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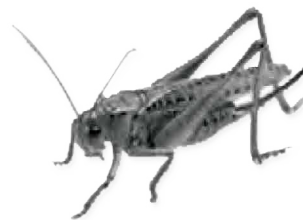
Japanese Beetle



Lice



Grasshopper

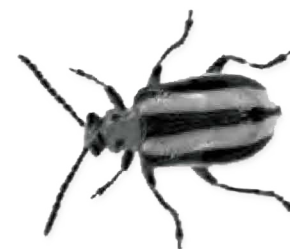


Cockroach



Insecticide Recommendations for Arkansas

Potato Beetle



Mosquito



Bed Bug



Brown Recluse



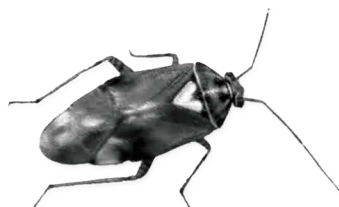
Brown Marmorated
Stink Bug



House Fly



Tarnished Plant Bug



Corn Earworm



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INSECTICIDE RECOMMENDATIONS FOR ARKANSAS

INTRODUCTION

Recommendations and products listed in this publication are reviewed annually by the contributing authors. Research on chemical control of insect pests is ongoing as new products are developed and registered for use in the crops and situations presented. The information presented in this publication is taken from tests conducted and recommendations developed in Arkansas and is supplemented by published information from surrounding states. **The use of any chemical suggested in this guide should always be preceded by a careful examination of the container label for directions and precautions.** Many insecticides have registrations for uses not listed in this publication. They are not included here because of either a lack of space in the publication, their lack of availability for purchase in the state, their inefficiency for the purpose intended or their extremely hazardous nature when a less hazardous chemical will do the job just as well. Rates of insecticides in this publication are presented as recommended rate ranges to provide a flexible guide for product use. Insecticide performance charts in this guide are intended to indicate relative performance of products and not percent control. Should the registration of an insecticide or certain uses of an insecticide be canceled by federal or state agencies, recommendations thus affected herein are no longer applicable after such action is taken.

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POISON CONTROL CENTERS IN ARKANSAS

The United States Environmental Protection Agency has established a Poison Control System throughout the nation. Participating hospitals function on a voluntary basis to provide special emergency aid in case of chemical intoxication. Each Poison Control Center has the capability to determine the toxic constituent of commercial products, respond to calls from physicians or individuals and provide supportive or antidotal treatment.

In a pesticide or poisoning emergency, call 1-800-222-1222. Your call will be directed to the nearest Poison Control Center.

INSECTICIDE APPLICATION

The success of any insecticide treatment depends upon proper application. There are several variables that impact proper application. This material briefly discusses application guidelines such as calibration, tank mixing, agitation, spray volume, drift control and nozzle selection. For more detailed information on most aspects of spray application, contact your county Extension office.

Checklist for Proper Spray Application

If you cannot check all the following (where applicable), perhaps you have a weakness in your sprayer program that can be corrected.

- ☐ Sprayer is calibrated accurately. (**Pages 4 and 5**)
- ☐ Band width is accurately measured and broadcast rates are changed for banding applications. (**Page 5**)
- ☐ Use a minimum screen size of 50 mesh for wettable powders or flowables.
- ☐ Have proper agitation (not just bypass) for powders and flowables. (**Page 8**)
- ☐ Refer to label and precautions in this publication to choose proper spray volume and pressure for insecticide used. (**Page 8**)
- ☐ Use the appropriate style nozzle designed to balance drift control and coverage (**Pages 6 and 7**)
- ☐ Use nozzles designed to resist wear when applying wettable powders or flowables. (**Page 6**)
- ☐ Properly clean application equipment when switching pesticides and at the end of day. (**Page 9**)

Sprayer Calibration

No single aspect of spray application is as important and as abused as sprayer calibration. There is no way to accurately apply an insecticide without accurately calibrating the sprayer and figuring the tank mix. Using the following method and examples, you can calibrate quickly and easily.

Measuring Travel Speed

Measure a test course in the area to be sprayed or in an area with similar surface conditions. Minimum lengths of 100 and 200 feet are recommended for measuring speeds up to 5 and 10 mph, respectively. Determine the time required to travel the test course. To help ensure accuracy, conduct the speed check with a loaded sprayer and select the engine throttle setting and gear that will be used when spraying. Repeat the above process and average the times that were measured. Use the following equation or the table below to determine ground speed.

$$\text{Speed (mph)} = \frac{\text{Distance (ft)} \times 60}{\text{Time (seconds)} \times 88}$$

Determining Gallons Per Acre (Ounce Method)

1. Check the table below for the proper distance related to the row or nozzle spacing on your sprayer. For broadcast, use nozzle spacing; for band application such as post directed or band behind press wheel, use row spacing. Mark off this distance in the field you will be spraying.

Row or Nozzle Spacing (inches)	Calibration Distance (feet)	Row or Nozzle Spacing (inches)	Calibration Distance (feet)
40	102	28	146
38	107	26	157
36	113	24	170
34	120	22	185
32	127	20	204
30	136	18	227

For row or nozzle spacing's and calibration distances not shown here – any calibration distance (feet) may be determined by the following equation:

$$4080 / \text{average row or nozzle spacing (in inches)}.$$

All rates are given as broadcast rates. For band application, you must adjust the rate by the following formula:

$$\frac{\text{Band Width}}{\text{Row Width}} \times \text{Broadcast Rate} = \text{Band Rate}$$

2. Attach row conditioner, Triple-K, planter or whatever tool is to be pulled by the tractor when spraying. Engage the tool to the proper depth and use the throttle setting and gear that will be used for spraying. Note the time in seconds on a stopwatch that it takes to drive the calibration distance measured.
3. Catch the nozzle discharge for the noted time in Step 2 in a container graduated in ounces (plastic measuring cup, baby bottle, etc.). If you are using a broadcast boom with nozzles spaced evenly, catch the output from one nozzle for the time measured in Step 2. If more than one nozzle per row is used (directed, insecticide or fungicide rig), catch the spray from each nozzle for the time noted in Step 2. Then combine the amount from all nozzles spraying on a single row.
4. The total discharge measured in ounces is equal to the gallons per acre applied. With a broadcast boom, this is the amount caught from one nozzle. Where you have used row spacing in Step 1, all nozzles directed to that row must be measured to determine the gallons per acre.
5. Check each nozzle to ensure equal spray distribution across the width of the sprayer. Repeat Steps 3 and 4 to ensure that nozzles do not vary more than 10 percent across the width of the sprayer.

Determining Tank Mix

Divide tank refill capacity by the calibrated gallons per acre (determined in Step 4). This is the number of acres the sprayer will cover per refill. Multiply the broadcast rate of insecticide (or band rate) times the acreage per refill to get the amount of insecticide (commercial product) to be put in the tank.

Example 1 – Broadcast Application

A grower will apply Anychem 1 with a broadcast boom having nozzles spaced 20 inches apart while pulling a disk for incorporation.

1. The distance to travel for 20-inch nozzle spacing is 204 feet. Next, measure and flag off 204 feet in the field to be sprayed.
2. Select the desired gear and throttle setting with the disk down. Let's say it takes 20 seconds to cover the 204 feet.
3. Set the pressure to be used and catch the output from one nozzle for 20 seconds (the time required to travel the 204 feet).
4. The output in ounces is the amount applied in gallons per acre. If the nozzle output was 15 ounces in 20 seconds, the sprayer applies 15 gpa.
5. Repeat Step 4 checking each nozzle.

Let's assume you have a 200-gallon tank and wish to apply one pint of Anychem 1 per acre.

$$\frac{200 \text{ gal/refill}}{15 \text{ gpa}} = 13.3 \text{ acres covered per tank (or refill)}$$

Since you wish to use 1 pt/A, you would use 13.3 pints of Anychem 1 per refill; i.e., 1 pt/A × 13.3 acres = 13.3 pints. [See Note in Example 2.]

Example 2 – Band Behind Planter

A grower will apply Anychem 2 behind his planter with a 14-inch spray band on a 38-inch row.

1. The distance to travel for a 38-inch row is 107 feet.
2. Select the planting speed and travel the measured 107 feet with planter down. Let's say it takes 18 seconds in this example.
3. Set the pressure and catch the output from one nozzle for 18 seconds (the time required to travel 107 feet).
4. The output in ounces is the amount applied in gallons per acre. If the nozzle output was 10 ounces in 18 seconds, the sprayer applies 10 gpa. (This is all on a band.)
5. Repeat Step 4 checking each nozzle.

Let's assume a 400-gallon tank (two 200-gallon saddle tanks) refill capacity and the rate of Anychem 2 50W for your soil is 1 pound/A broadcast. Reduce this rate to a 14-inch band.

$$\frac{14'' \text{ band}}{38'' \text{ row}} \times \frac{1 \text{ lb}}{\text{A}} = \frac{0.37 \text{ lb}}{\text{A}} \text{ to be applied on the band}$$

$$\frac{400 \text{ gal/refill}}{10 \text{ gpa}} = 40 \text{ acres per tank refill}$$

$$40 \text{ acres} \times 0.37 \text{ lb/A} = 14.8 \text{ lb of Anychem 2 50W per tank refill}$$

$$(7.4 \text{ pounds in each 200-gallon saddle tank})$$

NOTE: Plan on the amount of water required to refill the tank, not the capacity of the tank itself. For example, if you have the above 200-gallon saddle tanks but you have 50 gallons of spray left in each when you refill, it only takes 300 gallons to refill them.

Therefore:

$$\frac{300 \text{ gal/refill}}{10 \text{ gpa}} = 30 \text{ acres per refill}$$

$$30 \text{ A/refill} \times 0.37 \text{ lb/A} = 11 \text{ lb of Anychem 2 50W per refill}$$

(5.5 pounds in each of the two tanks)

Example 3 – Directed Spray

A grower will apply Anychem 3 + Anychem 4 on a 16-inch band on a 32-inch row using 2 OC-02 nozzles per row (one on each side). **[Step 1]** The distance to travel for a 32-inch row is 127 feet. **[Step 2]** Select speed and drive the 127 feet. Assume it takes 15 seconds. **[Step 3]** Set the pressure and catch each of the two nozzles per row for 15 seconds or time determined in Step 2. **[Step 4]** Add the quantity from the two tips. The amount in ounces is the gallons per acre. Assume 5 ounces per tip for a total of 10; therefore, a 10 gpa output. **[Step 5]** Repeat Step 4 checking the nozzles on each row.

Let's assume two 200-gallon saddle tanks and the broadcast rate is 1 pound Anychem 3 50W + 1 pint Anychem 4 per acre. Reduce the rates for the 16-inch band.

$$16/32 \times 1 \text{ lb} = 1/2 \text{ lb Anychem 3}$$

$$16/32 \times 1 \text{ pt} = 1/2 \text{ pt Anychem 4/A}$$

$$\frac{400 \text{ gal tank capacity}}{10 \text{ gpa}} = 40 \text{ acres per refill}$$

$$40 \text{ acres} \times 1/2 \text{ lb Anychem 3} = 20 \text{ lb Anychem 3}$$

$$40 \text{ acres} \times 1/2 \text{ pt Anychem 4} = 20 \text{ pt Anychem 4}$$

Put 1/2 this amount (10 lb Anychem 3 + 10 pt Anychem 4) in each tank.

Nozzle Selection

Insecticides are best applied with the proper nozzle tip design. A balance must be struck for each application between responsible drift control and acceptable coverage. This balance will change depending on controllable factors like the pesticide formulation, pressure, rate and equipment speed. Nozzle manufacturers have made much advancement in spray technology recently. These advancements have set producers up to be more effective, more efficient and more responsible applicators. Next to calibration and proper tank mixing, nozzle selection is key to proper application.

Nozzle Nomenclature

In addition to a company's name, most nozzle tips are coded with important information – often starting with an abbreviation of a nozzle type, next is usually fan angle, then flow rate and finally the tip material composition.

Example – TeeJet AIXR11002 VS is an air induction (AI), extended range (XR), 110° flat fan, size number 02 (0.2 GPM), color coded (V - ISO color coding system) and stainless steel nozzle (S) that is made by Spray Systems Company.

Tip Materials and Durability

Tips are available in a number of materials. Stainless steel, hardened stainless steel, nylon and ceramics offer the best wear characteristics and are often worth the additional cost, especially when using abrasive products like wettable powders. Plastic tips are now available that are imbedded with more durable materials in key locations. These tips offer the durability of stainless steel or ceramic nozzles at a fraction of the cost.

Common Nozzle Spray Patterns

- **Standard Flat-Fan** – common broadcast nozzle, poor drift control and narrow recommended pressure range. **30-60 psi**
- **Extended Range Flat** – better spray distribution over wider pressure range. Provides some drift control at low pressures (<30 psi). **15-60 psi**
- **Even Flat-Fan** – used to band rows uniformly. Not a broadcast tip. **20-60 psi**
- **Off-Center Flat** – used on boom ends to increase uniformity and width of spray swath. Also used for banding under foliage. **30-115 psi**
- **Twin Orifice Flat** – produces one fan tilted forward and one tilted backward. Improves coverage of contact pesticides but highly drift prone. **30-60 psi**
- **Hollow Cone** – common in directed contact pesticides because of fine spray pattern and excellent coverage. Very drift prone. **40-100 psi**

Many of the listed spray patterns offer excellent coverage of both contact and systemic pesticides. Excellent coverage can come with very small spray droplets known as driftable fines. Nozzle manufacturers have worked hard to maintain desired levels of coverage while reducing economic and environmental damage caused by pesticide drift. This work has produced many options of common spray patterns with added drift control technology from which applicators can select. Applicators should select nozzle options carefully to ensure proper coverage while responsibly controlling driftable fines.

Tips for Balancing Drift Control and Coverage

When wind velocity is too high to be practical, the best solution is to park the sprayer. However, there are approaches to compensate for some wind. Spray droplets should always be as large as possible while still obtaining appropriate coverage. This is particularly true in a high drift potential application. One solution is to change tips. Use a larger tip (i.e., an 8005 instead of an 8003), and lower the spray pressure (i.e., go up on the nozzle size and down on the pressure). Also, consider a wider angle tip such as a 11003 instead of an 8003. This allows the nozzle to be adjusted closer to the ground without changing the width of the spray pattern where it contacts the ground. A more recent option is to change your tip design, such as adding tips with air induction, pre-orifice and/or turbulence chamber technology. Coverage can be improved with drift reduction tips by using tips with multiple nozzles facing different angles across the boom.

Air induction style nozzles emit fewer fines and can be a very good tool to avoid drift potential. Air induction tips are typically not as sensitive to droplet size changes as operating pressures increase. This helps avoid small droplet formations when the sprayer is operating at higher speeds and the flow control is increasing pressure to ensure the correct dosage. Some examples of tips that have air induction capabilities are Greenleaf Technologies Air Mix and TurboDrop series; Hypro's Ultra Low Drift (ULD) and Guardian Air (GA) series; and TeeJet Technologies Air Induction (AI) and Turbo Tee Induction (TTI) series.

Pre-orifices meter the flow of pesticide before it reaches the spray orifice. This produces a larger droplet spectrum and helps to reduce the number of drift-prone fines. Examples of tips using pre-orifice technology include Wilger Industries Small Range (SR), Medium Range (MR) and Drift Reduction (DR) tips; TeeJet Technologies Drift Guard (DG), Air Induction (AI), Turbo Tee (TT), Turbo Tee Induction (TTI) and Air Induction Extended Range (AIXR) series; Hypro's Guardian (GRD) and Guardian Air (GA) series; and Greenleaf Technologies Turbo Drop XL (TDXL) series.

Nozzles that use **turbulence chambers** go one step further. This design uses a pre-orifice to meter the pesticide into the turbulence chamber and then out of the final orifice (often a smaller size). These nozzles are designed to produce a larger droplet with more uniform coverage along the boom. Examples of tips using turbulence chamber technology include Hypro's Guardian (GRD) and Guardian Air (GA) series; TeeJet Technologies Drift Guard (DG) and Turbo Tee (TT) series; and Wilger Industries Small Range (SR), Medium Range (MR), and Drift Reduction (DR) tips.

Twin or duo nozzles facing forward and backward across the boom can increase coverage when using drift control tips. Depending on the manufacturer, these will be two nozzles molded into one body or two separate nozzles plumbed together. If used properly, twin nozzle configuration can improve foliar penetration and coverage while using drift control tips. Examples of twin or duo nozzles are TeeJet Technologies Turbo TeeJet Duo Dual Polymer Nozzle and Greenleaf Technologies TurboDrop Asymmetric DualFan Nozzle.

Quick Reference Guide to Selecting a Nozzle

1. **Read the pesticide label** to find the following information. Some information may not be on the label and should be determined by University of Arkansas Systems Division of Agriculture recommendations or equipment capabilities.

- a. Spray volume (GPA) _____
- b. Droplet classification (for example, coarse) _____
- c. Nozzle type (if listed) _____
- d. Select an appropriate travel speed (mph) _____
- e. Determine boom spacing in inches (W)* _____

2. **Calculate needed nozzle discharge** using the following formula.

$$GPM \text{ (per nozzle)} = \frac{GPA \times mph \times W}{5,940}$$

- *W** – Spray width (inch) for single nozzle, band spraying or boomless spraying.
– For directed spraying, divide row spacing (inch) by the number of nozzles per row.
– If the "W" term is the width of the band, do not worry about converting for bandwidth, it is inclusive.

3. **Consult a nozzle catalog or website** to select a nozzle. Nozzle catalogs will be organized by nozzle type first. Use the information described in this section and the information from the catalog to select a nozzle type. Next, use the recommended droplet classification from the label and the nozzle discharge rate calculated from Step 2 to determine the proper tip size.

Many nozzles may fit your qualifications. Try to find a nozzle that operates at a lower pressure and allows you to operate comfortably in your droplet classification.

4. Once nozzles are installed, do not forget to **recalibrate your sprayer**.

Another way to quickly and easily obtain a nozzle recommendation is to visit a nozzle manufacturer's website and locate their nozzle selection tool. Simply type in the information that has been identified from **Step 1** and the website will generate a list of appropriate nozzles from which you may select. Nozzle manufacturer URLs and their Nozzle Selection Tools URLs are listed on page 8.

Nozzle Resources

Manufacturers of spray nozzles provide a wealth of information about the selection, setup and use of their products in their catalogs. These include such things as hose flow information and nozzle selection guides. Typically, the guides will show setup criteria and give recommendations for contact and systemic differences. It would be impractical to reprint all of that information here. Manuals or catalogs for the specific product you are using can be obtained from dealers. If you cannot locate a personal copy, each county Extension office usually keeps at least one copy of popular brand item catalogs. The more common way is to access this information over the Internet. Several URL listings are included for some of the more popular manufacturers on page 8.

Nozzle and Tip Companies

Greenleaf Technologies

Phone: 800-881-4832

<http://www.greenleaftech.com>

[greenleaftech.com/dynamic.php?pg=Choosing the Right Nozzle/Nozzle Calculator](http://www.greenleaftech.com/dynamic.php?pg=Choosing_the_Right_Nozzle/Nozzle_Calculator)

Pentair Hypro Shurflo

Phone: 800-445-8360

<http://hypro.pentair.com/en/spray-it>

Spray Systems Company - Teejet Technologies

Phone: 630-665-5000

www.teejet.com

Wilger Industries Ltd.

Phone: 877-968-7695 or 731-968-7695

www.wilger.net

<http://www.wilger.net/index.php/tip-wizard>

Sprayer Tank Agitation

The type of pesticide formulation dictates the need for agitation. Soluble liquids, soluble powders and emulsifiable concentrates require little agitation. Usually the flow from the bypass hose maintains a uniform mixture.

Wettable powders and flowable formulations are only in suspension, and they require vigorous agitation to prevent settling out. Many instances can be cited where insufficient agitation has resulted in undesirable responses. Consider the following when examining the need for agitation in application equipment:

- Insufficient agitation can cost more than the entire sprayer costs.
- Running a bypass hose into the tank is not agitation.
- Agitation can be expected to use more pump capacity than the nozzles require.
- Pre-mixing wettable powders will get pesticides into suspension; insufficient agitation allows them to drop out. Continue agitation until all the spray is distributed.

Spray Volumes

In general, spray volumes should be in the 10 to 20 GPA range for most insecticides. For band applications, a volume equivalent to 1/2 gallon per inch of band is sufficient (i.e., 10 GPA on a 20-inch band). Refer to the comments on each insecticide to note any specific application instructions.

Tips for Proper Mixing

1. See that equipment is clean and in good running condition, free of oil, grease or residue.
2. Be sure to have a shut-off valve installed in the bottom of each tank.
3. Use a 16-mesh suction screen to allow chemicals to circulate through the pump.
4. If there is any question about chemical compatibility, do a jar test first.
5. Always follow label instructions about mixtures. In absence of instructions, use the WALE method.
6. Add chemicals in the W-A-L-E sequence.
 - Wettable powders or water dispersible granules
 - Agitation
 - Liquids (flowable liquids)
 - Emulsifiable concentrates
 - Surfactants and solutions
7. Begin with tank 1/4 full of carrier and start agitation until solution is rolling.
8. W – Add all W and WDG chemicals to solution.
9. A – Get good, strong agitation with a rolling effect on the surface of the carrier. Allow time for good dispersal.
10. L – Next add all L or F while continuing to agitate.
11. E – Finally, add all E or EC.
12. Empty the tank as much as possible before mixing a new batch.

Compatibility Test

Since liquid fertilizers can vary, even within the same analysis, always check compatibility with insecticide(s) each time before use. Be especially careful when using complete suspension or fluid fertilizers, as serious compatibility problems are more likely to occur. Commercial application equipment may improve compatibility in some instances. The following test assumes a spray volume of 25 gallons per acre. For other spray volumes, make appropriate changes in the ingredients. Check compatibility using this procedure:

1. Add 1 pint of fertilizer to each of two 1-quart jars with tight lids.
2. To one of the jars, add 1/4 tsp or 1.2 milliliters of a compatibility agent approved for this use, such as Compex or Unite (1/4 tsp is equivalent to 2 pt per 100 gal spray). Shake or stir gently to mix.
3. To both jars, add the appropriate amount of insecticide(s). If more than one insecticide is used, add them separately with dry insecticides first, flowables next and emulsifiable concentrates last. After each addition, shake or stir gently to thoroughly mix. The appropriate amount of insecticides for this test follows.
4. *Dry Insecticides:* For each pound to be applied per acre, add 1.5 level teaspoons to each jar. *Liquid Insecticides:* For each pint to be applied per acre, add 0.5 teaspoon or 2.5 milliliters to each jar.
5. After adding all ingredients, put lids on and tighten. Invert each jar ten times to mix. Let the mixtures stand 15 minutes and then look for separation, large flakes, precipitates, gels, heavy oily film on the jar or other signs of incompatibility. Determine if the compatibility agent is needed in the spray mixture by comparing the two jars. If either mixture separates but can be remixed readily, the mixture can be sprayed as long as good agitation is used. If the mixtures are incompatible, test the following methods of improving compatibility: (A) slurry the dry insecticide(s) in water before addition or (B) add one-half of the compatibility agent to the fertilizer and the other one-half to the emulsifiable concentrate or flowable insecticide before addition to the mixture.

Application Equipment Cleanout

Equipment cleanout is essential to avoid crop injury from a contaminated sprayer. It is particularly important when changing from wettable powders that are more prone to collect in filters, boom and nozzle bodies. Ensure proper clean-out by disassembling, inspecting and cleaning trouble areas when using these products. Also, many growth regulating herbicides can be particularly destructive to sensitive crops even in extremely small concentrations. Ensure proper cleanout by using proper soaking procedures and always refer to product labels for any clarification.

Following the procedures specified on the pesticide or commercial cleaner label is critical to removing pesticide residue from the sprayer system. Consult labels of the products that were previously in the tank and for the products that will be used for the next application for specific cleaning and mixing/loading instructions.

The University of Arkansas System Division of Agriculture recommends a minimum triple rinse for cleanout of all pesticides regardless of label recommendations.

FORMULATIONS AND CONCENTRATIONS

Aerosols (A) – solid or liquid air suspensions of ultramicroscopic size which remain suspended for long periods.

Baits (B) – a poison or poisons plus some substance which will attract the insect.

Dusts (D) – diluted toxicant with finely ground, dried plant materials or minerals. These include wheat, soybean, walnut shells, talc, clay or sulfur.

Emulsifiable Concentrates (E or EC) – insecticide and an emulsifying agent in a suitable solvent. These are diluted with water to form an emulsion and applied as sprays.

Flowable (F)/Liquid (L) – viscous concentrate of suspended pesticide in water.

Fumigant – substance or mixture of substances which produce gas, vapor, fume or smoke intended to destroy insects, bacteria, rodents or other organisms.

Granules (G) – insecticide attached to an inert carrier of 30- to 60-mesh particle size.

Low Volume (LV)/Concentrated Low Volume (CLV)/Ultra Low Volume (ULV) – formulation containing higher concentration of active ingredient per gallon of formulation that results in a lower volume of formulation per unit area.

Pellet (P or PS) – granular formulation where all of the particles are of the same weight and size.

Ready To Use (RTU) – formulation in a form that requires no mixing before use.

Soluble Powder (SP)/Water Soluble Powders (WSP) – powder formulation that dissolves in water.

Solutions (S) – liquid forms of insecticides that are dissolved in suitable solvents such as petroleum distillates or liquid gas. Oil-based cattle sprays, household sprays and gas-propelled aerosols are examples of insecticide solutions.

Suspension Concentrates (SC) or Capsule Suspensions (CS) – particles in suspension.

Water-Dispersible Granules (WDG)/Dry Flowables (DF) – granules of a pesticide formulation that disperse in water to form a spray solution.

Wettable Powders (WP) – dry forms of insecticides in which the toxicant is impregnated or absorbed on powders that can be readily mixed with water because a wetting agent has been added. These form a suspension-type spray that must be kept agitated in a sprayer tank.

