



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY  
WASHINGTON, D.C. 20460

OFFICE OF CHEMICAL SAFETY  
AND POLLUTION PREVENTION

**NOTIFICATION**

**JUL 16 2012**

Luz Chan  
Drexel Chemical Company  
P.O. Box 13327  
Memphis, TN 38113-0327

Subject: Notification to add insect resistance box group and instructions.

Registration #: 19713-49

Decision#: 466693

Dear Mrs. Chan:

The Agency is in receipt of your Application for Pesticide Notification under Pesticide Registration Notice (PRN) 2001-5 dated June 15, 2012 for product EPA Reg No. 19713-49. The Registration Division (RD) has conducted a review of this request and finds that the action requested falls within the scope of PRN 2001-5. The label submitted with the application has been stamped "Notification" and will be placed in our records. If you have any questions, please contact Jessica Rogala at (703) 347-0263 or via email at [rogala.jessica@epa.gov](mailto:rogala.jessica@epa.gov).

Sincerely,

Jessica Rogala  
Environmental Protection Specialist  
Insecticide-Rodenticide Branch  
Registration Division (7505P)

2/17

NOTIFICATION

JUL 16 2012



# Carbaryl 4L

Insecticide

**GROUP 1A INSECTICIDE**

Intended For Agricultural or Commercial Use.

**ACTIVE INGREDIENT:**

Carbaryl . . . . . 43.4%

**OTHER INGREDIENTS:** . . . . . 56.6%

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

This product contains 4 pounds of Carbaryl per gallon.

**KEEP OUT OF REACH OF CHILDREN**

## CAUTION

See **FIRST AID** Below

**SHAKE WELL BEFORE USING**

**[OPTIONAL: RECIRCULATE CONTENTS BEFORE USE]**

EPA Reg. No. 19713-49

EPA Est. No. 19713-GA-002 Net Content: 2.5 Gals. (9.46 L)

### FIRST AID

**IF SWALLOWED:**

- Immediately call a poison control center or doctor for treatment advice.
- Have person sip a glass of water if able to swallow.
- Do not induce vomiting unless told to do so by a poison control center or doctor.
- Do not give anything by mouth to an unconscious or convulsing person.

**IF ON SKIN OR CLOTHING:**

- Take off contaminated clothing.
- Rinse skin immediately with plenty of water for 15 to 20 minutes.
- Call a poison control center or doctor for treatment advice.

**IF INHALED:**

- Move person to fresh air.
- If person is not breathing, call 911 or an ambulance, then give artificial respiration, preferably mouth-to-mouth if possible.
- Call a poison control center or doctor for further treatment advice.

**IF IN EYES:**

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

Have the product container or label with you when calling poison control center or doctor, or going for treatment. For information on this pesticide product (including health concerns, medical emergencies, or pesticide incidents), call the National Pesticide Information Center at 1-800-858-7378

**Note to Physician:** Carbaryl is an N-methyl carbamate that inhibits cholinesterase. Drugs like 2-PAM (pyridine-2-aldoxime methiodide) are NOT recommended.

### PRECAUTIONARY STATEMENTS

**Hazards to Humans and Domestic Animals**

**CAUTION:** Harmful if swallowed, absorbed through skin, or inhaled. Avoid breathing spray mist. Avoid contact with skin, eyes, or clothing. **OVEREXPOSURE MAY CAUSE:** Salivation, watery eyes, pinpoint eye pupils, blurred vision, muscle tremors, difficult breathing, excessive sweating, abdominal cramps, nausea, vomiting, diarrhea, weakness or headache.

**IN SEVERE CASES, CONVULSIONS, UNCONSCIOUSNESS, AND RESPIRATORY FAILURE MAY OCCUR. SIGNS AND SYMPTOMS MAY OCCUR RAPIDLY FOLLOWING OVEREXPOSURE TO THIS PRODUCT.**

**PERSONAL PROTECTIVE EQUIPMENT (PPE)**

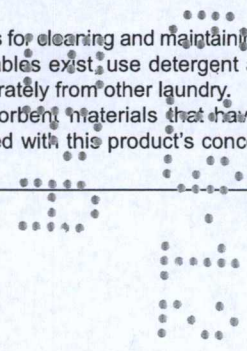
Some materials that are chemical-resistant to this product are made of any waterproof material. If you want more options, follow the instructions for Category A on an EPA chemical-resistance category selection chart.

**Handlers applying with open cab airblast equipment at application rates equal to or greater than 5 quarts of this product (5 lbs. a.i.) must wear:** Coveralls over long-sleeved shirt and long pants, chemical-resistant gloves, chemical-resistant footwear plus socks, chemical-resistant headgear, and a NIOSH-approved dust/mist filtering respirator with NIOSH/MSHA approval number prefix TC-21C or a NIOSH-approved respirator with any N, R, P or HE filter.

**All other mixers, loaders, applicators, and handlers must wear:** Long-sleeved shirt and long pants, shoes plus socks, chemical-resistant gloves, and a chemical-resistant apron when mixing, loading or cleaning up spills or equipment. In addition, mixers and loaders supporting aerial or chemigation applications must wear a NIOSH-approved dust/mist filtering respirator with NIOSH/MSHA approval number prefix TC-21C or a NIOSH-approved respirator with any N, R, P or HE filter.

**See engineering controls for additional requirements and exceptions.**

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



Manufactured By:

**Drexel Chemical Company**

P.O. BOX 13327, MEMPHIS, TN 38113-0327

**SINCE 1972**

### ENGINEERING CONTROLS

Pilots must use an enclosed cockpit in a manner that is consistent with the WPS for agricultural pesticides [40 CFR 170.240(d)(6)]. Applicators using airblast equipment for application to Citrus in California and for wide area mosquito adulticide applications must use an enclosed cab that meets the definition in the WPS for agricultural pesticides [40 CFR 170.240(d)(5)] for dermal protection. In addition, such applicators must:

- wear long-sleeved shirt, long pants, shoes and socks;
- either wear a NIOSH-approved dust/mist filtering respirator with NIOSH/MSHA approval number prefix TC-21C or a NIOSH-approved respirator with any N, R, P, or HE filter or use an enclosed cab that is declared in writing by the manufacturer or by a government agency to provide at least as much respiratory protection as this type of respirator;
- be provided, have immediately available for use, and wear in an emergency when they must exit the cab in the treated area coveralls, chemical-resistant gloves, chemical-resistant footwear and chemical-resistant headgear (if overhead exposure) plus – if not already using one – the respirator specified above;
- take off any PPE that was worn in the treated area before reentering the cab, and
- store all such PPE in a chemical-resistant container, such as a plastic bag, to prevent contamination of the inside of the cab.

Human flagging is prohibited, except for flagging to support ultra low volume aerial applications for Rangeland Grasshopper and Mormon Cricket Suppression through the Animal and Plant Health Inspection Service (APHIS) Program or affiliated state programs. Flagging to support aerial application for all other use patterns is limited to the use of Global Positioning System (GPS) or mechanical flaggers.

Flaggers supporting ultra low volume aerial applications for Rangeland Grasshopper and Mormon Cricket Suppression through APHIS program or affiliated state programs must use an enclosed cab that meets the definition in the WPS for agricultural pesticides [40 CFR 170.240(d)(5)] for dermal protection. In addition, flaggers must:

- wear long-sleeved shirt, long pants, shoes, and socks;
- either wear a NIOSH-approved dust/mist filtering respirator with NIOSH/MSHA approval number prefix TC-21C or NIOSH-approved respirator with any N, R, P or HE filter or use an enclosed cab that is declared in writing by the manufacturer or by government agency to provide at least as much respiratory protection as this type of respirator;
- be provided, have immediately available for use, and wear in an emergency when they must exit the cab in the treated area: chemical-resistant gloves and chemical-resistant headgear, and, if using an enclosed cab that provides respiratory protection, a respirator of the type specified above;
- take off any PPE that was worn in the treated area before reentering the cab; and
- store all such PPE in a chemical-resistant container, such as plastic bag, to prevent contamination of the inside of the cab.

When applicators use enclosed cabs in a manner that meets the requirements listed in the WPS for agricultural pesticides [40 CFR 170.240(d)(5)], the handler PPE requirements may be reduced or modified as specified in the WPS.

### USER SAFETY RECOMMENDATIONS

**Users should:** 1) Wash hands thoroughly with soap and water before eating, drinking, chewing gum, using tobacco or using the toilet. 2) Remove clothing/PPE immediately if pesticide gets inside. Then wash thoroughly and put on clean clothing. 3) 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 product is extremely toxic to aquatic invertebrates. For terrestrial uses, do not apply directly to water or to areas where surface water is present or to intertidal areas below the mean high water mark. Discharge from Rice fields may kill aquatic and estuarine invertebrates. Do not apply when weather conditions favor drift from area treated. Drift and runoff may kill aquatic invertebrates in water adjacent to treated areas. Do not contaminate water by cleaning equipment or disposal of wastes. Do not contaminate water when disposing of washwaters.

**BE CAUTION:** May kill honeybees and other bees in substantial numbers. This product is highly toxic to bees exposed to direct treatment or residues on crops or weeds in bloom.

Notifying beekeepers in 1 mile of treatment area at least 48 hours before product is applied will allow them to take additional steps to protect their bees.

Limiting applications to times when bees are least active, e.g., within 2 hours of sunrise or sunset, will minimize risk to bees.

**For crops in bloom (except corn and soybeans):**

Do not apply this product to target crops or weeds in bloom.

**For corn and soybeans:**

If application cannot be avoided when target crop or weeds are in bloom, limiting applications to times when bees are least active, e.g., within 2 hours of sunrise or sunset, will minimize risk to bees.

### DIRECTIONS FOR USE

It is a violation of Federal law to use this product in a manner inconsistent with its labeling. Read the entire label before using this product. Strictly observe label directions and precautions. 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.

### AGRICULTURAL USE REQUIREMENTS

Use this product only in accordance with its labeling and with the Worker Protection Standard (WPS), 40 CFR Part 170. This standard contains requirements for the protection of agricultural workers on farms, forests, nurseries, 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), restricted entry interval (REI), and notification to workers. The requirements in this box only apply to uses of this product that are covered by the WPS.

Do not enter or allow worker entry into treated areas during the REI. The REI for carbaryl is 12 hours unless otherwise specified in the directions for use associated with each crop.

PPE required for early entry to treated areas that is permitted under the WPS and that involves contact with anything that has been treated, such as plants, soil or water is: Coveralls over short-sleeved shirt and short pants, chemical-resistant gloves made of any waterproof material, chemical-resistant footwear plus socks, and chemical-resistant headgear if overhead exposure.

When the REI for a crop is 7 days or longer, you must notify workers of the application by warning them orally and by posting warning signs at entrances to treated area.

### NON-AGRICULTURAL USE REQUIREMENTS

The requirements in this box apply to uses of this product that are NOT within the scope of the WPS for agricultural pesticides (40 CFR Part 170). The WPS applies when this product is used to produce agricultural plants on farms, forests, nurseries or greenhouses.

Do not enter or allow others to enter the treated area until sprays have dried.

### USE INFORMATION

CARBARYL 4L Insecticide is a suspension of microfine carbaryl insecticide in an aqueous medium. It readily disperses in water to form a spray which may be applied by air or ground.

