Colaspis (Adult)			
Beet Armyworm <sup>1,3</sup>	Spider Mites <sup>2</sup>	0.03	3.84
Blotch Leafminer <sup>3</sup>			

<sup>1</sup> Use higher rates for large larvae.

<sup>2</sup> Suppression only.

<sup>3</sup> See **Resistance Management** statement under general **Use Directions**.

<sup>4</sup> Does not include Western Flower Thrips.

#### Application Instructions for ALFALFA AND ALFALFA GROWN FOR SEED:

- Apply as required by scouting. Timing and frequency of applications should be based upon insect populations reaching locally determined economic thresholds.
- Apply with ground or air equipment using sufficient water to obtain full coverage of foliage. Apply in a minimum of 2 gallons per acre by air or 10 gallons per acre by ground. When foliage is dense and/or pest populations are high, 5 - 10 gallons per acre by air or 20 gallons per acre by ground and higher use rates are recommended. Use higher rates for increased residual control.
- Avoid application when bees are actively foraging by applying during the early morning or during the evening hours. Be aware of bee hazard resulting from a cool evening and/or morning dew. It may be advisable to remove bee shelters during and for 2 - 3 days following application. Do not apply directly to bee shelters.
- Do not apply more than 0.03 lb. a.i. (3.84 fl. oz. or 0.24 pt. of product) per acre per cutting.

- Do not apply more than 0.12 lb. a.i. (15.36 fl. oz. or 0.96 pt. of product) per acre per season.
- Do not apply within 1 day of harvest for forage or within 7 days of harvest for hay.

#### CANOLA

Target Pests		Rate	
		lb. a.i./A	fl. oz./A
Armyworm species	Flea Beetle	0.015 - 0.03	1.92 - 3.84
Cabbage Seedpod Weevil	Grasshoppers		
Cutworm species	Looper species		
Diamondback Moth	<i>Lygus</i> Bug		
Cabbage Aphid		0.03	3.84

#### Application Instructions for CANOLA:

- 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 threshold.
- Apply with ground or air equipment using sufficient water to obtain full coverage of foliage. When applying by air, apply a minimum of 2 gallons of water per acre.
- Do not apply within 7 days of harvest.
- Do not apply more than 0.09 lb. a.i. (11.52 fl. oz. or 0.72 pt. of product) per acre per year.

#### CEREAL GRAINS

##### Corn (at Plant): Field Corn, Popcorn, Seed Corn, Sweet Corn

Target Pests		Rate	
		lb. a.i./A	fl. oz./A
Corn Rootworm Larvae:	Lesser Cornstalk Borer	0.005 lb. a.i. per 1,000 ft. of row <sup>2</sup>	0.66 fl. oz. per 1,000 ft. of row <sup>2</sup>
Mexican	Seedcorn Beetle		
Northern	Seedcorn Maggot		
Southern	White Grub species		
Western	Wireworm species		
Cutworm species			

##### <sup>2</sup>lbs. a.i. and fl. oz./A of Serpent 1 EC Applied at 0.66 fl. oz./1,000 ft. of Row for Various Row Spacings

Row Spacing	40"	38"	36"	34"	32"	30"
linear ft./A	13,068	13,756	14,520	15,374	16,335	17,424
lbs. a.i./A	0.067	0.07	0.075	0.079	0.084	0.09
fl. oz./A	8.6	9.1	9.6	10.1	10.8	11.5

#### Application Instructions for CEREAL GRAINS:

##### Corn (at Plant): Field Corn, Popcorn, Seed Corn, Sweet Corn:

- Banded Applications - Apply at planting as a 5 - 7 inch T-band sprayed across the open seed furrow between the furrow openers and the press wheels or as a band application behind the press wheel.
- In-Furrow Applications - Apply into the seed furrow through spray nozzles or micro-tubes, behind the planter furrow openers and in front of the press wheel.
- Apply a minimum of 3 gallons finished spray per acre.
- Do not harvest or graze livestock or cut treated crops for feed within 21 days of plant application.



- Do not apply more than 0.09 lb. a.i. (11.52 fl. oz. or 0.72 pt. of product) per acre per crop at plant.
- For field corn, popcorn, and seed corn do not apply more than 0.12 lb. a.i. (15.36 fl. oz. or 0.96 pt. of product) per acre per crop from at plant and foliar applications. For sweet corn do not apply more than 0.48 lb. a.i. (61.44 fl. oz. or 3.84 pt. of product) per acre per crop from at plant and foliar applications.

### CEREAL GRAINS

#### Corn (Foliar): Field Corn, Popcorn, Seed Corn

Target Pests		Rate	
		lb. a.i./A	fl. oz./A
Corn Earworm <sup>1</sup>	Meadow Spittlebug	0.015 - 0.025	1.92 - 3.20
Cutworm species	Western Bean Cutworm <sup>1</sup>		
Green Cloverworm			
Armyworm <sup>2</sup>	Flea Beetle species	0.02 - 0.03	2.56 - 3.84
Bean Leaf Beetle	Grasshopper species		
Bird Cherry-Oat Aphid <sup>3</sup>	Hop Vine Borer <sup>1</sup>		
Cereal Leaf Beetle	Japanese Beetle (Adult)		
Corn Leaf Aphid <sup>3</sup>	Lesser Cornstalk Borer		
Corn Rootworm Beetle (Adult):	Sap Beetle (Adult)		
Mexican	Seed Corn Beetle		
Northern	Southwestern Corn Borer <sup>1</sup>		
Southern	Stalk Borer <sup>1</sup>		
Western	Stink Bug species		
English Grain Aphid <sup>3</sup>	Tobacco Budworm <sup>1,4</sup>		
European Corn Borer <sup>1</sup>	Webworm species		
Fall Armyworm <sup>2</sup>	Yellowstriped Armyworm <sup>2</sup>		
Beet Armyworm <sup>4</sup>	Rice Stalk Borer <sup>1</sup>	0.03	3.84
Chinch Bug	Southern Corn Leaf Beetle <sup>3</sup>		
Greenbug <sup>3,4</sup>			
Mexican Rice Borer <sup>1</sup>	Sugarcane Borer <sup>1</sup>		

<sup>1</sup> For control before the larva bores into the plant stalk or ear.  
<sup>2</sup> Use higher rates for large larvae.  
<sup>3</sup> Suppression only.  
<sup>4</sup> See **Resistance Management** statement under general **Use Directions**.

#### Application Instructions for CEREAL GRAINS:

##### Corn (Foliar): Field Corn, Popcorn, Seed Corn:

- Apply as required by scouting, or locally prescribed corn growth stages, usually at intervals of 7 or more days. Timing and frequency of applications should be based upon insect populations reaching locally determined economic thresholds or other locally recommended methods.
- Apply with ground or air equipment using sufficient water and application methods to obtain full coverage of target location. When applying by air, apply in a minimum of 2 gallons of water per acre.
- For chinch bug control, begin applications when bugs migrate from small grains or grass weeds to small corn. Direct spray to the base of corn plants. Repeat applications at 3 - 5 day intervals if needed. **Serpent 1 EC** may only suppress heavy infestations and/or subsequent migrations.
- For control of adult corn rootworm beetles (*Diabrotica* species) as part of an aerial applied corn rootworm control program use a minimum of 0.03 lb. a.i. (3.84 fl. oz. of product) per acre.
- Do not apply within 21 days of harvest.

- Do not allow livestock to graze in treated areas or harvest treated corn forage as feed for meat or dairy animals within 1 day after last treatment. Do not feed treated corn fodder or silage to meat or dairy animals within 21 days after last treatment.
- Do not apply more than 0.12 lb. a.i. (15.36 fl. oz. or 0.96 pt. of product) per acre per crop from at plant and foliar application.
- Do not apply more than 0.06 lb. a.i. (7.68 fl. oz. or 0.48 pt. of product) per acre after silk initiation. Do not apply more than 0.03 lb. a.i. (3.84 fl. oz. or 0.24 pt. of product) per acre after corn has reached the milk stage (yellow kernels with milky fluid).