TABLE OF WEIGHTS, MEASURES AND DILUTIONS

Weights

28.35 grams = 1 ounce
 16 ounces = 1 pound = 453.6 grams
 1 gallon water = 8.34 pounds
 1 cubic foot water = 62.4 pounds
 1 gallon No. 2 fuel oil = 7 pounds
 1 gallon kerosene = 6.7 pounds

Volume and Liquid Measure

3 teaspoons = 1 tablespoon = 14.8 cc/ml
 2 tablespoons = 1 fluid ounce = 29.6 cc/ml
 8 fluid ounces = 16 tablespoons = 1 cup = 236.6 cc/ml
 2 cups = 32 tablespoons = 1 pint = 473.1 cc/ml
 2 pints = 64 tablespoons = 1 quart = 946.2 cc/ml
 4 quarts = 256 tablespoons = 1 gallon = 3785 cc/ml
 128 fluid ounces = 1 gallon = 3785 cc/ml

Land Measure

16¹/₂ feet = 5¹/₂ yards = 1 rod
 66 feet = 4 rods = 1 chain
 272¹/₄ square feet = 30¹/₄ square yards = 1 square rod
 4356 square feet = 16 square rods = 1 square chain
 43560 square feet = 160 square rods = 1 acre
 43560 square feet = 10 square chains = 1 acre

Length of Row Required for One Acre

Row Spacing

24 inch
 30 inch
 36 inch
 38 inch
 40 inch
 42 inch
 48 inch

Length or Distance

7,260 yards = 21,780 feet
 5,808 yards = 17,424 feet
 4,840 yards = 14,520 feet
 4,585 yards = 13,756 feet
 4,356 yards = 13,068 feet
 4,149 yards = 12,446 feet
 3,630 yards = 10,890 feet

Determining Contents — Standard 55-Gallon Drum

Drum on Side		Drum Upright	
Depth of Liquid in Inches	Volume in Gallons	Depth of Liquid in Inches	Volume in Gallons
1	0.89	1	1.7
2	2.4	2	3.4
3	4.4	3	5.2
4	6.7	4	6.7
5	9.3	5	8.6
6	12.0	6	10.3
7	14.8	7	12.0
8	17.8	8	13.8
9	20.9	9	15.5
10	24.0	10	17.2
11	27.2	11	18.9
12	30.2	12	20.6
13	33.4	13	22.4
14	36.5	14	24.1
15	39.5	15	25.0
16	42.5	16	27.5
17	45.3	17	29.3
18	47.9	18	30.9
19	50.3	19	32.7
19.75	52.0	20	34.4
		21	36.1
		22	37.8
		23	39.6
		24	41.3
		25	43.0
		26	44.8
		27	46.5
		28	48.2
		29	49.9
		30	51.6
		30.19	52.0

Travel Speed Chart

Miles per Hour	Time Required in Seconds to Travel		
	100 Ft	200 Ft	300 Ft
1	68	136	205
2	34	68	102
3	23	46	68
4	17	34	51
5	14	27	41
6	11	23	34
7	10	20	29
8	9	17	26
9	8	15	23
10	7	14	21

1 MPH = 88 feet per minute
1 MPH = 1.466 feet per second
Speed in MPH = $\frac{\text{Distance (ft)} \times 60}{\text{Time (seconds)} \times 88}$

Tables of Dilutions for Liquids and Dusts

1. Equivalent Quantities of Liquid Materials When Mixed by Parts.

Water	Amount of Insecticides for Different Dilutions		
	1-400	1-800*	1-1600
100 gals	1 qt	1 pt	1 cup
50 gals	1 pt	1 cup	1/2 cup
5 gals*	3 T	5 t*	2 1/2 t
1 gal	2 t	1 t	1/2 t

*Example: If a recommendation calls for 1 part of the chemical to 800 parts of water, it would take 5 teaspoonfuls in 5 gallons of water to give 5 gallons of a mixture of 1-800.

2. Backpack or Pump-up Sprayer Quick Calibration Table

The table below gives the amount of insecticide needed to spot spray an area. For example if you want to spray bifenthrin at a rate of 4 fl oz per acre, you would need to add 0.16 oz of product to 1 gallon of water. This table supplies the amount of product you would need per fill-up for your sprayer assuming 25 GPA output.

Rate	Product needed for a 1 gallon sprayer*	Product needed for a 2.5 gallon sprayer*
2 fl oz/A	0.08 oz	0.2 oz
3 fl oz/A	0.12 oz	0.3 oz
4 fl oz/A	0.16 oz	0.4 oz
5 fl oz/A	0.20 oz	0.5 oz
6 fl oz/A	0.24 oz	0.6 oz

*All applications assume output of 25 GPA – foliage sprayed until liquid is running off.

Field Re-Entry Times for Insecticides

TRADE NAME	COMMON NAME	RE-ENTRY PERIOD-HOURS
Admire, Alias, Couraze, Trimax, Axxess, Senator, Concur, Wrangler	imidacloprid	12
AgLogic	aldicarb	48
Agri-Mek, Epi-Mek, Zoro, Abba	abamectin	12
Ambush, Pounce, Perm-Up	permethrin	12
Applaud, Centaur, Courier, Talus	buprofezin	12
Argyle	acetamiprid/bifenthrin	12
Asana XL, Adjourn	esfenvalerate	12
Azatrol, Azatin XL, Neemix	azadirachtin	4
Aztec, Defcon	cyfluthrin/phostebupirim	48
Baythroid XL, Tempo Ultra	beta-cyfluthrin	12
Belay, Poncho, NipsIt	clothianidin	12
Besiege, Voliam Xpress	chlorantraniliprole/lambda-cyhalothrin	24
Bidrin, Dicromax	dicrotophos	6 days
Biobit, Dipel, MVP, Javelin, Agree, XenTari	Bacillus thuringiensis	4
Blackhawk, Tracer, Spintor, Entrust	spinosad	4
Brigade, Capture, Discipline, Fanfare	bifenthrin	12
Brigadier, Swagger	imidacloprid/bifenthrin	12
Carbine, Beleaf	flonicamid	12
Centric, Actara, Cruiser, Platinum	thiamethoxam	12
Cobalt Advanced, Lambdafos	chlorpyrifos/lambda-cyhalothrin	24
Comite, Omite	propargite	2-20 days
Confirm	tebufenozide	4
Cormoran	acetamiprid/novaluron	12
Counter	terbufos	48
Deadline, Metarex, Slug-Fest	metaldehyde	12
Denim	emamectin benzoate	12
Diamond, Rimon	novaluron	12
Dimate, Dimethoate	dimethoate	48
Dimilin, Unforgiven, Durant, Micromite	diflubenzuron	12
Di-Syston	disulfoton	48
Endigo	thiamethoxam/lambda-cyhalothrin	24
Fastac	alpha-cypermethrin	12
Fyfanon, Atrapa	malathion	12
Heligen	nucleopolyhedrovirus	4
Hero	zeta-cypermethrin+bifenthrin	12
Holster	cypermethrin	12

TRADE NAME	COMMON NAME	RE-ENTRY PERIOD-HOURS
Imidan	phosmet	1-14 days
Intrepid Edge	methoxyfenozide/spinetoram	4
Intrepid, Troubador, Invertid, Turnstyle	methoxyfenozide	4
Intruder, Strafer, Assail	acetamiprid	12
Lannate, Lanveer, Nudrin	methomyl	2-7 days
Larvin	thiodicarb	48
Leverage	cyfluthrin/imidacloprid	12
Lindane	lindane	24
Lorsban, Nufos, Warhawk	chlorpyrifos	24
Magister, Magus	fenazaquin	12
Mesurol	methiocarb	24
Mustang Maxx, Respect	zeta-cypermethrin	12
Nurizma	broflanilide	12
Oberon	spiromesifen	12
Orthene, Bracket, Livid	acephate	24
Portal, Fujimite, Tyoga	fenpyroximate	12
PQZ	pyrifluquinazon	12
Prevathon, Altacor, Shenzi, Vantacor	chlorantraniliprole	4
Prolex, Proaxis, Declare	gamma-cyhalothrin	24
Radiant, Delegate, Hemi	spinetoram	4
Regent	fipronil	0
Sefina, Versys	afidopyropen	12
Sevin	carbaryl	12
Sivanto	flupyradifurone	4
Spear-LEP	GS-omega/kappa-Hctx-Hv1a	4
Steward, Avaunt, Comber, Host	indoxacarb	12
Supracide	methadathion	72
Tempo, Tombstone	cyfluthrin	12
Tenchu, Scorpion, Venom	dinotefuran	12
Thimet, Phorate	phorate	48
Thiodan, Thionex	endosulfan	48
Transform, Closer	sulfoxaflor	24
Vendex	fenbutatin oxide	48
Vydate	oxamyl	48
Warrior II, Karate, Silencer, Ravage, Grizzly	lambda-cyhalothrin	24
Zeal, Stifle, Zara	etoxazole	12

COMMON AND TRADE NAMES OF SOME OF THE CHEMICALS MENTIONED IN THIS GUIDE

Common Name	Trade Name	Company	Spray Formulations
abamectin	Varsity, Raid Fire Ant Bait, Zephyr, Agri-Mek, Avid, Epi-Mek, Clinch	Syngenta	0.011% granular bait, 0.15 lb EC, 0.7 SC
	Abba	MANA	0.15 EC
	Abacus	Rotam Agro	0.15 EC
	AbamectinE	Etigra	0.15 EC
	Flora-Mek	Prokoz	0.15 EC
	Reaper	Loveland Products	0.15 EC
	Temprano	Chemtura Corporation	0.15 EC
	Zoro	Cheminova	0.15 EC
acephate	Orthene	Amvac Chemical	15.6% EC, 75 S, 90 S, 97 WDG
	Bracket	Agrilience LLC	90 S, 97 WDG
	Livid Prill	Innvictus Crop Care, LLC	90 DG, 97 DG
acequinocyl	Shuttle	Arysta LifeScience North America Corporation	15.8% SC
acetamiprid	Assail	Cerexagri, Inc., Cerexagri-Nisso LLC	30 SG, 70 WP, 70 WSP
	Intruder	DuPont	70 WSP
	Tristar	Cleary Chemical Corporation	30 SG, 70 WSP
afidopyrofen	Sefina, Versys	BASF	0.42 DC, 0.83 DC
azadirachtin	Azatrol	PBI Gordon Corporation	1.2% EC
	Azatin XL	OHP, Inc.	3.0%
	Debug	Agro Logistics	0.7% EC
	Neemix	Advan LLC	4.5%
	Aza-Direct, Azahar, Ecozin Plus	Gowan Company	1.2%
<i>Bacillus thuringiensis aizawai</i>	Agree WG	Certis USA	WG
	XenTari	Valent U.S.A Corporation	DF
<i>Bacillus thuringiensis israelensis</i>	Gnatrol	Valent U.S.A. Corporation	WDG
<i>Bacillus thuringiensis kurstaki</i>	Crymax WDG, Deliver, Javelin WG	Certis	WDG, WG
	BT Now	BioSafe Systems	
	Dipel ESNT, Biobit HP	Valent U.S.A. Corporation	DF, ES, 10G, WP
	Leptotec	Vestaron	S, WG
	Thuricide	Bonide Products, LLC	SC
beta-cyfluthrin	Tempo	Bayer Crop Science	1% D, 20% WP, 11.8% SC, 10% WP, 10% WSP
	Bayer Advanced Power Force	Bayer Crop Science	0.05% RTU, 0.05% G
	Bayer Advanced Home Pest Control	Bayer Crop Science	0.05% RTU
	Baythroid XL	Bayer Crop Science	1 EC
bifenazate	Floramite	Chemtura Corporation	22.6% SC, 50% WSP
bifenthrin	Capture, Brigade	FMC Corporation	2 EC, 10% WSB, 1.15 G
	Bifenthrin Pro	BASF Specialty Products	7.9% EC
	Home Defense MAX	Ortho	0.115% G
	Bug-B-Gon MAX	Ortho	0.3% EC
	Onyx	FMC Corporation	23.4% EC
	Talstar	FMC Corporation	7.9% F, 0.2% G
	Sniper, Bisect L	Loveland Products	2 EC, 7.9% EC
	Bifenture, UpStar	United Phosphorus, Inc.	2 EC, 0.2% G, 7.9% SC, 10 DF
	Menace	NuFarm	7.9% F
	Tundra	Agrisolutions	2 EC
	Fanfare	MANA	2 EC
	Bifenthrin, Empower2	Helena	2 EC
	Discipline	Amvac Chemical	2 EC

Common Name

buprofezin

carbaryl

chlorantraniliprole

chlorantraniliprole + bifenthrin

chlorantraniliprole + lambda-cyhalothrin

chlorpyrifos

chlorpyrifos + lambda-cyhalothrin

chlorpyrifos-methyl + deltamethrin

clofentazine

clothianidin

coumaphos

cyantraniliprole

cyfluthrin

cyfluthrin + tebupirimfos

cypermethrin

cyromazine

deltamethrin

Trade Name

Talus

Applaud, Centaur, Courier

Sevin

Altacor, Coragen, Prevathon, Dermacor, Vantacor

Shenzi

Elevest

Besiege, Voliam Xpress

CPF

Lorsban, Dursban, Hatchet

Eraser

Govern

Pilot

Vulcan

Cobalt Advanced

Storcide II

Ovation

Celero, Arena

Poncho

Belay, Clutch, NipsIt Inside

Co-Ral, Checkmite

Fortenza

Renounce, Tempo

Decathlon

Bayer Advanced Power Force

Tombstone

Aztec

Defcon

Battery

Cyper G-Ag

Cypermethrin

Holster

UP-Cyde

Citation

Battalion

Centynal

Chipco Choice

Chipco FireStar

MaxForce

DeltaDust

DeltaGard, Suspend

Over 'n Out!

Top Choice

Delta Gold

Shooter

Suspend

Company

SePRO Corporation

Nichino America

Bayer Crop Science, Prokoz, Loveland Products

FMC Corporation

UPL

FMC Corporation

Syngenta

Direct Ag Source, LLC

Corteva, Gowan Company

Independent Agribusiness Professionals

Tenkoz, Inc.

Gharda Chemicals LTD

Makhteshim-Agan of North America

Corteva

Bayer CropScience

Scotts-Sierra Crop Protection Company

Arysta LifeScience North America

Bayer Crop Science

Valent U.S.A. Corporation

Bayer Crop Science

Syngenta Crop Protection

Bayer Crop Science

OHP, Inc.

Bayer Crop Science

Loveland Products

Bayer Crop Science, Amvac Chemical

Helena

Agrilience LLC

Direct Ag Source, LLC

Tenkoz, Inc.

Loveland Products

United Phosphorus, Inc.

Syngenta Professional Products

Arysta LifeScience North America

Wellmark International

Bayer Crop Science

Bayer Crop Science

Bayer Crop Science

Bayer Crop Science

Bayer Crop Science

GardenTech

Bayer Crop Science

AgriSolutions

Arysta LifeScience

Bayer Crop Science

Spray Formulations

40%

70 DF, 70 WDG, 3.6 SC

XLR, 4 lb EC, 80 S and 50% WP, 20% B

35 WG, 1.67 SC, 0.43 SC

400SC and 700WG

2.22 SC

1.252 SC

4 lb EC, 15% G

4 lb EC, 2 lb EC, 15% G, 50 W

4 lb EC

4 lb EC

4 lb EC, 15G

2.5% G

2.11 EC

42% SC

16% WSG, 0.25% G, 0.5% G, 50% WDG

5 F

2.13 EC, 50 WDG, 5 F

4% pour on, 1 lb EC, 25% WP, 5 D

5 FS

20 WP

20 WP

0.75% EC

2 EC

2.1 G, 4.67 G

2.1 G

2.5 EC

2.5 EC

2.5 EC

2.5 EC

2.5 EC, 2.0 EC

75% WSP

0.5 EC, 1.5 EC

0.42 EC

0.1% G

0.00015% granular bait

0.01% bait station (BS), 0.1% BS, 0.05% BS,

0.0001% gel bait (GB), 0.05% GB

0.05% D

0.1% G, 4.75% SC

0.0103% G

0.0143% G

1.5 EC

0.05 EC

0.42 SC

COMMON AND TRADE NAMES OF SOME OF THE CHEMICALS MENTIONED IN THIS GUIDE

Common Name	Trade Name	Company	Spray Formulations
diazinon	Spectracide	Syngenta	4 and 2 lb EC, 50% WP, 14 G
dichlorvos	DDVP, Vapona	Fermenta Animal Health	4 lb EC, 1.6 lb EC
dicrotofos	Bidrin	Amvac Chemical	8 lb EC
dicrotofos + bifenthrin	BidrinXP II	Amvac Chemical	4 lb + 1 lb EC
diflubenzuron	Dimilin	Chemtura Corporation	25 W, 2 L, 4 L
dimethoate	Dimate	AgriLiance LLC	4 E
	Dimethoate	Arysta LifeScience, Drexel, Helena, Loveland Products, Gowan, Britz	2.67 EC, 4 EC
dinotefuran	Safari, Venom	Valent U.S.A. Corporation Professional Products	20% SG
	Tenchu	Mitsui Chemicals Agro	20% SG
emamectin benzoate	Denim	Syngenta	0.16 lb EC
endosulfan	Thiodan, Endosulfan	UCP, Drexel	3 lb EC
	Thionex	Makhteshim-Agan of North America	3 EC, 50 WP
esfenvalerate	Asana XL	Valent	1.9 lb EC, 0.66 lb EC
	Adjourn	MANA	0.66 EC
	S-FenvaloStar	LG International	0.66 EC
ethioprop	Mocap	Bayer Crop Science	10, 15 and 20 G, 6 EC
etoxazole	TetraSan, Zeal	Valent U.S.A. Corporation Professional Products	5% WDG, 70 WSP
famphur	Famophos, Warbex	BASF	1% D, 13.2% ready-mix
fenazaquin	Magister, Magus	Gowan Company	1.6 SC
fenbutatin-oxide	Vendex	DuPont	50% WP, 4 L
fenpropathrin	Tame	Valent U.S.A. Corporation	2.4 EC
fenpyroximate	Portal, Fujimite	Nichino America	5 EC
	Tyoga	Sipcam Agro USA	0.42 EC
fipronil	Regent	BASF	4 SC
flupyradifurone	Sivanto	Bayer Crop Science	1.67 SL
gamma-cyhalothrin	Proaxis	UAP-Loveland Products, Inc., TENKOZ, Inc.	0.5 lb
	Prolex	UAP-Loveland Products, Inc., TENKOZ, Inc.	1.5 lb
	Declare	Cheminova	1.5 lb
GS-omega/kappa-Hctx-Hv1a	Spear-LEP	Vestaron Corporation	0.17 L
hexythiazox	Hexygon	Gowan Company	50% DF
hydramethylnon	Amdro, Amdro Pro Fire Ant Bait	BASF	0.73% granular bait
imidacloprid	Provado, Admire, Trimax Pro, Gaucho	Bayer Crop Science	1.6 F, 2 F, 4.44 F, 4 F
	Alias, Pasada	MANA	2 F, 4 F, 75 WSB
	Couraze	Cheminova	1.6 F, 2 F, 4 F
	Prey, Sherpa, Widow, Wrangler	Loveland Products	1.6 F, 2 F, 4 F
	Advise, Concur	AgriSolutions	2 F, 4 F

Common Name	Trade Name	Company	Spray Formulations
imidacloprid	Imida ImiGold Nuprid, Senator Axxess	Etigra United Phosphorus, Inc. NuFarm BASF	1.6 F, 2 F, 4 F, 5 F 0.5 G, 2 F, 70 DF 1.6 F, 2 F, 4.6 F, 4 F, 5 FS 5 FS
indoxacarb	Steward, Avaunt Advion, Provaunt	FMC Corporation DuPont Professional Products	1.25 lb SC, 30% DG 0.045% bait, 0.05% bait, 0.1% bait, 0.22% bait, 0.6% gel, 30% DG 0.016% bait
lambda-cyhalothrin	Spectracide Fire Ant Killer Plus Preventer Bait Once & Done Comber, Host Battle Scimitar, Lamcap Spectracide Triazicide Once & Done Jitzu Karate Z, Warrior Z Kendo Grizzly Z, Taiga Z, Mystic Z Helena Lambda, Lambda-T Kaiso, Lambda-Cyhalothrin Lambda-Cy LambdaStar Silencer, Paradigm	Spectrum Brands, Inc. Sharda USA, LLC Lesco Syngenta Professional Products Spectrum Brands, Inc. Fuzion Technologies, LLC Syngenta Helm Agro US Agrisolutions Helena NuFarm United Phosphorus, Inc. LG International MANA	30 DG, 1.25 EC 9.7% EC 9.7% EC, 1 CS 0.002% RTU, 0.1% G, 0.25% EC 1 EC 2.08 CS, 1 CS 1 EC, 9.7 CS 1 CS, 2.08 CS 2.08 CS, 1 CS 24 WG, 1 EC 1 EC 1 EC 1 EC
lindane	Kwell Shampoo	Various (FDA regulated)	1% shampoo (by prescription only)
malathion	Malathion, Fyfanon	Cheminova, Helena, Gowan, Arysta	5 lb EC, 8 lb EC, 5% D, 6% D, 25% WP
metaldehyde	Slug and snail bait, Deadline	Several companies	Snarol pellets, etc.
methiocarb	Mesurol	Bayer Corporation	2% ready-to-use bait, 75% WP
methomyl	Lannate	DuPont	1.8 lb EC, 90% WS powder, 2.4 LV
methoxyfenozide	Intrepid	Corteva Agriscience	2.0 lb F
methoxyfenozide + spinetoram	Intrepid Edge	Corteva Agriscience	3 F
neem oil	Triact	OHP, Inc.	70%
novaluron	Pedestal, Rimon Diamond	Chemtura Corporation MANA	0.83 SC 0.83 EC
nucleopolyhedrovirus	Heligen	AgRiTech, LLC	50% SC
oxamyl	Vydate C, CLV	Corteva Agriscience	2 EC, 3.77 EC
permethrin	Ambush, Ectiban Astro, Pounce Atroban Permethrin II Permethrin Pro Perm-Up Arctic	Amvac Chemical FMC Corporation Cooper Chemical Company Anchor Chemical Company Micro Flo Company United Phosphorus, Inc. AgriSolutions	2 lb EC, 5.7% EC, 25 W 36.8% EC, 3.2 EC, 25 WP, 1.5 G 11% EC, ear tag 10% EC 36.8% EC 25% WP, 36.8% EC 3.2 EC
phorate	Thimet, Phorate	BASF, AgriSolutions	15% G, 20% G
phosmet	Imidan	Gowan Corporation	50 WP
pirimiphos-methyl	Actellic	Syngenta	5 E
propargite	Comite, Omite	Uniroyal/Crompton Corporation	6.55 and 6.0 EC, 30% W

COMMON AND TRADE NAMES OF SOME OF THE CHEMICALS MENTIONED IN THIS GUIDE

Common Name	Trade Name	Company	Spray Formulations
propoxur	Invader	FMC Corporation	1%
pymetrozine	Endeavor	Syngenta Professional Products	50% WDG
pyrethrins + rotenone	Pyrellin E.C.	Webb Wright Corporation	0.6% + 0.5% EC
pyriproxyfen	Distance, Esteem, Spectracide Fire Ant Bait	Valent U.S.A. Corporation	0.5%, 0.5% and 0.05% granular bait
S-methoprene	Extinguish Fire Ant Bait	Zoecon	0.5% granular bait
silicon dioxide (diatomaceous earth)	Diacon	Wellmark International	0.8% D, 2.5 SC
	Insecto	Natural Insecto Products, Inc.	90% D
	Dryacide	WinField Solutions	88.25% D
spinetoram	Radiant, Delegate	Corteva Agriscience	1 SC, 25 WG
spinosad	Conserve	Corteva Agriscience	11.6% SC
	Contain, Sensat	Bayer CropScience	8.66%
	Tracer, Spintor, Blackhawk, Success, Entrust	Corteva Agriscience	4 L, 2 L
spiromesifen	Oberon	Bayer Crop Science	2 SC, 4 SC
	Judo	OHP, Inc.	45.2%
sulfoxaflor	Closer, Transform	Corteva Agriscience	2 SC, 50 WG
tebufenozide	Confirm	Corteva Agriscience	2 F
tefluthrin	Force	Syngenta, Amvac Chemical	3 G
temephos	Abate	BASF	4 lb EC, 5% CG, 2% CG, 1% SG, 15 G
terbufos	Counter	BASF, Amvac	20 G, 15 G
tetrachlorvinphos	Rabon, Ravap	Fermenta Animal Health Company	75% WP, 50% WP, 3% D, 23% EC
thiamethoxam	Centric, Actara, Meridian, Cruiser	Syngenta	25% WG, 40% WG, 0.33% G, 5 FS
	Flagship, Optigard	Syngenta Professional Products	0.22% G, 25% WG, 0.01% gel, 2 SC
	Warden CX	Winfield Solutions	1.9 FS
thiamethoxam + chlorantraniliprole	Voliam Flexi	Syngenta	40 WG
thiamethoxam + lambda-cyhalothrin	Endigo	Syngenta	2.06 ZC
thiodicarb	Larvin	Bayer Crop Science	3.2 lb F
trichlorfon	Dipterex, Dylox, Neguvon, Proxol	Bayer Crop Science	80% SP, 4 lb LS
zeta-cypermethrin	Mustang Maxx	FMC Corporation	0.8 EC
	Respect	BASF	0.8 EC
zeta-cypermethrin + bifenthrin	Hero	FMC Corporation	1.24 EC

B = Bait
 CG = Concentrate granules
 CS = Capsule suspension
 D = Dust
 DC = Dispersable concentrate
 DF = Dry flowable
 DG = Water dispersible granules

E = Emulsifiable concentrate
 EC = Emulsifiable concentrate
 F = Flowable
 G = Granules
 L = Liquid
 LS = Liquid soluble
 LV = Low volatile

RTU = Ready to use
 S = Solution
 SC = Suspension concentrate
 SG = Soluble granules
 SP = Soluble powder
 W = Wettable powder
 WDG = Wettable dispersible granules

WDL = Water dispersible liquid
 WG = Water dispersible granules
 WP = Wettable powder
 WSB = Water soluble bags
 WSG = Water soluble granules
 WSP = Water soluble packet
 ZC = Zeon capsule technology

NAMES, CLASSIFICATION, AND TOXICITY OF INSECTICIDES

The following chart will help you identify specific pesticides and give you an indication of their toxicities, as well as their mode of action (IRAC code).