### RESISTANCE MANAGEMENT

#### GROUP 1A INSECTICIDE

CARBARYL 4L contains a Group 1A insecticide. Insect biotypes with acquired resistance to Group 1A may eventually dominate the insect population if Group 1A insecticides are used repeatedly in the same field or in successive years as the primary method of control for targeted species. This may result in partial or total loss of control of those species by this product or other Group 1A insecticides.

To delay insecticide resistance, consider:

- Avoiding the consecutive use of this product or other Group 1A insecticides that have similar target site of action on the same insect species.
- Using tank mixtures or premixes with insecticides from a different target site action Group as long as the involved products are all registered for the same use and have different sites of action.
- Basing insecticide use on a comprehensive IPM program.
- Monitoring treated insect populations for loss of field efficacy.
- Contacting your local extension specialist, certified crop advisors, and/or manufacturer for insecticide resistance management and/or IPM recommendations for specific site and resistant pest problems.

**PLANT RESPONSE PRECAUTIONS**

Application to wet foliage or during periods of high humidity may cause injury to tender foliage.

Do not use on Boston ivy, Virginia creeper and Maidenhair fern, as injury may result. Carbaryl may also injure Virginia and Sand pines.

The use of adjuvants may increase the potential for crop injury to sensitive crops.

**PRE-HARVEST AND GRAZING RESTRICTIONS AND LIMITATIONS**

For all listed crops and uses, do not apply at greater rates or at more frequent intervals than stated on the label. If forage is grazed or used as feed for dairy and meat animals, follow all use restrictions in order to avoid illegal residues in crops, meat or milk.

Do not use reclaimed irrigation water from crops treated with carbaryl on crop for which carbaryl tolerances are not established.

**APPLICATION INFORMATION**

Calibrate and adjust application equipment to ensure proper rate and accurate placement. To clean spray system after use, drain and flush with water and detergent mixture. Rinse thoroughly with clean water. Refer to the "STORAGE AND DISPOSAL" section for disposal instructions.

**Note:** Staining may occur on certain surfaces such as stucco, brick, cinder block and wood. Spray deposits on painted or stained surfaces or finishes (i.e., cars, houses, trailers, boats, etc.) should be immediately removed by washing to prevent discoloration. Avoid applications to surfaces where visible spray residues are objectionable. For outdoor use only.

**RESISTANT SPECIES NOTICE:** All references to Armyworms on the crops listed on this label refer to the species, *Pseudaletia unipuncta*, often called the "true armyworm". Except where indicated otherwise, this product is not registered for the control of other Armyworm species. Regional differences have been noted in the susceptibility of certain strains of Colorado potato beetles, Diamondback moths, Fall armyworms and Southern green stink bugs to carbaryl. If local experience indicates inadequate product performance, use an alternative pesticide.

**MIXING, LOADING AND HANDLING INSTRUCTIONS**

To assure a uniform suspension, agitate, stir or recirculate all containers of this product prior to use. Remove oil, rust, scale, pesticide residues and other foreign matter from mix tanks and entire spray system. Flush with clean water. Fill spray or mix tank with one-half to three-fourths the desired amount of water. Start mechanical or hydraulic agitation. Slowly add the required amount of this product and then the remaining volume of water. Include rinse water from container. Prepare only as much spray mixture as can be applied on the day of mixing. Maintain continuous agitation during mixing and application to assure a uniform suspension. Do not store spray mixture for prolonged periods or degradation of carbaryl may occur. Local water conditions may also accelerate the degradation of spray mixtures containing carbaryl. See the following "COMPATIBILITY INFORMATION".

**COMPATIBILITY INFORMATION**

This product, when diluted with at least an equal volume of water, is compatible with a wide range of pesticides. It is not compatible with diesel fuel, kerosene, fuel oil or aromatic solvents. If compatibility with another product and the resulting crop response is unknown, the mixture should be tested on a small scale. Curdling, precipitation, greasing, layer formation or increased viscosity are symptoms of incompatibility. Incompatibility will reduce product performance and may cause application and handling difficulties or plant injury. Observe all precautions and limitations on labeling of all products used in mixtures. When preparing combination sprays, first add this product to at least an equal volume of water, mix thoroughly and then add combination products to the mixture. Do not apply tank mix combinations unless your previous experience indicates the mixture is effective and will not result in application problems or plant injury.

Carbaryl is unstable under highly alkaline conditions and mixtures with strong bases, such as Bordeaux, lime-sulfur and casein-lime spreaders and will result in chemical degradation of the insecticide. Do not use this product in water with pH values above 8.0 unless a buffer is added. If necessary, water should be buffered to neutral (pH = 7.0) before adding this product to the spray tank. Overhead irrigation with alkaline or muddy water after application will also accelerate chemical degradation and may result in reduced product performance.

**APPLICATION PROCEDURES**

On all crops, use sufficient gallonage to obtain thorough and uniform coverage. Observe crop label instructions for specific directions regarding spray volume where they occur. Calibrate spray equipment to deliver the required volume. The flow rate of this product diluted 1:1

with water is similar to that of the other. Use of 50-mesh slotted strainers in spray system and 25-mesh screen strainers behind nozzles is recommended.

**Ground Application:** Apply in sufficient volume for adequate coverage on all crops and sites.

**Aerial Application:** For adequate distribution, use at least 10 gallons of spray mixture per acre for application to tree and orchard crops or at least 2 gallons of spray mixture per acre for application to other crops. **EXCEPTION:** For use on Rangeland as a pest management approach for grasshoppers under the Reduced Area and Agent Treatment (RAATs) program only, use at least 16 fl. ozs. of finished spray mixture per acre for aerial application.

**Sprinkler Irrigation Systems:** Apply this product only through sprinkler irrigation systems including center pivot and solid set. Do not apply this product through any other type of irrigation system.

**Spray Preparation:** First prepare a suspension of this product in a mix tank. Fill tank with one-half to three-fourths the desired amount of water. Start mechanical or hydraulic agitation. Add the required amount of this product and then the remaining volume of water. (Suspension concentrations using the appropriate dosage per acre recommended on this label per 1 to 4 gallons of water are recommended.) Then set sprinkler to deliver 0.1 to 0.3 inches of water per acre. Start sprinkler and uniformly inject the suspension of this product into the irrigation water line so as to deliver the desired rate per acre. The suspension of this product should be injected with a positive displacement pump into the main line ahead of a right angle turn to ensure adequate mixing. If you should have any other questions about calibration, you should contact your State Extension Service Specialists, equipment manufacturers or other experts.

**Note:** When treatment with this product has been completed, further field irrigation over the treated area should be avoided for 24 to 48 hours to prevent washing the chemical off the crop.

**Applications Through Sprinkler Irrigation Systems:**

Maintain continuous agitation in mix tank during mixing and application to assure a uniform suspension.

Greater accuracy in calibration and distribution will be achieved by injecting a larger volume of a more dilute solution per unit time.

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

Do not apply when wind speed favors drift beyond the area intended for treatment, when system connection or fittings leak, when nozzles do not provide uniform distribution or when lines containing the product must be dismantled and drained.

Crop injury, lack of effectiveness or illegal pesticide residues in the crop may result from non-uniform distribution of treated water.

Allow sufficient time for pesticide to be flushed through all lines and all nozzles before turning off irrigation water. A person knowledgeable of the chemigation system and responsible for its operation shall shut the system down and make necessary adjustments should the need arise. Do not connect an irrigation system (including greenhouse systems) used for pesticide application to a public water system unless the label-prescribed safety devices for public water supplies are in place.

**SPECIFIC USE DIRECTIONS**

**Crop/Site Groupings:** Asparagus, Brassica leafy vegetable crops, Cereal grain crops (Field and Popcorn, Grain sorghum, Rice, Sweet corn), Cucurbit vegetables, Flax, Forage crops (Alfalfa, Birdsfoot trefoil, Clovers, Pasture and Grasses grown for hay and/or seed, Rangeland), Fruiting vegetables (Eggplant, Peppers, Tomato), Leafy vegetables (Dandelion, Endive, Lettuce, Parsley, Spinach, Leaf Petiole Subgroup 4B), Legume vegetables (Edible-Podded Legume Vegetables; Dried

Shelled Pea and Bean (except Soybean, Soybean; Foliage of Legume Vegetables), Non-cropland (Conservation Reserve Program, Ditch-banks, Hedgerows, Rights-of-way, Roadsides, Set-Aside Program Acreage, Wasteland), Okra, Peanuts, Prickly pear cactus, Root and Tuber crops, Sugar beets, Sweet potatoes, Small Fruits and Berries (Bushberries, Caneberries, Cranberries, Grapes, Strawberries), Sunflowers, Tobacco, Tree fruit crops (Citrus fruits, Olives, Pome fruits, Stone fruits), Tree nut crops (Pistachios, Tree nuts), Forested areas and Rangeland trees, Ornamental trees and plants, Turfgrass, Specific pests across multiple sites (Grasshoppers, Imported fire ants, Ticks which may vector Lyme disease, and Nuisance Pests).

**APPLICATION TIMING AND DIRECTIONS**

Begin application when insect populations reach recognized economic threshold levels. Consult the cooperative extension service, consultants or other qualified authorities to determine appropriate threshold levels and timing for treatment in your area. Where a dosage range is indicated, use the lower rate on light to moderate infestations, young plants and early instars and use the higher rate on heavy infestations, mature plants, advanced instars and adults. Thorough and uniform spray coverage is essential for product performance.

REI = Restricted Entry Interval.

**ASPARAGUS**

Crop	Pest	This Product Per Acre (qts.)
Asparagus	Apache cicadas, Asparagus beetles, Cutworms	1
	SPECIFIC DIRECTIONS: Apply prior to harvest. Repeat applications as necessary up to a total of 3 times prior to harvest or a total of 5 applications per year to spears and ferns combined. Do not apply more than once every 3 days. Do not apply within 1 day of harvest. For Cutworm, this product is most effective against species which feed on the upper portions of the plant.	
	Apache cicadas, Asparagus beetles, Cutworms	2
	SPECIFIC DIRECTIONS: Applications after harvest: Apply to ferns or brush growth following harvest of spears. Repeat applications as necessary at minimum 7 day intervals. Do not make more than a total of 5 applications per year to spears and ferns combined.	
<b>RESTRICTIONS:</b> BEE CAUTION: Do not apply this product to target crops or weeds in bloom.		

**BRASSICA (LEAFY VEGETABLES)**

Repeat applications as needed up to a total of 4 times per year at minimum 7 day intervals.

Crop	Pest	This Product Per Acre (qts.)
<b>All members of the Brassica leafy vegetable Group 5 including:</b> Broccoli, Broccoli raab (rapini), Brussels sprouts, Cauliflower, Cabbage, Cavalo broccolo, Chinese broccoli (gai lon), Chinese cabbage (bok choy), Chinese cabbage (napa), Chinese mustard cabbage (gai choy), Collards, Kale, Kohlrabi, Mizuna, Mustard greens, Mustard spinach, Rape greens, Turnip greens	Flea beetles, Harlequin bugs, Leafhoppers	0.5 to 1
	Armyworms, Aster leafhoppers, Corn earworms, Diamondback moth, Fall armyworms, Imported cabbageworms, Lygus bugs, Spittlebugs, Stink bugs, Tarnished plant bugs	1 to 2
<b>RESTRICTIONS:</b> BEE CAUTION: Do not apply this product to target crops or weeds in bloom. For Head and Stem Brassica Subgroup 5A including Broccoli, Chinese broccoli (gai lon), Brussels sprouts, Cabbage, Chinese cabbage (napa), Chinese mustard cabbage (gai choy), Cauliflower,		
<b>(Continued)</b>		

(Cont.)