### CEREAL GRAINS

#### Corn (Foliar): Sweet Corn

Target Pests		Rate	
		lb. a.i./A	fl. oz./A
Aphid Species <sup>2,3</sup>	European Corn Borer	0.02 - 0.03	2.56 - 3.84
Armyworm <sup>1</sup>	Fall Armyworm <sup>1</sup>		
Aster Leafhopper	Flea Beetle species		
Beet Armyworm <sup>1,3</sup>	Grasshopper species		
Chinch Bug	Japanese Beetle (Adult)		
Common Cornstalk Borer	Sap Beetle (Adult)		
Corn Earworm	Southern Armyworm <sup>1</sup>		
Corn Rootworm Beetle (Adult):	Southwestern Corn Borer		
Mexican	Spider Mite species <sup>2</sup>		
Northern	Stink Bug species		
Southern	Tarnished Plant Bug		
Western	Webworm species		
Cutworm species	Western Bean Cutworm		
	Yellowstriped Armyworm <sup>1</sup>		
Corn Silkyfly (Adult) <sup>2</sup>			

<sup>1</sup> Use higher rates for large larvae.  
<sup>2</sup> Suppression only.  
<sup>3</sup> See **Resistance Management** statement under general **Use Directions**.

#### Application Instructions for CEREAL GRAINS:

##### Corn (Foliar): Sweet Corn:

- Apply as required by scouting, or locally prescribed corn growth stages, usually at intervals of 4 or more days. Timing and frequency of applications should be based upon insect populations reaching locally determined economic thresholds or other locally recommended methods and should be targeted for control before insects enter the stalk or ear.
- Apply with ground or air equipment using sufficient water and application methods to obtain full coverage of foliage and ears (if present). When applying by air, apply in a minimum of 2 gallons of water per acre.
- For control of adult corn rootworm beetles (*Diabrotica* species) as part of an aerial applied corn rootworm control program use a minimum of 0.025 lb. a.i. (3.2 fl. oz. of product) per acre.
- Do not apply within 1 day of harvest.
- Do not allow livestock to graze in treated areas or harvest treated corn forage as feed for meat or dairy animals within 1 day after last treatment. Do not feed treated corn fodder or silage to meat or dairy animal within 21 days after last treatment.
- Do not apply more than 0.48 lb. a.i. (61.44 fl. oz. or 3.84 pt. of product) per acre per crop from at plant and foliar applications.

## CEREAL GRAINS

### Rice, Wild Rice

Target Pests		Rate	
		lb. a.i./A	fl. oz./A
Bird Cherry-Oat Aphid	Rice Water Weevil (Adult)	0.025 - 0.04	3.20 - 5.12
Cinch Bug	Riceworm		
Fall Armyworm	Sharpshooter species		
Grasshopper species	True Armyworm		
Greenbug	Yellow Sugarcane Aphid		
Leafhopper species	Yellowstriped Armyworm		
Rice Stink Bug			
European Corn Borer <sup>1</sup>	Rice Stalk Borer <sup>1</sup>	0.03 - 0.04	3.84 - 5.12
Mexican Rice Borer <sup>1</sup>	Sugarcane Borer <sup>1</sup>		
Rice Seed Midge <sup>1</sup>			

<sup>1</sup> For control before the larvae bores into the plant stalk.

#### Application Instructions for CEREAL GRAINS:

##### Rice, Wild Rice:

- Apply as required by scouting. Timing and frequency of application should be based upon insect populations reaching locally determined economic thresholds. Determine the need for repeat applications, usually at intervals of 5 - 7 days, by scouting.
- **Serpent 1 EC** can be safely used when propanil products are being used for weed control.
- Apply by air or by ground equipment using sufficient water to obtain full coverage of foliage. When applying by air, apply in a minimum of 2 gallons of water (or a total carrier volume) per acre but ensure sufficient volume is used to provide adequate coverage. In addition, adding an emulsifiable crop oil (e.g., 1 pt. per acre) when lower aerial application volumes are used is recommended to help improve coverage, reduce evaporation, and improve efficacy.
- For control of rice water weevil in dry seeded rice, 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 weevils have not been previously present. Adults may also be treated at later stages of rice development to reduce overwintering populations.
- For control of rice water weevil in water seeded rice, make the first foliar application after pinpoint flood as indicated by scouting for the presence of adults and/or feeding scars usually 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.
- California: In addition to above directions for control of rice water weevil in water seeded rice, **Serpent 1 EC** may be applied at the 1 - 3 leaf growth stage, with the majority at the 2 leaf growth stage. Adults are vulnerable on levees and in the water. Larvae are vulnerable while feeding on the leaf prior to entering the soil. Monitor for adults, based upon field history and density of population. Monitor field edges and levee areas for adults. Treat in the following manner: a) spray the inside perimeter of the field, or b) spray the entire field.
- Greenbug is known to have many biotypes. **Serpent 1 EC** may only provide suppression. If satisfactory control is not achieved with the first application of **Serpent 1 EC**, a resistant biotype may be present. Use alternate chemistry for control.
- For control of stem borers, scout fields, when rice growth is near panicle differentiation, for early symptoms of damaging populations exhibited as discoloration (orange-tan) around the junction of the leaf sheath and leaf blade which is caused by feeding

of young larvae within the sheath. Applications must be made before larvae bore into rice stems. Make the first application at panicle differentiation to 2 inch panicle for partial control. Make the second application at boot to heading for maximum control. All rice varieties are susceptible to stem borer damage, but Cocodrie and Priscilla are particularly susceptible.

- Mixers/loaders supporting aerial applications to wild rice at a rate of 0.04 lb. a.i. per acre, and treating 1,200 acres (or more) per day must wear dust-mist respirator.
- Do not release flood water within 7 days of an application.
- Do not apply more than 0.12 lb. a.i. (15.36 fl. oz. or 0.96 pt. of product) per acre per season.
- Do not apply more than 0.04 lb. a.i. (5.12 fl. oz. or 0.32 pt. of product) per acre within 21 - 27 days of harvest.
- Do not apply within 21 days of harvest.
- Do not use treated rice fields for the aquaculture of edible fish and crustacean.
- Do not apply as an ultra-low volume (ULV) spray.

## CEREAL GRAINS

### Sorghum (Grain)

Target Pests		Rate	
		lb. a.i./A	fl. oz./A
Cutworm species	Sorghum Midge	0.015 - 0.02	1.92 - 2.56
Armyworm	Grasshopper species	0.02 - 0.03	2.56 - 3.84
Beet Armyworm <sup>3</sup>	Lesser Cornstalk Borer <sup>2</sup>		
Corn Earworm	Southwestern Corn Borer <sup>2</sup>		
European Corn Borer <sup>2</sup>	Stink Bug species		
Fall Armyworm <sup>1</sup>	Webworm species		
Flea Beetle species	Yellowstriped Armyworm <sup>1</sup>		
Chinch Bug	Rice Stalk Borer <sup>2</sup>	0.03	3.84
Mexican Rice Borer <sup>2</sup>	Sugarcane Borer <sup>2</sup>		

<sup>1</sup> Use higher rates for large larvae.  
<sup>2</sup> For control before the larva bores into the plant stalk.  
<sup>3</sup> See **Resistance Management** statement under general **Use Directions**.