Names — Each generally used name of each pesticide is listed alphabetically in the left-hand column of the chart. Synonyms in general usage are listed in the next column opposite each entry. Trade names are indicated by the superscript “[®]”; they should be capitalized. Other names are usually not capitalized.

Classes — Most insecticides are classified chemically as:

Class	Primary Site of Action	IRAC CODE	Class	Primary Site of Action	IRAC CODE
Car. = carbamate	Acetylcholinesterase inhibitor	1A	B = bacterial origin	Insect midgut membranes	11A, 11B
OP = organophosphate	Acetylcholinesterase inhibitor	1B	PRO = propargite	ATP synthase inhibitors	12C
OC = organochlorines	GABA-gated chloride channel antagonists	2A	IGR = insect growth regulator	Chitin synthesis inhibitors	15, 16, 17, 18
PP = phenylpyrazoles	GABA-gated chloride channel antagonists	2B	METI= Meti-acaricides/insecticides	Mitochondrial complex inhibitors	21A
SyP = synthetic pyrethroids	Sodium channel modulators	3A	OX = oxadiazine	Sodium channel blocker	22A
NEO = neonicotinoids	Nicotinic acetylcholine receptor	4A	TET= tetronic & tetramic acid derivatives	Acetyl CoA carboxylase inhibitor	23
SX = sulfoximines	Nicotinic acetylcholine receptor agonist	4C	Phos. = phosphine	Mitochondrial inhibitors	24A
BU = butenolides	Nicotinic acetylcholine receptor agonist	4D	DM = diamides	Ryanodine receptor	28
SP = spinosyns	Nicotinic acetylcholine receptor activator	5	FL = flonicamid	Chordotonal organ inhibitors	29
AV = avermectins	Chloride channel modulators	6	MDM = meta-diamides	Gaba-gated chloride channel	30
JH = juvenile hormone	Juvenile hormone mimic	7A	NPV= nucleopolyhedrovirus	Baculoviruses	31
PAD= pyridine azomethine derivatives	Chordotonal organ	9B	GSO=GS-omega/kappa HXTX-Hv1a	Nicotinic ACH modulator	32
Pyr=pyropenes	Chordotonal organ	9D	MISC = chemistry unclear	Uncertain mode of action	UN
ET = etoxazole	Mite growth inhibitors	10B	MD = mechanical disruptors	Non-specific mechanical/physical disruption	UNM

Toxicity Categories and LD₅₀ Values — When registering pesticides, the Environmental Protection Agency uses acute LD₅₀ values to determine the toxicity category and words or symbols that must be placed on the label. For this purpose, the test animals are usually rats, mice, or rabbits, but other mammals are sometimes used.

Toxicity Category	Signal Words Required On Label by EPA	ORAL LD ₅₀ (mg/kg)	DERMAL LD ₅₀ (mg/kg) 24-Hr. Exposure	Probable Lethal Oral Dose For Adult Humans
I. Highly Toxic	DANGER, POISON, Plus Skull & Crossbones Symbol	0 to 50	0 to 200	A few drops to 1 t
II. Moderately Toxic	WARNING	50 to 500	50 to 2,000	1 t to 2 T
III. Slightly Toxic	CAUTION	500 to 5,000	2,000 to 20,000	1 oz to 1 pt (1 lb)
IV. Low Toxicity	CAUTION	5,000	20,000	1 pt (1 lb) or more

The LD₅₀ is the dosage of the chemical at which one-half of the test animals are killed. It is based on the bodyweight of the animal and is expressed in milligrams of the chemical per kilogram of animal (mg/kg). A mg/kg is equivalent to 1 ppm. The lower the LD₅₀ value, the higher the toxicity. Although most reported LD₅₀ values are for technical material or actual toxicant, they are based on formulated products in some instances. All of these in the charts are for the technical material unless otherwise indicated. The toxicity categories given in the following charts are based on available data and are not necessarily the toxicity categories that would be assigned by EPA for the specific pesticides. Formulated pesticides usually have a higher LD₅₀ than the technical material and may not fall in the same toxicity category as the technical material.

The usual ways of administering chemicals are oral (by mouth), dermal (applied to the skin), and inhalation. Inhalation toxicity is expressed as LC₅₀ (lethal concentration). It is not as generally used as the other two.

Toxicity may be either acute or chronic. Acute refers to rather quick action from a single exposure, while chronic refers to the toxic effect of many exposures over a period of time.

INSECTICIDES

Insecticide Names	Other Names	Class	Toxicity Category	IRAC Code	Acute LD ₅₀ Values for White Rats	
					ORAL (mg/kg)	DERMAL (mg/kg)
Abacus*	abamectin, Agri-Mek*, Abba*, AbamectinE*, Flora-Mek*, Reaper*, Temprano*, Zoro*, Clinch*	AV	II	6	300	>1800
abamectin	Agri-Mek*, Abba*, Abacus*, AbamectinE*, Flora-Mek*, Reaper*, Temprano*, Zoro*, Clinch*	AV	II	6	300	>1800
Abate*	temephos	OP	III	1B	8600-13,000	>4000
Abba*	abamectin, Agri-Mek*, Abacus*, AbamectinE*, Flora-Mek*, Reaper*, Temprano, Zoro*, Clinch*	AV	II	6	300	>1800
acephate	Orthene*, Bracket*, Livid*	OP	III	1B	866-945	>10,250 (rabbit)
acetamiprid	Intruder*, Assail*, TriStar*, Strafer*, Anarchy*, ArVida*	NEO	III	4A	1,064	>2000
Actara*	thiamethoxam, Cruiser*, Centric*, Flagship*, Meridian*, Platinum*	NEO	III	4A	>5000	>2000
Actellic*	pirimiphos-methyl, Actellifog*	OP	III	1B	>2000	>4592
Adjourn*	esfenvalerate, Asana XL*, S-FenvaloStar*, Zyrate*	SyP	II	3A	458	>2000
Admire*	imidacloprid, Provado*, Merit*, Gaucho*, Advise*, Couraze*	NEO	III	4A	4,350	>5050 (rabbit)
Advantage*	imidacloprid	NEO	III	4A	1732-1943	>2000
afidopyrophen	Sefina	Pyr	III	9D	>2000	>5000
AgLogic*	aldicarb	Car.	I	1A	0.93	<5.0 (rabbit)
Agri-Mek*	abamectin, Epi-Mek*, Abacus*, AbamectinE*, Flora-Mek*, Reaper*, Temprano*, Zoro*, Abba*, Clinch*	AV	II	6	300	>1800
aldicarb	AgLogic*	Car.	I	1A	0.93	<5.0 (rabbit)
allethrin	Pynamin*	SyP	III	3A	680-1000	>11,200
alpha-cypermethrin	Fastac*	SyP	III	3	210-1050	>5000
Altacor*	chlolantraniliprole, Coragen*, Prevathon*, Dermacor*, GrubEx*, Acelepryn*, Altriset*, Vantacor, Shenzi*	DM	II	28	98.11	>5000
Alias*	imidacloprid, Admire*, Provado*, Merit*, Couraze*, Prey*, Sherpa*, Widow*, Wrangler*, Pasada*, Advise*, Imida*, ImiGold*, Nuprid*	NEO	III	4A	4350	>5050 (rabbit)
Altosid*	methoprene, Diacon*	JH	III	7A	>34,600	>3,000 (rabbit)
Aluminum Phosphide*	Phostoxin*, Gastoxin*, Fumitoxin*, Weevil-Cide*, Killz-All*	Phos.	I	24A	20	
Ambush*	permethrin, Pounce*, Arctic*, Perm-Up*	SyP	II	3A	430-4000	>4000
Amdro*	hydramethylnon	IGR	III	20A	>5000	>2000 (rabbit)
Applaud*	buprofezin, Talus*, Centaur*, Courier*	IGR	III	16	>5000	>2000
Arctic*	permethrin, Pounce*, Ambush*, Perm-Up*	SyP	II	3A	430-4000	>4000
arprocarb	Baygon*, propoxur	Car.	II	1A	128	800-1000
Asana XL*	esfenvalerate, Adjourn*, S-FenvaloStar*, Zyrate*	SyP	II	3A	458	>2000
Assail*	acetamiprid, Intruder*, TriStar*, Strafer*, Anarchy*, ArVida*	NEO	III	4A	1064	>2000
Atroban*	permethrin	SyP	II	3A	>4000	>4000
azadirachtin	Azatrol*, Azatin XL*, Neemix*, Azahar*, Ecozin Plus*, Debug*, Ornazin*	MISC	IV	UN	>5000	>2000
Azahar*	azadirachtin, Azatrol*, Azatin*, Neemix*, Ecozin*, Debug*, Ornazin*	MISC	IV	UN	>5000	>2000
Azatrol*	azadirachtin, Azahar*, Azatin*, Neemix*, Ecozin*, Debug*, Ornazin*	MISC	IV	UN	>5000	>2000
Aztec*	cyfluthrin + tebupirimfos, Defcon*	SyP + OP	I	3A + 1B	1.3	
<i>Bacillus thuringiensis</i> var. <i>aizawai</i>	Agree*, Xentari*	B	IV	11A	>5000	>2000 (rabbit)
<i>Bacillus thuringiensis</i> var. <i>kurstaki</i>	Dipel*, Thuricide*, Biobit*, Crymax*, Deliver*, Javelin*, Leprotec*	B	IV	11A	Non-toxic to mammals	
<i>Bacillus thuringiensis</i> var. <i>israelensis</i>	Bti*, Bactomos*, Gnatrol*	B	IV	11A	Non-toxic to mammals	
Battalion*	deltamethrin, DeltaDust*, DeltaGard*, DeltaGold*, Shooter*, Decis*, Over 'n Out!*, TopChoice*, Chipco Choice*, Maxforce*, Centynal*, Chipco Firestar*, Suspend*	Syp	I	3A	42.9	>2000

INSECTICIDES

Insecticide Names	Other Names	Class	Toxicity Category	IRAC Code	Acute LD ₅₀ Values for White Rats	
					ORAL (mg/kg)	DERMAL (mg/kg)
Battery*	cypermethrin, UP-Cyde*,Cyper G*, Holster*	SyP	I	3A	257	>2000
Baygon*	propoxur, arprocarb	Car.	II	1A	128	800-1000
Baythroid XL*	beta-cyfluthrin, Tempo Ultra*	SyP	III	3A	647	>2000
Belay*	clothianidin, Poncho*, NipsIt Inside*, Crossfire*	NEO	III	4A	3044	>5000
Beleaf*	flonicamid, Carbine*, Aria*	FL	II	29	>2000	>2000
Besiege*	chlorantraniliprole + lambda-cyhalothrin, Voliam Xpress*	DM + SyP	III	28 + 3A	180	>2000
beta-cyfluthrin	Baythroid XL*, Tempo Ultra*	SyP	I	3A	647	>5000
Bidrin*	dicrotophos, Inject-A-Cide B*, Dicromax*	OP	I	1B	17-22	224 (rabbit)
Bidrin XP II*	dicrotophos + bifenthrin	OP + SyP	I	1B + 3A	17-22	224 (rabbit)
bifenthrin	Bifenture*, Bisect*, Sniper*, UpStar*, Menace*, Tundra*, Capture*, Talstar*, Brigade*, Fanfare*, Discipline*	SyP	II	3A	375	>2000 (rabbit)
Bifenture*	bifenthrin, Bisect*, Sniper*, UpStar*, Menace*, Tundra*, Capture*, Talstar*, Brigade*, Fanfare*, Discipline*	SyP	II	3A	375	>2000 (rabbit)
Bisect*	bifenthrin, Bifenture*, Sniper*, UpStar*, Menace*, Tundra*, Capture*, Talstar*, Brigade*, Fanfare*, Discipline*	SyP	II	3A	375	>2000 (rabbit)
Blackhawk*	spinosad, Tracer*, Spinto*, Success*, Entrust*, Sensat*, Execute*, Consero*, Contain*	SP	IV	5	5000	>5000
Bracket*	acephate, Orthene*, Livid*	OP	III	1B	866-945	>10,250 (rabbit)
Brigadier*	bifenthrin + imidacloprid	SyP + NEO	II	3A + 4A	175	>5000
broflanilide	Nurizma*	MDM	II	30	>2000	>5000
buprofezin	Applaud*, Talus*, Centaur*, Courier*	IGR	III	16	>5000	>2000
Capture*	bifenthrin, Talstar*, Brigade*, Discipline*, Fanfare*, Tundra*, Talstar*, Bisect*, Sniper*	SyP	II	3A	275	>2000 (rabbit)
carbaryl	Sevin*	Car.	III	1A	246-283	4000
Carbine*	flonicamid, Beleaf*, Aria*	FL	II	29	>2000	>2000
Centric*	thiamethoxam, Cruiser*, Actara*, Flagship*, Meridian*, Platinum*	NEO	III	4A	>5000	>2000
chlorantraniliprole	Altacor*, Coragen*, Prevathon*, Dermacor*, GrubEx*, Acelepryn*, Altriset*, Vantacor*, Shenzi*	DM	II	28	98.11	>5000
chlorpyrifos	Dursban*, Lorsban*, Hatchet*, , Eraser*, Govern*, Pilo*, CPF*, Vulcan*, Pyrofos*	OP	II	1B	97-276	2000 (rabbit)
chlorpyrifos-methyl + deltamethrin	Storcide II*	OP + SyP	II	1B + 3A	150	>5000
Clinch*	abamectin, Agri-Mek*, Avid, Epi-Mek*, Zephyr*	AV	II	6	300	>1800
Closer*	sulfoxaflor, Transform*	SX	IV	4C	>2000	>4000
clothianidin	Poncho*, Belay*, NipsIt Inside*, Arena*, Crossfire*	NEO	III	4A	3044	>5000
Cobalt*	chlorpyrifos + lambda-cyhalothrin, Lambdafos*	OP + SyP	II	1B + 3A	97-276	>2000
Comite*	propargite, Omite*	PRO	I	12C	600	>5000
Confirm*	tebufenozide	IGR	IV	18	5000	>5000
Consero*	spinosad, Tracer*, Spintor*, Success*, Entrust*, Sensat*, Execute*, Blackhawk*, Contain*	SP	IV	5	5000	>5000
Contain*	spinosad, Tracer*, Spintor*, Success*, Entrust*, Sensat*, Execute*, Blackhawk*, Consero*	SP	IV	5	5000	>5000
Coragen*	chlorantraniliprole, Altacor*, Prevathon*, Dermacor*, GrubEx*, Acelepryn*, Altriset*	DM	II	28	98.11	>5000
Co-Ral*	coumaphos	OP	I	1B	15.5-41	860
coumaphos	Co-Ral*	OP	I	1B	15.5-41	860
Counter*	terbufos	OP	I	1B	4.5-9.0	1.1 (rabbit)
Couraze*	imidacloprid, Provado*, Admire*, Merit*, Alias*, Prey*, Sherpa*, Widow*, Wrangler*, Imida*, Advise*, Pasada*, ImiGold*, Nuprid*	NEO	III	4A	4350	>5050 (rabbit)
Cruiser*	thiamethoxam, Centric*, Warden*, Seed Shield*, Adage*	NEO	III	4A	>5000	>2000
cyantraniliprole	Fortenza, Exirel, Verimark	DM	III	28	>5000	>5000
cyfluthrin	Tombstone*, Decathlon*, Renounce*, Tempo*, Optashield*,	SyP	I	3A	1015	>2000 (rabbit)
cyfluthrin + tebupirimfos	Aztez*, Defcon*	SyP + OP	I	3A + 1B	1.3	
Cymbush*	cypermethrin, Holster, Battery*, UP-Cyde*	SyP	I	3A	247	>2000
cypermethrin	Cymbush*, Battery*, UP-Cyde*, Cyper G*, Holster*	SyP	I	3A	247	>2000

Insecticide Names	Other Names	Class	Toxicity Category	IRAC Code	Acute LD ₅₀ Values for White Rats	
					ORAL (mg/kg)	DERMAL (mg/kg)
cyromazine	Larvadex*	IGR	IV	17	3387	>3100
DDVP*	dichlorvos, dichlorphos, Vapona*	OP	I	1B	56-80	75-107
Decathlon*	cyfluthrin, Tombstone*, Renounce*, Tempo*, Optashield*	SyP	I	3A	1015	>2000 (rabbit)
Declare*	gamma-cyhalothrin, Proaxis*, Prolex*	SyP	III	3A	2250-2646	>5000
Defcon*	cyfluthrin + tebupirimfos, Aztec*	SyP + OP	I	3A + 1B	1.3	
Delegate*	Radiant*, spinetoram	SP	IV	5	>5000	>5000
deltamethrin	DeltaDust*, DeltaGard*, Delta Gold*, Shooter*, Over 'n Out!*, Battalion*, Top Choice*, Maxforce*, Chipco Choice*, Centynal*, Chipco FireStar*, Decis*, Suspend*	SyP	I	3A	42.9	>2000
Demon*	cypermethrin	SyP	I	3A	247	>2000
Denim*	emamectin benzoate	AV	I	6	2950	>2000 (rabbit)
Diacon*	S-methoprene*	IGR	III	7A	>34,600	>3000 (rabbit)
Diamond*	novaluron, Pedestal*, Rimon*	IGR	III	15	3914	8,000 (rabbit)
Diazinon*	Spectracide*, Dryzon*	OP	II, III	1B	300-400	3600 (rabbit)
Dibrom*	naled	OP	I	1B	430	1100 (rabbit)
dichlorvos	dichlorphos, Vapona*, DDVP*	OP	I	1B	56-80	75-107
Dicromax*	Bidrin*, dicrotophos, Inject-A-Cide B*	OP	I	1B	17-22	224 (rabbit)
dicrotophos	Bidrin*, Inject-A-Cide B*, Dicromax*	OP	I	1B	17-22	224 (rabbit)
diflubenzuron	Dimilin*, Durant*, Micromite*, Unforgiven*	IGR	III	15	4540	
dimethoate	Dimate*, Dimethoate*	OP	II	1B	215	400-610
Dimilin*	diflubenzuron, Durant*, Micromite*, Unforgiven*	IGR	III	15	4540	
dinotefuran	Tenchu*, Certador, Safari, Scorpion, Venom	NEO	IV	4A	>2000	>2000
Dipel ESNT*	<i>Bacillus thuringiensis</i>	B	IV	11	Non-toxic to mammals	
Dipterex*	Dylox*, trichlorfon, Neguvon*, Anthion*, Proxol*, GX-130*	OP	III	1B	560-630	2000
Dragnet*	permethrin	SyP	I-III	3A	430-4000	>4000
Dryacide*	Insecto*, silicon dioxide, diatomaceous earth	MD	IV	UNM		
Dursban*	chlorpyrifos, Lorsban*	OP	II	1B	97-276	2000 (rabbit)
Dylox*	trichlorfon, Dipterex*, Neguvon*, Proxol*	OP	II	1B	560-630	>2000
Ectiban*	permethrin	SyP	II	3A	4000	>4000
Endigo*	thiamethoxam + lambda-cyhalothrin	NEO + SyP	II	4A + 3A	310.2	>2000
endosulfan	Thionex*	OC	I	2A	30-110	359 (rabbit)
Entrust*	spinosad, Tracer*, Spintor*, Success*, Consero*, Sensat*, Execute*, Blackhawk*, Contain*	SP	IV	5	5000	>5000
Epi-Mek*	abamectin, Agri-Mek*, Abba*, Abacus*, AbamectinE*, Flora-Mek*, Reaper*, Temprano*, Zoro*, Clinch*	AV	II	6	300	>1800
Eraser*	chlorpyrifos, Lorsban*, Pilot*, Govern*, CPF*, Vulcan*	OP	II	1B	97-276	2000 (rabbit)
esfenvalerate	Asana XL*, Adjourn*, S-FenvalStar*	SyP	II	3A	458	>2000 (rabbit)
etoxazole	Zeal*, Zara*, Stifle	ET	III	10B	>5000	>5000
Execute*	spinosad, Tracer*, Spintor*, Success*, Consero*, Sensat*, Entrust*, Blackhawk*, Contain*	SP	IV	5	5000	>5000
famphur	Warbex*	OP	I	1B	35-62	1460-5093 (rabbit)
Fastac*	alpha-cypermethrin	SyP	III	3	210-1050	>5000
fenpyroximate	Portal*, Fujimite*, Tyoga*	METI	III	21A	810	>5000
fipronil	Regent*, Termidor*	PP	II	2B	336	382 (rabbit)
flonicamid	Carbine*, Beleaf*, Aria*	FL	II	29	>2000	>2000
Flora-Mek*	abamectin, Agri-Mek*, Abba*, Abacus*, AbamectinE*, Epi-Mek*, Reaper*, Temprano*, Zoro*, Clinch*	AV	II	6	300	>1800
flupyradifurone	Sivanto*	BU	III	4D	>2000	>2000
Fumitoxin*	aluminum phosphide, Phostoxin*	Phos.	I	24A	20	
gamma-cyhalothrin	Proaxis*, Prolex*, Declare*	SyP	III	3A	2250-2646	>5000
Gaucho*	imidacloprid	NEO	III	4A	609	>2000

INSECTICIDES

Insecticide Names	Other Names	Class	Toxicity Category	IRAC Code	Acute LD ₅₀ Values for White Rats	
					ORAL (mg/kg)	DERMAL (mg/kg)
Govern*	chlorpyrifos, Lorsban*, Pilot*, Eraser*	OP	II	1B	97-276	2000 (rabbit)
Grizzly*	lambda-cyhalothrin, Karate*, Silencer*, Kendo*, Jitzo*, Paradigm*, Lamcap*, Warrior*	SyP	II	3A	180	>2000
GS-omega/kappa-HXTX-Hv1a	Spear-LEP*	GSO	III	32	>5000	>5000
Hatchet*	chlorpyrifos, Dursban*, Lorsban*	OP	II	1B	97-276	>2000 (rabbit)
Heligen	nucleopolyhedrovirus	NPV	III	31	>4000	>4000
Holster	cypermethrin, Battery*, UP-Cyde*, Cyper G*	SyP	II	3A	247	>2000
hydramethylnon	Amdro*	MISC	III	20A	>5000	>2000 (rabbit)
Imida*	imidacloprid, Provado*, Alias*, Couraze*	NEO	III	4A	4350	>5050 (rabbit)
imidacloprid	Admire*, Provado*, Gaucho*, Merit*, Alias*, Couraze*, Imidacloprid*, Prey*, Sherpa*, Widow*, Wrangler*, Pasada*, Advise*, Imida*, ImiGold*, Nuprid*, Axxess*, Concur*, Sativa IM*, Senator*	NEO	III	4A	4350	>5050 (rabbit)
Imidan*	phosmet	OP	II	1B	147-316	>4640 (rabbit)
ImiGold*	imidacloprid, Provado*, Imida*, Alias*	NEO	III	4A	4350	>5050 (rabbit)
indoxacarb	Steward*, Avaunt*, Comber*, Host*	OX	III	22A	268	>5000
Insecto*	diatomaceous earth, Dryacide*, silicon dioxide	MD	IV	UNM		
Intrepid*	Methoxyfenozide, Invertid*, Troubador*, Turnstyle*	IGR	IV	18A	>5000	>2000
Intrepid Edge*	methoxyfenozide + spinetoram	IGR + SP	IV	18A + 5	>5000	>2000
Intruder*	acetamiprid, Assail*, Strafer*, Anarchy*, ArVida*	NEO	III	4A	1064	>2000
Ivermectin*	Ivomec*	AV		6		
Ivomec*	Ivermectin*	AV		6		
Javelin*	<i>Bacillus thuringiensis</i>	B	IV	11	Non-toxic to mammals	
Kaiso*	lambda-cyhalothrin, Karate*, Silencer*, Kendo*, Jitzo*, Paradigm*, Lamcap*, Warrior*	SyP	II	3A	180	>2000
Karate*	lambda-cyhalothrin, Silencer*, Warrior*, Kendo*, Jitzo*, Paradigm*, Lamcap*	SyP	II	3A	180	>2000
lambda-cyhalothrin	Karate*, Silencer*, Warrior*, Battle, Scimitar*, Grizzly*, Kendo*, Taiga*, Mystic*, Helena lambda*, Lambda-T*, Kaiso*, Lamcap*, Lambda-Cyhalothrin*, Lambda-Cy*, LambdaStar*, Paradigm*	SyP	II	3A	180	>2000
LambdaStar*	lambda-cyhalothrin, Karate*, Silencer*, Warrior*	SyP	II	3A	180	>2000
Lambda-T*	lambda-cyhalothrin, Karate*, Silencer*, Warrior*	SyP	II	3A	180	>2000
Lannate*	methomyl, Nudrin*, Lanveer*	Car.	I	1A	17-24	>5880 (rabbit)
Larvadex*	cyromazine	IGR	IV	17	3387	>3100
Larvin*	thiodicarb	Car.	II	1A	66-120	>2000 (rabbit)
Leverage 360*	beta-cyfluthrin + imidacloprid	SyP + NEO	III	3A + 4A	>1044	>2000
lindane	gamma isomer of BHC	OC	II	2A	88-125	1000
Lorsban*	chlorpyrifos, Dursban*, Nufos*, Warhawk*, Whirlwind*, Hatchet*, Yuma*, Eraser*, Pilot*, Govern*, CPF*, Vulcan*	OP	II	1B	97-276	2000 (rabbit)
malathion	Fyfanon*	OP	III	1B	1000-1375	4100 (rabbit)
Menace*	bifenthrin	SyP	II	3A	375	>2000 (rabbit)
Merit*	imidacloprid, Admire*, Alias*, Couraze*, Trimax*, Provado*, Prey*, Sherpa*, Widow*, Wrangler*	NEO	III	4A	4350	>5050 (rabbit)
MesuroI*	methiocarb, Slug-Geta*, Bug-Geta*	Car.	II		10-130	5000 (rabbit)
Metaldehyde*	Slug and snail bait, Deadline*, Durham Metaldahyde*, Metarex*, Slug-Fest*	MISC	II, III		630	
methiocarb	MesuroI*	Car.	II		10-130	5000 (rabbit)
methomyl	Lannate*, Nudrin*, Lanveer*	Car.	I	1A	17-24	5880 (rabbit)
methoprene	Altosid*, Diacon*	IGR	III	7A	>34,600	>3000 (rabbit)
methoxyfenozide	Intrepid*, Argyle, Invertid, Troubador, Turnstyle, Vexer	IGR	IV	18A	>5000	>2000
methoxyfenozide + spinetoram	Intrepid Edge*	IGR + SP	IV	18A + 5	>5000	>2000
Mustang Maxx*	zeta-cypermethrin, Respect*	SyP	I	3A	106	>5000
Mystic Z*	lambda-cyhalothrin, Karate*, Silencer*, Warrior*	SyP	II	3A	180	>2000
naled	Dibrom*	OP	II	1B	430	1100 (rabbit)