Cavalo broccolo, and Kohlrabi, do not apply within 3 days of harvest. For Leafy Brassica Greens Subgroup 5B including Broccoli raab (rapini), Chinese cabbage (bok choy), Collards, Kale, Mizuna, Mustard greens, Mustard spinach, Rape greens, Turnip greens, do not apply within 14 days of harvest. Application is only permitted within 30 days from date of crop emergence or the date of transplanting. Do not apply more than a total of 6 qts. per acre per crop per year.

**CEREAL GRAIN CROPS**

**Corn (Field, Pop) (REI = 24 hours)**

Repeat applications as needed up to a total of 4 times per year at minimum 14 day intervals. Good timing and good coverage are essential for effective product performance.

Crop	Pest	This Product Per Acre (qts.)
Field corn, Popcorn	Armyworms, Chinch bugs, Corn earworms, Corn rootworm adults, Fall armyworms, Flea beetles, Japanese beetles, Sap beetles, Southwestern corn borers, Leafhoppers	1 to 2
	SPECIFIC DIRECTIONS: For best results on Chinch bug, use ground equipment to apply at least 20 gals. of water per acre and direct spray toward stalk to provide thorough coverage.	
	European corn borers	1.5 to 2
	SPECIFIC DIRECTIONS: For best results on European corn borer, do not apply in less than 3 gals. of water per acre by air and 15 gals. of water by ground.	
	Cutworms, Western bean cutworms	2
	SPECIFIC DIRECTIONS: For best results on Cutworm, apply in a 12-inch band over the row using sufficient volume of water to obtain thorough coverage. For broadcast application, use at least 20 gals. by ground or 5 gals. by air per acre. For Cutworm, this product is most effective against species which feed on the upper portions of the plant. For Western bean cutworms, treat when infestation averages 15% and at 90 to 100% tassel emergence. Treatment after 100% silk emergence will reduce effectiveness.	
<b>RESTRICTIONS:</b> BEE CAUTION: If application cannot be avoided when target crops or weeds are in bloom, limiting applications to times when bees are least active, e.g. within 2 hours of sunrise or sunset, will minimize risk to bees. Notifying beekeepers within 1 mile of treatment area at least 48 hours before product is applied will allow them to take additional steps to protect their bees. Do not apply more than a total of 8 qts. per acre per crop per year. Do not apply within 48 days of harvest of grain and fodder or within 14 days of harvest or grazing forage or silage. <b>Prohibition:</b> Do not enter or allow workers to enter treated areas to perform hand detasselling tasks 21 days after application. Hand harvesting is prohibited.		

**Corn (Sweet) (REI = 24 hours)**

Repeat applications as necessary up to a total of 8 times per year at minimum 3 day intervals. Good timing and good coverage are essential for effective product performance.

For insects attacking silks and ears, insecticide sprays should be applied starting when first silks appear and continuing until silks begin to dry. During silking, the minimum retreatment interval (3 days) may not provide adequate levels of protection under conditions of rapid growth or severe pest pressure. The use of an alternative product should be considered in conjunction with this product.

Crop	Pest	This Product Per Acre (qts.)
Sweet corn	Armyworms, Chinch bugs, Corn earworms, Corn rootworm adults, Fall armyworms, Flea beetles, Japanese beetles, Leafhoppers, Sap beetles, Southwestern corn borers	1 to 2
	SPECIFIC DIRECTIONS: For best results on Chinch bug, use ground equipment to apply at least 20 gals. of water per acre and direct spray toward stalk to provide thorough coverage.	
	European corn borers	1.5 to 2
	SPECIFIC DIRECTIONS: For best results on European corn borer, do not apply in less than 3 gals. of water per acre by air and 15 gals. of water by ground.	
	Cutworms, Western bean cutworms	2
SPECIFIC DIRECTIONS: For best results on Cutworm, apply in a 12-inch band over the row using a sufficient volume of water to obtain thorough coverage. For broadcast application, use at least 20 gals. by ground or 5 gals. by air per acre. For Cutworm, this product is most effective against species which feed on the upper portions of the plant. For Western bean cutworms, treat when infestation averages 15% and at 90 to 100% tassel emergence. Treatment after 100% silk emergence will reduce effectiveness.		
<b>RESTRICTIONS:</b> BEE CAUTION: If application cannot be avoided when target crops or weeds are in bloom, limiting applications to times when bees are least active, e.g. within 2 hours of sunrise or sunset, will minimize risk to bees. Notifying beekeepers within 1 mile of treatment area at least 48 hours before product is applied will allow them to take additional steps to protect their bees. Do not apply within 2 days of harvest of ears, within 14 days of harvest or grazing of forage or within 48 days of harvest of fodder. Do not apply more than a total of 16 qts. per acre per crop per year. <b>Prohibition:</b> Do not enter or allow workers to enter treated areas to perform hand detasselling tasks until 21 days after application. Hand harvesting is prohibited.		

**Grain Sorghum**

Repeat applications as necessary up to a total of 4 times per year at minimum 7 day intervals. Direct spray into forming heads for best results on of insects attacking heads.

Crop	Pest	This Product Per Acre (qts.)
Grain sorghum	Armyworms, Chinch bugs, Corn earworms, Fall armyworms, Stink bugs, Webworms	1 to 2
	SPECIFIC DIRECTIONS: For best results on Chinch bug, use high gallonage ground application at the base of the plants.	
	Southwestern corn borers	1.5
	Cutworms	2
SPECIFIC DIRECTIONS: For Cutworm, this product is most effective against species which feed on the upper portions of the plant.		
<b>RESTRICTIONS:</b> BEE CAUTION: Do not apply this product to target crops or weeds in bloom. Do not apply within 21 days of harvest for grain or fodder or within 14 days of harvest or grazing of forage or silage. Do not apply more than a total of 6 qts. per acre per crop per year.		

**Rice**

Up to 2 applications can be made per year per crop at minimum 7 day intervals.

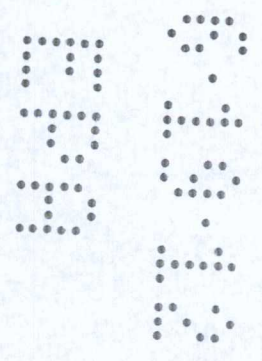
Crop	Pest	This Product Per Acre (qts.)
Rice	Armyworms, Chinch bugs, Fall armyworms, Leafhoppers, Stink bugs	1 to 1.5
	SPECIFIC DIRECTIONS: Up to 2 applications per crop per year may be made, but not more often than once every 7 days.	
(Continued)		

(Cont.)		
Crop	Pest	This Product Per Acre (qts.)
	Tadpole shrimp (CA Only)	1.5
SPECIFIC DIRECTIONS: For best results on Tadpole shrimp, apply to water when pest first appears.		
<b>RESTRICTIONS:</b> BEE CAUTION: Do not apply this product to target crops or weeds in bloom. Do not apply within 14 days of harvest for grain or straw. Do not apply more than a total of 3 qts. per acre per crop per year. Discharge from rice fields may kill shrimp, crabs and crayfish. Do not apply propanil herbicides within 15 days before or after application of this product, or plant injury may result.		

**CUCURBIT VEGETABLES**

Repeat applications as necessary up to a total of 6 times per year at minimum 7 day intervals.

Crop	Pest	This Product Per Acre (qts.)
<b>All members of the Cucurbit Vegetables Crop Group 9 including:</b> <i>Momordica</i> spp. (includes Balsam apple, Balsam pear, Bitter melon, Chinese cucumber), Chayote, Chinese waxgourd (Chinese preserving melon), Citron melon, Cucumber, Gherkin, Edible gourd (includes hyotan, cucuzza, hechima, Chinese okra), Muskmelon (includes hybrid and/or cultivars of <i>Cucumis melo</i> including Cantaloupe, true Cantaloupe, Casaba, Crenshaw melon, Golden pershaw melon, Honeydew melon, Honey balls, Mango melon, Persian melon, Pineapple melon, Santa Claus melon, snake melon), Pumpkin, Squash (includes Summer squash types such as: crookneck squash, scallop squash, straightneck squash, vegetable marrow, Zucchini and Winter squash types such as Acorn squash, Butternut squash, Calabaza, Cushaw, Hubbard squash, and Spaghetti squash), Watermelon (includes hybrids and/or varieties of <i>Citrullus lanatus</i> )	Melonworms, Pickleworms	0.5 to 1
	Cucumber beetles, Flea beetles, Leafhoppers, Squash bugs	1
SPECIFIC DIRECTIONS: For best results on of Squash bugs, apply sufficient spray volume for thorough coverage and time sprays for early morning or late afternoon.		
<b>RESTRICTIONS:</b> Do not apply within 3 days of harvest. Do not apply more than a total of 6 qts. per crop per acre per year. Observe "PLANT RESPONSE PRECAUTIONS". BEE CAUTION: Do not apply this product to target crops or weeds in bloom.		



**FLAX**

Up to 2 applications can be made per crop per year at minimum 14 day intervals.

Crop	Pest	This Product Per Acre (qts.)
Flax (Except CA)	Armyworms	1 to 1.5
<b>RESTRICTIONS:</b> Do not use in California. Do not apply within 42 days of harvest for seed or straw. Do not apply more than a total of 3 qts. per acre per crop per year. BEE CAUTION: Do not apply this product to target crops or weeds in bloom.		

## FORAGE CROPS

### Alfalfa, Birdsfoot Trefoil, Clovers

On dense growth, apply in 25 to 40 gallons of water per acre with ground equipment to ensure adequate coverage.

Crop	Pest	This Product Per Acre (qts.)
Alfalfa, Birdsfoot trefoil, Clover	Blister beetles, Mexican bean beetles	0.5 to 1
	Alfalfa caterpillars, Bean leaf beetles, Cucumber beetles, Green cloverworms, Japanese beetles, Leafhoppers, Potato leafhoppers, Three-cornered alfalfa hoppers, Thrips, Velvetbean caterpillars	1
	Alfalfa blotch leafminers, Armyworms, Cloverhead weevils, Corn earworms, Cutworms, Egyptian alfalfa weevil larvae, Essex skippers, European alfalfa beetles, Fall armyworms, Lygus bugs, Stink bugs, Webworms, Yellowstriped armyworms	1 to 1.5
	SPECIFIC DIRECTIONS: For Cutworm, this product is most effective against species which feed on the upper portions of the plant.	
	Alfalfa weevil larvae (West of the Rocky Mountains)	1 to 1.5
	SPECIFIC DIRECTIONS: For Alfalfa weevil larvae, if pre-treatment damage is extensive, cut Alfalfa and treat the stubble. This product is not effective against adult Alfalfa weevils.	
	Alfalfa weevil larvae (East of the Rocky Mountains)	1.5
SPECIFIC DIRECTIONS: For Alfalfa weevil larvae, if pre-treatment damage is extensive, cut Alfalfa and treat the stubble. This product is not effective against adult Alfalfa weevils.		
<b>RESTRICTIONS:</b> BEE CAUTION: Do not apply this product to target crops or weeds in bloom. Observe <i>PLANT RESPONSE PRECAUTIONS</i> . Do not apply more than once per cutting per year. Do not apply within 7 days of harvest or grazing. Do not exceed 1.5 qts. per acre per cutting. Carbaryl may cause temporary bleaching of tender Alfalfa foliage.		