#### Application Instructions for CEREAL GRAINS:

##### Sorghum (Grain):

- 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 with ground or air equipment using sufficient water and application methods to obtain full coverage of target location. When applying by air, apply in a minimum of 2 gallons of water per acre.
- For sorghum midge control, begin applications when 25% of the sorghum heads have emerged and are in tip bloom. Repeat applications at 5 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 sorghum plants. Repeat applications at 3 - 5 day intervals if needed. **Serpent 1 EC** may only suppress heavy infestations and/or subsequent migrations.
- Do not apply more than 0.08 lb. a.i. (10.24 fl. oz. or 0.64 pt. of product) per acre per season.
- Do not apply more than 0.06 lb. a.i. (7.68 fl. oz. or 0.48 pt. of product) per acre per season after crop emergence.
- Do not apply more than 0.02 lb. a.i. (2.56 fl. oz. or 0.16 pt. of product) per acre per season once crop is in soft dough stage.
- Do not apply within 30 days of harvest.

## CEREAL GRAINS

### Buckwheat, Barley, Oats, Rye, Triticale, Wheat, Wheat Hay

Target Pests		Rate	
		lb. a.i./A	fl. oz./A
Army Cutworm	Cutworm species	0.015 - 0.025	1.92 - 3.20
Armyworm	Hessian Fly <sup>4</sup>	0.02 - 0.03	2.56 - 3.84
Bird Cherry-Oat Aphid <sup>1</sup>	Orange Blossom Wheat Midge		
Cereal Leaf Beetle	Russian Wheat Aphid <sup>1</sup>		
English Grain Aphid <sup>1</sup>	Stink Bug species		
Fall Armyworm	Yellowstriped Armyworm		
Flea Beetle species			
Grasshopper species			
Grass Sawfly		0.025 - 0.030	3.20 - 3.84
Chinch Bug	Greenbug <sup>1,3</sup>	0.03	3.84
Corn Leaf Aphid <sup>2</sup>	Mite species <sup>2</sup>		

<sup>1</sup> Best control is obtained before insects begin to roll leaves. Once crop has started to boot, **Serpent 1 EC** may provide suppression only. Higher rates and increased coverage will be necessary.

<sup>2</sup> Suppression only.

<sup>3</sup> See **Resistance Management** statement under general **Use Directions**.

<sup>4</sup> Make applications when adults emerge.

#### Application Instructions for CEREAL GRAINS:

##### Buckwheat, Barley, Oats, Rye, Triticale, Wheat, Wheat Hay:

- 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 with ground or air equipment using sufficient water and application methods to obtain full coverage of foliage. When applying by air, apply in a minimum of 2 gallons of water per acre.
- For chinch bug control, repeat applications at 3 - 5 day intervals if needed. **Serpent 1 EC** may only suppress heavy infestations and/or migrations.
- Greenbug is known to have many biotypes. **Serpent 1 EC** may provide suppression only. In this situation, a second application using an alternative chemistry may be needed.
- Do not apply within 30 days of harvest.
- Do not allow livestock to graze in treated areas or harvest treated wheat forage as feed for meat or dairy animals within 7 days after treatment. Do not feed treated straw to meat or dairy animals within 30 days after the last treatment.
- Do not apply more than 0.06 lb. a.i. (7.68 fl. oz. or 0.48 pt. of product) per acre per season.

## COLE CROPS (HEAD AND STEM BRASSICA)

### Broccoli; Brussels Sprouts; Cabbage; Cauliflower; Cavolo Broccolo; Chinese Broccoli (gai lon); Chinese Cabbage (napa); Chinese Mustard (gai choy); Kohlrabi

Target Pests		Rate	
		lb. a.i./A	fl. oz./A
Alfalfa Looper	Cutworm species	0.015 - 0.025	1.92 - 3.20
Cabbage Looper	Imported Cabbageworm		
Cabbage Webworm	Southern Cabbageworm		

(continued)

## COLE CROPS (HEAD AND STEM BRASSICA) (continued)

### Broccoli; Brussels Sprouts; Cabbage; Cauliflower; Cavolo Broccolo; Chinese Broccoli (gai lon); Chinese Cabbage (napa); Chinese Mustard (gai choy); Kohlrabi

Target Pests		Rate	
		lb. a.i./A	fl. oz./A
Aphid species <sup>2,3</sup>	Meadow Spittlebug	0.02 - 0.03	2.56 - 3.84
Armyworm	Plant Bug species including <i>Lygus</i> species <sup>3</sup>		
Beet Armyworm <sup>1,3</sup>	Spider Mite species <sup>2</sup>		
Corn Earworm	Stink Bug species		
Diamondback Moth <sup>3</sup>	Thrips species <sup>2</sup>		
Fall Armyworm <sup>1</sup>	Vegetable Weevil (Adult)		
Flea Beetle species	Whitefly species <sup>2,3</sup>		
Grasshopper species	Yellowstriped Armyworm		
Japanese Beetle (Adult)			
Leafhopper species			

<sup>1</sup> For control of first and second instar only.

<sup>2</sup> Suppression only.

<sup>3</sup> See **Resistance Management** statement under general **Use Directions**.

#### Application Instructions for COLE CROPS (HEAD AND STEM BRASSICA):

- 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 with ground or air equipment using sufficient water to obtain full coverage of foliage. When applying by air, apply in a minimum of 2 gallons of water per acre.
- Do not apply within 1 day of harvest.
- Do not apply more than 0.24 lb. a.i. (30.72 fl. oz. or 1.92 pt. of product) per acre per season.

## COTTON

Target Pests		Rate	
		lb. a.i./A	fl. oz./A
Cutworm species	Tobacco Thrips	0.015 - 0.020	1.92 - 2.56
Soybean Thrips			
Cabbage Looper	<i>Lygus</i> Bug species <sup>3</sup>	0.02 - 0.03	2.56 - 3.84
Cotton Fleahopper	Pink Bollworm		
Cotton Leaf Perforator	Saltmarsh Caterpillar		
Cotton Leafworm			
Banded-wing Whitefly <sup>2,3</sup>	Fall Armyworm	0.025 - 0.040	3.20 - 5.12
Beet Armyworm <sup>1,3</sup>	Green Stink Bug		
Boll Weevil	Southern Green Stink Bug		
Brown Stink Bug	Sweet Potato Whitefly <sup>2,3</sup>		
Cotton Aphid <sup>2,3</sup>	Tobacco Budworm <sup>3</sup>		
Cotton Bollworm	Two-spotted Spider Mite <sup>2</sup>		
European Corn Borer			

<sup>1</sup> For control of first and second instar only.

<sup>2</sup> Suppression only.

<sup>3</sup> See **Resistance Management** statement under general **Use Directions**.

### Application Instructions for COTTON:

- Apply as required by scouting, usually at intervals of 5 - 7 days. Timing and frequency of applications should be based upon insect populations reaching locally determined economic thresholds.
- Apply with ground or air equipment using sufficient water to obtain full coverage of foliage.
- Applications may also be made with equipment adapted and calibrated for ULV sprays. **Serpent 1 EC** may be mixed with once-refined vegetable oil and applied in a minimum of at least one quart of finished spray/A.
- Under light bollworm/budworm infestation levels, 0.02 lb. a.i. (2.56 fl. oz. of product) per acre may be applied in conjunction with intense field monitoring.
- For boll weevil control spray on a 3 - 5 day schedule.
- When applied according to label directions for control of cotton bollworm and tobacco budworm, **Serpent 1 EC** also provides ovicidal control of unhatched *Heliothine* species eggs.
- Do not apply within 21 days of harvest.
- Do not graze livestock in treated areas.
- Do not apply more than 0.2 lb. a.i. (25.6 fl. oz. or 1.6 pt. of product) per acre per season.
- Do not make more than a total of 10 synthetic pyrethroid applications (of one product or combination of products) to a cotton crop in one growing season.