Insecticide Names	Other Names	Class	Toxicity Category	IRAC Code	Acute LD ₅₀ Values for White Rats	
					ORAL (mg/kg)	DERMAL (mg/kg)
Neguvon*	trichlorfon, Dipterox*, Dylox*, GX-130*, Proxol*	OP	III	1B	560-630	>2000
NipsIt Inside*	clothianidin, Poncho*, Belay*, Arena*, Crossfire*	NEO	III	4A	3044	>5000
novaluron	Diamond*, Pedestal*, Rimon*, Mayhem*	IGR	III	15	3914	8000 (rabbit)
nucleopolyhedrovirus	Heligen	NPV	III	31	>4000	>4000
Nuprid*	imidacloprid, Provado*, Alias*, Couraze*	NEO	III	4A	4350	>5050 (rabbit)
Nurizma*	broflanilide	MDM	II	30	>2000	>5000
Oberon*	spiromesifen	TET	III	23	>2000	>4000
Omite*	propargite, Comite*	MISC	III	12C	2200	
Orthene*	acephate, Bracket*, Livid*	OP	III	1B	866-945	>2000 (rabbit)
Overtime*	permethrin	SyP	II	3A	4000	4000
oxamyl	Vydate*, ReTurn	Car.	I	1A	5.4	37
paradichlorobenzene	PDB*	OC	III		500-5000	2000 (rabbit)
PDB*	paradichlorobenzene	OC	III		500-5000	2000 (rabbit)
Permethrin II*	permethrin	SyP	II	3A	430-4000	>4000
permethrin	Ambush*, Atroban*, Overtime*, Permethrin II*, Ectiban*, Pounce*, Astro*, Arctic*, Perm-Up*	SyP	II	3A	430-4000	>4000
phorate	Thimet*	OP	I	1A	2-4	20-30 (guinea pig)
phosmet	Imidan*	OP	II	1B	147-316	>4640 (rabbit)
phostoxin	aluminum phosphide, Weevil-Cide*	Phos.	I	24A	20	
Pilot*	chlorpyrifos, Lorsban*, Eraser*, Nufos*, Warhawk*, Whirlwind*	OP	II	1A	97-276	2000 (rabbit)
piperonyl butoxide	Butacide*, Incite*, Exponent*, PBO-8*	MISC	III		>7500	
Poncho*	clothianidin, Belay*, Arena*, NipsIt Inside*, Crossfire*	NEO	III	4A	3044	>5000
Portal*	fenproximate, Fujimite*, Tyoga*	METI	III	21	810-1004	>5000
Pounce*	permethrin	SyP	I	3A	439-4000	>4000
PQZ	pyrifluquinazon	PAD	III	9B	2000	>2000
Premise*	imidacloprid	NEO	III	4A	4143-4870	>2000
Prey*	imidacloprid, Admire*, Alias*, Provado*, Merit*, Couraze*, Sherpa*, Widow*, Wrangler*	NEO	III	4A	4350	>5050 (rabbit)
Proaxis*	gamma-cyhalothrin, Prolex*, Declare*	SyP	III	3A	2250-2646	>5000
Prolex*	gamma-cyhalothrin, Proaxis*, Declare*	SyP	III	3A	2250-2646	>5000
propargite	Omite*, Comite*	Phos.	III	12C	220-600	>5000
propoxur	Baygon*, arprocarb	Car.	II	1A	128	800-1000
Provado*	imidacloprid, Admire*, Gaucho*, Merit*, Alias*, Couraze*, Prey*, Sherpa*, Widow*, Wrangler*	NEO	III	4A	4350	>5050 (rabbit)
Proxol*	trichlorfon, Dylox*	OP	III	1B	560-630	>2000
pyrethrins	pyrethrum	Pyr.	III	3A	1500	>1800
pyrethrum	pyrethrins	Pyr.	III	3A	1500	>1800
pyrifluquinazon	PQZ	PAD	III	9B	2000	>2000
Rabon*	tetrachlorvinphos, Ravap*	OP	III	1B	4000-5000	>2500 (rabbit)
Radiant*	spinetoram, Delegate*, Hemi*	SP	IV	5	>5000	>5000
Ravap*	tetrachlorvinphos, Rabon*	OP	III	1B	4000-5000	>2500 (rabbit)
Regent*	fipronil	PP	II	2B	336	382 (rabbit)
resmethrin	Chryson*, Synthrin*	Pyr.	III	3A	4240	2500 (rabbit)
Sefina	afidopyropen	Pyr.	III	9D	>2000	>5000
Sensat*	spinosad, Tracer*, Spintor*, Success*, Consero*, Execute*, Entrust*, Blackhawk*, Contain*	SP	IV	5	5000	>5000
Sevin*	carbaryl	Car.	III	1A	246-283	4000
S-FenvaloStar*	esfenvalorate, Asana XL*, Adjourn*	SyP	II	3A	458	>2000
Shenzi*	chlorantraniliprole, Coragen*, Prevathon*, Vantacor*	DM	II	28	98.11	>5000
Sherpa	imidacloprid, Admire*, Alias*, Provado*, Merit*, Couraze*, Prey*, Widow*, Wrangler*	NEO	III	4A	4350	>5050 (rabbit)
silicon dioxide	Insecto*, Dryacide*, diatomaceous earth	MD	IV	UNM		
Sivanto*	flupyradifurone	BU	III	4D	>2000	>2000

INSECTICIDES

Insecticide Names	Other Names	Class	Toxicity Category	IRAC Code	Acute LD ₅₀ Values for White Rats	
					ORAL (mg/kg)	DERMAL (mg/kg)
Sniper*	bifenthrin, Brigade*, Discipline*, Fanfare*	SyP	II	3A	347	>2000 (rabbit)
Spectracide*	diazinon	OP	II, III	1B	300-400	3600 (rabbit)
spinetoram	Radiant*, Delegate*, Hemi*	SP	IV	5	>5000	>5000
spinosad	Tracer*, Spintor*, Blackhawk*, Success*, Contain*, Sensat*, Entrust*, Execute*, Consero*	SP	IV	5	5000	>5000
Spintor*	spinosad, Tracer*, Blackhawk*, Success*, Contain*, Sensat*, Entrust*, Execute*, Consero*	SP	IV	5	5000	>5000
spiromesifen	Oberon*, Forbid, Savate	TET	III	23	>2000	>4000
Steward*	indoxacarb	OX	III	22A	268	>5000
Storcide II*	chlorpyrifos-methyl + deltamethrin	OP + SyP	II	1B + 3A	150	>5000
Strafer*	acetamiprid, Assail*, Intruder*, Anarchy*, ArVida*	NEO	III	4A	1064	>2000
Success*	spinosad, Tracer*, Spintor*, Blackhawk*, Contain*, Sensat*, Entrust*, Execute*, Consero*	SP	IV	5	5000	>5000
sulfoxaflor	Closer, Transform	SX	IV	4C	>2000	>4000
Tactic*	amitraz	MISC	II	19	400	>1600
Talstar*	bifenthrin	SyP	II	3A	375	>2000 (rabbit)
Tame*	Danitol*, fenpropathrin	SyP	I	3A	68	
tebufenozide	Confirm*, Mach II*	IGR	IV	18A	5000	>5000
temephos	Abate*	OP	III	1B	8600-13,000	>4000
Tempo*	cyfluthrin, Decathlon*, Renounce*, Tombstone*	SyP	I	3A	1015	>2000 (rabbit)
Tempo Ultra*	beta-cyfluthrin, Baythroid XL*	SyP	III	3A	647	>2000
Tenchu*	dinotefuron, Certador, Safari, Scorpion, Venom	NEO	IV	4A	>2000	>2000
terbufos	Counter*	OP	I	1B	4.5-9.0	1.1 (rabbit)
tetrachlorvinphos	Rabon*	OP	III	1B	4000-5000	>2500 (rabbit)
thiamethoxam	Centric*, Cruiser*, Actara*, Platinum*	NEO	III	4A	>5000	>2000
Thimet*	phorate	OP	I	1B	204	20-30 (guinea pig)
thiodicarb	Larvin*	Car.	II	1A	66-120	>2000 (rabbit)
Thionex*	endosulfan	OC	I	2A	30-110	359 (rabbit)
Tombstone*	cyfluthrin, Decathlon*, Renounce*, Tempo*	SyP	I	3A	1015	>2000 (rabbit)
Torpedo*	permethrin	SyP	II	3A	430-4000	>4000
Tourizmo*	flubendiamide + buprofezin, Vetica*	DM + IGR	III	28 + 16	<2000	>2000
Tracer*	spinosad, Spintor*, Sensat*, Contain*, Conserve*, Entrust*, Blackhawk*, Consero*, Success*	SP	IV	5	5000	>5000
Transform	Closer*, sulfoxaflor	SX	IV	4C	>2000	>4000
trichlorfon	Dylox*, Dipterex*, Neguvon*	OP	III	1B	560-630	>2000
Tundra*	bifenthrin	SyP	II	3A	347	>2000 (rabbit)
UP-Cyde*	cypermethrin, Battery*, Cyper G*, Holster*	SyP	I	3A	247	>2000
UpStar*	bifenthrin	SyP	II	3A	347	>2000 (rabbit)
Vantacor*	chlorantraniliprole, Prevathon*, Shenzi*, Coragen*	DM	II	28	98.11	>5000
Vapona*	dichlorphos, DDVP*, dichlorvos	OP	I	1B	80	107
Vendex*	fenbutatin-oxide	MISC	I	12B	2631	>2000
Vetica*	flubendiamide + buprofezin, Tourizmo*	DM + IGR	III	28 + 16	<2000	>2000
Vydate*	oxamyl, ReTurn	Car.	I	1A	5.4	37
Warbex*	famphur	OP	I	1B	35-62	1460-5093 (rabbit)
Wrangler*	imidacloprid, Admire*, Alias*, Provado*, Merit*, Couraze*, Prey*, Sherpa*, Widow*	NEO	III	4A	4350	>5050 (rabbit)
Yuma*	chlorpyrifos, Lorsban*, Whirlwind*, Warhawk*, Hatchet*, Dursban*	OP	II	1B	97-276	>2000 (rabbit)
Zeal*	etoxazole, Stifle*, Zara*	ET	III	10B	>5000	>5000
zeta-cypermethrin	Mustang*, Mustang Maxx*, Respect*	SyP	II	3A	106	>5000
Zoro*	abamectin, Agri-Mek*, Epi-Mek*, Abacus*, AbamectinE*, Flora-Mek*, Temprano*, Reaper*, Abba*, Clinch*	AV	II	6	300	>1800

Ecological Characteristics of Some Agricultural Insecticides Commonly Used in Arkansas

Insecticide (common name)	Relative Toxicity ^a to:		
	Fish	Birds	Bees
abamectin (Agri-Mek)	VH	VL	VH
acephate (Orthene)	VL	M	H
acetamiprid (Assail, Intruder, Strafer)		M	M
afidopyropen (Sefina)	VH	L	L
aldicarb (AgLogic)	M	VH	VL
azadirachtinw	H	NT	VL
<i>Bacillus thuringiensis</i> (DiPel)	NT	NT	NT
bifenthrin (Brigade)	M	L	VH
buprofezine (Applaud)		VL	L
carbaryl (Sevin)	VH	H	VH
chlorantraniliprole (Prevathon, Coragen, Vantacor)		VL	VH
chlorpyrifos (Lorsban-Dursban)	VH	H	H
chlorpyrifos-methyl/deltamethrin (Storcide II)	H	VL	VH
chlothianidin (Belay, Poncho)	H	L	H
cyfluthrin (Tempo, Tombstone)	VH	L	VH
cypermethrin (Holster)	VH	VL	VH
deltamethrin (Battalion, Centynal, Suspend)	VH	H	VH
dicrotophos (Bidrin)	M	VH	VH
diflubenzuron (Dimilin)	VL	VL	NT
dimethoate (Cygon)	M	H	M
dindotefuran (Tenchu)		L	H
endosulfan (Thionex)	VH	H	M
esfenvalerate (Adjourn, Asana)	VH	H	L
etoxazole (Stifle, Zeal, Zara)		VL	VL
fenpropathrin (Danitol)	VH	M	VH
fenpyroximate (Portal)		VL	L
fipronil (Regent)		L	VH
flonicamid (Carbine)	VL	L	L
flupyradifurone (Altus, Sivanto)	H		L
imidacloprid (Trimax, Admire, Alias, etc.)		L	M
indoxacarb (Steward)		M	H
lambda-cyhalothrin (Warrior, Grizzly)	VH	L	VH
malathion	M	H	H
metaldehyde (Deadline)		H	L
methiocarb (Mesurol)		H	H
methomyl (Lannate, Nudrin)	M	H	H
methoxyfenozide (Intrepid)	M	L	L
novaluron (Diamond)		L	M
oxamyl (Vydate)	M	VH	VH
permethrin (Ambush, Pounce, etc.)	VH	H	L
phorate (Thimet)	VH	VH	VL
phosmet (Imidan)	VH	VH	VL
pirimifos-methyl (Actellic)		H	VH
propargite (Comite)	VH	L	L
spinetoram (Delegate, Radiant)	M	VL	VH
spinosad (Blackhawk, Entrust, Tracer, Spintor)	L	L	VH
spiromesifen (Oberon)			L
tebufenozide (Confirm)	M	L	L
tefluthrin	VH	H	L
terbufos (Counter)	VH	M	H
thiamethoxam (Centric, Cruiser)		L	H
thiodicarb (Larvin)	M	M	L

^aVL=very low; L=low; M=moderate; H=high; VH=very high; NT=no evidence of acute or chronic toxicity.

TRADE NAMES OF GENERIC INSECTICIDES

Active Ingredient	Trade Names
abamectin	Abba, Abacus, AbamectinE, Agri-Mek, Averland, Avid, Clinch, Enterik, Epi-Mek, Flora-Mek, Reaper, Temprano, Varsity, Zephyr, Zoro
acephate	Acephate, Bracket, Orthene, Avatar, Livid
acetamiprid	Assail, Intruder, Tristar, Strafer, Anarchy, ArVida
<i>Bacillus thuringiensis</i>	Agree, Biobit, BT Now, Crymax, Deliver, Dipel, Javelin, Leptotec, PHT Bt, Thuricide, XenTari
beta-cyfluthrin	Baythroid XL, Cryptoid XL, Sultrus, Tempo Ultra, Tirade Ultra
bifenthrin	Bifenthrin AG, Bifenture, Bisect, Brigade, Capture, Discipline, Empower, Fanfare, Menace, Onyx, Sniper, Talstar, Tundra, UpStar, Wisdom
buprofezin	Applaud, Centaur, Courier, Talus
chlorantraniliprole	Coragen, Prevathon, Vantacor, Shenzi
chlorpyrifos	Chlorpyrifos, Govern, Hatchet, Lock-On, Lorsban, Eraser, Pilot, CPF, Vulcan
chlothianidin	Belay, Clutch, Ponco, NipsIt Inside, Arena
cyfluthrin	Decathalon, Renounce, Tempo, Tombstone, Sultrus
cypermethrin	Battery, Cypermethrin, Mustang, UP-Cyde, Cyper-G, Holster
deltamethrin	Chipco Choice, Chipco Firestar, DeltaDust, DeltaGard, Delta Gold, Over 'n Out, Shooter, Top Choice, Battalion, Centynal, Suspend
dicrotophos	Bidrin, Dicromax
diflubenzuron	Dimilin, Durant, Micromite, Unforgiven
esfenvalerate	Adjourn, Asana XL, S-Fenvalostar, Zyrate
etoxazole	Beethoven, Eschaton, Inntervene, Stifle, TetraSan, Zamdia, Zara, Zeal
fenproximate	Fujimite, Portal, Tyoga
gamma-cyhalothrin	Declare, Proaxis, Prolex
lambda-cyhalothrin	Battle, Grizzly, Helena Lambda, Kaiso, Karate, Karate Z, Lambda T, Lambda-Cy, Lambda-Cyhalothrin, LambdaStar, Mystic Z, Silencer, Taiga Z, Warrior II, Warrior Z, Kendo, Jitzu, Lamcap, Paradigm, Province, Ravage, Ballista
imidacloprid	Admire, Advise, Advise Max, Alias, Couraze, Couraze Max, Imida E, Imidacloprid, ImiGold, Macho, Merit, Montana, Nuprid, Pasada, Prey, Provado, Provoke, S-Cloprid, Sherpa, Trimax Pro, Widow, Wrangler, Zenith
indoxacarb	Avaunt, Comber, Host, Steward
malathion	Fyfanon, Malathion
metaldehyde	Deadline, Metarex, Slug-Fest
methomyl	Lannate, Lanveer, Nudrin
methoxyfenozide	Intrepid, Troubadour, Turnstyle, Vexer
novaluron	Diamond, Rimon
permethrin	Actroban, Ambush, Arctic, Astro, Ectiban, Permethrin, Permethrin, Perm-UP, Pounce
pyriproxyfen	Distance, Esteem, Knack, Seize
silicon dioxide	Insecto, Dryacide, Diatomaceous Earth
spinetoram	Delegate, Radiant, Hemi
spinosad	Blackhawk, Conserve, Entrust, SpinTor, Success, Tracer, Contain, Sensat
thiamethoxam	Actara, Centric, Cruiser, Hub, Platinum
zeta-cypermethrin	Cortes Maxx, Mustang Maxx, Respect

PROTECTING POLLINATORS FROM PESTICIDES

- Apply pesticides only when and where necessary. Use Integrated Pest Management, incorporating cultural, mechanical, and biological control methods wherever possible.
- Read and follow all product label instructions and requirements. Pay particular attention to the label precautions that indicate specific hazards to bees and other pollinators.
- Be aware of any bee hives in the area that could be affected by application. When spraying is necessary, notify beekeepers in advance, so that they can adequately protect bee hives.
- Use ground equipment instead of aircraft, especially near bee hives.

- Avoid application to crops in bloom where possible. If application is necessary, apply when bees are least likely to be actively foraging (after 3 p.m.).
- Reduce drift and avoid spraying onto non-target areas, including adjacent vegetation that may contain flowers attractive to bees.
- Where possible, leave a border of untreated vegetation between treated areas and areas where wildlife may be present.
- Store and dispose of all pesticides properly.
- If more than one pesticide can provide control, choose the least toxic product and formulation available.

Arkansas Pollinator Stewardship Program

This program seeks to minimize economic loss for both farmers and beekeepers by adequately managing row crop pests while minimizing impact of pesticides on honey bee colonies.

Cooperation and communication is encouraged among beekeepers, farmers and pesticide applicators.

The presence of the yellow and black Bee Aware flags will help to clearly identify locations where honey bees are located near crop areas.

For more information about this program or to obtain flags, contact:

Jon Zawislak, UA Extension Apiculturist
(501) 671-2222, jzawislak@uada.edu

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**MORE
HAZARDOUS
FOR BEES**



**LESS
HAZARDOUS
FOR BEES**

Insecticidal Dusts

- particles cling to bees with pollen grains, may be carried back to the hive and stored with food

ULV Formulations

- highly concentrated, dangerous to bees

Wettable Powders

- often have longer residual activity than other spray formulations; longer REI for humans typically results in greater hazard for bees

Emulsifiable Concentrates

- usually have shorter residual toxicity for bees than wettable powders, safer for bees

Water Soluble Compounds

- generally safest type of spray, dries quickly leaving little residue to be picked up by bees; fine sprays are less dangerous than coarse droplets

Granules

- safest formulation for bees, not always suitable for all pest control situations

RELATIVE TOXICITY OF PESTICIDES TO HONEYBEES

Group 1 – HIGHLY TOXIC. Severe bee losses should be expected if the following pesticides are used when bees are present, if the product is applied near bee hives or if bees forage in the application area within a day after treatment.

Abamectin (Avermectin, Agri-Mek)	Deltamethrin (Battalion, Centynal)	Indoxacarb (Steward, Avaunt)	Phosmet (Imidan)
Acephate (Orthene)	Diazinon (Diazinon, Spectracide)	Lambda-cyhalothrin (Karate, Silencer, Warrior, Voliam)	Pyrethrin
Aldicarb (AgLogic)	Dicrctophos (Bidrin)	Malathion (Fyfanon, Malathion, Cythion)	Pyridaben Pyridaben (Nexter, Pyramite, Sanmite)
Alpha-cypermethrin (Fastac)	Dimethoate (Dimate)	Methidathion (Supracide)	Resmethrin (Scourge)
Azinphos-methly (Guthion)	Dinotefuran (Safari)	Methiocarb (Mesurol)	Sabadilla (Veratran-D)
Beta-cyfluthrin (Baythroid XL, Tempo, Leverage)	Emamectin benzoate (Denim)	Methomyl (Lannate, Nudrin)	Sulfoxaflor (Transform, Closer)
Bifenthrin (Brigade, Capture, Discipline)	Esfenvalerate (Asana XL, Adjourn)	Methoprene	Thiamethoxam (Actara, Adage, Centric, Endigo, Platinum, Voliam)
Carbaryl (Sevin)	Fenpropathrin (Danitol, Tame)	Methyl parathion (Penncap-M)	Zeta-cypermethrin (Mustang Maxx, Hero, Stallion)
Carbofuran (Furadan)	Fipronil (Regent, Taurus)	Naled (Dibrom, Trumpet)	
Chlorpyrifos (Dursban, Lorsban, Warhawk)	Gamma-cyhalothrin (Declare, Proaxis)	Oxamyl (Vydate)	
Clothianidin (Belay, Poncho)	Imidacloprid (Admire, Advise, Alias, Brigadier, Couraze, Merit, Pasada, Provado, Trimax, Wrangler)	Permethrin (Ambush, Pounce)	
Cyfluthrin (Decathlon, Tombstone, Tempo)		Phorate (Thimet)	
Cypermethrin (Holster, Cymbush)			

Group 2 – MODERATELY TOXIC. These pesticides can be used in the vicinity of bees as long as dosage, timing, method of application and conditions are correct. These products should NEVER be applied directly on bees in the field or near bee colony locations (apiaries). Apply late in evening, at night, or early morning if blooming plants are present.

Acetamiprid (Assail, Intruder, Strafer)	Cyromazine (Trigard)	Horticultural oil (Superior, Dormant, Summer)	Spirotetramat (Movento)
Azadirachtin (Aza-Direct, Azera, Neemix, Ecozin)	Diatomaceous earth	Novaluron (Diamond)	Temephos (Abate)
<i>Beauveria bassiana</i> (Mycotrol, Botaniguard)	Disulfoton (Di-Syston)	Primicarb	Terbufos (Counter)
Bifenazate (Acramite, Floramite)	Endosulfan (Thionex)	Pymetrozine (Fulfill)	Thiacloprid (Calypso)
Chlorfenapyr (Phantom, Pylon)	Ethoprop (Mocap)	Pyrethrum	Thiodicarb (Larvin)
Copper hydroxide (Kocide)(FUNGICIDE)	Fluvalinate (Mavrik)	Spinetoram (Radiant)	
Coumphaos (Co-Ral)	Glyphosate (Roundup)	Spinosad (Blackhawk, Spintor, Tracer)	

Group 3 – RELATIVELY NONTOXIC. These pesticides can generally be used around bees with a minimum of injury provided that dosage, timing, and method are correct. NEVER apply pesticides directly to bee hives.

Acaricides, Diseases, IGRs and Insecticides

Aldoxycarb (Standak)	Clofentezine (Apollo)	Lime sulfur	Spiromesifen (Oberon)
Amitraz (Mitac)	Diflubenzuron (Dimlin)	Metaldehyde bait (<i>MOLLUSCIDE</i>)	Tebufenozide (Confirm)
<i>Bacillus thuringiensis</i> (Bt, Agree, Biotrol, Javelin, Thurcide)	Etoazole (Zeal)	Methoxyfenozide (Intrepid)	
<i>Bacillus subtilis</i> (Rhapsody, Serenade, Cease)	Fenbutatin-oxide (Vendex)	<i>Nosema locustae</i> fungus (Canning)	
Calcium Polysulfide (Lime Sulfur, Sulforix)	Fenproximate (Akari, Fujimite)	Nucleopolyhedrovirus (Heligen)	
Chlorantraniliprole (Altacor, Coragen, Grubex Prevathon)	Fonicamid (Carbine, Beleaf)	Progargite (Comite, Omite)	
	Hexythiazox (Onager, Savey)	Pyriproxyfen (Esteem, Knack)	
	Kaolin Clay (Surround)	Rotenone	

RELATIVE TOXICITY OF PESTICIDES TO HONEYBEES

Group 3 — RELATIVELY NONTOXIC. These pesticides can generally be used around bees with a minimum of injury provided that dosage, timing, and method are correct. NEVER apply pesticides directly to bee hives.