### Pastures and Grasses Grown for Hay and/or Seed

Up to 2 applications per year can be made at minimum 14 day intervals. Accurately mark swaths to avoid overapplication.

Crop	Pest	This Product Per Acre (qts.)
Pasture and Grasses grown for hay and/or seed	Armyworms, Cereal rust mite (Timothy mite), Chinch bugs, Essex skippers, Fall armyworms, Striped grass loopers, Thrips, Range caterpillars, Range crane flies	1 to 1.5
	SPECIFIC DIRECTIONS: To kill Thrips in grasses grown for hay and/or seed, use high spray pressure to improve penetration into the boot.	
	Ticks	1
SPECIFIC DIRECTIONS: Will kill only Ticks present at the time of application and directly contacted by product.		
<b>RESTRICTIONS:</b> BEE CAUTION: Do not apply this product to target crops or weeds in bloom. Do not apply within 14 days of harvest or grazing. Do not exceed a total of 3 qts. per acre per year.		

## RANGELAND

Do not make more than 1 application per year. Accurately mark swaths to avoid overapplication.

Site	Pest	This Product Per Acre (qts.)
Rangeland	Black grass bugs, Range caterpillars, Range crane flies	0.5 to 1
	Grasshoppers, Mormon crickets	0.5
	SPECIFIC DIRECTIONS: Aerial application is allowed only through USDA APHIS and affiliated state grasshopper and Mormon cricket suppression programs. Reduced Area and Agent Treatment (RAATs) is required. See the following website for details: <a href="http://www.sidney.ars.usda.gov/Research/lockwood.htm">www.sidney.ars.usda.gov/Research/lockwood.htm</a> .	
	Ticks	1
SPECIFIC DIRECTIONS: Will only kill Ticks present at the time of application and directly contacted by product.		
<b>RESTRICTIONS:</b> BEE CAUTION: Do not apply to target crops or weeds in bloom. May be harvested or grazed the same day of treatment. Do not apply more than 1 qt. per acre per crop per year.		

## FRUITING VEGETABLES

Repeat applications as necessary up to a total of 7 times per year at minimum 7 day intervals. When disease transmission is suspected, monitor fields following application and retreat if reinfestation occurs, but not more often than once every 7 days.

Crop	Pest	This Product Per Acre (qts.)
<b>All members of the Fruiting Vegetables Crop Group 8 including:</b> Eggplant, Groundcherry, Pepinos, Pepper (includes: bell pepper, chili pepper, cooking pepper, pimento, sweet pepper), Tomatillo, Tomato	Colorado potato beetles, European corn borers, Fall armyworms, Lace bugs, Stink bugs (suppression), Tarnished plant bugs, Thrips (suppression), Tomato fruitworms, Tomato hornworms, Tomato pinworms	1 to 2
	SPECIFIC DIRECTIONS: Thorough coverage is essential to effectively suppress Stink bugs.	
	Flea beetles, Leafhoppers	0.5 to 1
	Cutworms	2
	SPECIFIC DIRECTIONS: For Cutworm, this product is most effective against species which feed on the upper portions of the plant.	
<b>RESTRICTIONS:</b> BEE CAUTION: Do not apply to target crops or weeds in bloom. Do not apply within 3 days of harvest. Do not apply more than a total of 8 qts. per acre per crop per year.		

**LEAFY VEGETABLES**

Repeat applications as necessary up to a total of 5 times per year at minimum 7 day intervals.

Crop	Pest	This Product Per Acre (qts.)
Dandelion, Endive (escarole), Lettuce (head and leaf), Parsley, Spinach, and <b>All members of the Leaf Petioles Vegetables Subgroup 4B including:</b> Cardoon, Celery, Celtuce, Chinese celery, Florence fennel (including sweet anise, sweet fennel, Finocchio), Rhubarb, Swiss chard	Flea beetles, Harlequin bugs, Leafhoppers	0.5 to 1
	Armyworms, Aster leafhoppers, Corn earworms, Fall armyworms, Imported cabbageworms, Lygus bugs, Spittlebugs, Stink bugs, Tarnished plant bugs	1 to 2
<b>RESTRICTIONS:</b> BEE CAUTION: Do not apply to target crops or weeds in bloom. Do not apply within 14 days of harvest. Do not apply more than a total of 6 qts. per acre per crop per year.		

**LEGUME VEGETABLES**

Repeat applications as necessary up to a total of 4 times per year at minimum 7 day intervals. Use lower rates for light to moderate populations and smaller instars. Use the higher rates for heavy populations and larger instars. Use on fresh/succulent shelled beans and peas (Crop Subgroup 6B) is prohibited.

Crop	Pest	This Product Per Acre (qts.)
<b>All members of the Edible Podded Legume Vegetables Crop Subgroup 6A including:</b> <i>Phaseolus</i> spp. including Runner bean, Snap bean, and Wax bean; <i>Vigna</i> spp. including Asparagus bean, Chinese longbean, Moth bean, and Yardlong bean; <i>Pisum</i> spp. including Dwarf pea, edible-pod Pea, Snow pea, Sugar snap pea; Jackbean; Pigeon pea; Soybean (immature seed); Sword bean <b>All members of the Dried Shelled Legume Vegetables (except soybeans) Crop Subgroup 6C including:</b> <i>Lupinus</i> spp.	Bean leaf beetles, Blister beetles, Cucumber beetles, Grape colapsis, Green cloverworms, Japanese beetles, Mexican bean beetles, Velvetbean caterpillars	0.5 to 1.0
	Corn earworms	0.5 to 1.5
	Alfalfa caterpillars, Colorado potato beetles, Flea beetles, Leafhoppers, Threecornered alfalfa hoppers, Thrips, Western bean cutworms	1
	Armyworms, Cutworms, European corn borers, Fall armyworms, Stink bugs, Tarnished plant bugs, Webworms	1 to 1.5
SPECIFIC DIRECTIONS: For Cutworm, this product is most effective against species which feed on the upper portions of the plant.		
<b>(Continued)</b>		

(Cont.)

Crop	Pest	This Product Per Acre (qts.)
including Grain lupin, Sweet lupin, White lupin, and White sweet lupin; <i>Phaseolus</i> spp. including Field bean, Kidney bean, dry Lima bean, navy bean, pinto bean, tepary bean; <i>Vigna</i> spp. including Adzuki bean, Black-eyed pea, Catjang, Cowpea, Crowder pea, Moth bean, Mung bean, Rice bean, Southern pea, Urd bean; <i>Pisum</i> spp. including Dwarf pea, edible-podded pea, English pea, Field pea, Garden pea, Green pea, Snow pea, Sugar snap pea; Broad bean (dry); Chickpea (dry); Guar (dry); Lablab bean (dry); Lentil (dry); Pigeon pea (dry)	Alfalfa loopers (suppression), Cowpea curculios (suppression), Painted ladies (Thistle caterpillars), Pea leaf weevils, Pea weevils, Saltmarsh caterpillars, Woollybear caterpillars, Yellowstriped armyworms	1.5
<b>All members of the Foliage of Legume Vegetables Crop Group 7:</b> Plant parts of any legume vegetables included in the legume vegetable (Crop Group 6) that will be used as animal feed; and Soybeans	CA ONLY: Corn earworms (suppression), Limabean podborers (suppression), Lygus bugs (suppression), Stink bugs (suppression)	1.5
<b>RESTRICTIONS:</b> Do not apply within 14 days of grazing or harvest for forage or within 3 days of harvest of fresh edible-podded Beans or Peas or within 21 days of harvest of Dried beans or peas, seed or hay. Do not apply more than a total of 6 qts. per acre per crop per year. Do not apply a combination of this product and 2,4-DB herbicides to Soybeans, as crop injury may result. Observe "PLANT RESPONSE PRECAUTIONS". BEE CAUTION: For crops in bloom (except Soybeans): Do not apply this product to target crops or weeds in bloom. For Soybeans, if application cannot be avoided when target crops or weeds are in bloom, limiting applications to times when bees are least active, e.g. within 2 hours of sunrise or sunset, will minimize risk to bees. Notifying beekeepers within 1 mile of treatment area 48 hours before product is applied will allow them to take additional steps to protect their bees.		



**NON-CROPLAND**

Up to 2 applications can be made per year at minimum 14 day intervals. Accurately mark swaths to avoid overapplication.

Site	Pest	This Product Per Acre (qts.)
Conservation Reserve Program Acreage, Set-Aside Program Acreage, Wasteland, Rights-of-Way, Hedge rows, Ditchbanks, Roadsides	Black grass bugs	0.25 to 0.5 (0.2 to 0.4 fl. oz. per 1,000 sq.ft.)
	Range caterpillars, Range crane flies	0.5 to 1.0 (0.4 to 0.75 fl. oz. per 1,000 sq. ft.)
	Mormon crickets	0.5 (0.4 fl. oz. per 1,000 sq. ft.)
	Ticks	1 (0.75 fl. oz. per 1,000 sq. ft.)
SPECIFIC DIRECTIONS: Will kill only Ticks present at the time of application and directly contacted by product.		

**RESTRICTIONS:** Do not apply within 14 days of grazing or harvest for forage or hay. Do not apply more than a total of 3 qts. per acre per year. BEE CAUTION: Do not apply this product to target crops or weeds in bloom.

**OKRA**

Up to 4 applications can be made per year at minimum 6 day intervals.

Crop	Pest	This Product Per Acre (qts.)
Okra	Corn earworms, Stink bugs	1 to 1.5
	SPECIFIC DIRECTIONS: Apply using ground equipment in sufficient volume to ensure good coverage. For Grasshopper, refer to the "SPECIFIC PESTS ACROSS MULTIPLE SITES" section.	

**RESTRICTIONS:** Do not apply within 3 days of harvest. Do not apply more than a total of 6 qts. per acre per crop per year. BEE CAUTION: Do not apply this product to target crops or weeds in bloom.

**PEANUTS**

Repeat applications as necessary up to a total of 5 times per year at minimum 7 day intervals.

Crop	Pest	This Product Per Acre (qts.)
Peanuts	Blister beetles, Mexican bean beetles	0.5 to 1
	Alfalfa caterpillars, Bean leaf beetles, Cucumber beetles, Green cloverworms, Japanese beetles, Leafhoppers, Red-necked peanutworms, Three-cornered alfalfa hoppers, Thrips, Velvetbean caterpillars	1
	SPECIFIC DIRECTIONS: For best results on Thrips, use directed or banded sprays with hollow cone spray nozzles. Ensure adequate coverage for the underside of leaves.	
	Armyworms, Corn earworms, Fall armyworms, Stink bugs, Webworms	1 to 1.5
	Whitefringed beetle adults, Cutworms	2
SPECIFIC DIRECTIONS: For Cutworm, this product is most effective against species which feed on the upper portions of the plant.		

**RESTRICTIONS:** Observe "PLANT RESPONSE PRECAUTIONS". Do not apply within 14 days of harvest. Do not apply more than a total of 8 qts. per acre per crop per year. BEE CAUTION: Do not apply this product to target crops or weeds in bloom.

**PRICKLY PEAR CACTUS**

Apply using ground equipment in sufficient volume to ensure good coverage. Up to 3 applications can be made per year at minimum 7 day intervals.

Crop	Pest	This Product Per Acre (qts.)
Prickly pear cactus	Cochineal scales (crawlers)	2
	SPECIFIC DIRECTIONS: For Grasshopper, refer to the "SPECIFIC PESTS ACROSS MULTIPLE SITES" section.	