### CUCURBIT VEGETABLES

**Chayote (fruit); Chinese Waxgourd (Chinese preserving melon); Citron Melon; Cucumber Gherkin; Gourd (edible), *Lagenaria* species - includes: hyotan, cucuzza, *Luffa acutangula*, *L. cylindrical* - includes: hechima, Chinese okra; *Momordica* species - 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, honeydew melon, honey balls, mango melon, Persian melon, pineapple melon, Santa Claus melon, snake melon; Pumpkin; Squash, summer (*Cucurbita pepo* var. *meloepo*) - includes: crookneck squash, scallop squash, straightneck squash, vegetable marrow, zucchini; Squash, winter (*Cucurbita maxima*; *C. moschata*) - includes butternut squash, calabaza, hubbard squash (*C. mixta*; *C. pepo*) - includes: acorn squash, spaghetti squash; Watermelon - includes: hybrids and/or varieties of *Citrullus lanatus***

Target Pests	Rate	
	lb. a.i./A	fl. oz./A
Armyworm species <sup>1</sup>	0.02 - 0.03	2.56 - 3.84
Melonworm		
Blister Beetle species		
Pickleworm		
Cabbage Looper		
Plant Bug species		
Corn Earworm		
Rindworm species complex		
Cricket species		
Saltmarsh Caterpillar		
Cucumber Beetle species (Adult)		
Squash Beetle		
Squash Bug species		
Cutworm species		
Squash Vine Borer species		
Flea Beetle species		
Grasshopper species		
Stink Bug species		
June Beetle species		
Thrips species <sup>1,2</sup>		
Leaf-footed Bug		
Tobacco Budworm <sup>1</sup>		
Leafhopper species		
Webworm species		
<i>Lygus</i> Bug species <sup>1</sup>		
Aphid species <sup>1</sup>	0.03	3.84
Spider Mite species <sup>3</sup>		
Leafminer species <sup>1,3</sup>	0.03	3.84
Whitefly species <sup>1,3</sup>		

<sup>1</sup> See **Resistance Management** statement under general **Use Directions**.  
<sup>2</sup> Does not include Western Flower Thrips.  
<sup>3</sup> Suppression only.

### Application Instructions for CUCURBIT VEGETABLES:

- 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 with ground or air equipment using sufficient water and application methods to obtain full coverage of all plant parts. When applying by air, apply in a minimum of 2 gallons total solution per acre. When applying by ground, a minimum of 10 gallons total solution per acre is recommended.
- Use higher application volumes and/or rates when foliage is dense, pest populations are high, larvae are large, weather conditions are adverse and/or as plant size increases. Use higher rates for longer residual.
- Insects that bore or tunnel into leaves, vines, stems or fruit must be controlled before penetration. Only exposed insects (larvae and/or adults) can be controlled with foliar applications of **Serpent 1 EC**.
- Do not apply more than 0.18 lb. a.i. (23 fl. oz. or 1.44 pt. of product) per acre per season. Do not apply within 1 day of harvest.

### FRUITING VEGETABLES

**Eggplant; Ground cherry; Pepino; Peppers (bell and nonbell); Tomatillo; Tomato**

Target Pests	Rate	
	lb. a.i./A	fl. oz./A
Cabbage Looper	0.015 - 0.025	1.92 - 3.20
Hornworm species		
Cutworm species	0.02 - 0.03	2.56 - 3.84
Aphid species <sup>2,3</sup>		
Pepper Weevil (Adult)		
Beet Armyworm <sup>1,3</sup>		
Plant Bug species		
Blister Beetle species		
Southern Armyworm <sup>1</sup>		
Colorado Potato Beetle <sup>3</sup>		
Spider Mite species <sup>2</sup>		
Cucumber Beetle species (Adult)		
Stalk Borer <sup>4</sup>		
Stink Bug species		
European Corn Borer <sup>4</sup>		
Thrips <sup>5</sup>		
Fall Armyworm <sup>1</sup>		
Tobacco Budworm <sup>3</sup>		
Flea Beetle species		
Tomato Fruitworm		
Grasshopper species		
Tomato Pinworm		
Japanese Beetle (Adult)		
Tomato Psyllid <sup>2,3</sup>		
Leafhopper species		
Vegetable Weevil (Adult)		
Leafminer species <sup>2</sup>		
Whitefly species <sup>2,3</sup>		
Meadow Spittlebug		
Yellowstriped Armyworm <sup>1</sup>		

<sup>1</sup> For control of first and second instar only.  
<sup>2</sup> Suppression only.  
<sup>3</sup> See **Resistance Management** statement under general **Use Directions**.  
<sup>4</sup> For control before the larva bores into the plant stalk or fruit.  
<sup>5</sup> Does not include Western Flower Thrips.

### Application Instructions for FRUITING VEGETABLES:

- 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 with ground or air equipment using sufficient water to obtain full coverage of foliage. When applying by air, apply in a minimum of 2 gallons of water per acre.
- Do not apply within 5 days of harvest.
- Do not apply more than 0.36 lb. a.i. (46.08 fl. oz. or 2.88 pt. of product) per acre per season.



## GRASS FORAGE, FODDER AND HAY

### Pasture and Rangeland; Grass; Grass Grown for Hay or Silage and Grass Grown for Seed

Target Pests		Rate	
		lb. a.i./A	fl. oz./A
Army Cutworm Cutworm species Essex Skipper	Range Caterpillar Striped Grass Looper	0.015 - 0.025	1.92 - 3.20
Beet Armyworm Billbug species <sup>3</sup> Bird Cherry-Oat Aphid <sup>1</sup> Black Grass Bug Black Turfgrass Beetle (Adult) Blue Stem Midge Cereal Leaf Beetle Chinch Bug Crane Fly species Cricket species English Grain Aphid <sup>1</sup> Fall Armyworm Flea Beetle species Grass Mealybug Grass Sawfly (Adult) Grasshopper species	Green June Beetle (Adult) Greenbug <sup>1,2</sup> Japanese Beetle (Adult) Katydid species Leafhopper species Mite species <sup>3</sup> Russian Wheat Aphid <sup>1</sup> Southern Armyworm Spittlebug species Stink Bug species Sugarcane Aphid Thrips species Tick species True Armyworm Webworm species Yellowstriped Armyworm	0.02 - 0.03	2.56 - 3.84
<sup>1</sup> Best control is obtained before insects begin to roll leaves. <sup>2</sup> See <b>Resistance Management</b> statement under general <b>Use Directions</b> . <sup>3</sup> Suppression only.			

#### Application Instructions for GRASS FORAGE, FODDER AND HAY:

- Apply as required by scouting. Timing and frequency of applications should be based upon insect populations reaching locally determined economic thresholds.
  - Apply with ground or air equipment using sufficient water and application methods to obtain full coverage of foliage. When applying by air, apply in a minimum of 2 gallons total solution per acre. When applying by ground, a minimum of 7 gallons total solution per acre is recommended.
  - Use higher application volumes and rates when foliage is dense, pest populations are high, larvae are large and/or weather conditions are adverse. Use higher rates for longer residual.
  - For chinch bug control, **Serpent 1 EC** may only suppress heavy infestations and/or migrations. In this situation, a second application using an alternative chemistry may be needed.
  - Greenbug is known to have many biotypes. **Serpent 1 EC** may provide suppression only. In this situation, a second application using an alternative chemistry may be needed.
  - Pasture and rangeland grass may be used for grazing or cut for forage 0 days after application. Do not cut grass to be dried and harvested for hay until 7 days after the last application.
- Grass grown for seed:
- Straw and mature seed (seed screenings) may be used as feed 7 days after the last application. Regrowth of grass grown for seed may be used for grazing, cut for forage or cut to be dried and harvested for hay.

- Do not apply more than 0.03 lb. a.i. (3.84 fl. oz. or 0.24 pt. of product) per acre per cutting for pastures, rangeland and grasses grown for seed. A minimum re-treatment interval (RTI) of 30 days is required for pastures and rangeland receiving 0.03 lb. a.i. per acre which have not been cut between applications.
- Do not apply more than 0.09 lb. a.i. (11.52 fl. oz. or 0.72 pt. of product) per acre per season.