Fungicides

Acibenzolar-S-methyl (Actigard)	Cyrodinil (Switch, Vanguard WP)	Mefenoxam (Maxim, Ridomil)	Tetraconazole (Mettle)
Aluminum tris O-ethyl phosphonate (Alliette, Fosetyl-Al)	Difenoconazole (Inspire, Quadrus, Revus)	Metconazole (Quash)	Thiophanate-methyl (Topsin-M)
Azoxystrobin (Abound, Quadris)	Dodine (Syllit)	Metrafenone (Vivando)	Thiram (Arasan, Mercuram, Nonersan, Thiramad)
Benomyl (Benlate)	Fenarimol (Bloc, Rimidin, Rubigan, Vintage)	Myclobutanil (Rally, Sonoma)	Trifloxystrobin (Flint, Stratego, Compass)
Bordeaux mixture	Fenbuconazole (Indar)	Nabam (Parzate)	Triflumizole (Procure)
Boscalid (Endura, Pristine)	Fenhexamid (Elevate 50 WDG)	Penthiopyrad (Fontelis)	Triphenyltin hydroxide (Super Tin)
Calcium Polysulfide (Lime Sulfur, Sulfurix)	Fluazinam (Omega 500F)	Potassium bicarbonate (MilStop, Greencure, Kaligreen)	Ziram (Vancide)
Captan (Captan, Captec, Captevate)	Fludioxonil (Switch)	Propiconazole (Propicure, Quilt, Tilt)	Zoxamide (Gavel, Zing)
Chlorothalonil (Bravo, Echo)	Fluopicolide (Presidio)	Pyraclostrobin (Cabrio, Pristine)	
Copper 8-quinolate	Fluopyram (Luna)	Pyrimethanil (Luna, Scala)	
Copper sulfate—monohydrated	Iprodione (Rovral)	Quinoxifen (Quintec)	
Cuprous oxide	Kresoxim methyl (Sovran)	<i>Streptomyces lydicus</i> (Actinovate)	
Cyflufenamid (Miltrex, Torino)	Mancozeb (Dithane, Gavel, Manzate, Penncozeb, Ridomil Gold MZ)	Tebuconazole (Adament, Luna, Orius)	
Cymoxanil (Curzate 60DF, Tanos)	Maneb (Manzate)	Sulfur (various)	

Herbicides, Defoliants, Desiccants and PGRs

2,4-D	Cyhalofop-butyl (Clincher)	Fluthiacet-methyl (Athem, Cadet)	Prometryn (Caparol)
2,4-DB (Butyrac)	Dicamba (Banvel)	Foramsulfuron (Option)	Pronamide (Kerb)
Acetochlor	Dichlobenil (Casoron)	Imazapyr (Arsenal)	Propanil (Stam F-34)
Alachlor (Lasso)	Diflufenzopyr (Distinct)	Imazamox (Raptor)	Quinclorac (Facet)
Ammonium sulfate	EPTC (Eptam)	Isoxaflutole (Balance)	S-metolachlor (Dual)
Atrazine (Aatrex)	Ethephon (Prep)	Linuron (Lorox)	Simazine (Princep)
Bentazon (Basagran)	Ethalfuralin (Sonalan)	MCPA (Bonide)	Sodium chlorate (Defol)
Bromacil (Hyvar)	Flufenacet (Axiom DF)	Metribuzin (Sencor, Cloak)	Terbacil (Sinbar)
Clodinafop-propargyl (Discover)	Fluometuron (Cotoran)	Mesotrione (Callisto)	Tribufos (Def, Folex)
Cloproxydim (Select)	Flumioxazin (Valor)	Paraquat Dichloride (Paraquat)	Trifluralin (Treflan)
Cloransulam-methyl (First-Rate)	Fluridone (Brake, Sonar)	Picloram (Tordon)	
Cyanazine (Bladex)	Fluroxypyr (Starane EC)	Prohexadone calcium (Apogee PGR, Baseline)	

Sources:

Hooven et. al (2006) How to Reduce Bee Poisoning from Pesticides. Pacific Northwest Extension Publication PNW591. <https://extension.oregonstate.edu/catalog/pub/pnw-591-how-reduce-bee-poisoning-pesticides>

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Clemson University (2012) Department of Pesticide Regulation Bulletin 5: How to Protect Honey Bees from Pesticides: A Guide for Beekeepers and Applicators. <https://www.clemson.edu/public/regulatory/pesticide-regulation/bulletins/bulletin-5-protecting-honeybees.pdf>

ANIMAL INSECT CONTROL

Animal	Pest Problem	Insecticide Formulation	Method and Rate	Restrictions/Remarks
BARNs, STABLES AND DAIRY BARNs (Not for human dwellings) See Poultry section for poultry houses.	Adult Flies	Sprays and Fogs Rabon 50% WP (tetrachlorvinphos)	3 lb 50% WP in 7.5 gal water. Spray 1 gal/500-1,000 sq ft to wet all surfaces. Repeat every 3 or 4 weeks.	General Precautions for All Insecticides Are: 1. Apply where flies congregate; i.e., ceilings, light fixtures, walls, windows, etc. DO NOT apply within 1 week of applying whitewash. 2. DO NOT spray in milk houses. 3. DO NOT spray on milk utensils. 4. DO NOT contaminate feed or water supplies. Cover them when spraying. 5. Remove animals before spraying. 6. Keep out of reach of animals and children. 7. DO NOT mix a combination of compounds. 8. Wear protective clothing—jacket or coveralls, cap or hat, rubber gloves, and preferably a respirator. Wash protective clothing after using. Wash with soap and water after spraying. Apply as directed on label. Treat walls, ceilings, moldings, screens, door and window frames and similar resting places. Treat fly resting areas. Apply 0.5% dilution as a space spray mist; spray at the rate of 1 qt per 8,000 cu ft or at 1 qt per 1,000 sq ft for a coarse surface spray. For the 1.0% dilution, apply as above but only half the total volume of mixture. DO NOT use this product in areas where animals have received a direct organophosphosphate application within 8 hours. If animals are present, ventilate treated area immediately following application. DO NOT contaminate water, feed or foodstuffs, milk or milking utensils. Treat fly resting areas in sufficient water volume to treat 1000 sqft. Remove animals from area before treatment. May be applied to walls, ceilings and other fly resting areas in unoccupied animal housing areas. Apply dilution to horizontal and overhead surfaces where flies rest. DO NOT make applications in areas where animals are present. Allow to dry before reintroducing animals or birds. DO NOT contaminate animal food, feed or water during application. Spray 1 gallon of diluted spray to treat 500-1,000 sq ft fly resting surfaces. Other similar permethrin formulations are registered as surface sprays. 1 gallon covers 1,000 sq ft. DO NOT use in milk rooms. Target areas where flies rest such as ceilings, trusses, rafters, supports, walls, windows and vegetation.
		Ravap EC (23% tetrachlorvinphos and 5.3% dichlorvos)	1 gal Ravap EC/25 gal water. Allow 4 hours to dry before returning cows to barn. Apply 1 gal spray solution/1,000 sq ft.	
		Atroban 11% EC (permethrin)	1 pt/10 gal clean water. Apply 1 gal/750-1,000 sq ft. Provides up to 8 weeks of control.	
		Permethrin 3.2 EC, Tengard SFR (36.8% permethrin)	4 oz/12.5 gal water. Apply 1 gal/750 sq ft.	
		Pyranha Stock Guard Concentrate (10% permethrin and 10% piperonyl butoxide)	Mix 2 to 8 oz product per gallon of water. For severe infestations use the higher rate.	
		Elector PSP (44.2% Spinosad)	Mix 2 oz product per 10 gallons of water to treat 5,000 -10,000 sqft,	
		Vapona Concentrate Insecticide (R) (40.2% dichlorvos)	2 oz/1.5 gal water (0.5% dilution) 5 oz/2 gal water (1.0% dilution)	
		Onslaught microencapsulated insecticide (6.4% esfenvalerate)	Mix 0.5 oz product/gallon of water. Application rates is 0.5 oz product/1000 sqft.	
		Annihilator Polyzone (4.75% deltamethrin)	Mix and apply according to directions.	
		Grenade ER, Oxyfly, Cyonara 9.7 (9.7% lambda-cyhalothrin)	Mix 0.2-0.4 oz/gal water to make a 0.015% to 0.03% dilution.	
		Pyrethrins (synergized)	Use as directed on label.	
		Permethrin II (10% permethrin)	1 qt 10% permethrin/25 gal water. Use 1 gal/750 sq ft.	
		GardStar 40% EC (permethrin)	4 oz/10 gal of water (surface spray).	
		Talstar P, Bifen I/T (7.9% bifenthrin)	Mix with water and apply 0.33-1.0 oz product per 1,000 sq ft.	

ANIMAL INSECT CONTROL

Animal	Pest Problem	Insecticide Formulation	Method and Rate	Restrictions/Remarks
BARNs, STABLES AND DAIRY BARNs (cont.) (Not for human dwellings) See Poultry section for poultry houses.	Adult Flies (cont.)	Sprays and Fogs (cont.) Optashield CS (6% cyfluthrin) Optimate CS (5.9% gamma-cyhalothrin)	Mix with water and apply 1.0 – 2.0 oz. product per 1,000 sqft. Mix 0.16 oz (5 mL)/gal of water.	Target areas where flies rest such as ceilings, trusses, rafters, supports, walls, windows and vegetation Spray 1 gallon of diluted spray to treat 500-1,000 sq ft fly resting surfaces.
		Baits QuickBayt Fly Bait (0.5% imidacloprid and 0.1% muscalure (z)-9-tricosene) Ready-to-Use Fly Bait	Scatter 6 oz of bait/1,000 sq ft around the outside of dairies, stables, animal barns and inaccessible areas of animal housing facilities, or mix 1.5 oz bait/1 oz water, mix thoroughly, let stand for 15 minutes and paint on non-dusty fly resting areas inaccessible to animals.	Use around the outside of dairies and other animal housing structures. DO NOT apply to milking equipment or allow bait to contact food or water. Can be used inside horse stables, broiler, turkey and caged layer houses, swine confinement buildings, dairy barns and milking parlors ONLY if used in bait stations. Bait stations must be placed at least 4 feet above ground level and in areas inaccessible to animals, children or pets.
		QuickBayt Spot Spray (10% imidacloprid and 0.1% muscalure (z)-9-tricosene)	Mix 16 oz/gal of water. Carefully read label directions.	For use in and around agriculture production facilities such as poultry houses, turkey and chicken houses, cattle, sheep and goat facilities, feedlots, dairy barns, swine confinement buildings, dog kennels and horse stables. Carefully read label directions. DO NOT apply on surfaces accessible to children or pets. DO NOT apply where animals can ingest the bait. DO NOT apply to milking equipment at dairy facilities.
		Starbar DuraStrike Fly Scatter Bait (0.5% dinotefuran and 0.04% (z)-9-tricosene)	Scatter 4 oz/500 sq ft of fly breeding area, or use bait in any commercial bait station.	Use as a scatter bait only around the outside of animal housing areas. Bait stations must be hung at least 4 feet from ground level. Scatter baits and bait stations must only be used in areas inaccessible to animals, pets or children.
		Starbar QuikStrike Fly Bait Spray (0.5% dinotefuran and 0.04% (z)-9-tricosene)	To spray on, mix 2 oz product with 16 oz of water to treat 250 sq ft. To paint on, mix 2 oz product with 3 oz water to treat 250 sq ft.	Apply to fly resting areas such as walls, fences, window sills, posts, etc., typically 4 feet above the floor surface. Do not apply to milking equipment.
		Starbar QuikStrike II Fly Abatement strip (1.0% dinotefuran)	Ready-to-hang strip.	Hang 1 strip for every 150-300 sq ft. Hang close to the ground or floor in areas inaccessible to animals, birds or children. Do not place in areas where strips will become wet.
		Starbar Golden Malrin (1.1% methomyl and 0.049% (z)-9-tricosene)	Scatter 4 oz/500 sq ft of fly breeding area, or use bait in any commercial bait station.	Use as a scatter bait only around the outside of animal housing areas. Can be used in walkways of caged layer houses. Bait stations must be hung at least 4 feet from ground level. Scatter baits and bait stations must only be used in areas inaccessible to animals, pets or children.
		Gordon's Fly Bait (0.5% spinosad and 0.04% (z)-9-tricosene)	Scatter 12-16 oz of bait per 2,000 sq ft. Bait can also be used in bait stations or applied to hang boards/cards. Use 8-10 bait stations or hang boards/cards per 2,000 sq ft. See label for more detailed instructions on bait station and hang board/card use.	DO NOT allow bait to contact food, feedstuffs, water, milk or milking utensils. DO NOT use where milk is processed or stored. When using in bait stations, hang stations in areas inaccessible to children, livestock and pets, bait stations or hang cards must be located at least 4 feet above the ground.
		Decimari Fly Bait (0.5% clothianidin and 0.5% pyriproxyfen)	Scatter 6.3 oz product per 1,000 sqft in areas inaccessible to children, pets and animals or use in bait station inaccessible to children, pets and animals.	Follow other label recommendations. May also be used as a paint-on application.

ANIMAL INSECT CONTROL

Animal	Pest Problem	Insecticide Formulation	Method and Rate	Restrictions/Remarks
BARNs, STABLES AND DAIRY BARNs (cont.) (Not for human dwellings) See Poultry section for poultry houses.	Adult Flies (cont.)	Baits (cont.) Starbar Cyanarox Insecticidal Bait, Zyrox Fly Granular Bait (0.5% cyantraniliprole)	Ready-to-use granular fly bait. Apply from 3.2-6.4 oz granular bait per 1,000 square feet. Depending upon application site, product can be scattered or placed in bait stations.	Do not place bait in areas accessible to food-producing animals or animals being grown for food. Do not place bait in areas accessible to children and pets. Bait stations must be used if bait is applied inside residential structures, commercial establishments, food processing plants, restaurants and animal housing units. Do not apply bait outdoors when rain is expected.
		Starbar Aviator Fly Bait aerosol (0.5% acetamiprid and 0.05% Z-9 tricosine)	Ready to use aerosol	Do not apply directly to animals, food, feed handling and feed storage areas. Keep treatments out of the reach of children, pets and other animals.
		Starbar QuikStrike Fly Abatement Strip (1% nithiazine)	Ready-to-use strip. Hang 1 strip/100-300 sq ft depending on fly population.	Hang in enclosed areas protected from rain. Keep out of reach of children and animals.
	Fly Maggots	Neporex 2 SG (2% cyromazine)	Spray: Mix 1 lb Neporex 2 SG per gallon of water. Apply as a coarse low-pressure spray on fly breeding sites with suitable spray equipment (hand-pressurized or power-operated sprayers). One gallon of finished solution will treat 200 sq ft. Scatter: Apply 1 lb Neporex 2 SG per 200 sq ft. Apply directly and evenly on fly breeding sites. Use dry scattering only in case of wet manure or liquid manure. Treat edges and spillage areas around feed and water troughs and where manure accumulates. The spray solutions may also be applied 3 days after manure removal and repeated after next manure removal or when fly larvae are found.	DO NOT apply directly to livestock or livestock feed. DO NOT feed treated manure to animals. Allow at least 1 day between last application and harvest. May be used with slatted floors to treat areas where manure and other refuse accumulate to create fly breeding sites.
		Dimilin 2L, Unforgiven, Cavalier 2L (22% diflubenzuron)	For spot treatments: Mix 7.5 oz product to 15 gallons of water. Apply one quart per 10 square feet area of fly breeding material infested with fly eggs and larvae.	
		Archer Insect Growth Regulator (1.3% pyriproxyfen)	Use 1 oz. product/1500 sqft in sufficient water volume to achieve thorough coverage.	Spray surfaces where flies rest and breed
		Tekko 10 (9.3% novoluron)	For spot treatments: Apply 3 oz Tekko 10 per 1,000 square feet of fly breeding material in sufficient volume to ensure coverage.	
	Fire Ants	Apply baits only on the perimeter of barns, stables and dairy barns.		
		Amdro Pro (hydramethylnon)	5 Tbsp/mound or 1.0-1.5 lb/acre if broadcast.	Mound treatment – uniformly distribute materials 3-4 feet around the mound NOT on top of mound.
		Extinguish Professional Fire Ant Bait (methoprene)	3-5 Tbsp/mound or 1.0-1.5 lb/acre if broadcast.	
		Extinguish Plus (methoprene and hydramethylnon)	3-5 Tbsp/mound or 1.0-1.5 lb/acre if broadcast.	
		Esteem Ant Bait (pyriproxyfen)	2-4 Tbsp/mound or 1.5-2.0 lb/acre if broadcast.	
		Clinch Ant Bait (abamectin)	5-7 Tbsp/mound or 1.0 lb/acre if broadcast.	

ANIMAL INSECT CONTROL

Animal	Pest Problem	Insecticide Formulation	Method and Rate	Restrictions/Remarks	Minimum Days From Last Application to Slaughter
BEEF CATTLE	Cattle Grub (Also controls lice, some reduction of horn flies.)	Pour-Ons Cydectin (moxidectin)	1 mL/22 lb body weight.	Pour along midline of back.	0 Do not use in calves to be processed for veal.
	Systemics for grub control should be applied before Oct. 15 in Arkansas. Treatment later than Oct. 15 may cause toxic reactions in cattle from dying grubs.	Ivermectin 0.5% pour-on (Ivomec), generics available	1 mL/22 lb body weight.	Pour along midline of back.	48
		Dectomax pour-on (doramectin)	1 mL/22 lb body weight.	Pour along midline of back.	45
		Ivomec Eprinex pour-on (eprinomectin)	1 mL/22 lb body weight.	Pour along midline of back.	0
	Proper timing of treatment is important. For most effective results, cattle should be treated as soon as possible after heel fly activity ceases. Heel fly activity ceases in Arkansas any time after Aug. 1.	Injections Ivermectin 1% injection, generics available	1 mL/110 lb body weight.	Subcutaneous injection.	48
		Dectomax injection (doramectin)	1 mL/110 lb body weight.	Subcutaneous injection.	35
		Cydectin injection (moxidectin)	1 mL/110 lb body weight.	Subcutaneous injection.	21
	Horn Flies, Lice (Aids in control of face flies.)	Dust Bags Co-Ral (Coumaphos) 1% livestock dust	Dust bag treatment; self-treatment. No mixing necessary.	DO NOT contaminate feed or water.	0
		permethrin (Permethrin Fly and Louse Dust and ProZap Insectrin Dust) 0.25% D	Dust bag treatment; self-treatment. No mixing necessary.	Dust bags have shown an indication of good lice control when left in place during winter months. Install in gates, doorways, loafing areas, etc.	0
		Python Dust (0.075% zeta-cypermethrin and 0.150% piperonyl butoxide)	Dust bag treatment; self-treatment. Ready-to-use dust.	DO NOT use Python Dust if currently using ear tags containing cypermethrin or zeta-cypermethrin.	0
Several different dusts can be purchased and hand-sprinkled on cattle. Do not use these in dust bags unless the label indicates you can do so.					

ANIMAL INSECT CONTROL

Animal	Pest Problem	Insecticide Formulation	Method and Rate	Restrictions/Remarks	Minimum Days From Last Application to Slaughter
BEEF CATTLE (cont.)	Horn Flies, Lice (cont.) (Aids in control of face flies.)	Backrubbers Permethrin II, Martin's Permethrin, Permethrin, Insectrin, Prozap X, Permethrin 10 (10% permethrin)	Backrubber treatment. Add 1 qt to 20 gal oil. Apply 1 gal solution/20 ft cable to saturate backrubber.	Backrubbers help prevent lice infestations. Install cable in gates, doorways, loafing areas, etc., at first sign of pest. DO NOT use motor oil. Use only No. 2 oil or diesel oil. (Mineral oils are a little less irritating than fuel oils.)	0
		Pyranha Stock Guard Concentrate (10% permethrin and 10% piperonyl butoxide)	Dilute 8 oz in 5 gallons of oil.		0
		Co-Ral Fly and Tick Spray (6.15% coumaphos)	Use 9 3/4 oz/gal of fuel oil. Apply 1 gal solution per 20 ft cable to saturate backrubber.		0
		Ravap EC (23% tetrachlorvinphos and 5.3% dichlorvos)	Backrubber treatment. Use 1 qt of Ravap in 7 gal of No. 2 diesel oil. Apply 1 gal of mixed solution/20 ft cable to saturate backrubber.		0
		Prolate/Lintox HD (11.75% phosmet)	Use 1 pt/6.25 gal of fuel oil. Apply solution to backrubber.	DO NOT treat sick, stressed or convalescent animals or animals less than 3 months of age. Phosmet is a cholinesterase inhibitor. Consult veterinarian at first sign of adverse reaction.	3
	Horn Flies, Face Flies, Biting and Sucking Lice	Pour-Ons CyLence (1% cyfluthrin)	Ready to use in dispenser.	Use 4-12 mL depending on weight of animal. See label.	0
		Brute (10% permethrin)	Ready to use in dispenser.	Also aids in control of other flies.	0
		Boss (5% permethrin)	Ready to use.	Pour correct dose on back and down the face.	0
		Permethrin 1% pour-on	Ready to use.	Pour correct dose on back and down the face.	0
		Synergized Permethrin Pour-on (permethrin and piperonyl butoxide), Permethrin CDS, Martin's Fly Ban Synergized Pour-on, Ultra Boss, Synergized DeLice, Permethrin S, Cattle Armor Revenge Synergized fly and lice pour-on and generic pour-ons	Ready to use.	Pour correct dose on back and down the face.	0
		Ultra Saber, Exile Ultra, Embargo Ultra and Cyonara Plus Pour-ons (1% lambda-cyhalothrin and 5% piperonyl butoxide)	Ready to use.	Pour correct dose down the backline at rates specified on label. DO NOT APPLY TO FACE OF CATTLE.	0
		StandGuard Pour-on (0.05% gamma-cyhalothrin)	Ready to use.	Pour correct dose down the backline at rates specified on label. DO NOT APPLY TO FACE OF CATTLE.	0
		Clean-Up II pour-on, Gardatis pour-on (3% diflubenzuron and 5% permethrin)	Apply 3 mL/100 lb of body weight along backline and down face. DO NOT apply more than 30 mL to any animal.		0

ANIMAL INSECT CONTROL

Animal	Pest Problem	Insecticide Formulation	Method and Rate	Restrictions/Remarks	Minimum Days From Last Application to Slaughter
BEEF CATTLE (cont.)	Horn Flies, Face Flies, Biting and Sucking Lice (cont.)	Pour-Ons JustiFly 5-5 Pour-on (5% diflubenzuron and 5% piperonyl butoxide)	Apply 3 mL/100 lb of body weight along backline and down face. DO NOT apply more than 30 mL to any animal.		
		Saber, Exile and Cyonara Lambda Pour-ons (1% lambda-cyhalothrin)	Apply 10 mL to animals less than 600 lb or 15 mL to animals over 600 lb. Pour along the backline of the animal.	DO NOT apply more than 4 times within a 6-month period. DO NOT apply more often than every two weeks. Not recommended for veal calves. DO NOT apply to dry or lactating dairy cows. DO NOT apply to the face of beef cattle or calves.	0
		Endectocides Ivomec Eprinex pour-on (eprinomectin)	1 mL/22 lb body weight.	Endectocides (ivermectin, moxidectin and doramectin) are used as part of an integrated control program for internal and external parasite management. For optimal horn fly control over an extended period, use other methods and chemistries. Pour along midline of back from withers to tailhead. Provides 7 days of persistent activity against horn flies.	0
		Cydectin (0.5% moxidectin)	1 mL/22 lb body weight.	Apply along the topline of the back from withers to tailhead; not labeled to control face flies. Provides 7 days of persistent activity against horn flies.	0
		Dectomax Pour-on (0.5% doramectin)	1 mL/22 lb body weight.	Apply along the topline of the back from withers to tailhead; not labeled to control face flies. DO NOT use on calves to be processed for veal. Provides 7 days of persistent activity against horn flies.	45
		Remote Delivery Capsule AIM-L VetCaps (1.5% lambda-cyhalothrin and 7.5% piperonyl butoxide), one vetcap contains 10 mL product)	Apply only 1 VetCap per animal to the upper two-thirds of the body between the front shoulder and 6 inches ahead of the tail with an AIM-L VetGun. Application should be made no closer than 15 feet and no further than 30 feet from the animal.	Use only on cattle weighing 600 pounds or more. DO NOT repeat treatment more often than once every 2 weeks or more often than 4 times within any 6-month period. DO NOT expose VetCaps to humidity above 50% or temperatures above 70°F for any extended period. DO NOT apply to any animal in or within 10 feet of any body of water.	0
		AIM-A VetCaps (3.15% abamectin)		Rotate the use of AIM-L and AIM-A VetCaps.	
		Oral Larvicides Rabon Oral Larvicide (tetrachlorvinphos)	Read label directions carefully. Use salt block or pre-mixed mineral as directed on the label.	Start feeding early in spring before flies appear. Oral larvicides pass through the digestive system and kill fly larvae in manure. For horn, face, stable and house fly control.	0
		Altosid IGR. Alliance IGR Cattle Concentrate, Ragland IGR Fly CURB, Vitalix #5 IGR Fly Tub, Mineralix Fly Tub with IGR, Ignite IGR Mineral, Purina Wind & Rainstorm Hi MAG 4 CP ALTOSID (S-methoprene)	Read label directions carefully.	For horn fly control. Several formulation are available.	0

ANIMAL INSECT CONTROL

Animal	Pest Problem	Insecticide Formulation	Method and Rate	Restrictions/Remarks	Minimum Days From Last Application to Slaughter
BEEF CATTLE (cont.)	Horn Flies, Face Flies (cont.)	Oral Larvicides (cont.) ClariFly, TermiFly, JustiFly Larvicide 0.67% premix or Justify feedthrough – 3% (diflubenzuron)	Read label directions carefully.	For house, stable, horn and face fly control. Several other formulations of feed-through diflubenzuron are available.	0
		BOLUS Altosid IGR XRB (extended release bolus) (1.5% (s)-methoprene)	Administer ½ bolus for a 300-659 lb. BW cow, calf or bull. Administer 1 bolus for an 660-1400 lb BW cow, calf or bull	Existing adult horn flies will not be affected. Controls horn fly larvae developing in manure for up to 6 ½ months.	
		Ear Tags and Ear Strips A number of brand names of insecticide-impregnated ear tags are available for purchase.	Use number of tags recommended on label. Alternating the use of pyrethroid, organophosphate and macrocyclic lactone ear tags will mini-mize resistance/ tolerance issues. Ear tags are primarily used to control horn flies and ear ticks; however, some ear tags will aid in controlling face flies.	If ear tags within the same insecticide class have been used for two or more consecutive years, substantial reduction in control effectiveness is possible. Use dusts, sprays or ear tags in a different insecticide class or alternative methods.	0
	Horn Flies, Lice, Ticks (Aids in control of face flies.)	Dips Prolate/Lintox-HD (11.75% phosmet)	Follow label directions.	DO NOT treat sick, stressed or convalescent animals or animals less than 3 months of age. Phosmet is a cholinesterase inhibitor. Consult veterinarian at first sign of adverse reaction.	3
		Sprays Co-Ral Fly and Tick Spray (6.15% coumaphos)	For horn flies and lice, use 5 oz/4 gal of water; for ticks, use 10 oz/4 gal of water.	One application of these sprays may be sufficient for lice. If live lice are present after 2 weeks, apply a second treatment.	0
		GardStar 40% EC, Tengard SFR (permethrin)	4 oz/2.5 gal of water. Low-pressure spray. 4 oz/25 gal of water. High-pressure spray.	Spray to point of runoff.	0
		Rabon (tetrachlorvinphos)	Mix as directed on label for specific pest. Use between 1/2 and 1 gal of spray per animal. Spray face to aid in face fly control.		0
		Permethrin II 10% EC, Martin's Permethrin, Permethrin, Prozap Insectrin X, Permethrin 10 (10% permethrin)	Use 1 qt in 100-200 gal water. Re-treat after 3 to 5 weeks. Spray to runoff or fog using 1 gal spray mix per head.		0
		Atroban (permethrin)	1 pt 11% EC/50 gal water for horn fly; 1 pt/25 gal for lice. Use 1 qt spray per head for horn fly and 2 qt spray for lice.		0
		Synergized Delice (1% permethrin and 1% piperonyl butoxide)	Ready to Use Pour-on. Use as directed.		0
		Pyranha Stock Guard Concentrate (10% permethrin and 10% piperonyl butoxide)	Mix 4 to 8 teaspoons per gallon of water. Thoroughly wet animal's hair.	For severe infestations use the 8 oz/gallon rate.	0
		Ravap EC (23% tetrachlorvinphos and 5.3% dichlorvos)	Use 1 pt Ravap/10 gal water for horn flies and lice or 1 pt/6 gal water for ticks; then use 1/2-1 gal of spray mixture per animal.		0