**RESTRICTIONS:** BEE CAUTION: Do not apply this product to target crops or weeds in bloom. Do not apply within 3 days of harvest. Do not apply more than a total of 6 qts. per acre per year.

**ROOT AND TUBER CROPS**

(Except Sugar Beets and Sweet Potatoes)

Repeat applications as necessary up to a total of 6 times per year at minimum 7 day intervals.

Crop	Pest	This Product Per Acre (qts.)
All members of the Root and Tuber Vegetables Crop Group 1 except sugar beets and sweet potatoes: Arracacha, Arrowroot, Artichoke (Chinese and Jerusalem), Beet (sugar, root), Burdock (edible), Canna (edible, Queensland arrowroot), Carrot, Cassava (bitter & sweet), Celeriac (celery root), Chayote (root), Chervil (turnip-rooted), Chicory, Chufa, Dasheen (taro), Ginger, Ginseng, Horseradish, Leren, Parsley (turnip-rooted), Parsnip, Potato, Radish, Oriental radish (daikon), Rutabaga, Salsify (black), Salsify (oyster plant), Salsify (Spanish), Skirret, Tanier (cocoyam), Turmeric, Turnip, Yam bean (jicama, manioc pea), Yam (true)	Flea beetles, Leafhoppers	0.5 to 1
	Armyworms, Aster leafhoppers, Colorado potato beetles, Corn earworms, Cutworms, European corn borers, Fall armyworms, Lace bugs, Lygus bugs, Spittlebugs, Stink bugs, Tarnished plant bugs	1 to 2
SPECIFIC DIRECTIONS: For Cutworm, this product is most effective against species which feed on the upper portions of the plant.		

**RESTRICTIONS:** BEE CAUTION: Do not apply this product to target crops or weeds in bloom. Do not apply within 7 days of harvest. Do not apply more than a total of 6 qts. per acre per crop per year.

**SMALL FRUITS AND BERRIES**

(REI for Grapes Only—West of the Rocky Mountains = 6 days; East of the Rocky Mountains = 2 days for all activities except for grape girdling and cane turning. The REI is 6 days for grape girdling and cane turning.) Repeat applications as necessary up to a total of 5 times per year at minimum 7 day intervals.

Crop	Pest	This Product Per Acre (qts.)
All members of the Caneberry Crop Subgroup 13-07A including: Blackberry ( <i>Rubus</i> spp. including Andean blackberry, Artic blackberry, bingleberry, black satin berry, boysenberry, Brombeere, California	European fruit lecaniums, European raspberry aphids, Flea beetles, Grape leafrollers, Grape leafhoppers, Japanese beetles, Leafhoppers, Leafrollers, Meadow spittlebugs,	1 to 2

(Continued)

(Cont.)		
Crop	Pest	This Product Per Acre (qts.)
blackberry, Cherokee blackberry, blackberry, Chesterberry, Cheyenne blackberry, Common blackberry, Coryberry, Darrowberry, Dewberry, Dirksen thornless berry, Evergreen blackberry, Himalayaberry, Hullberry, Lavacaberry, Loganberry, Lowberry, Lucretiaberry, Mammoth blackberry, Marionberry, Mora, Mures deronce, Nectarberry, Northern dewberry, Olallieberry, Oregon evergreen berry, phenomenalberry, rangeberry, Ravenberry, Rossberry, Shawnee blackberry, Southern dewberry, Tayberry, Youngberry, Zazzamora plus cultivars, varieties and/or hybrids of these); Raspberry ( <i>Rubus</i> spp. including Bababerry, black and red raspberry, Blackcap, Caneberry, Framboise, Frambueso, Himbeere, Keriberry, Mayberry, Purple raspberry, Thimbleberry, Tulameen, Wild raspberry, Yellow raspberry plus cultivars, varieties and/or hybrids of these).	Omnivorous leaf tiers, Rose chafers, Snowy tree crickets, Strawberry bud weevils, Strawberry clippers, Strawberry fruitworms, Strawberry leafrollers, Strawberry weevils, Western grapeleaf skeletonizers, Western yellowstriped armyworms	
	SPECIFIC DIRECTIONS: In Grapes, for Grape leaf folder, apply before the first brood larvae emerge from rolls.	
	Blueberry maggots, Cherry fruitworms, Cranberry fireworms, Cranberry fruitworms, Cranberry twig girdlers, Elm spanworms, Gypsy moths, Sparganothis fruitworms, Tarnished plant bugs	1.5 to 2
	Eightspotted foresters, Cutworms, Grape berry moths, June beetles, Omnivorous leafrollers, Orange tortrix, Raspberry fruitworms, Raspberry sawflies, Redbanded leafrollers, Saltmarsh caterpillars	2
	SPECIFIC DIRECTIONS: For Cutworm, this product is most effective against species which feed on the upper portions of the plant.	
<b>All members of the Bushberry Crop Subgroup 13-07B including:</b> Aronia berry, Blueberry ( <i>Vaccinium</i> spp.-highbush, lowbush and cultivars, and/or hybrids of these [=blueberry species]), Chilean guava, Currant (black, buffalo, native, red), European barberry, Elderberry, Gooseberry, Highbush cranberry, Honeysuckle (edible), Jostaberry, Huckleberry, Juneberry, Lingonberry, Salal, Sea buckthorn, plus varieties and/or hybrids of these. <b>Cranberries; Grapes; Strawberries</b>		
<b>RESTRICTIONS:</b> BEE CAUTION: Do not apply this product to target crops or weeds in bloom. If weed or cover crop bloom is present, mow orchard floor or between rows prior to applying this product. Do not apply within 7 days of harvest. Do not apply more than a total of 10 qts. per acre per crop per year. <b>Note:</b> Use on Cranberries may kill shrimp and crabs. Do not use in areas where these are important resources. Carbaryl may injure Early dawn and Sunrise varieties of Strawberries. In Grapes, do not concentrate spray on the bunch or visible residues may result.		

**SUGAR BEETS**

Repeat applications as necessary up to a total of 2 times per year at minimum 14 days intervals.

Crop	Pest	This Product Per Acre (qts.)
Sugar beets	Armyworms, Beet leaf beetles, Fall armyworms, Flea beetles, Leafhoppers, Webworms	1 to 1.5
	Cutworms	1.5
SPECIFIC DIRECTIONS: For Cutworm, this product is most effective against species which feed on the upper portions of the plant.		

**RESTRICTIONS:** BEE CAUTION: Do not apply this product to target crops or weeds in bloom. Do not apply within 28 days of harvest of roots or forage. Do not apply more than a total of 3 qts. per acre per crop per year.

**SUNFLOWERS**

Up to 2 applications can be made per year at minimum 7 day intervals

Crop	Pest	This Product Per Acre (qts.)
Sunflowers	Stem weevils, Sunflower beetles	1 to 1.5
	Armyworms, Cutworms, Fall armyworms, Sunflower moths	1.5
SPECIFIC DIRECTIONS: For Cutworm, this product is most effective against species which feed on the upper portions of the plant.		

**RESTRICTIONS:** BEE CAUTION: Do not apply this product to target crops or weeds in bloom. Do not apply within 30 days of grazing or harvest for forage or within 60 days of harvest for seed. Do not apply more than a total of 3 qts. per acre per crop per year.

**SWEET POTATOES**

Up to 8 foliar applications can be made per year at minimum 7 day intervals.

Crop	Pest	This Product Per Acre (qts.)
Sweet potatoes	Corn earworms, Cucumber beetles, Flea beetles, Sweet potato hornworms, Sweet potato weevils, Tortoise beetles, Whitefringed beetles	1 to 2
	Yellowstriped armyworms	2

**RESTRICTIONS:** BEE CAUTION: Do not apply this product to target crops or weeds in bloom. Do not apply within 7 days of harvest. Do not apply more than a total of 8 qts. per acre per crop per year.

**TOBACCO (REI = 48 hours)**

**Plant Bed and Field Treatment** – Repeat treatments as necessary up to a total of 4 times per year at minimum 7 day intervals. Use lower rate on young plants (up to knee height). Use at least 10 gallons of prepared spray per acre. Begin treatments when worms are small.

Crop	Pest	This Product Per Acre (qts.)
Tobacco	Budworms, Fall armyworms, Hornworms, Japanese beetles, June beetles, Suckflies, Tobacco flea beetles	1 to 2

**RESTRICTIONS:** Do not apply within 2 days of harvest. Do not apply more than a total of 8 qts. per acre per crop per year. Observe "PLANT RESPONSE PRECAUTIONS". BEE CAUTION: Do not apply this product to target crops or weeds in bloom.

## TREE FRUIT CROPS

On all tree fruit crops, apply in sufficient volume for adequate coverage. This will vary depending on the pest and its severity, the tree condition, size, density and other factors. By air, use at least 10 gallons of spray mixture per acre for adequate distribution.

### Citrus

(REI for Citrus in All States Other Than CA = 12 hours)

(REI for Citrus in CA = 3 days for application rates greater than or equal to 5 qts. per acre)

Crop	Pest	This Product Per Acre (qts.)
<b>All members of the Citrus Fruit Crop Group 10 including:</b> Calamondin, Citrus citron, Citrus hybrids ( <i>Citrus</i> spp., includes chironja, tangelo and tangor), Grapefruit, Kumquat, Lemon, Lime, Mandarin (tangerine), Orange (sweet and sour), Pummelo, Tangelo, Satsuma mandarin, White sapote ( <i>Casimiroa</i> spp.) and other cultivars and/or hybrids of these.	Avocado leafrollers, California orange dogs, Citrus cutworms, Fruitree leafrollers, Orange tortrix, Western tussock moths	2 to 3
	Citrus rust mites, Eriophyid mites, Plant bugs, Scale insects (Black scales, Brown soft scales, California red scales [except in CA], Citrus snow scales, Yellow scales [except in CA])	3 to 5
	SPECIFIC DIRECTIONS: For Scale, apply when crawlers are present. For results on Eriophyid mites, including Citrus rust mites, apply when pest populations are low.	
	Apopka weevils (adult), Citrus root weevils (adults), Fuller rose beetles, Little leaf notchers (adult)	5
	Psyllid	1.5 to 3
	SPECIFIC DIRECTIONS: Apply at the beginning and at the end of the overwintering period before the first spring flush of the year. Additional sprays are needed during the year just before each major flush in the grove or when an increase in Psyllid populations is observed. Use the lower rate on light to moderate infestations, young plants and early instars. Use the higher rate on heavy infestations, mature plants, advanced instars and adults. Thorough and uniform spray coverage is essential for effective control.	
	<b>CA Only:</b> California red scales, Yellow scales	5 to 12
	SPECIFIC DIRECTIONS: Do not make more than 1 application per crop per year in CA for California red scale. Apply when crawlers are present.	
	<b>Florida Only:</b> Adult citrus weevils (such as <i>Diaprepes abbreviatus</i> , <i>Pantomorus cervinus</i> , <i>Artipes floridanus</i> , and <i>Pachnaeus</i> spp.)	5 to 8
	SPECIFIC DIRECTIONS: Apply as a foliar spray by ground as dilute or concentrate spray or by air in 10 to 25 gallons of water per acre.	
<b>RESTRICTIONS:</b> BEE CAUTION: Do not apply this product to target crops or weeds in bloom. Mowing weed or cover crop bloom prior to application will reduce hazard to bees. Do not apply within 5 days of harvest. Do not apply more than a total of 20 qts. per acre per crop per year. Minimum retreatment interval is 14 days.		
<b>All States except CA and FL:</b> Do not apply more than 5 qts. per acre per application.		
<b>CA Only:</b> Do not apply more than 12 qts. per acre per application.		
<b>FL Only:</b> Do not apply more than 8 qts. per acre per application.		