## LEGUME VEGETABLES (BEANS AND PEAS)

- Edible Podded (Only)** including: *Canavalia ensiformis* – jackbean; *Canavalia gladiata* – sword bean; *Glycine max* – soybean (immature seed);  
**Edible Podded Succulent Shelled or Dried Shelled** including:  
 - *Cajanus cajan* – Pigeon pea; *Phaseolus* species - includes: field, kidney, lima, navy, pinto, runner, snap, tepary and wax beans; *Pisum* species including: dwarf, edible-pod, English, field, garden, green, snow and sugar snap peas; *Vigna* species - includes: adzuki, asparagus, moth, mung, rice, urd and yard long beans, black-eye pea, catjang, Chinese longbean, cowpea, Crowder pea, and Southern pea; **Succulent Shelled or Dried Shelled** including:  
*Vicia faba*; - broadbean (favabean); **Dried Shelled (Only)** including:  
*Cicer arietinum* - chickpea (garbanzo bean), *Cyamopsis tetragonoloba* – guar, *Lablab purpureus* - Lablab bean (hyacinth bean), *Lupinus* species - includes: grain, sweet, white and sweet white lupines, *Lens esculenta* - Lentils

Target Pests		Rate	
		lb. a.i./A	fl. oz./A
Cutworm species Green Cloverworm Imported Cabbageworm	Mexican Bean Beetle Saltmarsh Caterpillar Velvetleaf Caterpillar	0.015 - 0.025	1.92 - 3.20
Alfalfa Caterpillar Aphid species <sup>4</sup> Armyworm <sup>2</sup> Bean Leaf Beetle Bean Leaf Skeletonizer Blister Beetle species Corn Earworm Corn Rootworm Beetle species (Adult) Cucumber Beetle species (Adult) Curculio and Weevil species <sup>1</sup> (Foliage and Pod Feeding Adults and Larvae) European Corn Borer Fall Armyworm <sup>2</sup> Flea Beetle species (Adult) Flea Hopper species Grasshopper species	Japanese Beetle (Adult) Leafhopper species Leaf-tier species Looper Species Meadow Spittlebug Painted Lady Butterfly (Larvae) Plant Bug species including <i>Lygus</i> species <sup>4</sup> Stalk Borer <sup>1</sup> Stink Bug species Threecornered Alfalfa Hopper Thrips species <sup>4,5</sup> Tobacco Budworm Webworm species Western Bean Cutworm <sup>2</sup> Western Yellowstriped Armyworm Yellowstriped Armyworm <sup>2</sup>	0.02 - 0.03	2.56 - 3.84
Beet Armyworm <sup>3,4</sup> Leafminer species <sup>3,4</sup> Lesser Cornstalk Borer <sup>3</sup>	Soybean Looper <sup>3,4</sup> Spider Mite species <sup>3</sup> Whitefly species <sup>3,4</sup>	0.03	3.84
<sup>1</sup> For control before the larva bores into the plant stalk or pods. <sup>2</sup> Use higher rates for large larvae. <sup>3</sup> Suppression only. <sup>4</sup> See <b>Resistance Management</b> statement under general <b>Use Directions</b> . <sup>5</sup> Does not include Western Flower Thrips.			

**Application Instructions for LEGUME VEGETABLES (BEANS AND PEAS):**

- 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 with ground or air equipment using sufficient water to obtain full coverage of foliage. When applying by air, apply in a minimum of 2 gallons of water per acre.
- For edible podded and succulent shelled legume, vegetables, do not apply within 7 days of harvest.
- For dried shelled legume vegetables, do not apply within 21 days of harvest.
- Do not apply more than 0.12 lb. a.i. (15.36 fl. oz. or 0.96 pt. of product) per acre per season.
- For succulent and dried shelled peas and beans, do not graze livestock in treated areas or harvest vines for forage or hay.

**LEGUME VEGETABLES (SOYBEANS)**

Target Pests		Rate	
		lb. a.i./A	fl. oz./A
Bean Leaf Beetle	Mexican Bean Beetle	0.015 - 0.025	1.92 - 3.20
Cabbage Looper	Painted Lady (Thistle) Caterpillar		
Corn Earworm	Potato Leafhopper		
Corn Rootworm Beetle (Adult):	Saltmarsh Caterpillar		
Mexican	Soybean Aphid <sup>4</sup>		
Northern	Threecornered Alfalfa Hopper		
Southern	Thrips species <sup>5</sup>		
Western	Velvetbean Caterpillar		
Cutworm Species	Woollybear Caterpillar		
Green Cloverworm			
Armyworm <sup>1</sup>	Plant Bug species	0.025 - 0.03	3.20 - 3.84
Blister Beetle species	Silver-spotted Skipper		
European Corn Borer	Stink Bug species		
Fall Armyworm <sup>1</sup>	Tobacco Budworm <sup>3</sup>		
Grasshopper species	Webworm species		
Japanese Beetle (Adult)	Yellowstriped Armyworm <sup>1</sup>		
Beet Armyworm <sup>2,3</sup>	Soybean Looper <sup>2,3</sup>	0.03	3.84
Lesser Cornstalk Borer <sup>2</sup>	Spider Mite species <sup>2</sup>		

<sup>1</sup> Use higher rates for large larvae.  
<sup>2</sup> Suppression only.  
<sup>3</sup> See **Resistance Management** statement under general **Use Directions**.  
<sup>4</sup> Use lower rates for early season applications and/or lighter populations.  
<sup>5</sup> Does not include Western Flower Thrips.

**Application Instructions for LEGUME VEGETABLES (SOYBEANS):**

- 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.
- Do not graze or harvest treated soybean forage, straw or hay for livestock feed.
- Apply with ground or air equipment using sufficient water to obtain full coverage of foliage. When applying by air, apply in a minimum of 2 gallons of water per acre.
- For control of adult corn rootworm beetles (*Diabrotica* species) as part of an aerial applied corn rootworm control program use a minimum of 0.02 lb. a.i. (2.56 fl. oz. of product) per acre.
- Do not apply within 30 days of harvest.

- Do not apply more than 0.06 lb. a.i. (7.68 fl. oz. or 0.48 pt. of product) per acre per season.

**LETTUCE (HEAD AND LEAF)**

Target Pests		Rate	
		lb. a.i./A	fl. oz./A
Alfalfa Looper	Green Cloverworm	0.015 - 0.025	1.92 - 3.20
Cabbage Looper	Imported Cabbageworm		
Cutworm species	Saltmarsh Caterpillar		
Aphid species <sup>2,3</sup>	Leafhopper species	0.02 - 0.03	2.56 - 3.84
Armyworm	Meadow Spittlebug		
Beet Armyworm <sup>1,3</sup>	Plant Bug species including <i>Lygus</i> species <sup>3</sup>		
Corn Earworm	Southern Armyworm		
Diamondback Moth <sup>3</sup>	Spider Mite species <sup>2</sup>		
European Corn Borer	Stink Bug species		
Fall Armyworm <sup>1</sup>	Tobacco Budworm <sup>3</sup>		
Flea Beetle species	Vegetable Weevil (Adult)		
Grasshopper species	Whitefly species <sup>2,3</sup>		
Japanese Beetle (Adult)			

<sup>1</sup> For control of first and second instar only.  
<sup>2</sup> Suppression only.  
<sup>3</sup> See **Resistance Management** statement under general **Use Directions**.

**Application Instructions for LETTUCE (HEAD AND LEAF):**

- 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 with ground or air equipment using sufficient water to obtain full coverage of foliage. When applying by air, apply in a minimum of 2 gallons of water per acre.
- Do not apply within 1 day of harvest.
- Do not apply more than 0.3 lb. a.i. (38.4 fl. oz. or 2.4 pt. of product) per acre per season.