ANIMAL INSECT CONTROL

Animal	Pest Problem	Insecticide Formulation	Method and Rate	Restrictions/Remarks	Minimum Days From Last Application to Slaughter
BEEF CATTLE (cont.)	Lice, Internal Parasites (cont.)	Injectables Ivomec injection (1% ivermectin)	1 mL/110 lb body weight. Follow label directions.	Subcutaneous injection. For sucking lice.	35
		Cydectin injection (moxidectin)	1 mL/110 lb body weight.	Subcutaneous injection. For sucking lice.	21
		Dectomax injection (doramectin)	1 mL/110 lb body weight.	Subcutaneous injection. For sucking lice.	35
		Pour-Ons Ivomec, Ivermectin, Bimectin (0.5% ivermectin)	1 mL/22 lb body weight.	Apply along the topline of the back from withers to tailhead.	45
		Cydectin pour-on (moxidectin)	1 mL/22 lb body weight.	Apply along topline of the back from withers to tailhead.	0
		Dectomax pour-on (0.5% doramectin)	1 mL/22 lb body weight.	Apply along topline of the back from withers to tailhead. DO NOT use on calves to be processed for veal.	45
		Ivomec Eprinex pour-on (eprinomectin)	1 mL/22 lb body weight.	Pour along midline of back from withers to tailhead. Provides 7 days of persistent activity against horn flies.	0
	Ear Ticks	Catron IV (permethrin)	Use as directed on label.	For spinose ear ticks spray directly into animal's ear. For Gulf coast ticks spray onto the outer surface of the animal's ear.	0
		Insecticide-impregnated ear tags	Use as directed on label.	Many ear tag brands will control spinose and Gulf Coast ticks; some will aid in control of lone star ticks.	
	Screwworms (maggots in wounds)	Catron IV (permethrin)	Ready to use. Spray wounds thoroughly.		0
	Mites, scabies (Psoroptic, Chorioptic, Sarcoptic)	Sprays Prolate/Lintox (11.7% phosmet)	Mix 1 qt in 25-50 gallons of water.	Apply as a coarse spray to runoff. Do not re-treat for 7 days. Do not treat non-lactating dairy cattle within 28 days of freshening. If freshening should occur within the 28 day period after treatment, that milk must not be used as human food. For Sarcoptic mange.	3
		Pour-Ons Dectomax Pour-on (0.5% doramectin)	Ready to use.	Apply 1ml/22 lbs body weight. Not for use in female dairy cattle 20 months of age or older. Do not use in calves to be processed for veal.	45
		Ivomec Eprinex Pour-on for Beef Cattle (5 ml eprinomectin per mL)	Ready to use	Apply 1 mL/22lbs body weight. When used according to label directions, neither a pre-slaughter drug withdrawal period nor a milk discard time is required, therefore, meat and milk from cattle treated with IVOMECEPRINEX (eprinomectin) Pour-On may be used for human consumption at any time following treatment. Do not use in calves intended for veal or unapproved animal species as severe adverse reaction, including fatalities in dogs, may result.	0

ANIMAL INSECT CONTROL

Animal	Pest Problem	Insecticide Formulation	Method and Rate	Restrictions/Remarks	Minimum Days From Last Application to Slaughter
BEEF CATTLE (cont.)	Mites, scabies (cont.) (Psoroptic, Chorioptic, Sarcoptic)	Pour-Ons (cont.) Cydectin Pour-on (5 mg moxidectin/mL)	Ready to use	Apply 1ml/22lbs body weight. When used according to label directions, neither a pre-slaughter drug withdrawal period nor a milk discard time are required. Meat and milk from cattle treated with CYDECTIN (moxidectin) Pour-On may be used for human consumption at any time following treatment. A withdrawal period has not been established for this product in preruminating calves. Do not use in calves to be processed for veal.	0
		Ivomec Pour-on (5 mL/ivermectin/mL)	Ready to use.	Apply 1 ml/22lbs body weight. Because a withdrawal time for milk has not been established, non-lactating dairy cows must not be treated within two months of calving.	49
		Injectable Ivomec 1% injection (1% ivermectin)	Ready to use sterile solution.	Inject 1 ml/110 lbs body weight subcutaneously. Do not treat cattle within 35 days of slaughter. Because a withdrawal time in milk has not been established, do not use in female dairy cattle of breeding age. A withdrawal period has not been established for this product in pre-ruminating calves. Do not use in calves to be processed for veal.	35
		Cydectin Injectable Solution (10mg moxidectin/mL)	Ready to use sterile solution.	Inject 1 ml/110 lbs body weight subcutaneously. Cattle must not be slaughtered for human consumption within 21 days of treatment. This drug product is not approved for use in female dairy cattle 20 months of age or older, including dry dairy cows. Use in these cattle may cause drug residues in milk and/or in calves born to these cows. A withdrawal period has not been established for preruminating calves. Do not use in calves to be processed for veal.	21
		Dectomax Injectable Solution (1% doramectin)	Ready to use sterile solution.	Inject 1 ml/110 lbs body weight subcutaneously. Do not slaughter for human consumption within 35 days of treatment. Not for use in female dairy cattle 20 months of age or older. A withdrawal period has not been established for this product in preruminating calves. Do not use in calves to be processed for veal.	35

ANIMAL INSECT CONTROL

INSECTICIDE EAR TAGS 2025

Organophosphate Tags		
Trade Name	Market Source	Active Ingredient
Corathon (AB)	Elanco	coumaphos (2) + diazinon (2)
Dominator (C)	Merck	pirimiphos-methyl (2)
Optimizer (AC)	Y-Text Corporation	diazinon (2)
Patriot (AC)	Elanco	diazinon (2)
MAX40 (AC)	Y-Text Corporation	diazinon (2)

Synthetic Pyrethroid Tags		
Trade Name	Market Source	Active Ingredient
Cylence Ultra (5) (AB)	Elanco	beta-cyfluthrin (1) + piperonyl butoxide (4)
GardStar Plus (5) (AB)	Y-Text Corporation	permethrin (1)
Python Ear Tag (5) (AB)	Y-Text Corporation	zeta-cypermethrin (1), piperonyl butoxide (4)
Python Magnum (5) (C)	Y-Text Corporation	zeta-cypermethrin (1) + piperonyl butoxide (4)
Saber Extra (B)	Merck	lambda-cyhalothrin (1) + piperonyl butoxide (4)

Macrocyclic Lactone Tags		
Trade Name	Market Source	Active Ingredient
XP 820 Ear Tag (5) (AC)	Y-Text Corporation	abamection (3) + piperonyl butoxide (4)

Insecticide Combination Ear Tags		
Trade Name	Market Source	Active Ingredient
Tri-Zap (5) (AB)	Y-Text Corporation	Zeta-cypermethrin (1) + abamectin (3) + piperonyl butoxide (4)
Double Barrel VP (B)	Merck	Lambda-cyhalothrin (1) and pirimiphos-methyl (2)

1 = synthetic pyrethroid, 2 = organophosphate, 3 = macrocyclic lactone, 4 = synergist, 5 = labeled for use on lactating dairy cattle

Carefully read label concerning the number of tags to apply (1 or 2 per animal) and any precautions concerning calves and lactating dairy cattle.

A = Aids in control of ticks, B = Controls face flies, C = Aids in control of face flies. All insecticide ear tags control insecticide susceptible horn flies.

ANIMAL INSECT CONTROL

Animal	Pest Problem	Insecticide Formulation	Method and Rate	Restrictions/Remarks
DAIRY CATTLE, Lactating	Cattle Grub	Ivomec Eprinex pour-on (eprinomectin)	Pour 1 mL/22 lb body weight along backline.	DO NOT treat after Oct. 15 to avoid toxic reactions in cattle unless cattle were treated for grubs at end of heel fly season.
		Cydecin (0.5% moxidectin)	1 mL/22 lb body weight.	Apply along the topline from withers to the tailhead. To avoid undesirable host-parasite reactions, cattle should be treated as soon as possible after heel fly season (between Aug. 1 and Oct. 15).
	Horn Flies (Flies around the face)	Sprinkle-On Dusts and Dust Bags		
		C-Ral 1% livestock dust	1-2 oz/head.	Apply at first sign of pest. Dust only after milking. Rub dust lightly into hair on poll, neck, back and upper sides. Repeat Co-Ral dust application as necessary.
		Co-Ral 1% D (coumaphos)	Follow label directions.	Install bags across gate or door where cows leave milking parlor. DO NOT hang bags over feed, mineral or water troughs. No restrictions when used as recommended.
		Permethrin Fly and Louse Dust, Prozap Insectrin Dust 0.25% (permethrin)	Follow label directions.	
Horn Flies, Stable Flies and Flies around the face		Python Dust (0.075% zeta-cypermethrin and 0.150% piperonyl butoxide)	Follow label directions.	DO NOT use Python Dust if currently using ear tags containing zeta-cypermethrin or cypermethrin. Apply into the hair over the head, ears, neck, shoulders, back and tailhead. Use shaker can, mechanical duster or dusting glove.
		Mist Sprays		
		Permethrin II 10% EC and several 10% generics (permethrin)	Use 1 qt in 100-200 gal water applied as mist; use 1 gal of mixture per head.	
		Atroban, Expar 11% EC (permethrin)	1 pt/25 gal water.	
		Vapona Concentrate Insecticide (R) (40.2% dichlorvos)	Mix 5 oz/2 gal water to make a 1% dilution. Apply 1-2 oz of the dilution per animal as a fine mist spray (such as an exit sprayer). May be used daily. DO NOT apply in combination with any other dermal organo-phosphate insecticides (trichlofon). DO NOT treat Brahman or Brahman crossbred cattle due to hypersensitivity to organophosphates. DO NOT apply to calves under 6 months of age.	
		Animal Sprays		
		Permethrin II and generics (10% permethrin)	Follow label directions for low- or high-pressure spray applications or mixing with oil for spot applications.	
		Ravap EC (23% tetrachlorvinphos and 5.3% dichlorvos)	Mix 2 oz Ravap per 3 gal of water. Direct spray to cover thoroughly with up to 1/2 gal of the dilution per animal.	Care should be taken so the spray does not come in contact with lactating cows' teats unless they are washed with an approved cleansing solution and dried before milking. Apply the spray at least 20 minutes prior to milking or after milking has been completed.

ANIMAL INSECT CONTROL

Animal	Pest Problem	Insecticide Formulation	Method and Rate	Restrictions/Remarks
DAIRY CATTLE, Lactating (cont.)	Horn Flies, Stable Flies and Flies around the face	Oral Larvicides Rabon oral larvicide (7.76% and 97.3% tetrachlorvinphos formulations)	Use salt block or pre-mixed mineral as directed on label. Look for specific instructions on label.	Start feeding early in the spring before flies begin to appear. Continue feeding throughout the summer and into the fall until cold weather restricts fly activity.
		ClariFly Larvicide 0.67% premix or Justify feedthrough – 3%	Read label directions carefully.	Must be used on a program basis. For control of house, stable, horn and face flies. Several other formulations are available.
		Altosid IGR, Alliance IGR Cattle Concentrate, Ragland IGR Fly CURB, Vitalix #5 IGR Fly Tub, Mineralix Fly Tub with IGR, Ignite IGR Mineral, Purina Wind & Rainstorm Hi MAG 4 CP ALTOSID (S-methoprene)	Read label directions carefully. Methoprene is used as a mineral or feed additive.	Methoprene must be used on a program basis for horn fly control. Several other S-methoprene formulations are available.
	Horn Flies, Flies around the face	BOLUS Altosid IGR XRB (extended release bolus) (1.5% (s)-methoprene)	Administer ½ bolus for a 300-659 lb. BW cow, calf or bull. Administer 1 bolus for an 660-1400 lb BW cow, calf or bull	Existing adult horn flies will not be affected. Controls horn fly larvae developing in manure for up to 6 ½ months.
		Ear Tags Several brand names of insecticide-impregnated ear tags are available for purchase.	Use as directed on label. Make sure it states for use on dairy animals. Ear tags registered for use on lactating dairy cattle include Gold Star Plus, Python, Python Magnum, and CyLence. Ear tags are primarily used to control horn flies and ear ticks; however, some ear tags will aid in controlling face flies.	If ear tags within the same insecticide class have been used for two or more consecutive years, substantial reduction in control effectiveness is possible. Use dusts, sprays or ear tags in a different insecticide class or alternative methods.
(Aids in control of lice and ticks.)		Backrubbers Co-Ral Fly and Tick Spray (6.15% coumaphos)	Use 9 3/4 oz per gal of fuel oil.	Use only diesel oil or No. 2 fuel oil to dilute concentrates. Use 1 gal of oil solution per 20 ft of backrubber. Re-treat back-rubbers weekly. DO NOT treat calves under 6 months old.
		Permethrin II, Martin's Permethrin, Permethrin, Insectrin, Prozap X	1/2 pt/5 gal of oil.	
		Pyranha Stock Guard Concentrate (10% permethrin and 10% piperonyl butoxide)	Dilute 8 oz in 5 gallons of oil.	
		Ravap EC (23% tetrachlorvinphos and 5.3% dichlorvos)	5 oz/1 gal of oil.	
		GardStar 40% EC, Tengard SFR (permethrin)	4 oz/10 gal of oil.	
		Dusts Python Dust (0.075% zeta-cypermethrin and 0.15% piperonyl butoxide)	Up to 2 oz per animal.	Apply into hair over the head, ears, neck, shoulders, back and tailhead. Use shaker can, mechanical duster or dusting glove. Python Dust is labeled for use in self-treatment dust bags. DO NOT use Python Dust if currently using ear tags containing cypermethrin or zeta-cypermethrin.
		Co-Ral (coumaphos) 1% livestock dust	Dust bag treatment; self-treatment. No mixing necessary.	DO NOT contaminate feed or water.
		Permethrin Fly and Louse Dust, Prozap Insectrin Dust (0.25% permethrin)	Dust bag treatment; self-treatment. No mixing necessary.	Dust bags have shown an indication of good lice control when left in place during winter months. Install in gates, doorways, loafing areas, etc.

ANIMAL INSECT CONTROL

Animal	Pest Problem	Insecticide Formulation	Method and Rate	Restrictions/Remarks
DAIRY CATTLE, Lactating (cont.)	Horn Flies, Face Flies, Biting and Sucking Lice	Pour-Ons		
		CyLence (1% cyfluthrin)	Ready to use in dispenser.	Use 4-12 mL per animal. See label for dosage. Use on both lactating and non-lactating animals.
		Brute (10% permethrin)	Ready to use in dispenser.	Aids in control of other flies.
		Boss (5% permethrin)		
		Permethrin CDS, Martin's Fly Ban pour-on (permethrin and piperonyl, butoxide)	Pour correct dose on back and down the face.	Comes in ready-to-use dispenser.
		Ultra Boss and Synergized DeLice, Permethrin CDS, Cattle Armor Pour-ons (permethrin and piperonyl butoxide)	Pour correct dose on back and down the face.	Comes in ready-to-use dispenser.
		Clean-Up II, Gardatis pour-on (3% piperonyl butoxide and 5% permethrin)	Apply 3 mL/100 lb body weight along backline and down face. DO NOT apply more than 30 mL to any animal.	Ready to use.
		Justify 5-5 Pour-on (5% piperonyl butoxide and 5% permethrin)	Apply 3 mL/100 lb body weight along backline and down face. DO NOT apply more than 30 mL to any animal.	Ready to use.
	Lice and Ticks	Synergized Delice (1% permethrin and 1% piperonyl butoxide)	Follow label directions. Ready-to-use pour-on.	DO NOT exceed 5 fluid oz/animal.
		Cydetin (0.5% moxidectin)	1 mL/22 lb body weight.	Apply along the topline from withers to tailhead. Provides 7 days of persistent activity against horn flies. Not labeled for face fly control.
		Sprays and Dusts		
		Co-Ral Fly and Tick Spray (6.15% coumaphos)	For lice, use 2.5 oz/4 gal of water.	Complete wetting to runoff.
		Atroban (permethrin)	1 pt/25 gal water. Use 2 qt of spray per animal.	Spray only after milking.
		Ravap EC (23% tetrachlorvinphos and 5.3% dichlorvos)	2 oz/3 gal water. 1 gal/200 gal water.	Use 1/2 gal of diluted spray per animal. Repeat as necessary.
		GardStar 40% EC, Tengard SFR (permethrin)	4 oz/25 gal water treats 50-100 head. High-pressure spray.	1-2 qt of coarse spray per animal.
		Pyranha Stock Guard Concentrate (10% permethrin and 10% piperonyl butoxide)	Mix 2 to 8 oz product per gallon of water. For severe infestations use the higher rate.	Wet hair thoroughly. Spray lactating dairy cows only after milking has been completed.
		Python Dust (0.075% zeta-cypermethrin and 0.15% piperonyl butoxide)	Up to 2 oz per animal.	Apply into hair over the head, ears, neck, shoulders, back and tailhead. Use shaker can, mechanical duster or dusting glove. Python Dust is labeled for use in self-treatment dust bags.

ANIMAL INSECT CONTROL

Animal	Pest Problem	Insecticide Formulation	Method and Rate	Restrictions/Remarks
DAIRY CATTLE Non-lactating (Dry Cows and Heifers Only)	Cattle Grubs Late summer or fall treatments (July through Oct. 15 prior to freshening)	Pour-Ons		
		Ivomec Eprinex pour-on (eprinomectin)	1 mL/22 lb body weight.	Pour along midline of back. DO NOT treat after Oct. 15 to avoid toxic reactions in cattle unless cattle were treated for grubs at end of heel fly season.
		Cyductin pour-on (0.5% moxidectin)	1 mL/22 lb body weight.	Apply along topline from withers to the tailhead. To avoid undesirable host-parasite reactions, cattle should be treated as soon as possible after heel fly season (between Aug. 1 and Oct. 15).
		Injectables Ivermectin, Ivomec, Noromectin and other generics (1% ivermectin)	1% ready to use. 1.0 mL/110 lb body weight.	Use subcutaneous injection only. Allow 35 days from last application to slaughter. Not for intravenous or intramuscular use. No more than 10 mL of Ivomec should be used on animals over 1,100 lb (see label for specific instructions). Also controls sucking lice. DO NOT use in female dairy cattle of breeding age.
		Cyductin injectable (1% moxidectin)	1% ready to use. 1.0 mL/110 lb body weight.	Use subcutaneous injection only. Cattle must not be slaughtered for human consumption within 21 days of treatment. Not for use in female dairy cattle 20 months of age or older (including dry dairy cows), veal calves and calves less than 8 weeks of age.
	Lice	Pour-Ons		
		Synergized Delice (1% permethrin and 1% piperonyl butoxide)	0.5 fl oz/100 lb body weight.	0 days. DO NOT exceed 5 fl oz/animal. These pour-ons can also be used on lactating dairy cattle.
		Synergized DeLice, Synergized Permethrin, Permethrin S, Cattle Armor (1% permethrin and 1% piperonyl butoxide)	Pour 1/2 oz/100 lb body weight up to a maximum of 5 oz per animal. Pour correct dose down face and along back.	Can also be applied undiluted as a mist spray or diluted with mineral oil or diesel fuel (1 pt Synergized DeLice to 1 gal mineral oil or diesel fuel) for use in a backrubber.
		Permethrin CDS, Martin's Fly Ban pour-on (permethrin and piperonyl butoxide)	Pour correct dose on back and down the face.	Comes in ready-to-use dispenser.
		Clean-Up II pour-on (3% piperonyl butoxide and 5% permethrin)	Apply 3 mL/100 lb body weight along backline and down face. DO NOT apply more than 30 mL to any animal.	
		Ivomec Eprinex pour-on (eprinomectin)	Pour 1 mL/22 lb body weight along backline.	DO NOT treat after Oct. 15 to avoid toxic reactions in cattle unless cattle were treated for grubs at the end of heel fly season.
		Cyductin (0.5% moxidectin)	1 mL/22 lb body weight.	Apply along the topline from withers to tailhead. To avoid undesirable host-parasite reactions, cattle should be treated as soon as possible after heel fly season (between Aug. 1 and Oct. 15).
	Mites, scabies (Psoroptic, Chorioptic, Sarcptic)	Sprays Prolate/Lintox (11.7% phosmet)	Mix 1 qt in 25-50 gallons of water.	Apply as a coarse spray to runoff. Do not re-treat for 7 days. Do not treat non-lactating dairy cattle within 28 days of freshening. If freshening should occur within the 28 day period after treatment, that milk must not be used as human food. For Sarcptic mange.

ANIMAL INSECT CONTROL

Animal	Pest Problem	Insecticide Formulation	Method and Rate	Restrictions/Remarks
DAIRY CATTLE Non-lactating (cont.) (Dry Cows and Heifers Only)	Mites, scabies (cont.) (Psoroptic, Chorioptic, Sarcoptic)	Pour-Ons Dectomax Pour-on (0.5% doramectin)	Ready to use.	Apply 1ml/22 lbs body weight. Not for use in female dairy cattle 20 months of age or older. Do not use in calves to be processed for veal.
		Ivomec Eprinex Pour-on for Beef Cattle (5 ml eprinomectin per mL)	Ready to use	Apply 1 ml/22lbs body weight. When used according to label directions, neither a pre-slaughter drug withdrawal period nor a milk discard time is required, therefore, meat and milk from cattle treated with IVOMECEPRINEX (eprinomectin) Pour-On may be used for human consumption at any time following treatment. Do not use in calves intended for veal or unapproved animal species as severe adverse reaction, including fatalities in dogs, may result.
		Cydectin Pour-on (5 mg moxidectin/mL)	Ready to use	Apply 1ml/22lbs body weight. When used according to label directions, neither a pre-slaughter drug withdrawal period nor a milk discard time are required. Meat and milk from cattle treated with CYDECTIN (moxidectin) Pour-On may be used for human consumption at any time following treatment. A withdrawal period has not been established for this product in prerinuating calves. Do not use in calves to be processed for veal.
		Ivomec Pour-on (5 mL/ivermectin/mL)	Ready to use.	Apply 1 ml/22lbs body weight. Because a withdrawal time for milk has not been established, non-lactating dairy cows must not be treated within two months of calving.
		Injectable Ivomec 1% injection (1% ivermectin)	Ready to use sterile solution.	Inject 1 ml/110 lbs body weight subcutaneously. Do not treat cattle within 35 days of slaughter. Because a withdrawal time in milk has not been established, do not use in female dairy cattle of breeding age. A withdrawal period has not been established for this product in prerinuating calves. Do not use in calves to be processed for veal.
		Cydectin Injectable Solution (10mg moxidectin/mL)	Ready to use sterile solution.	Inject 1 ml/110 lbs body weight subcutaneously. Cattle must not be slaughtered for human consumption within 21 days of treatment. This drug product is not approved for use in female dairy cattle 20 months of age or older, including dry dairy cows. Use in these cattle may cause drug residues in milk and/or in calves born to these cows. A withdrawal period has not been established for prerinuating calves. Do not use in calves to be processed for veal.
		Dectomax Injectable Solution (1% doramectin)	Ready to use sterile solution.	Inject 1 ml/110 lbs body weight subcutaneously. Do not slaughter for human consumption within 35 days of treatment. Not for use in female dairy cattle 20 months of age or older. A withdrawal period has not been established for this product in prerinuating calves. Do not use in calves to be processed for veal.
	Horn Flies	Ear Tags and Ear Strips Several brand names of insecticide-impregnated ear tags are available for purchase.	Use as directed on label. Ear tags are primarily used to control horn flies and ear ticks; however, some ear tags will aid in controlling face flies.	If ear tags within the same insecticide class have been used for two or more consecutive years, substantial reduction in control effectiveness is possible. Use dusts, sprays or ear tags in a different insecticide class or alternative methods.
	Horn Flies, Stable Flies, and Flies Around the Face	Sprays, Dusts and Backrubbers	Insecticides recommended for lactating dairy cattle can be used on non-lactating dairy cattle. Some insecticides recommended for use on beef cattle can be used on non-lactating dairy cattle. Be certain to follow the days to freshening guidelines and instructions on the label before using any insecticide labeled for beef cattle.	