## Olives (REI = 72 hours)

Up to 2 applications can be made per crop per year at minimum 14 day intervals.

Crop	Pest	This Product Per Acre (qts.)
Olives	Scale insects (Black scales, Olive scales)	5 to 7.5

**RESTRICTIONS:** Do not apply within 14 days of harvest. Do not apply more than a total of 15 qts. per acre per crop per year. BEE CAUTION: Do not apply this product to target crops or weeds in bloom. If weed or cover crop bloom is present, mow orchard floor or between rows prior to applying this product.

## Pome Fruits

Repeat applications as necessary up to a total of 8 times per crop per year including thinning sprays on Apples at minimum 14 day intervals.

Crop	Pest	This Product Per Acre (qts.)
<b>Members of the Pome Fruit Group 11 including:</b> Apples, Crab-apples, Pears, Loquats, Mayhaw, Oriental pears	White apple leafhoppers	0.5 to 1.5
	Apple aphids, Codling moths	1 to 3
	Apple aphids, Apple maggots, Apple mealybugs, Apple rust mites, Bagworms, California pearslugs (Pear sawflies), European apple sawflies, Eyespotted bud moths, Fruitree leafrollers, Gypsy moths, Japanese beetles, Lesser appleworms, Lygus bugs, Orange tortrix, Pearleaf blister mites, Pear psyllas, Pear rust mites, Periodical cicadas, Plum curculios, Redbanded leafrollers, Rosy apple aphids, Scale insects (Forbes scales, Lecanium scales, San Jose scales), Tarnished plant bugs, Tentiform leafminers, Woolly apple aphids, Yellowheaded fireworms	1.5 to 3
	SPECIFIC DIRECTIONS: On Apples, avoid use during the period from full bloom until 30 days after full bloom unless fruit thinning is desired. Use for pest control activity during this period also may result in fruit removal. For Psylla, apply when eggs hatch or young nymphs are present. For Scale, apply when crawlers are present.	
Apples Only, for fruit thinning	—	1 to 3
<b>SPECIFIC DIRECTIONS:</b> Apply between 80% petal fall and 16 mm fruit size. Use the higher rates on hard to thin varieties at the early thinning which is the 80% petal fall to 6 mm fruit size. Use the lower rates on easy to thin varieties and at the later thinning period which is the 10 to 16 mm fruit size. The rate to use per acre will depend on varieties, tree size, row spacing, weather conditions at the time of and following applications. The most effective spray gallonage will depend on the size, planting density, row spacing and amount of foliage. Use sufficient spray volume to ensure adequate coverage (100 to 400 gals. per acre). Avoid spray to the point of runoff. <b>Reduce spray coverage to the lower portion of the tree since overthinning may occur here.</b> Factors such as climatic temperature, high humidity, frost, tree age, variety, nutrition, previous crop, pruning and bloom may influence fruit thinning results with the product. Exercise precautions to avoid possible overthinning. For most effective results, apply under good drying conditions and when daytime temperatures (°F) will be 70 to low 80's for the following 1 to 3 days. Application with daytime temperatures in excess of 80°F may result in overthinning.		

(Continued)

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(Cont.)		
Crop	Pest	This Product Per Acre (qts.)
	<p>This product may be mixed with other fruit thinners; however, use precautions to avoid overthinning and other adverse effects. Consult with local fruit thinning experts in your area for recommendations on appropriate tank mixing partners. Refer to the other product labels for specific use directions.</p> <p>NOTE: The use of this product may result in fruit deformity under certain environmental conditions. Before using on any variety of Apples, the user must weigh the risk versus benefits when using this product, particularly when using between 80% petal fall and 6 mm fruit size. Red Delicious are more sensitive to this phenomenon and in particular, the varieties Bisbee, Red Chief and Vallee Spur are very susceptible to conditions causing fruit deformity. Precipitation and temperatures below 65°F increase the possibility of fruit deformity. The use with Summer spray oils and wetting agents may increase the risk of fruit deformity and injury.</p> <p>Consult with fruit thinning experts in your area for advice on using this product on specific apple varieties under local growing conditions or other questions. Observe all restrictions on the use of this product for apple thinning.</p>	
<p><b>RESTRICTIONS:</b> Do not apply to Quince. Do not use on Pears between the tight flower cluster up to the 20 mm fruit size. Use during this period may result in undesirable fruit thinning and/or deformed fruit. Do not apply within 3 days of harvest. Do not apply more than a total of 15 qts. per acre per crop per year.</p> <p><b>BEE CAUTION:</b> Do not apply this product to target crops or weeds in bloom. If weed or cover crop bloom is present, mow orchard floor or between rows prior to applying this product.</p> <p><b>FOR APPLE THINNING USE:</b> Do not apply during bloom. Remove bee hives from orchard to be treated before applying this product. Removing bee hives from adjacent orchards will further minimize risks to bees.</p>		

**DRIFT MANAGEMENT:**

For airblast application, follow the following drift management practices:

- Adjust deflectors and aiming devices so that the spray is only directed into the canopy.
- Block off upward pointed nozzles when there is no overhanging canopy.
- Do not allow the spray to go beyond the edge of the cultivated area (i.e., turn off sprayer when turning at end rows). For applications to the outside rows, only spray inward, toward the orchard.

**Stone Fruits**

Up to 3 applications can be made per crop per year at minimum 7 day intervals. An additional application can be made during the dormant or delayed dormant timing.

Crop	Pest	This Product Per Acre (qts.)
<p><b>All members of the Stone Fruits Crop Group 12 including:</b> Apricot, Cherry (including sweet and tart), Nectarine, Peach, Plum (including Chickasaw, Damson and Japanese), Plumcot, Prune (fresh)</p>	<p>Apple pandemis, Black cherry aphids, Cherry fruitworms, Cherry maggots (Cherry fruit flies), Codling moths, Cucumber beetles, Eastern tent caterpillars, Eyespotted bud moths, European earwigs, Fruittree leafrollers, Green fruitworms, Gypsy moths, Japanese beetles, June beetles, Lesser peachtree borers, Mealy plum aphids, Orange tortrix, Oriental fruit moths, Peach twig borers, Periodical cicadas, Plum curculios, Prune leafhoppers,</p>	<p>2 to 3</p>

(Continued)

(Cont.)		
Crop	Pest	This Product Per Acre (qts.)
	<p>Redbanded leafrollers, Rose chafers, Scale insects (Brown soft scales, Forbes scales, Lecanium scales, Olive scales, Oystershell scales, San Jose scales), Tarnished plant bugs, Tussock moths, Variegated leafrollers</p>	
<p><b>SPECIFIC DIRECTIONS:</b> Repeat applications as necessary, up to a total of 3 times per crop, but not more often than once every 7 days. An additional application at the dormant or delayed dormant timing may be made. For best results on Scale, apply when crawlers are present. For Lesser peachtree borers, best results have been found by thoroughly spraying limbs and tree trunks at weekly intervals during moth flight.</p>		
	<p>Peach twig borers, Scale insects (Brown soft scales, Forbes scales, Lecanium scales, Olive scales, Oystershell scales, San Jose scales)</p>	<p>4 to 5</p>
<p><b>SPECIFIC DIRECTIONS:</b> For dormant or delayed dormant timing, apply in combination with a recommended dormant oil. Refer to the dormant oil product label for additional use directions and restrictions.</p>		
	<p><b>CA ONLY:</b> Black cherry aphids, Cherry fruitworms, Cherry maggots (Cherry fruit flies), Codling moths, Cucumber beetles, Eyespotted bud moths, European earwigs, Fruittree leafrollers, Green fruitworms, Mealy plum aphids, Orange tortrix, Oriental fruit moths, Peach twig borers, Scale insects (Brown soft scales, Forbes scales, Lecanium scales, Olive scales, Oystershell scales, San Jose scales), Tarnished plant bugs, Tussock moths</p>	<p>3 to 4</p>
<p><b>SPECIFIC DIRECTIONS:</b> Repeat applications as necessary up to a total of 3 times per crop, but not more often than once every 14 days. An additional application at the dormant or delayed dormant timing may be made. For Scale, apply when crawlers are present.</p>		

**RESTRICTIONS:**

**All States Except CA:** Do not apply within 3 days of harvest. Do not apply more than 3 qts. per acre per application during the production season.

**CA only:** Do not apply within 1 day of harvest. Do not apply more than 4 qts. per application during the production season.

**All States Including CA:** Do not apply more than a total of 14 qts. per acre per crop per year. Do not apply more than a total of 5 qts. per acre at the dormant or delayed dormant timing. Do not apply more than a total of 9 qts. per acre during the production season.

**BEE CAUTION:** Do not apply this product to target crops or weeds in bloom. If weed or cover crop bloom is present, mow orchard floor or between rows prior to applying this product.

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**TREE NUT CROPS**

On all tree nut crops, apply in sufficient volume for adequate coverage. This will vary depending on the pest and its severity, the tree condition, size and density and other factors.

Crop	Pest	This Product Per Acre (qts.)
Pistachios	Armyworm (Except in CA), Brown soft scales, Lecanium scales, Navel orangeworms (Except in CA)	3 to 5
	SPECIFIC DIRECTIONS: Repeat applications as necessary up to a total of 4 times per crop per year (including any applications at the dormant or delayed dormant timing) at minimum 7 day intervals. For Scale, apply when crawlers are present.	
	California Only: Armyworm Navel orangeworm	3 to 6
	SPECIFIC DIRECTIONS: Apply by air in a minimum of 20 gallons of water per acre. Do not make more than 1 application at the maximum rate of 6 quarts per acre per crop per year. If needed, make up to 3 additional applications per crop per year at a rate not exceeding 5 quarts per acre per application (including applications at the dormant or delayed dormant timing) at minimum 7 day intervals.	
	Scale insects	4 to 5

**RESTRICTIONS:** Do not apply within 14 days of harvest. Do not apply more than a total of 15 qts. per acre per year including any application at the dormant or delayed dormant timing. **In All States Except California:** Do not apply more than 5 qts. per acre per application. **In California:** Do not make more than 1 application at the maximum rate of 6 qts. per acre per crop per year. For any additional applications, do not apply more than 5 qts. per acre per application. **BEE CAUTION:** Do not apply this product to target crops or weeds in bloom. If weed or cover crop bloom is present, mow orchard floor or between rows prior to applying this product.