**ONION (BULB) AND GARLIC**

Target Pests		Rate	
		lb. a.i./A	fl. oz./A
Cutworm species	Onion Maggot (Adult)	0.015 - 0.025	1.92 - 3.20
Leafminer species (Adult)	Seedcorn Maggot (Adult)		
Aphid species <sup>2</sup>	Plant Bug species	0.02 - 0.03	2.56 - 3.84
Armyworm species <sup>1</sup>	Stink Bug species		
Flower Thrips <sup>2,3</sup>	Tobacco Thrips <sup>3</sup>		
Onion Thrips <sup>3</sup>	Western Flower Thrips <sup>2,3</sup>		

<sup>1</sup> For control of first and second instar only.  
<sup>2</sup> Suppression only.  
<sup>3</sup> See **Resistance Management** statement under general **Use Directions**.

**Application Instructions for ONION (BULB) AND GARLIC:**

- 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.
- Use the higher label rates as thrips population increases and avoid rescue situations.



- Apply with ground or air equipment using sufficient water and application methods to obtain full coverage of foliage. When applying by air, apply in a minimum of 2 gallons of water per acre.
- For thrips control by aerial application, the addition of 1% COC v/v, 1/4% NIS v/v or a silicone adjuvant (follow manufacturers use directions) may enhance the deposition of the spray and increase plant coverage.
- Do not apply within 14 days of harvest.
- Do not apply more than 0.24 lb. a.i. (30.72 fl. oz. or 1.92 pt. of product) per acre per season.

## PEANUTS

Target Pests	Rate		
	lb. a.i./A	fl. oz./A	
Cutworm species Green Cloverworm Potato Leafhopper Red-necked Peanut Worm	Threecornered Alfalfa Hopper Velvetbean Caterpillar	0.015 - 0.025	1.92 - 3.20
Bean Leaf Beetle Corn Earworm Fall Armyworm <sup>1</sup> Grasshopper species Southern Corn Rootworm (Adult)	Stink Bug Species Tobacco Thrips Vegetable Weevil Whitefringed Beetle (Adult)	0.02 - 0.03	2.56 - 3.84
Aphid species <sup>2</sup> Beet Armyworm <sup>2,3</sup> Lesser Cornstalk Borer <sup>2</sup>	Soybean Looper <sup>2,3</sup> Spider Mite species <sup>2</sup>	0.03	3.84
<sup>1</sup> Use higher rates for large larvae.			
<sup>2</sup> Suppression only.			
<sup>3</sup> See <b>Resistance Management</b> statement under general <b>Use Directions</b> .			

### Application Instructions for PEANUTS:

- Apply as required by scouting, usually at intervals of 7 or more days. Timing and frequency of applications should be based upon insect populations reaching locally determined economic thresholds.
- Apply with ground or air equipment using sufficient water to obtain full coverage of foliage. When applying by air, apply in a minimum of 2 gallons of water per acre.
- Do not apply within 14 days of harvest.
- Do not apply more than 0.12 lb. a.i. (15.36 fl. oz. or 0.96 pt. of product) per acre per season.

## POME FRUITS

### Apple, Crabapple, Loquat, Mayhaw, Oriental Pear, Pear, Quince

Target Pests	Rate		
	lb. a.i./A	fl. oz./A	
Apple Aphid Apple Maggot (Adult) Cherry Fruit Fly species (Adult) Codling Moth Green Fruitworm Japanese Beetle	Leafhopper species Leafroller species Lesser Appleworm Omnivorous Leafroller Orange Tortrix Oriental Fruit Moth (continued)	0.02 - 0.04	2.56 - 5.12

(continued)

## POME FRUITS (continued)

### Apple, Crabapple, Loquat, Mayhaw, Oriental Pear, Pear, Quince

Target Pests	Rate		
	lb. a.i./A	fl. oz./A	
Pear Psylla <sup>1</sup> Pear Sawfly Periodical Cicada Plant Bug species Plum Curculio Rosy Apple Aphid San Jose Scale (fruit infestations only)	Spirea Aphid <sup>1</sup> Stink Bug species Tent Caterpillar species Tentiform Leafminer species Tree Borer species Tufted Apple Budworm Webworm species	0.02 - 0.04	2.56 - 5.12
<sup>1</sup> Suppression only.			

### Application Instructions for POME FRUITS:

- 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 and IPM recommendations.
- Apply with ground or air equipment using sufficient water to obtain full coverage of the foliage or target area. When applying by air, apply in a minimum of 5 gallons of water per acre, but use higher volumes as appropriate for thorough coverage.
- Do not apply within 21 days of harvest.
- Do not apply more than 0.2 lb. a.i. (25.6 fl. oz. or 1.6 pt. of product) per acre per year. Do not apply more than 0.16 lb. a.i. (20.48 fl. oz. or 1.28 pt. of product) per acre per year post bloom.

## STONE FRUITS

### Apricot, Chickasaw Plum, Damson Plum, Japanese Plum, Nectarine, Peach, Plum, Plumcot, Prune, Sweet and Tart Cherry

Target Pests	Rate		
	lb. a.i./A	fl. oz./A	
American Plum Borer Apple Maggot (Adult) Black Cherry Aphid Cherry Fruit Fly species (Adult) Codling Moth Green Fruitworm Japanese Beetle June Beetle Leafhopper species Leafroller species	Oriental Fruit Moth Peach Twig Borer Peachtree Borer species Pear Sawfly Periodical Cicada Plant Bug species Plum Curculio Rose Chafer Stink Bug species Tent Caterpillar species Thrips species	0.02 - 0.04	2.56 - 5.12

### Application Instructions for STONE FRUITS:

- 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 threshold and IPM recommendations.
- Apply with ground or air equipment using sufficient water to obtain full coverage of the foliage or target area. When applying by air, apply a minimum of 5 gallons of water per acre, but use higher volumes as appropriate for thorough coverage.
- Do not apply within 14 days of harvest.

- Do not apply more than 0.2 lb. a.i. (25.6 fl. oz. or 1.6 pt. of product) per acre per year. Do not apply more than 0.16 lb. a.i. (20.48 fl. oz. or 1.28 pt. of product) per acre per year post bloom.

SUGARCANE			
Target Pests		Rate	
		lb. a.i./A	fl. oz./A
Mexican Rice Borer <sup>1</sup>	Sugarcane Beetle (Adult) <sup>2</sup>	0.025 - 0.040	3.20 - 5.12
Pygmy Mole Cricket	Sugarcane Borer <sup>1</sup>		
Rice Stalk Borer <sup>1</sup>	West Indian Crane Fly		
Sugarcane Aphid <sup>3</sup>	Yellow Sugarcane Aphid <sup>3</sup>		
<sup>1</sup> For control before the larva bores into the plant stalk. <sup>2</sup> Suppression only of beetles active above ground. <sup>3</sup> See <b>Resistance Management</b> statement under general <b>Use Directions</b> .			

#### Application Instructions for SUGARCANE:

- Apply as required by scouting, usually at intervals of 7 or more days. Timing and frequency of applications should be based upon insect populations reaching locally determined economic threshold.
- Apply with ground or air equipment using sufficient water to obtain full coverage of the foliage or target area. When applying by air, apply a minimum of 2 gallons of water per acre.
- Do not apply within 21 days of harvest.
- Do not apply more than 0.16 lb. a.i. (20.48 fl. oz. or 1.28 pt. of product) per acre per season.

SUNFLOWER			
Target Pests		Rate	
		lb. a.i./A	fl. oz./A
Cutworm species	Sunflower Beetle	0.015 - 0.025	1.92 - 3.20
Banded Sunflower Moth	Seed Weevil (Adult)	0.02 - 0.03	2.56 - 3.84
Fall Armyworm <sup>1</sup>	Spotted Cabbage Looper		
Grasshopper species	Stem Weevil (Adult)		
Head-Clipper Weevil (Adult)	Stink Bug species		
Japanese Beetle (Adult)	Sunflower Maggot (Adult)		
Leafhopper species	Sunflower Moth		
Meadow Spittlebug	Woollybear Caterpillar		
Painted Lady (Thistle) Caterpillar			
Beet Armyworm <sup>2,3</sup>	Spider Mite species <sup>2</sup>	0.03	3.84
<sup>1</sup> Use higher rates for large larvae. <sup>2</sup> Suppression only. <sup>3</sup> See <b>Resistance Management</b> statement under general <b>Use Directions</b> .			