ANIMAL INSECT CONTROL

Animal	Pest Problem	Insecticide Formulation	Method and Rate	Restrictions/Remarks
DAIRY CATTLE, DAIRY BARNs	House Flies and Flies around the premises	Sanitation, Biological Control and Integrated Pest Management (IPM)	Sanitation is critical to any fly control program in dairies and animal housing facilities. IPM includes sanitation, insecticides (baits, contact insecticides, etc.), surveillance (monitoring and/or trapping) and biological control (conserving natural enemies and/or releases). Use insecticides judiciously to minimize impact on natural enemies and to prevent or delay insecticide resistance. Use a combination of management methods.	Waste (spilled feed, wet feed, manure, bedding) removal and management is the first line of defense in any filth fly management program. Prompt removal and disposal (such as spreading on pastures) of waste will reduce filth fly breeding sites and break the house fly life cycle. Some producers have experienced reduced fly populations with weekly releases of parasitic wasps beginning in April or May. Releases should be made in dry areas out of traffic and in areas where flies reproduce. Parasite and/or insecticide use are not a substitute for a good sanitation program.
		Sticky Ribbons/Tapes	Sticky ribbons and tapes can be effective in managing small to moderate fly populations. Sticky ribbons are also useful in monitoring house fly populations when used weekly.	Sticky ribbons and tapes may require changing every week or two because they become coated with dust, covered with flies or dry out.
		Baits QuickBayt Fly Bait (0.5% imidacloprid and 0.1% muscalure, (z)-9-tricosene) Ready-to-Use Fly Bait	Scatter 6 oz of bait/1,000 sq ft around the outside of dairies and in inaccessible areas of animal housing, or mix 1.5 oz/1 oz of water, mix thoroughly, let stand for 15 minutes or until a paste consistency and paint on non-dusty fly resting areas inaccessible to animals.	Use around the outside of dairies and animal housing areas. DO NOT apply to milking equipment or allow bait to contact food or water. Can be used inside horse stables, broiler, turkey and caged layer houses, swine confinement buildings, dairy barns and milking parlors ONLY if used in bait stations. Bait stations must be placed at least 4 feet above ground level and in areas inaccessible to animals, pets or children.
		QuickBayt Spot Spray (10% imidacloprid and 0.1% muscalure (z)-9-tricosene)	Mix 16 oz/gal water. Carefully read label directions.	For use in and around agriculture production facilities such as poultry houses, turkey and chicken houses, cattle, sheep and goat facilities, feedlots, dairy barns, swine confinement buildings, dog kennels and horse stables. DO NOT apply on surfaces accessible to children or pets. DO NOT apply where animals can ingest the bait. DO NOT apply to milking equipment at dairy facilities.
		Starbar Aviator Fly Bait aerosol (0.5% acetamiprid and 0.05% Z-9 tricosine)	Ready to use aerosol.	Do not apply directly to animals, food, feed handling and feed storage areas. Keep treatments out of the reach of children, pets and other animals.
		Starbar QuikStrike Fly Bait (0.5% dinotefuran and 0.04% (z)-9-tricosene)	Scatter 4 oz/500 sq ft of fly breeding area or use bait in any commercial bait station.	Use as a scatter bait only around the outside of animal housing areas. Bait stations must be hung at least 4 ft from ground level. Scatter baits and bait stations must only be used in areas inaccessible to animals, pets or children.
		Starbar QuikStrike Fly Bait Spray (0.5% dinotefuran and 0.04% (z)-9-tricosene)	To spray on, mix 2 oz product with 16 oz of water to treat 250 sq ft. To paint on, mix 2 oz product with 3 oz of water to treat 250 sq ft.	Apply to fly resting areas such as walls, fences, window sills, posts, etc., typically 4 feet above the floor surface. DO NOT apply to milking equipment.
		Starbar Golden Malrin Fly Bait (1.1% methomyl and 0.049% (z)-9-tricosene)	Scatter 4 oz/500 sq ft of fly breeding area or use bait in any commercial bait station.	Use as a scatter bait only around the outside of animal housing areas. Bait stations must be hung at least 4 ft from ground level. Scatter baits and bait stations must only be used in areas inaccessible to animals, pets or children.
		Decimari Fly Bait (0.5% clothianidin and 0.5% pyriproxyfen)	Scatter 6.3 oz product per 1,000 sqft in areas inaccessible to children, pets and animals or use in bait station inaccessible to children, pets and animals.	Follow other label recommendations. May also be used as a paint-on application.

ANIMAL INSECT CONTROL

Animal	Pest Problem	Insecticide Formulation	Method and Rate	Restrictions/Remarks
DAIRY CATTLE, DAIRY BARNs (cont.)	House Flies and Flies around the premises (cont.)	Baits Gordon's Fly Bait (0.5% spinosad and 0.04% (z)-9-tricosene)	Scatter 12-16 oz/2,000 sq ft. Bait can also be used in bait stations or applied to hang boards/ cards. Use 8-10 bait stations or hang boards/cards per 2,000 sq ft. See label for more detailed instructions on bait station and hang board/card use.	DO NOT allow Bait to contact food, feedstuffs, water, milk or milking utensils. DO NOT use where milk is processed or stored. When using in bait stations, hang stations in areas inaccessible to children, livestock and pets. Bait stations or hang cards must be located at least 4 ft above the ground.
		Starbar Cyanarox Insecticidal Bait, Zyrox Fly Granular Bait (0.5% cyantraniliprole)	Ready-to-use granular fly bait. Apply from 3.2-6.4 oz granular bait/1,000 square feet. Depending upon application site, product can be scattered or placed in bait stations.	DO NOT place bait in areas accessible to food-producing animals or animals being grown for food. DO NOT place bait in areas accessible to children and pets. Bait stations must be used if bait is applied inside residential structures, commercial establishments, food processing plants, restaurants and animal housing units. DO NOT apply bait outdoors when raining.
		Sprays Ravap EC (23% tetrachlorvinphos and 5.3% dichlorvos)	12 Tbsp/gal water/500-1,000 sq ft.	Remove animals from barn before spraying. Allow at least 4 hours for spray to dry before allowing cows to return to the barn. DO NOT contaminate feed, water or milking utensils.
		Rabon 50% WP (tetrachlorvinphos)	4 lb per 25 gal applied/1 gal per 500 sq ft.	
		GardStar 40% EC, Tengard SFR (permethrin)	4 oz/10 gal water. Surface spray.	1 gal/750-1,000 sq ft. (DO NOT use in milk rooms.)
		Pyranha Stock Guard Concentrate (10% permethrin and 10% piperonyl butoxide)	Mix 2 to 8 oz product per gallon of water. For severe infestations use the higher rate.	Apply as directed on label. Treat walls, ceilings, moldings, screens, door and window frames and similar resting places.
		Vapona Concentrate Insecticide (R) (40.2% dichlorvos)	2 oz/1.5 gal water (0.5% dilution). 5 oz/2 gal water (1.0% dilution).	Apply 0.5% dilution as a space spray mist to open air space at the rate of 1 qt/8,000 cu ft or as a coarse surface spray to indoor surfaces at the rate of 1 qt/1,000 sq ft. For the 1.0% dilution, apply as above but only half the total volume of mixture. DO NOT use this product in areas where animals have received a direct organophosphate application within 8 hours. If animals are present, ventilate treated area immediately following application. DO NOT contaminate water, feed or foodstuffs, milk or milking utensils.
		Elector PSP (44.2% Spinosad)	Mix 2 oz product per 10 gallons of water to treat 5,000 -10,000 sq ft.	Treat fly resting areas.
		Onslaught microencapsulated insecticide (6.4% esfenvalerate)	Mix 0.5 oz product/gallon of water. Application rates is 0.5 oz product/1000 sq ft.	Treat fly resting areas in sufficient water volume to treat 1000 sq ft. Remove animals from area before treatment.
		Suspend PolyZone (4.75% deltamethrin)	Mix with water and spray with low pressure (less than 50 psi). Apply 0.25 – 1.5 oz. product per 1,000 square feet.	Wet surfaces where flies rest. DO NOT spray animals, humans, animal feed or water. DO NOT apply more than once per week.
		Grenade ER (9.7% lambda-cyhalothrin)	Mix 0.2 to 0.4 oz/gal water to make a 0.015% to 0.03% dilution.	Apply dilution to horizontal and overhead surfaces where flies rest. DO NOT make applications in areas where animals are present. Allow to dry before reintroducing animals or birds. DO NOT contaminate animal food, feed or water during application.

ANIMAL INSECT CONTROL

Animal	Pest Problem	Insecticide Formulation	Method and Rate	Restrictions/Remarks
DAIRY CATTLE, DAIRY BARNs (cont.)	House Flies and Flies around the premises (cont.)	Sprays Atroban 11% EC (permethrin)	1 pt/10 gal water. Apply 1 gal/750-1,000 sq ft of surface.	Apply as directed on label.
		Talstar, Bifenthrin I/T 7.9F, Optashield CS (7.9% bifenthrin)	Mix with water and apply 0.33 to 1.0 oz product per 1,000 sq ft.	Target areas where flies rest such as ceilings, trusses, rafters, supports, walls, windows and vegetation.
		Optimate CS 5.9 (5.9% gamma-cyhalothrin)	Mix 0.16 oz (5 mL)/gal of water.	Spray 1 gal of diluted spray to treat 500-1,000 sq ft fly resting surfaces.
DAIRY CATTLE, MILK ROOMS Check label of any product before using in milk room.	Adult Flies	Sprays Pyrethrins (synergized)	Use as directed on label.	
		Tempo 20WP (cyfluthrin)	10-20 grams per 1,000 sq ft.	Use adequate water for coverage.
		Baits QuickBait Fly Bait (0.5% imidacloprid and 0.1% muscalure (z)-9-tricosene)	1.5 oz/bait station/250 sq ft.	Can be used inside horse stables, broiler, turkey and caged layer houses, swine confinement buildings, dairy barns and milking parlors ONLY if used in bait stations. Bait stations must be placed at least 4 feet above ground level and in areas inaccessible to animals, children or pets.
		Starbar Cyanarox Insecticidal Bait, Zyrox Fly Granular Bait (0.5% cyantraniliprole)	Ready-to-use granular fly bait. Apply from 3.2-6.4 oz granular bait/1,000 square feet. Depending upon application site, product can be scattered or placed in bait stations. When applied inside, product must be placed in commercial bait stations.	Bait stations must be used if bait is applied inside residential structures, commercial establishments, food processing plants, restaurants and animal housing units. Do not place bait in areas accessible to food-producing animals or animals being grown for food. Do not place bait in areas accessible to children and pets. Do not apply bait outdoors when raining.
		Decimari Fly Bait (0.5% clothianidin and 0.5% pyriproxyfen)	Scatter 6.3 oz product per 1,000 sqft in areas inaccessible to children, pets and animals or use in bait station inaccessible to children, pets and animals.	Follow other label recommendations. May also be used as a paint-on application.
PREMISES	Fleas (premises)	Often, animal treatment alone does not completely control severe flea infestations. Sanitation (removal of pet bedding, etc.) and insecticide application of the infested areas with an adulticide and an insect growth regulator mixture may be necessary.		
		Adulticides Permethrin concentrates (several formulations available): Martin's permethrin 10, Permethrin II, Tengard SFR Cypermethrin concentrates (Martin's Viper Insecticide Concentrate and others) Bifenthrin Bug Blaster Bifenthrin 2.4 and others (Outdoor USE only)	Mix according to label directions. Can be mixed with an insect growth regulator such as Nylar or Precor – listed below.	Can be mixed with an insect growth regulator. Apply only as directed on the label. Outdoors: When treating outdoors, concentrate in areas where fleas are present. Presence of fleas in the yard can be confirmed by walking the area while wearing white socks pulled to the knees; fleas will be easily seen against the white background of the socks. It is not usually necessary to treat the entire yard. Fleas normally occur in areas where pets rest, sleep, and run such as doghouse and kennel areas, under decks, along fences and next to the foundation. Indoors: Use only products labeled for indoor use and apply only as directed on the label. Pets and humans should not be in the house during treatment and should not return until the spray has dried or as directed on the label. Apply where pets spend the most time. Treat pet bedding, rugs, area under pet bedding, under furniture and in cracks and crevices. Hardwood floors seldom require treatment, but the area should be vacuumed thoroughly.

ANIMAL INSECT CONTROL

Animal	Pest Problem	Insecticide Formulation	Method and Rate	Restrictions/Remarks
PREMISES (cont.)	Fleas (premises) (cont.)	Insect Growth Regulators NyGuard IGR Concentrate (10% (2-[1-methyl-2-(4-phenocyphenoxy) ethoxyl] pyridine)	Mix according to label directions. Can be mixed with an adulticide such as those listed above.	Can be mixed with an adulticide. Apply only as directed on the label. Outdoors: When treating outdoors, concentrate in areas where fleas are present. Presence of fleas in the yard can be confirmed by walking the area while wearing white socks pulled to the knees; fleas will be easily seen against the white backround of the socks. It is not usually necessary to treat the entire yard. Fleas normally occur in areas where pets rest, sleep, and run, such as doghouse and kennel areas, under decks, along fences and next to the foundation. Indoors: Use only products labeled for indoor use and apply only as directed on the label. Pets and humans should not be in the house during treatment and should not return until the spray has dried or as directed on the label. Apply where pets spend the most time. Treat pet bedding, rugs, area under pet bedding, under furniture and in cracks and crevices. Hardwood floors seldom require treatment, but the area should be vacuumed thoroughly.
		NyGuard EZ1 IGR Concentrate (1.3% (2-[1-methyl-2-(4-phenocyphenoxy) ethoxyl] pyridine)		
		Archer Insect Growth Regulator (1.3% pyriproxyfen)		
		Ready-to-Use IGR and Adulticide Mixtures (Precor Premise Plus, Vet-Kem, Premise spray (aerosol): (S)-methoprene, permethrin, phenothrin, N-octyl bicycloheptene dicarboximide, piperonyl butozide)	Ready-to-use aerosol.	
		NyGuard Plus Flea and Tick Spray (0.4% 3-Phenoxybenzyl d-cis and trans-2,2-dimethyl-3-(2-methylpropenyl) cyclopropanecarboxylate 1.6 % N-Octyl bicycloheptene dicarboximide and 1.0% pyriproxyfen)	Ready to use as directed.	
		Prescription Treatment PT Ultracide Pressurized Flea IGR and Adulticide (aerosol): pyriproxyfen, pyrethrins, N-octyl bicycloheptene dicarboximide, permethrin	Ready-to-use aerosol.	Use only as directed on label. For use in the home, garage, kennel and commercial buildings. Cover aquariums before making applications. Pets and humans should not be in the house during treatment and should not return until the spray has dried or as directed on the label.
		PT Alpine Flea Insecticide with IGR (aerosol): dinotefuran, pyriproxyfen, prallethrin	Ready-to-use aerosol.	
		Raid Flea Killer Plus Carpet and Room Spray (aerosol): pyrethrins, tetramethrin, piperonyl butoxide, N-octyl bicycloheptene dicarboximide, (S)-methoprene	Ready-to-use aerosol.	

ANIMAL INSECT CONTROL

Animal	Pest Problem	Insecticide Formulation	Method and Rate	Restrictions/Remarks
DOGS	Fleas, Ticks	Dusts, Sprays, Spot-ons and Collars		
		GardStar Garden and Poultry Dust and others (0.25% permethrin dust).	Ready to use. Use 1/2 oz on dogs 20 lb and under. Use 1 oz on dogs greater than 20 lb.	Can be used to dust dog bedding and dog house. DO NOT use on puppies under 12 weeks of age. Use only on dogs.
		Hartz Flea and Tick Powder for Dogs (3.3% tetrachlorvinphos)	Ready to use. Use 1/2 ounce on small dogs, 1 oz on medium-sized dogs and 1 1/4 oz on large dogs.	Can be used to dust dog bedding – read label directions. DO NOT use on puppies under 12 weeks of age. Use only on dogs.
		Preventic Tick Collar for Dogs (amitraz)	Ready-to-use collar. Follow label directions.	DO NOT use on puppies less than 12 weeks old. For ticks only.
		Seresto Dog Collar 4.5% flumethrin and 10% imidacloprid	Ready to use collar.	DO NOT USE on puppies less than 7 weeks old.
		Permethrin II 10% EC (permethrin)	1 oz in 3-5 gal water. Use 1 qt on big dogs; 1 pt on small dogs.	Aerosol pest sprays are also available for controlling fleas and ticks.
		Pyranha Stock Guard Concentrate (10% permethrin and 10% piperonyl butoxide)	Mix 2 to 8 oz product per gallon of water.	Pet sensitivities may occur after using a pesticide product. If you see signs of sensitivity bathe your pet with mild soap and rinse with large quantities of water. If signs continue, consult a veterinarian immediately. Do not treat puppies less than twelve weeks old.
		Frontline or Parastar spot-on (fipronil)	Follow label directions.	Also controls ticks. DO NOT use on puppies less than 8 weeks old.
		Frontline Plus or Martin's Preferred for Dogs (9.8% fipronil and 8.8% methoprene)	Follow label directions.	DO NOT use on puppies less than 8 weeks old.
		Certifect for Dogs (fipronil, (S)-methoprene, amitraz)	Ready-to-use spot-on.	DO NOT use on puppies less than 8 weeks old. For ticks, fleas and lice.
		K-9 Advantix II (8.8% imidacloprid, 44% permethrin and 0.44% pyriproxyfen)	Ready-to-use spot-on. Apply 3 or 4 spots to the skin along the backline between back of the shoulders and base of the tail.	Purchase the appropriate formulation for the weight and age of your dog. Also repels mosquitoes and biting flies.
		GardStar 40% EC, Tengard SFR One Shot (permethrin)	4 oz/20 gal water (dip).	Make sure all areas are soaked to skin. DO NOT rinse off.
		Oral Tablets		
		NexGard (afoxolaner)	Available through prescription only. Administer tablet every 30 days.	DO NOT use on puppies less than 8 weeks old.
		Bravecto (fluralaner)	Available through prescription only. One tablet will last for 12 weeks.	Use only on dogs over 4.4 pounds or six months of age.
		Simparica (sarolaner)	Available through prescription only. Administer tablet every 30 days.	Use only on dogs over 2.8 pounds or six months of age.
		Comfortis (spinosad)	Chewable tablet. Follow label directions.	Available by prescription from licensed veterinarians.
		Program Flea Control (lufenuron)	Oral.	Available by prescription only.
		Capstar tablet (nitenpyram)	Oral tablet.	Do not use on puppies less than 4 weeks old.
	Fleas	Flea collars containing Vapona, Rabon, Baygon, Propoxur and other chemicals (permethrin)	Use as directed on label. Some animals are sensitive to collars.	Fleas are killed quickly. Ticks are tough and are killed slowly. They will usually be dead in 1-5 days. When bathing dogs, remove collar until dog is dry. Replace collar when effectiveness diminishes. Specially formulated dips for dogs are available for purchase.

ANIMAL INSECT CONTROL

Animal	Pest Problem	Insecticide Formulation	Method and Rate	Restrictions/Remarks
DOGS (cont.)	Fleas (cont.)			
	Also controls ticks	Seresto Collar (flumethrin and imidacloprid)	Collar. Use as directed on label.	DO NOT use on puppies less than 7 weeks old.
	Also controls ticks	Hartz UltraGuard Plus Flea and Tick Collar for Dogs and Puppies (tetrachlorvinphos and (S)-methoprene)	Use as directed on label.	DO NOT use on puppies less than 6 weeks of age.
		Synergized pyrethrins soap	Wet pet thoroughly. Apply soap and work up good lather. Let stand 5-10 minutes to kill fleas. Rinse.	The lather of this soap cleans, grooms and deodorizes as it kills fleas.
		methoprene or Precor 1%	Follow mixing directions on label and combine with adulticide for best results.	Premise spray for control of fleas. DO NOT use on dogs.
		methoprene 0.075% + permethrin 0.5% Ortho Total Flea Control	Follow label directions.	Medicated shampoos and dips labeled for use on dogs will often help reduce flea and tick problems.
	Also controls ticks, mosquitoes, mites and lice	Vectra 3D (dinotefuran, pyriproxyfen and permethrin)	Topical, Follow label directions.	Use the appropriate formulation based on the animal's weight.
		Frontline Plus (fipronil and(S)-methoprene)	Apply entire contents of the applicator in a single spot between the shoulder blades. Apply directly to the skin.	Do not use on dogs and puppies less than 8 weeks of age or weighing less than 5 pounds. Also control chewing lice and ticks.
		Frontline Gold (fipronil, (s)-methoprene, pyriproxyfen)	Ready-to-use spot-on. Apply 3 or 4 spots to the skin along the backline between back of the shoulders and base of the tail.	Purchase the appropriate formulation for the weight and age of your dog. Also kills lice.
		Advantage II Topical treatment (9.1% imidacloprid and 0.46% pyriproxyfen)	Ready-to-use spot-on. Apply 3 or 4 spots to the skin along the backline between back of the shoulders and base of the tail.	Purchase the appropriate formulation for the weight and age of your dog.
		Activyl for Dogs (indoxacarb)	Topical, follow label directions.	Use the appropriate formulation based on the animal's weight. Do not use on puppies under 8 weeks of age and weighing less than 4 lbs. Do NOT use on cats. Do not use on dogs (male or female) intended for breeding, pregnant or nursing.
	Ear Mites	Adams Pene-Mite, Eradimite and others (pyrethrins and piperonyl butoxide)	Ready-to-use drops.	DO NOT use on puppies less than 12 weeks of age.
		Ready-to-use permethrin or pyrethrin drops such as Mite-X and Ear-Rite		Apply as directed on label.
CATS		Durvet Ear Mite Killer (pyrethrins, piperonyl butoxide, N-Octyl bicycloheptene dicarboximide and Di-n-propyl isocinchomeronate)	Ready to use.	Do not apply more than once per day.
	Fleas	Pyrethrin 1% D	Lightly work material into the hair down to the skin. Repeat once a month.	Apply as directed on label.
	Also controls ticks	Bravecto spot-on (fluralaner)	Available by prescription only. One application lasts 12 weeks.	Use only on cats weighing 2.6 pounds or greater. Do not use on cats less than 6 months of age.
	Also controls ticks	Adams Plus Flea and Tick Collar for Cats and Kittens (propoxur, (S)-methoprene)	Use as directed on label.	Do not use on kittens less than 12 weeks of age.

ANIMAL INSECT CONTROL

Animal	Pest Problem	Insecticide Formulation	Method and Rate	Restrictions/Remarks
CATS (cont.)	Fleas (cont.)	Flea collars containing Vapona, Rabon, Baygon and other chemicals	Use as directed on label.	Fleas are killed quickly. Ticks are tough and are killed slowly. They will usually be dead in 1-5 days. New flea collars can sometimes cause severe skin irritation around the necks of dogs and cats. Should irritation occur, remove the collar and place it in a quart jar with a screw lid. Put the collar back on the pet after 2 or 3 days.
	Also controls ticks	Sentry PurrScriptions Dual Action Collar for Cats (phenothrin and propoxur)	Collar. Use as directed on label.	DO NOT use on kittens less than 12 weeks old.
	Also controls ticks	Seresto Collar (flumethrin and imidacloprid) Frontline, Sentry Fiproguard (fipronil)	Collar. Use as directed on label. Spray or spot-on.	DO NOT use on kittens less than 10 weeks old.
	Also controls ticks	Frontline Plus, Sentry Fiproguard Plus (fipronil and (S)-methoprene)	Available to use as a spot-on.	Apply as directed on label.
	Also controls ticks	Sergents Gold Squeeze-on for cats and kittens (etofenprox and pyriproxyfen)	Follow label directions.	DO NOT apply to kittens less than 12 weeks of age. DO NOT apply more often than every 3 weeks.
	Also controls ticks	Zodiac Spot-on for Cats and Kittens (S)-methoprene)	Follow label directions.	DO NOT apply to kittens less than 12 weeks of age.
	Also controls tick	Seresto Collar for cats (imidacloprid and flumethrin)	Follow label directions	Do not treat kittens less than 10 weeks old.
		Vectra for Cats and kittens (dinotefuran and pyriproxifen)	Topical. Follow label directions.	Do not use on kittens less than 8 weeks of age.
		Cheristin (spinetoram)	Topical. Follow label directions.	Do not use on cats or kittens < 8 weeks of age and weighing < 1.8 lbs.
		Advantage II (imidacloprid and pyriproxyfen)	Follow label directions.	DO NOT use on kittens less than 8 weeks old.
		Capstar tablet (nitenpyram)	Oral tablet.	Do not use on kittens less than 4 weeks old.
		Activyl for Cats (indoxacarb)	Topical. Follow label directions.	Activyl Spot-On for Cats, containing 0.03 fl. oz (1.03 ml), is meant for larger cats over 9 lbs and 8 weeks old. Activyl Spot-On for Cats and Kittens has 0.02 fl. oz (0.51 ml) and should be given to small cats and kittens weighing between 2 and 9 lbs, but over 8 weeks old.
	Ear Mites	Malathion 5% aerosol spray can	Apply to the ears.	Repeat every 7 days as needed.
		Adams Ear Mite Treatment, Eradimite and others (pyrethrins and piperonyl butoxide)	Ready-to-use drops.	DO NOT use on kittens less than 12 weeks of age.
	BIRDS, CANARIES AND PARAKEETS	Mites	Pyrethrins + Piperonyl butoxide	Remove birds and spray entire cage.
		Lice	Pyrethrins + Piperonyl butoxide	Spray bird directly—hold aerosol 18 inches from bird; spray one burst 2-3 seconds.
				Apply as directed on label.
				Apply no more than 3 times per week.
	RABBITS	Ear mites	Adams Ear Mite Treatment, Eradimite and others (pyrethrins and piperonyl butoxide)	Ready-to-use drops.
		Ear mites, fur mites and rabbit bots (Cuterebra spp.)	More effective treatments are available from licensed veterinarians.	DO NOT use on rabbits less than 12 weeks of age. Consult your veterinarian for other effective treatment options.