<b>All members of the Tree Nuts Crop Group 14 including:</b> Almond, Beech nut, Brazil nut, Butternut, Cashew, Chestnut, Chinquapin, Filbert (hazelnut), Hickory nut, Macadamia nut (bush nut), Pecan, Walnut [including black and English (Persian) walnuts]	Black margined aphids, Calico scales, Codling moths, European fruit lecaniums, Fall webworms, Filbert aphids, Filbert leafrollers, Filbertworms, Frosted scales, Fruittree leafrollers, Hickory shuckworms, Lesser webworms, Navel orangeworms, Peach twig borers, Pecan leaf phylloxeras, Pecan stem phylloxeras, Pecan nut casebearers, Pecan spittlebugs, Pecan weevils, San Jose scales, Twig girdlers, Walnut caterpillars	2 to 5
	SPECIFIC DIRECTIONS: Repeat applications as necessary up to a total of 4 times per year (including any applications at the dormant or delayed dormant timing) at minimum 7 day intervals. Use lower rates for pests attacking leaves. Use higher rates for pests attacking fruit and for higher infestations. For Scale, apply when crawlers are present. For Peach twig borers, best results with foliar applications have been found by making applications in popcorn or petal fall stages when the May brood begins to hatch. For Navel orangeworms	

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Crop	Pest	This Product Per Acre (qts.)
	in Almonds and Walnuts, best results have been found by timing early and mid-season applications to correspond with moth flight peaks. For Filbert leafrollers, best results have been found by making applications when eggs are hatching, repeating application in first appearance of moths and again 3 to 4 weeks later. For Codling moths in Walnuts, best results have been found by making applications when average cross-sectional diameters of developing nuts are one-half to three-fourths inches and again during middle or late June, as needed.	
	Chestnut weevils, European earwigs	4 to 5
	SPECIFIC DIRECTIONS: For Chestnut weevils, best results have been found with 4 applications at weekly intervals beginning in late July. The last application should be made prior to shuck split. For European earwigs, thorough coverage of trunks, branches and nuts is needed for best results.	
Almonds Only	Peach twig borers, Scale insects	4 to 5
	SPECIFIC DIRECTIONS: For dormant or delayed dormant timing, apply in combination with recommended dormant oil. Refer to the dormant oil product label for additional use directions and restrictions.	

**RESTRICTIONS:** **BEE CAUTION:** Do not apply this product to target crops or weeds in bloom. If weed or cover crop bloom is present, mow orchard floor or between rows prior to applying this product. Do not apply within 14 days of harvest. Do not apply more than a total of 15 qts. per acre per crop per year including any applications at the dormant or delayed dormant timing.

**FORESTED AREAS AND RANGELAND TREES**

Up to 2 spray applications can be made per year at minimum 7 day intervals and 2 direct trunk treatments per year at 6 month intervals. Apply in sufficient volume for adequate coverage by ground or air equipment. This will vary depending on the tree size, density and stage of growth.

Crop/Site	Pest	This Product Per Acre (qts.)
Forests, Tree plantations, Planted Christmas trees, Parks, Rural shelter belts, Rangeland trees	Ants*, Apple aphids, Armyworms, Ash whiteflies, Azalea leafminers, Bagworms, Balsam twig aphids, Birch leafminers, Blister beetles, Boxelder bugs, Boxwood leafminers, Browntail moths, Cankerworms, Catalpa sphinx, Chiggers**, Cooley spruce gall adelgids, Cutworms, Cypress tip moths, Douglas-fir tussock moths, Eastern spruce gall adelgids, Elm leaf aphids, Elm leaf beetles, Elm spanworms, Eriophyid mites, European pine shoot moths, Fall armyworms, Flea beetles, Fuchsia gall mites, Fuller rose beetles, Gall midges, Gall wasps, Greenstriped mapleworms, Grasshoppers, Hackberry nipplegall makers, Holly bud moths, Holly leafminers, Jackpine budworms, Japanese beetles, Jeffrey pine needleminers, June beetles, Lace bugs,	1 (0.75 fl. oz. per 1,000 sq. ft.)

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(Cont.)		
Crop/Site	Pest	This Product Per Acre (qts.)
	Leafhoppers, Leafrollers, Locust borers, Maple leafcutters, Mealybugs, Mimosa webworms, Nantucket pine tip moths, Oak leafminers, Oak moths, Oak skeletonizers, Oakworm (complex), Oleander caterpillars, Olive ash borers, Orangestriped oakworms, Periodical cicadas, Pine loopers, Pine sawflies, Pine spittlebugs, Pitch pine tip moths, Plant bugs, Poinsettia hornworms, Psyllids, Puss caterpillars, Redhumped oakworms, Rose aphids, Rose chafers, Rose slugs, Saddled prominents, Sawflies (exposed), Scale insects (crawlers), Sowbugs, Spiney elm caterpillars, Spring-tails, Spruce budworms, Spruce needle-miners, Subtropical pine tip moths, Tent caterpillars, Thornbugs, Thrips (exposed), Walnut caterpillars, Webworms, Western hemlock loopers, Western spruce budworms, Willow leaf beetles, Woolly gall aphids, Yellow poplar weevils	
SPECIFIC DIRECTIONS: Observe "PLANT RESPONSE PRECAUTIONS". Obtain thorough coverage of upper and lower leaf surfaces. The addition of a sticker may improve product performance. To kill Scale insects, treat trunks, stems and twigs in addition to plant foliage. For best results on Worm, treat when pests are small. Make applications for Maple leafcutters on Sugar maple when larvae are in 2nd instar after mining and as cases are being formed. *Except carpenter, harvester and Pharaoh. **Will kill only pest that are present at the time of application and directly contacted by product.		
Gypsy moths		0.75 to 1 (0.5 to 0.75 fl. oz. per 1,000 sq. ft.)
SPECIFIC DIRECTIONS: For Gypsy moth, use the higher rate for heavy infestations. Repeat treatments as necessary, up to a total of 2 times per year, but not more often than once every 7 days.		
Ticks		1 (0.75 fl. oz. per 1,000 sq. ft.)
SPECIFIC DIRECTIONS: Will only kill Ticks present at the time of application and directly contacted by product.		
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(Cont.)		
Crop/Site	Pest	This Product Per Acre (qts.)
	Elm bark beetles, Ips engraver beetles, Mountain pine beetles, Roundheaded pine beetles, Spruce beetles, Western pine beetles	5 fl. ozs. per gal.
SPECIFIC DIRECTIONS: <b>Direct Trunk Treatment</b> - Effective as a preventative treatment only. Treat annually as required to prevent Beetle attacks. Apply 1 gal. of spray per 50 sq. ft. of bark prior to Beetle flight or host-tree attack. Treat tree trunk from ground level up, until trunk diameter is less than 5 inches. For Elm bark beetles, apply approximately 20 to 30 gals. of spray mixture for each 50 ft. of bark for thorough coverage of all bark surfaces on trunks, limbs, and twigs.		
<b>RESTRICTIONS: BEE CAUTION:</b> Do not apply this product to target crops or weeds in bloom. Do not use on syrup-producing Sugar maples where sap is harvested. Do not enter or allow others to enter treated areas until sprays have dried.		

**ORNAMENTAL TREES AND PLANTS**

(REI = 12 hours; EXCEPTION: The REI is 18 days for ornamentals grown for cuttings (cut flowers or cut foliage) where production is in outdoor areas and where average annual rainfall is less than 25 inches a year. Notify workers of the application and REI by warning them orally and by posting warning signs at entrances to treated area. Note: Information on average annual rainfall for your area is available from any nearby weather bureau, such as one located at a local airport or one affiliated with the National Oceanographic and Atmospheric Administration (NOAA).

Up to 6 spray applications can be made per year at minimum 7 day intervals. Up to 2 direct trunk treatments can be made per year at minimum 6 month intervals.

Apply by ground in sufficient volume for adequate coverage. This will vary depending on the plant or tree size, density and stage of growth.

Crop/Site	Pest	This Product Per Acre (qts.)
Ornamental Trees and Plants: Roses, Flowers, Other Herbaceous plants, Evergreens, and Woody plants, Shrubs	Ants*, Apple aphids, Armyworms, Ash whiteflies, Azalea leafminers, Bagworms, Balsam twig aphids, Birch leafminers, Blister beetles, Boxelder bugs, Boxwood leafminers, Browntail moths, Cankerworms, Catalpa sphinx, Chiggers**, Cooley spruce gall adelgids, Cutworms, Cypress tip moths, Douglas-fir tussock moth, Eastern spruce gall adelgids, Elm leaf aphids, Elm leaf beetles, Elm spanworms, Eriophyid mites, European pine shoot moths, Fall armyworms, Flea beetles, Fuchsia gall mites, Fuller rose beetles, Gall midges, Gall wasps, Greenstriped mapleworms, Grasshoppers, Hackberry nipple-gall makers, Holly bud moths, Holly leafminers, Jack pine budworms, Japanese beetles, Jeffrey pine needleminers, June beetles, Lace bugs, Leafhoppers, Leafrollers, Locust borers, Maple leafcutters, Mealybugs,	1 qt. per acre -OR- per 100 gal. (0.75 fl. oz. per 1,000 sq. ft.)

(Continued)

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(Cont.)		
Crop/Site	Pest	This Product Per Acre (qts.)
	Mimosa webworms, Nantucket pine tip moths, Oak leafminers, Oak moths, Oak skeletonizers, Oakworm (complex), Oleander caterpillars, Olive ash borers, Orange-striped oakworms, Periodical cicadas, Pine loopers, Pine sawflies, Pine spittlebugs, Pitch pine tip moths, Plant bugs, Poinsettia hornworms, Psyllids, Puss caterpillars, Redhumped oakworms, Rose aphids, Rose chafers, Rose slugs, Saddled prominents, Sawflies (exposed), Scale insects (crawlers), Sowbugs, Spiny elm caterpillars, Springtails, Spruce needleminers, Subtropical pine tip moths, Tent caterpillars, Thornbugs, Thrips (exposed), Walnut caterpillars, Webworms, Western spruce budworm, Willow leaf beetles, Woolly gall aphids, Yellow-poplar weevils	
<p><b>SPECIFIC DIRECTIONS:</b> Observe "PLANT RESPONSE PRECAUTIONS". Obtain thorough coverage of upper and lower leaf surfaces. The addition of a sticker may improve product performance. To kill Scale insects, treat trunks, stems and twigs in addition to plant foliage. For best results on Worm, treat when pests are small. Make application for Maple leafcutters on Sugar maple when larvae are in 2nd instar after mining and as cases are being formed.</p> <p>* Except carpenter, harvester and Pharaoh.            ** Will only kill pests that are present at the time of application and directly contacted by product.</p>		
	Gypsy moths	0.75 to 1 qt. per acre or per 100 gal. (0.5 to 0.75 fl. oz. per 1,000 sq. ft.)
<p><b>SPECIFIC DIRECTIONS:</b> For Gypsy moth, use the higher rate for heavy infestations.</p>		
	Ticks	1 quart per acre or per 100 gal. (0.75 fl. oz. per 1,000 sq.ft.)
<p><b>SPECIFIC DIRECTIONS:</b> Will only kill Ticks present at time of application and directly contacted by product.</p>		
(Continued)		

(Cont.)		
Crop/Site	Pest	This Product Per Acre (qts.)
	Elm bark beetles, Ips engraver beetles, Mountain pine beetles, Roundheaded pine beetles, Spruce beetles, Western pine beetles	5 fl. ozs. per gal.
<p><b>SPECIFIC DIRECTIONS: Direct Trunk Treatment</b>            - Effective as a preventative treatment only. Treat annually to prevent Beetle attacks. Apply 1 gal. of spray per 50 sq. ft. of bark prior to Beetle flight or host-tree attack. Treat tree trunk from ground level up, until trunk diameter is less than 5 inches. For Elm bark beetles, apply approximately 20 to 30 gals. of spray mixture for each 50 ft. of Elm tree for thorough coverage of all bark surfaces on trunks, limbs, and twigs.</p>		
<p><b>RESTRICTIONS: BEE CAUTION:</b> Do not apply this product to target crops or weeds in bloom.            Do not use on syrup-producing Sugar maples where sap is harvested.            Do not enter or allow others to enter treated areas until sprays have dried.</p>		

**TURFGRASS**

(REI for Turf grown for Sod production = 24 hours)  
 Do not apply more than a total of 16 qts. per acre per year. Do not apply by air or by chemigation. Broadcast applications to Turfgrass are permitted only on Golf courses, Sod farms, Cemeteries, and Commercial landscapes. Applications to all other lawns or turf (residential settings) are limited to spot treatments. Apply the specified rates using ground pressure-type equipment in sufficient spray volume for thorough coverage and thatch penetration.