#### Application Instructions for SUNFLOWERS:

- 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 with ground or air equipment using sufficient water to obtain full coverage of sunflower heads and/or foliage. When applying by air, apply in a minimum of 2 gallons of water per acre.
- Do not apply within 45 days of harvest.

- Do not apply more than 0.12 lb. a.i. (15.36 fl. oz. or 0.96 pt. of product) per acre per season. Do not apply more than 0.09 lb. a.i. (0.72 pt.)/A per season after bloom initiation.
- Do not apply as an ultra-low volume (ULV) spray.

TOBACCO					
Target Pests		Rate			
		lb. a.i./A	fl. oz./A		
Armyworm species <sup>1</sup>	Salt Marsh Caterpillar	0.015 - 0.030	1.92 - 3.84		
Blister Beetle species	Stinkbug species				
Cabbage Looper	Tobacco Aphid species <sup>2,3</sup>				
Corn Earworm	Tobacco Budworm <sup>3</sup>				
Cucumber Beetle species (Adult)	Tobacco Flea Beetle (Adult)				
Cutworm species	Tobacco Hornworm				
Grasshopper species	Tobacco Thrips species <sup>2</sup>				
Japanese Beetle (Adult)	Tomato Hornworm				
Katydid species	Tree Cricket species				
Plant Bug species <sup>3</sup>	Vegetable Weevil (Adult)				
Potato Tuberworm	Webworm species				
<sup>1</sup> For control of first and second instar only. <sup>2</sup> Suppression only. <sup>3</sup> See <b>Resistance Management</b> statement under general <b>Use Directions</b> .					

#### Application Instructions for TOBACCO:

- Apply as required by scouting, usually at intervals of 7 or more days. Timing and frequency of applications should be based upon insect populations reaching locally determined economic threshold.
- Apply with ground or air equipment using sufficient water to obtain full coverage of the foliage. When applying by air, apply in a minimum of 2 gallons of water per acre.
- Do not apply within 40 days of harvest.
- Do not apply more than 0.09 lb. a.i. (11.52 fl. oz. or 0.72 pt. of product) per acre per year.

TREE NUTS			
<b>Almond, Beech Nut, Brazil Nut, Butternut, Cashew, Chestnut, Chinquapin, Filbert (Hazelnut), Hickory Nut, Macadamia Nut (Bush Nut), Pistachio, Walnut, Black Walnut, English (Persian)</b>			
Target Pests		Rate	
		lb. a.i./A	fl. oz./A
Ants	Peach Twig Borer	0.02 - 0.04	2.56 - 5.12
Chinch Bug	Plant Bug species		
Codling Moth	Stink Bug species		
Filbertworm	Walnut Aphid		
Leaf-footed Bug	Walnut Husk Fly species (Adult)		
Leafroller species			
Navel Orangeworm			



## TREE NUTS

### Pecans

Target Pests		Rate	
		lb. a.i./A	fl. oz./A
Hickory Shuckworm	Pecan Spittlebug	0.02 - 0.04	2.56 - 5.12
Pecan Aphid species	Pecan Weevil		
Pecan Casebearer species	Stink Bug species		
Pecan Phylloxera species			

#### Application Instructions for TREE NUTS:

- 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 threshold.
- Apply with ground or air equipment using sufficient water to obtain full coverage of the foliage or target area. When applying by air, apply in a minimum of 5 gallons of water per acre, but use higher rates as appropriate for thorough coverage.
- Do not apply within 14 days of harvest.
- Do not apply more than 0.16 lb. a.i. (20.48 fl. oz. or 1.28 pt. of product) per acre per year. Do not apply more than 0.12 lb. a.i. (15.36 fl. oz. or 0.96 pt. of product) per acre per year post bloom.

## TUBEROUS AND CORM VEGETABLES (Potato, Sweet Potato, Yams and Related)

**Arracacha, Arrowroot, Artichoke (Chinese and Jerusalem only), Canna (edible), Cassava (bitter and sweet), Chayote (root), Chufa, Dasheen, Ginger, Leren, Potato, Sweet Potato, Tanier, Turmeric, Yam (bean and true)**

Target Pests		Rate			
		lb. a.i./A	fl. oz./A		
Cutworm species	Sweet Potato Hornworm	0.015 - 0.025	1.92 - 3.20		
Leafhopper species	Woollybear Caterpillar species				
Saltmarsh Caterpillar					
Aphid species <sup>1</sup>	<i>Lygus</i> Bug species <sup>1</sup>	0.02 - 0.03	2.56 - 3.84		
Armyworm species <sup>1</sup>	Plant Bug species				
Blister Beetle species	Potato Psyllid				
Colorado Potato Beetle <sup>1</sup>	Potato Tuberworm				
Corn Earworm	Stink Bug species				
Cricket species	Sweet Potato Leaf Beetle (Adult)				
Cucumber Beetle species (Adult)	Sweet Potato Vine Borer				
European Corn Borer	Thrips species <sup>1,2</sup>				
Flea Beetle species (Adult)	Tortoise Beetle species				
Grasshopper species	Webworm species				
Looper species <sup>1</sup>	Weevil species (Adult)				
Leafminer species <sup>1,3</sup>	Spider Mite species <sup>3</sup>			0.03	3.84
Whitefly species <sup>1,3</sup>					

<sup>1</sup> See **Resistance Management** statement under general **Use Directions**.

<sup>2</sup> Does not include Western Flower Thrips.

<sup>3</sup> Suppression only.

#### Application Instructions for TUBEROUS AND CORM VEGETABLES: (Potato, Sweet Potato, Yams and Related):

- Apply as required by scouting, usually at intervals of 7 or more days. Timing and frequency of applications should be based upon insect populations reaching locally determined economic thresholds.
- Apply with ground or air equipment using sufficient water and application methods to obtain full coverage of all above ground plant parts. When applying by air, apply in a minimum of 2 gallons total solution per acre. When applying by ground, a minimum of 10 gallons total solution per acre is recommended.
- Use higher application volumes and/or rates when foliage is dense, pest populations are high, larvae are large, weather conditions are adverse and/or as plant size increases. Use higher rates for longer residual.
- Insects that bore or tunnel into leaves, vines, stems, tubers or corms must be controlled before penetration. Only exposed insects (larvae and/or adults) can be controlled with foliar applications of **Serpent 1 EC**.
- Do not apply more than 0.12 lb. a.i. (15.36 fl. oz. or 0.96 pt. of product) per acre per season. Do not apply within 7 days of harvest.

## NON-AGRICULTURAL USES

### CONIFER AND DECIDUOUS TREES

#### Plantations and Nurseries

Target Pests	Rate	
	lb. a.i./A	fl. oz./A
Bagworm	0.02 - 0.04	2.56 - 5.12
Pine Colaspis Beetle		
Balsam Twig Aphid		
Balsam Woolly Aphid		
Birch Leafminer		
Black Pine Weevil		
Elm Leaf Beetle		
European Elm Bark Beetle		
Gypsy Moth		
Japanese Beetle		
June Beetle species		
Leaf Beetle species		
Leafroller species		
May Beetle species		
Mealybug species <sup>1</sup>		
Pales Weevil		
Pine Chafer		
<sup>1</sup> Suppression only.		

#### Application Instructions for CONIFER AND DECIDUOUS TREES: Plantations and Nurseries:

- To control exposed foliage, flower, cone, seed and bark feeding insects, apply as required by scouting. Timing and frequency of applications should be based upon insect populations reaching locally determined economic thresholds.
- Apply with ground equipment using sufficient water to obtain full coverage of target site. When applying by air, apply a minimum of 2 gallons of water per acre.
- Do not apply more than 0.24 lb. a.i. (30.72 fl. oz. or 1.92 pt. of product) per acre per year.

### CONIFER AND DECIDUOUS TREES

#### Seed Orchards

Target Pests	Rate
Coneworm species	<ul style="list-style-type: none"> <li>▪ For high volume sprayers, dilute 5.12 fl. oz. per 100 gallons of water and apply 5 - 10 gallons of finished spray per tree.</li> <li>▪ For low volume sprayers, dilute 20 fl. oz. per 100 gallons of water and apply 100 gallons of finished spray per acre.</li> <li>▪ For aerial applications, apply 15 fl. oz. per acre in a minimum of 10 gallons finish spray per acre.</li> </ul>
Seed Bug species	
Thrips species	

#### Application Restriction for CONIFER AND DECIDUOUS TREES: Seed Orchards:

- Do not apply more than 0.5 lb. a.i. (64 fl. oz. or 4 pt. of product) per acre per year.

## NON-CROPLAND

(Crop Outlets, including turn rows, wind rows, hedge rows, field borders and buffer zones) (EXCLUDING PUBLIC LAND)

Target Pests	Rate	
	lb. a.i./A	fl. oz./A
See <b>Crop Outlets</b> on this <b>Serpent 1 EC</b> label for target pest and rates.	See <b>Crop Outlets</b>	

#### Application Instructions for NON-CROPLAND: (EXCLUDING PUBLIC LAND):

- Spray non-cropland adjacent to agricultural areas to control migratory insects, which may threaten crops.
- Follow general **Use Directions**, rates and spray recommendations found elsewhere in this label for the adjacent crop outlet and target pests.
- Use highest labeled rates for dense/large foliage, high insect populations and larger larval stages.
- Repeat as necessary to maintain control.
- Do not exceed 0.2 lb. a.i. (25.6 fl. oz. or 1.6 pt. of product) per acre per year.
- Do not graze livestock in treated areas.

#### Rate Conversion Chart

lb. a.i. Per Acre	fl. oz. Per Acre	Pints Per Acre	Treated Acres Per Gallon
0.015	1.92	0.12	66
0.02	2.56	0.16	50
0.025	3.20	0.20	40
0.03	3.84	0.24	33
0.04	5.12	0.32	25

## STORAGE AND DISPOSAL

Do not contaminate water, food or feed by storage or disposal.

**PESTICIDE STORAGE:** Store in a cool, dry place and away from open flame and extreme heat. Store in such a manner as to prevent cross contamination with other pesticides, fertilizers, food, and feed. Store in original container and out of the reach of children, preferably in a locked storage area. Handle and open container in a manner as to prevent spillage. If container is leaking, invert container to prevent leakage. If the container is leaking or material spilled for any reason or cause, carefully dam up spilled material to prevent runoff. Refer to Precautionary Statements on label for hazards associated with the handling of this material. Do not walk through spilled material. Absorb spilled material with absorbing type compounds and dispose of as directed for pesticides below. In spill or leak incidents, keep unauthorized people away.

**PESTICIDE DISPOSAL:** Pesticide wastes are acutely hazardous. 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 at the nearest EPA Regional Office for guidance.

### CONTAINER HANDLING:

**Nonrefillable container:** Do not reuse this container to hold materials other than pesticides or dilute pesticides (rinsate). After emptying and cleaning, it may be allowable to temporarily hold rinsate or other pesticide-related materials in the container. Contact your state regulatory agency to determine allowable practices in your state. Once cleaned, some agricultural plastic pesticide containers can be taken to a container collection site or picked up for recycling. To find the nearest site, contact your chemical dealer or manufacturer, or contact The Agricultural Container Recycling Council (ACRC) at [www.acrecycle.org](http://www.acrecycle.org). If not recycled, then 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. Triple rinse or pressure rinse container (or equivalent) promptly after emptying.

**For packages up to 5 gallons:** Triple rinse as follows: Empty the remaining contents into application equipment or a mix tank and drain for 10 seconds after the flow begins to drip. Fill the container 1/4 full with water and recap. Shake for 10 seconds. Pour rinsate into application equipment or a mix tank or store rinsate for later use or disposal. Drain for 10 seconds after the flow begins to drip. Repeat this procedure two more times. Pressure rinse as follows: Empty the remaining contents into application equipment or a mix tank and continue to drain for 10 seconds after the flow begins to drip. 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.

**For packages greater than 5 gallons and less than 56 gallons:** Triple rinse as follows: Empty the remaining contents into application equipment or a mix tank. Fill the container 1/4 full with water. Replace and tighten closures. Tip container on its side and roll it back and forth, ensuring at least one complete revolution, for 30 seconds. Stand the container on its end and tip it back and forth several times. Turn the container over onto its other end and tip it back and forth several times. Empty the rinsate into application equipment or a mix tank or store rinsate for later use or disposal. Repeat this procedure two more times. Pressure rinse as follows: Empty the remaining contents into application equipment or a mix tank and continue to drain for 10 seconds after the flow begins to drip. 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.

**For packages greater than 56 gallons:** To clean the container before final disposal, empty the remaining contents from this container into application equipment or mix tank. Fill the container about 10 percent full with water. Agitate vigorously or recirculate water with the pump for 2 minutes. Pour or pump rinsate into application equipment or rinsate collection system. Repeat this rinsing procedure two more times.

**For refillable containers:** Refill this container with this product only. Do not reuse this container for any other purpose. Cleaning the container before final disposal is the responsibility of the person disposing of the container. Cleaning before refilling is the responsibility of the refiller. To clean the container before final disposal, empty the remaining contents from this container into application equipment or mix tank. Fill the container about 10 percent full with water. Agitate vigorously or recirculate water with the pump for 2 minutes. Pour or pump rinsate into application equipment or rinsate collection system. Repeat this rinsing procedure two more times. For final disposal, offer for recycling or reconditioning if appropriate, or puncture and dispose of in a sanitary landfill, or by other procedures approved by state and local authorities.

**Container Disposal – Returnable/Refillable Sealed Container:** Do not rinse container. Do not break seals. Replace the dust cover/cap and return container, intact to point of purchase.

## LIMITATION OF WARRANTY AND LIABILITY

**IMPORTANT: READ BEFORE USE.** Read the entire Directions for Use, Conditions of Warranties and Limitations of Liability before using this product. If these terms and conditions are not acceptable, return the unopened product container at once. By using this product, user or buyer accepts the following Disclaimer of Warranties and Limitations of Liability.

**CONDITIONS:** The directions for use of this product are believed to be adequate and must be followed carefully. However, it is impossible to eliminate all risks associated with the use of this product. Ineffectiveness, injury, and other unintended consequences may result because of such factors as manner of use or application (including misuse), the presence of other materials, weather conditions, and other unknown factors, all of which are beyond the control of ATTICUS, LLC. All such risks shall be assumed by the user or buyer.

**DISCLAIMER OF WARRANTIES:** To the extent consistent with applicable law, ATTICUS, LLC makes no other warranties, express or implied, of merchantability or of fitness for a particular purpose or otherwise, that extend beyond statements on this label.

**LIMITATIONS OF LIABILITY:** To the extent consistent with applicable law, neither ATTICUS, LLC the manufacturer, nor the Seller shall be liable for any indirect, special, incidental or consequential damages resulting from the use, handling, application, storage, or disposal of this product. To the extent consistent with applicable law, the exclusive remedy of the user or buyer for any and all losses, injuries or damages resulting from the use, handling, application, or storage of this product, whether in contract, warranty, tort, negligence, strict liability or otherwise, shall not exceed the purchase price paid.

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