Site	Pest	This Product Per Acre (qts.)
Golf turf, Sports fields, Sod farms, Domestic and Commercial lawns, Cemeteries, Parks, Campsites, Recreational areas	Ants (except carpenter, harvester and Pharaoh)*, Armyworms, Cutworms, Essex skippers, European chafers, Fall armyworms, Fiery skippers, Grasshoppers, Green June beetle larvae, Leafhoppers, Lucerne moths, Millipedes, Mosquitoes (adults)*, Scarab beetle adults (May beetles, June beetles, Japanese beetles, Green June beetles), Sowbugs, Spittlebugs, Springtails, Yellowstriped armyworms	2 to 4 (1.5 to 3 fl. ozs. per 1,000 sq. ft.)
<p><b>SPECIFIC DIRECTIONS:</b> For Armyworm, Cutworm and Fall armyworm: Do not irrigate treated areas within 24 hours following insecticide application. For Green June beetle grub (larvae): Make applications when grubs are feeding near the soil surface. Water or irrigate turfgrass within 48 hours after treatment.</p>		
	Ticks*	1 (0.75 fl. oz. per 1,000 sq. ft.)
	Centipedes*, Chigger*, Earwigs*	4 (3 fl. ozs. per 1,000 sq. ft.)

**RESTRICTIONS: BEE CAUTION:** Do not apply this product to plants in bloom.  
 Repeat applications as necessary up to 4 times per year but not more often than once every 7 days. Do not allow public use of treated areas during applications or until sprays have dried.  
 \*Will kill only pests that are present at the time of application and directly contacted by product.

(Continued)

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(Cont.)		
Site	Pest	This Product Per Acre (qts.)
Golf turf, Sports fields, Sod farms, Domestic and Commercial lawns, Cemeteries, Parks, Campsites, Recreational areas	Chinch bugs, Sod webworms (Lawn moths)	6 to 8 (4.4 to 6 fl. ozs. per 1,000 sq. ft.)
	SPECIFIC DIRECTIONS: For Chinch bug: Treat entire grass area rather than just damaged areas. Irrigation prior to treatment will aid in penetration of insecticide into Turfgrass. Do not irrigate treated areas within 24 hours following insecticide application.	
	Bluegrass billbug larvae, European crane flies, White grubs (such as Japanese beetles, Chafer beetles and <i>Phyllophaga</i> spp. larvae), Black turfgrass ateniinus beetle larvae, Hyperodes weevils (Bluegrass weevil) larvae, Springtails	8 (6 fl. ozs. per 1,000 sq. ft.)
	SPECIFIC DIRECTIONS: For European Crane Fly: Apply in early Spring (April 1 to April 15) or at timing recommended by local Agricultural Extension Service Agents. Water or irrigate Turfgrass within 48 hours after treatment. For White grub: Apply when Grubs are feeding near the soil surface, usually during late March through May or July through early September or at timing as recommended by local Agricultural Extension Service Agents. Water or irrigate turfgrass within 48 hours after treatment.	
	Fleas*	8 (6 fl. ozs. per 1,000 sq. ft.)
<b>RESTRICTIONS:</b> BEE CAUTION: Do not apply this product to plants in bloom. Repeat applications as necessary up to 2 times per year but no more often than once every 7 days. Do not enter or allow others to enter treated areas until sprays have dried. * Will kill only pests present at the time of application and directly contacted by product.		

**SPECIFIC PESTS ACROSS MULTIPLE SITES**

**Grasshoppers**

Crop	Pest	This Product Per Acre
All crops on this labels	Grasshoppers	0.5 to 1.5
	SPECIFIC DIRECTIONS: Apply 0.5 to 0.75 qts. per acre for nymphs on small plants or sparse vegetation. Apply 1 to 1.5 qts. per acre for mature grasshoppers or applications to dense foliage. Be certain spray volumes are appropriate to assure adequate coverage.	
<b>RESTRICTIONS:</b> Refer to individual site listing elsewhere on this label for use limitations and restrictions. Do not use rates higher than listed for the site or exceed other use restrictions. Observe all use restrictions.		

**Imported Fire Ant**

Crop/Site	Pest	This Product Per Gallon
All crops/sites on this label	Imported fire ants	0.75 fl. oz. per gal.
	SPECIFIC DIRECTIONS: <b>Drench Application:</b> To kill active mounds, apply a total of 2 gals. of the diluted solution over the surface of each mound or at least 1 qt. per 6 inches of mound diameter using a bucket, can or other appropriate equipment. Thoroughly wet mound and surrounding areas to a 4-ft. diameter (12 sq. ft.). Do not disturb mound prior to treatment. Pour solution from a height of about 3 ft. to give sufficient force to break mound apex and flow into Ant tunnels. For best results, apply in cool weather (65 to 80°F) or in early morning or late evening hours. Repeat application if mound activity resumes after 30 days. Treat new mounds as they appear. Pressurized sprays may disturb the Ants and cause migration, reducing product effectiveness.	
	Imported fire ants (foraging)	1.5 fl. ozs. per gal.
	SPECIFIC DIRECTIONS: <b>Broadcast Application (outdoor use only)*:</b> Treat only the growing media when using on bedding plants and avoid contact with foliage. Do not make more than 1 application per year.	
<b>RESTRICTIONS:</b> Do not enter or allow others to enter treated areas until sprays have dried. For outdoor use only. Do not use in greenhouses. * Broadcast applications to turfgrass are permitted only on golf courses, sod farms, cemeteries, and commercial landscapes. Applications to all other lawns or turf (residential settings) are limited to spot treatments. <b>Note:</b> Do not use on any food crop not listed on this label. Refer to specific site use directions elsewhere on this label for additional restrictions.		

**Ticks which may Vector Lyme Disease**

To kill juvenile and adult Ticks which may vector Lyme Disease, apply the specified amount in sufficient volume for thorough coverage. This product will kill only Ticks that are present at the time of application and directly contacted by product. Up to 4 applications per year can be made.

Crop/Site	Pest	This Product Per Acre (qts.)
All crops on this label, Pastures, Forested areas, Wasteland, Rights-of way, Hedgerows, Ditchbanks, Roadsides, Set-Aside and Conservation Reserve Program Acreage, Ornamental trees and plants, Turfgrass*	<i>Ixodes</i> spp. (Deer ticks, Bear ticks, Black legged ticks), <i>Amblyomma</i> spp. (Lone star ticks)	1 (0.75 fl. oz. per 1,000 sq. ft.)
	SPECIFIC DIRECTIONS: To kill juvenile Ticks, apply in late Spring or early Summer. To kill adult Ticks, apply in late Summer to Fall. Treat entire area and perimeter areas where exposure to Ticks may occur. Ticks may be reintroduced from surrounding areas on host animals. Retreat as necessary to maintain low population levels.	
<b>RESTRICTIONS:</b> Do not enter or allow others to enter treated areas until sprays have dried. <b>Note:</b> Refer to individual site listings elsewhere on this label for use limitations and restrictions. Do not use rates higher than listed for the site or exceed other use restrictions. If product is used to kill Ticks on any use site listed on this label, the use rate must not exceed 1 qt. per acre (0.75 fl. oz. per 1,000 sq. ft.). Observe all use restrictions. * Broadcast applications to Turfgrass are permitted only on Golf courses, Sod farms, Cemeteries, and Commercial landscapes. Applications to all other lawns or turf (residential settings) are limited to spot treatments.		



## NUISANCE PESTS

**PERIMETER TREATMENT** – To kill Ants\*, Bees\* and Wasps\*, Brown dog ticks\*, Centipedes\*, Cockroaches\*, Crickets, Darkling beetles (Lesser mealworms or Litter beetles), Earwigs, Firebrats, Silverfish, Fleas\*, Millipedes, Scorpions\*, and Spiders\*, mix 2.5 fluid ounces of this product per gallon of water and apply as a coarse wet spray in a band of 6 to 10 feet wide around the outside perimeter of buildings contacting as many pests as possible.

Confine to areas immediately adjacent to the structure. Direct applications to the outside of the structure should be minimal and restricted to cracks and crevices and areas where insects tend to congregate.

For use in and around flower beds and ornamental plantings, apply as a coarse wet spray in and around plant beds.

### RESTRICTIONS:

- Do not enter or allow others to enter treated areas until sprays have dried.
  - Do not make more than 4 applications per year. Do not apply more often than once every 7 days.
  - NOTE: Staining may occur on certain surfaces such as brick, carpet, cinder block, fabrics, stucco, and wood. Spray deposits on painted or stained surfaces of finishes (e.g., boats, cars, house trailers, etc.) should be removed immediately by washing to prevent discoloration. Avoid application to surfaces where visible spray residues are objectionable. Staining of fabrics and carpet may be permanent. For outdoor use only.
  - Observe "PLANT RESPONSE PRECAUTIONS".
- \* Will kill only pests present at time of application and directly contacted by product.

## STORAGE AND DISPOSAL

Do not contaminate water, food or feed by storage and disposal. Open dumping is prohibited.

**PESTICIDE STORAGE:** Store unused product in original container only, in cool, dry area out of reach of children and animals. Do not store in areas where temperatures frequently exceed 100°F. If container is damaged, before cleaning up, put on Personal Protective Equipment (PPE).

**PESTICIDE DISPOSAL:** Wastes resulting from the use of this product may be disposed of on site or at an approved waste disposal facility.

### CONTAINER DISPOSAL:

**Nonrefillable Container (rigid material; less than 5 gallons):** Non-refillable container. Do not reuse or refill this container. Offer for recycling, if available. Clean container promptly after emptying. Triple rinse as follows: Empty the remaining contents into application equipment or a mix tank and drain for 10 seconds after the flow begins to drip. Fill the container one-fourth 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. Dispose of empty container in a sanitary landfill or by incineration, or, if allowed by State and local authorities, by burning. If burned, stay out of smoke.

**Nonrefillable Container (rigid material; 5 gallons up to < 250 gallons):** Nonrefillable container. Do not reuse or refill this container. Offer for recycling, if available. Clean container promptly after emptying. Triple rinse as follows: Empty the remaining contents into application equipment or a mix tank. Fill the container one-fourth 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. Dispose of empty container in a sanitary landfill or by incineration, or if allowed by State and local authorities, by burning. If burned, stay out of smoke.

**Refillable Container (≥ 250 gallons & Bulk):** Refillable container. Refill this container with pesticide 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% 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.

## WARRANTY— CONDITIONS OF SALE

OUR DIRECTIONS FOR USE of this product are based upon tests believed reliable. Follow directions carefully. Timing and method of application, weather and crop conditions, mixtures with other chemicals specifically recommended and other influencing factors in the use of this product are beyond the control of the Seller. To the extent consistent with applicable law, Buyer assumes all risks of use, storage and handling of this material not in strict accordance with directions given herewith.

To the extent consistent with applicable law, in no case shall the Manufacturer or the Seller be liable for consequential, special or indirect damages resulting from the use or handling of this product when such use and/or handling is not in strict accordance with directions given herewith. The foregoing is a condition of sale by the Seller and is accepted as such by the Buyer.

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