ANIMAL INSECT CONTROL

Animal	Pest Problem	Insecticide Formulation	Method and Rate	Restrictions/Remarks
HORSES	Bots	Ivermectin (Zimecterin, Eqvalan, Equimectrin) 1.87% paste	Oral paste.	Treat horses after second killing frost.
		Quest Plus Equine Oral Gel (moxidectin/praziquantel)	Oral paste.	
		Equinox Dewormer (ivermectin/praziquantel)	Oral paste.	
		Quest Equine Oral Gel (moxidectin)	Oral paste.	
	Manual Controls		Sponge animal with warm water (120 degrees F) to initiate egg hatching.	Firmly sponge horse's forelegs, chest, neck and belly on cool days (below 60 degrees F) so that larva will hatch and die of exposure. Manual control may limit bot infestations but may NOT eliminate infestations.
	Lice, Ticks	Co-Ral Fly and Tick Spray (6.15% coumaphos)	For horn flies and lice, use 5 oz in 4 gal water. For ticks, use 10 oz in 4 gal water.	Follow label directions. DO NOT use on horses intended for slaughter. Co-Ral is a cholinesterase inhibitor. DO NOT treat sick, stressed or convalescent animals. DO NOT use on animals less than 3 months of age. Use 2 qt spray per animal. Do not apply more often than once in 3 days.
		Atroban 11% EC (permethrin)	Mix 1 pt in 25 gal water.	
		Python Dust Livestock Insecticide (zeta-cypermethrin and piperonyl butoxide)	Apply 2 oz over the head, shoulders and back.	
		Clean-Up II pour-on (3% diflubenzuron and 5% permethrin)	Apply 3 mL/100 lb body weight as a spray or wipe-on only. DO NOT apply more than 30 mL to any one animal.	
	Horn Flies Stable Flies Horse Flies Mosquitoes Black Flies Deer Flies Biting Gnats House Flies Face Flies	Atroban 11% EC (permethrin)	Mix 1 pt 11% EC with 25 gal water. Horn flies require only 1 pt 11% EC/50 gal water.	Use 2 qt finished spray per animal.
		Permethrin II and generics (10% permethrin)	For high-pressure sprayers: Mix 1 qt in 200 gal of water; 8 oz in 50 gal of water.	Spray to thoroughly cover entire animal. Apply from 1/2 to 1 gal of spray per head. For lice or mites, a second treatment is recommended 14-21 days later.
		Pyranha Stock Guard Concentrate (10% permethrin and 10% piperonyl butoxide)	Mix 2 to 8 oz product per gallon of water. For severe infestations use the higher rate. For hand or garden sprayers and low-pressure sprayers: Mix 8 oz in 3 gal of water; 2.5 oz (5 Tbsp) in 1 gal of water; or 20 mL (4 tsp) in 1 qt of water.	Wet hair thoroughly. Spray each animal with up to 8 oz of mixed spray. For lice and mites, a second treatment is recommended 14-21 days later.
		Flysect, Equi-Spot, Fly Rid Plus, Bronco Equine Fly Spray (prallethrin, permethrin or pyrethrin)	Ready-to-use sprays and spot-ons.	Follow label directions.
		GardStar 40% EC, Tengard SFR (permethrin)	0.25 oz/1 pint of water. Low-pressure spray.	1-2 fl oz of spray per animal. Spot treat back, face, legs, tail and ears.
		Co-Ral Fly and Tick Spray (6.15% coumaphos)	For horn flies and lice, use 5 oz in 4 gal water. For ticks, use 10 oz in 4 gal water.	Follow label directions. DO NOT use on horses intended for slaughter. Co-Ral is a cholinesterase inhibitor. DO NOT treat sick, stressed or convalescent animals. DO NOT use on animals less than 3 months of age.
		Tri-Tec 14 (cypermethrin + pyrethrin)	Fly repellent and killer. Ready to use in dispenser.	Also kills ticks.
		Ecovet Fly Repellent (5% octanoic acid, 5% nonanoic acid, 5% decanoic acid)	Ready to use fly repellent spray. Apply to hair coat using small sprayer or soft cloth.	Follow label directions.

ANIMAL INSECT CONTROL

Animal	Pest Problem	Insecticide Formulation	Method and Rate	Restrictions/Remarks
HORSES (cont.)	Horn Flies Stable Flies Horse Flies Mosquitoes Black Flies Deer Flies Biting Gnats House Flies Face Flies (cont.)	Absorbine Ultra Shield Sport Insecticide and Repellent (cypermethrin)	Ready to use. Spray or wipe application.	Avoid contact with eyes or mucous membranes.
		Absorbine Ultrashield ES Insecticide and repellent (piperonyl butoxide, permethrin and pyrethrins)	Ready to use. Spray or wipe application.	Avoid contact with eyes or mucous membranes.
		Equi-Spot Spot-on Fly Control and generics (permethrin)	Ready to use. Follow label directions.	
		Brute pour-on Insecticide for Cattle (10% permethrin)	Ready to use. Apply 3-6 mL per 200 lb body weight (do not exceed 30 mL). Approved for horses.	Apply as a whole body wipe with a cloth or insecticide application mitt. For horn flies, pour 3-6 mL per 200 lb body weight over the withers and down the back. DO NOT treat more often than once every 7 days. DO NOT treat foals under 12 weeks of age.
		Martin's Fly Ban Synergized pour-on, Permethrin CDS pour-on, (7.4% permethrin and 7.4% piperonyl butoxide)	Ready to use. Apply 8-16 mL as a pour-on spray or wipe.	Apply as a whole body wipe with a cloth or insecticide application mitt. For pour-on application, pour over the withers and down the back. For spray application, apply with a mist sprayer in undiluted form after riding or exercise.
		Python Dust (0.075% zeta-cypermethrin and 0.150% piperonyl butoxide)	Ready-to-use dust. Apply up to 2 oz per animal.	DO NOT apply more often than every 3 days. Also controls ticks.
		A number of wipe-on towels and roll-on products are available in ready-to-use formulations for horses. These products can be useful, particularly on equines that become restless or agitated when attempting to apply insecticide spray formulations or to treat sensitive areas of the animal.		
		Roll-Ons		
		Endure Roll-On for Horses (0.15% cypermethrin, 0.02% pyrethrins, 1.63% piperonyl butoxide, 0.05% di-n-propyl isocinchomeronate and 4.85% butoxy polypropylene glycol)	Ready to use. Follow label directions.	DO NOT use on horses or foals intended for slaughter.
		Pyranha equine roll-on (permethrin, pyrethrins and piperonyl butoxide)	Ready to use. Follow label directions.	DO NOT use on animals less than 12 weeks of age. DO NOT use on dogs.
		Paste		
		War Paint Insecticide Paste (7% permethrin, 1% piperonyl butoxide)	Ready to use. Follow label directions. Applications can be directed to specific body areas to kill and repel specific fly species.	Do not apply to wet animals because the product does not adhere to wet surfaces.
		Swat Clear Fly Repellent, Swat Original Fly Repellent Ointment (.5% piperonyl butoxide, 0.2% pyrethrins and 1.0% Di-n-propyl isocinchomeronate)	Ready to use fly repellent ointment.	For use around sensitive areas and wounds.

ANIMAL INSECT CONTROL

Animal	Pest Problem	Insecticide Formulation	Method and Rate	Restrictions/Remarks
HORSE BARNs	Flies	SANITATION, BIOLOGICAL CONTROL AND INTEGRATED PEST MANAGEMENT (IPM)	Sanitation is critical to any fly control program in horse barns and animal housing facilities. IPM includes sanitation, insecticides (baits, contact insecticides, etc.), surveillance (monitoring and/or trapping) and biological control (conserving natural enemies and/or releases). Use insecticides judiciously to minimize impact on natural enemies and to prevent or delay insecticide resistance. Use a combination of management methods.	Waste (spilled feed, wet feed, manure, bedding) removal and management are the first lines of defense in any filth fly management program. Prompt removal and disposal (such as spreading on pastures) of waste will reduce filth fly breeding sites and break the house fly life cycle. Some producers have experienced reduced fly populations with weekly releases of parasitic wasps beginning in April or May. Releases should be made in dry areas out of traffic and in areas where flies reproduce. Parasite and/or insecticide use are not substitutes for a good sanitation program.
		Bait Mixtures QuickBayt, Fly Bait (0.5% imidacloprid and 0.1% muscalure (z)-9-tricosene) Ready-to-Use Fly Bait	Ready-to-use fly bait. Scatter 6 oz of bait/1,000 sq ft around the outside of horse barns in areas inaccessible to horses. Can also be mixed with water and painted on fly resting areas. See label directions.	Use only in fly bait stations inside horse stables. Place bait stations in areas inaccessible to animals.
		QuickBayt Spot Spray (10% imidacloprid and 0.1% muscalure (z)-9-tricosene)	Mix 16 oz/gal water.	For use in and around agriculture production facilities such turkey and chicken houses, cattle, sheep and goat facilities, feedlots, dairy barns, swine confinement buildings, dog kennels and horse stables. DO NOT apply on surfaces accessible to children or pets. DO NOT apply where animals can ingest the bait.
		Golden Malrin (1.1% methomyl and 0.049% (z)-9-tricosene)	Ready to use. Scatter 4 oz/500 sq ft of area where flies congregate, rest or feed, or use bait in any commercial bait station.	Use as a scatter bait only around the outside of animal housing areas. Can be used in horse stables ONLY if used in bait stations. Bait stations must be hung at least 4 ft from ground level. Scatter baits and bait stations must only be used in areas inaccessible to animals, pets or children.
		Starbar QuikStrike Fly Scatter Bait (0.5% dinotefuran and 0.04% (z)-9-tricosene)	Scatter 4 oz/500 sq ft of fly breeding area, or use bait in any commercial bait station.	Use as a scatter bait only around the outside of animal housing areas. Bait stations must be hung at least 4 ft from ground level. Scatter baits and bait stations must only be used in areas inaccessible to animals, pets or children.
		Starbar QuikStrike Fly Bait Spray (0.5% dinotefuran and 0.04% (z)-9-tricosene)	To spray on, mix 2 oz product with 16 oz of water to treat 250 sq ft. To paint on, mix 2 oz product with 3 oz of water to treat 250 sq ft.	Apply to fly resting areas such as walls, fences, window sills, posts, etc., typically 4 feet above the floor surface.
		Starbar Cyanarox Insecticidal Bait, Zyrox Fly Granular bait (0.5% cyantraniliprole)	Ready-to-use granular fly bait. Apply from 3.2-6.4 oz granular bait/1,000 sq ft. Depending upon application site, product can be scattered or placed in bait stations.	DO NOT place bait in areas accessible to food-producing animals or animals being grown for food. Do not place bait in areas accessible to children and pets. Bait stations must be used if bait is applied inside residential structures, commercial establishments, food processing plants, restaurants and animal housing units. Do not apply bait outdoors when raining.
		Decimari Fly Bait (0.5% clothianidin and 0.5% pyriproxyfen)	Scatter 6.3 oz product per 1,000 sqft in areas inaccessible to children, pets and animals or use in bait station inaccessible to children, pets and animals.	Follow other label recommendations. May also be used as a paint-on application.
		Nithiazine strip (QuikStrike)	Ready to use.	DO NOT use in areas accessible to animals.
		Starbar Aviator Fly Bait aerosol (0.5% acetamiprid and 0.05% Z-9 tricosine)	Ready to use.	Do not apply directly to animals, food, feed handling and feed storage areas. Keep treatments out of the reach of children, pets and other animals.
		Automatic Spray Systems Resmethrin, pyrethrin and piperonyl butoxide		Follow label directions.

ANIMAL INSECT CONTROL

Animal	Pest Problem	Insecticide Formulation	Method and Rate	Restrictions/Remarks
HORSE BARNS (cont.)	Flies (cont.)	Residual Sprays Rabon 50% WP (tetrachlorvinphos)	3 lb 50% WP in 7.5 gal water. Spray 1 gal/500-1,000 sq ft to wet all surfaces. Repeat every 3 or 4 weeks.	General Precautions for All Insecticides Are: <ol style="list-style-type: none"> 1. Apply where flies congregate; i.e., ceilings, light fixtures, walls, windows, etc. DO NOT apply within 1 week of applying whitewash. 2. DO NOT contaminate feed or water supplies. Cover them when spraying. 3. Remove animals before spraying. 4. Keep out of reach of animals and children. 5. DO NOT mix a combination of compounds. Wear protective clothing—jacket or coveralls, cap or hat, rubber gloves, and preferably a respirator. Wash protective clothing after using. Wash with soap and water after spraying.
		Ravap EC (23% tetrachlorvinphos and 5.3% dichlorvos)	1 gal Ravap EC/25 gal water. Allow 4 hours to dry before returning animals to barn. Apply 1 gal spray solution/1,000 sq ft.	
		Atroban 11% EC (permethrin)	1 pt/10 gal clean water. Apply 1 gal/750-1,000 sq ft. Provides up to 8 weeks of control.	
		Atroban 42.5% EC (permethrin)	4 oz/10 gal water. Apply 1 gal/750-1,000 sq ft.	
		Permethrin 3.2 EC, Tengard SFR (36.8% permethrin)	4 oz/12.5 gal water. Apply 1 gal/750 sq ft.	
		Pyranha Stock Guard Concentrate (10% permethrin and 10% piperonyl butoxide)	Mix 2 to 8 oz product per gallon of water. For severe infestations use the higher rate.	Apply as directed on label. Treat walls, ceilings, moldings, screens, door and window frames and similar resting places.
		Vapona Concentrate Insecticide (R) (40.2% dichlorvos)	2 oz/1.5 gal water (0.5% dilution). 5 oz/2 gal water (1.0% dilution).	Apply 0.5% dilution as a space spray mist; spray at the rate of 1 qt per 8,000 cu ft or at 1 qt per 1,000 sq ft for a coarse surface spray. For the 1.0% dilution, apply as above but only half the total volume of mixture. DO NOT use this product in areas where animals have received a direct organophosphate application within 8 hours. If animals are present, ventilate treated area immediately following application. DO NOT contaminate water, feed or foodstuffs, milk or milking utensils.
		Elector PSP (44.2% Spinosad)	Mix 2 oz product per 10 gallons of water to treat 5,000 -10,000 sq ft.	Treat fly resting areas.
		Onslaught microencapsulated insecticide (6.4% esfenvalerate)	Mix 0.5 oz product/gallon of water. Application rates is 0.5 oz product/1000 sq ft.	Treat fly resting areas in sufficient water volume to treat 1000 sq ft. Remove animals from area before treatment.
		Suspend Polyzone (4.75% deltamethrin)	Mix with water and apply 0.25 to 1.5 ounces per 1,000 square feet.	Wet surfaces where flies rest. DO NOT spray animals, humans, animal feed or water.
		Grenade ER, Cyonara 9.7 (9.7% lambda-cyhalothrin)	Mix 0.2-0.4 oz/gal water to make a 0.015% to 0.03% dilution.	Apply dilution to horizontal and overhead surfaces where flies rest. DO NOT make applications in areas where animals are present. Allow to dry before reintroducing animals or birds. DO NOT contaminate animal food, feed or water during application.
		Permethrin II (10% permethrin)	1 qt 10% permethrin/25 gal water. Use 1 gal/750 sq ft.	Other similar permethrin formulations are registered as surface sprays.

ANIMAL INSECT CONTROL

Animal	Pest Problem	Insecticide Formulation	Method and Rate	Restrictions/Remarks
HORSE BARNS (cont.)	Flies (cont.)	Residual Sprays (cont.) GardStar 40% EC (permethrin)	4 oz/10 gal of water (surface spray).	1 gal covers 1,000 sq ft. DO NOT use in milk rooms.
		Talstar, Bifenthrin I/T 7.9F, Optashield CS (7.9% bifenthrin)	Mix with water and apply 0.33-1.0 oz product per 1,000 sq ft.	Target areas where flies rest such as ceilings, trusses, rafters, supports, walls, windows and vegetation.
	Fly Maggots (developing in manure and/or moist spilled feed)	Dimilin 2L, Unforgiven, Cavalier 2L (22% diflubenzuron)	For spot treatments: Mix 7.5 oz Dimilin SL to 15 gallons of water. Apply one quart per 10 square feet area of fly breeding material infested with fly eggs and larvae.	DO NOT apply directly to livestock or livestock feed. DO NOT feed treated manure to animals.
		Tekko 10 (9.3% novoluron)	For spot treatments: Apply 3 oz Tekko 10 per 1,000 square feet of fly breeding material in sufficient volume to ensure coverage.	
		Neporex 2 SG (2% cyromazine)	Spray: Mix 1 lb Neporex 2 SG per gal of water. Apply as a coarse low-pressure spray on fly breeding sites with suitable spray equipment (hand-pressurized or power-operated sprayers). One gal of finished solution will treat 200 sq ft. Scatter: Apply 1 lb Neporex 2 SG per 200 sq ft. Apply after cleaning underneath bedding on stall floors.	Read and follow labeled rates. DO NOT use on horses intended for slaughter. Prevents the development of house and stable fly larvae in treated manure.
		Archer Insect Growth Regulator (1.3% pyriproxyfen)	Use 1 oz. product/1500 sqft in sufficient water volume to achieve thorough coverage.	Spray surfaces where flies rest and breed.
		Feed-Through Farnam SimpliFly Feed-thru Fly Control (0.24% diflubenzuron)	FOR HOUSE AND STABLE FLIES ONLY. Feed daily to horses. Rate is dependent on weight of the horse.	Read and follow labeled rates. DO NOT use on horses intended for slaughter. Prevents the development of house and stable fly larvae in treated manure.
		Farnam Equitol II Feed-thru Fly Control (diflubenzuron)	Feed-through house fly control for horse barns and stables. Add specified amount of Equitol to your horse's daily ration.	DO NOT use on horses intended for slaughter.
		Ragland Fly Block with Rabon oral larvicide, Stockade Rabon Fly Control Block (0.3% tetrachlorvinphos)	Follow label directions. Feed blocks at the rate of 0.88 oz per 100 lb of bodyweight per day.	Not to be used on horses destined for slaughter. PRECAUTIONS FOR HORSE USE: This product contains tetrachlorvinphos, a cholinesterase inhibitor. The most frequently reported clinical signs of cholinesterase inhibition in the horse are abdominal pain, lethargy, sweating, tearing and excessive salivation. If these signs are seen in horses, consult your veterinarian immediately. DO NOT use this product simultaneously or within a week before or after treatment with cholinesterase-inhibiting drugs, pesticides or chemicals. Consult a veterinarian before using this product on debilitated, aged, pregnant or nursing animals. This product has not been tested in breeding horses.
		Solitude IGR feed-through (2.12% cyromazine)	Daily Dosage: Using 1/2 oz scoop supplied with the product, mix one (1) scoop of Solitude IGR in the horse's ration every day . Alternate Day Dosage: Using 1/2 oz scoop supplied with the product, mix two (2) scoops of Solitude IGR in the horse's ration every other day .	

ANIMAL INSECT CONTROL

Animal	Pest Problem	Insecticide Formulation	Method and Rate	Restrictions/Remarks
POULTRY	Litter Treatments for Fleas, Lice and Mites (including northern fowl mites)	Sprays Rabon 50% WP (tetrachlorvinphos)	For floor management/roost paint, make 1% solution (1/2 lb Rabon 50% per 3 gal water). Spray finished solution into cracks and crevices at rate of 1 pt solution per 100 ft.	No withholding period from last application to slaughter. Read label directions carefully.
		Ravap EC (23% tetrachlorvinphos and 5.3% dichlorvos)	Mix 1 gal of Ravap in 50 gal water. Use 1-2 gal of finished spray per 1,000 sq ft. Spray evenly for penetration of litter surface. Spray walls, roosts, cracks, crevices and interiors thoroughly. Spray birds lightly. Mix EC with water as directed on label.	
		Dusts Beetle Shield 6 (6% tetrachlorvinphos)	For roost paint, mix 1 lb of Rabon Beetle Shield with 1 pt of water to make a slurry (will treat 100 ft). For dust boxes, use 1 pound per 100 birds.	Check label. No waiting period between application and slaughter.
		Rabon 50% WP (tetrachlorvinphos)	Mix evenly throughout top layer of box using 2.5 oz per 50 birds.	No waiting period between application and slaughter.
	Litter Beetles (Darkling beetles, black bugs, lesser mealworms)	A litter beetle treatment/monitoring program should be maintained year-round to reduce litter beetle populations and damage caused by this pest. Frequent removal of litter and replacement with fresh shavings in poultry houses can help reduce beetle populations. Litter beetle populations at outbreak levels are difficult to control. Loss of insecticide susceptibility has been observed in some parts of the country; therefore, periodic rotation of insecticides from different insecticide classes should be considered. The life cycle from egg to an adult darkling beetle ranges from about 40 to 100 days, indicating that classes should be rotated every 2-3 flocks (in broiler production) depending upon growout duration.		
		Pyrethroid Insecticides ZetaGard LBT (0.375% zeta-cypermethrin (2S), 0.750% piperonyl butoxide)	Apply from 25-50 lb per broiler or turkey growout house (see remarks to the right). Applications should be made with a drop-type dust/granular spreader in bands under feed lines and along walls. See product label for more details.	For use in chicken broiler houses and turkey growout houses. Do not apply with power duster equipment. Do not enter or allow others to enter until dusts have settled. The maximum use rate is 50 pounds of product per broiler or turkey growout house. The application can be split into two 25-pound applications, or one single 50-pound application, per flock. These applications can occur as one application at the 50-pound rate prior to the flock being placed in the broiler house, or as one application at the 25-pound rate prior to the flock being placed in the broiler house and a second 25-pound application occurring not later than three weeks prior to shipping the birds for slaughter. If one single application is made at the maximum rate of 50 pounds, slaughter cannot occur sooner than six weeks after application.
		Tempo 20 WP (cyfluthrin) 9.5-gram packet or 50-gram powerpack OR Tempo SC Ultra (11.8% beta-cyfluthrin) Grenade ER, Cyonara 9.7 (9.7% lambda-cyhalothrin) Optimate CS (5.9% gamma-cyhalothrin)	Two 9.5-gram packets (19 grams) or two Tempo scoopfuls of 20 WP in a water-based spray per 1,000 sq ft. Four level teaspoonfuls also equals 9.5 grams. Mix 15 mL per gallon of water. Apply as a general spray or to cracks and crevices. Mix 0.8 oz (24 mL) per gallon of water. Apply to walls and floors following cleanout. Mix according to label. Apply to walls and floor following cleanout or after growout.	DO NOT apply while birds are in house. DO NOT make application to feeding or watering equipment. When applications are made with existing manure and litter on the floor, allow that accumulation to dry enough to form a crust before applications are made. DO NOT apply when birds are present. DO NOT contaminate feed, water or feeding and watering equipment with spray. Also helps in fly control if applied to fly resting areas. Apply only when birds are NOT present. DO NOT contaminate feed, water or feeding and watering equipment with spray. Follow label directions. Apply only when birds are NOT present. DO NOT contaminate feed, water or feeding and watering equipment with spray.

ANIMAL INSECT CONTROL

Animal	Pest Problem	Insecticide Formulation	Method and Rate	Restrictions/Remarks
POULTRY (cont.)	Litter Beetles (cont.) (Darkling beetles, black bugs, lesser mealworms)	Pyrethroid Insecticides (cont.) Onslaught microencapsulated insecticide (6.4% esfenvalerate)	Use 1.0 fl. oz. product in sufficient water volume to cover 1,000 sq. ft.	To control litter beetles (darkling, hide, and carrion beetles), apply ONSLAUGHT® Microencapsulated Insecticide to walls and floors at cleanout and before reintroduction of animals. Treat areas where beetles frequently occur, such as walls, supports, cages, cage framing, stalls, and around feeders. To reduce immigration of insects, make a perimeter treatment around the outside of building foundations. Apply in a uniform band 1-3 feet up the exterior foundation wall and 3-6 feet out from the foundation.
		Bifen I/T Insecticide/Termiticide, TalstarOne Multi-insecticide (7.9% bifenthrin)	Mix according to label. Apply to walls, floors and posts following cleanout or after growout.	Follow label directions. Apply only when birds are NOT present. DO NOT contaminate feed, water or feeding and watering equipment with spray.
		Organophosphate insecticides		
		Rabon 50% WP (tetrachlorvinphos)	Mix 2 lb of 50% WP in 25 gal of water.	Treat evenly and thoroughly using 3/4 oz/100 sq ft.
		Ravap EC (23% tetrachlorvinphos and 5.3% dichlorvos)	Mix as directed on label. Use as a residual spray.	Apply 1 gal of dilution/500-1,000 sq ft.
		Neonicotinoid insecticides		
		Credo SC, Midash Forte and others (42.8% imidacloprid)	Mix as directed on the label. Apply 3 fl oz Credo SC diluted in water per 1,000 sq ft.	Apply between flocks following de-caking/sanitation procedures. Apply a 3-foot band to litter under feed and/or water lines and a 3-foot band to litter adjacent to walls, including 1 foot up the wall above the foundation. Follow all other application directions on the label. Under severe infestations, Credo SC and specific generics may be applied to the whole house.
		Imidashot DF (270% imidacloprid)	Mix as directed on the label. Apply 0.14 lb. product diluted in water per 1,000 sq ft. Apply from 1/2 to 2 gal of finished spray per 1,000 sq ft.	Apply between flocks following de-caking/sanitation procedures. Apply a 3-foot band to litter under feed and/or water lines and a 3-foot band to litter adjacent to walls, including 1 foot up the wall above the foundation. Follow all other application directions on the label. Under severe infestations, Credo D may be applied to the whole house.
		Darlex (23.6% clothianidin)	Use 4 oz product per 1,000 sq ft. For example, mix 4 oz product with 1/2 to 2 gal of water to treat 1,000 sq ft of floor, litter or wall.	Apply between flocks following de-caking/sanitation procedures. Do not apply when birds are present. Addition of disinfectants to insecticide tank mix may affect insecticidal activity.
		Spinosyn insecticides		
		Elector PSP (44.2% spinosad)	Use 8 oz per 20,000 sq ft (use up to 16 oz for heavy infestations). Mix enough water to ensure coverage of treated area. Treat litter along feed and water lines, walls and support beams.	DO NOT apply premise treatment directly to poultry. Read and follow label precautions.
		Insect Growth Regulators		
		Tekko Pro, Archer Insect Growth Regulator (1.3% pyriproxyfen)	Use 1 oz/1,000 sq ft space in sufficient volume water to wet litter. General broadcast, spot, crack and crevice treatment.	FOR LARVAL CONTROL ONLY. Tekko Pro and Nylar are insect growth regulators that will alter the development of larval forms. Can be used in conjunction with an adulticide to provide immediate control of adults. For best results, apply following cleanout. Remove birds from immediate treatment area. DO NOT contaminate food or water.
		Combinations		
		Tobex Multi MoA Concentrate (4% lambda-cyhalothrin, 0.4% prallethrin, 1.3% pyriproxyfen and 6% piperonyl butoxide)	Apply 2 – 4 ounces of product per 1,000 sqft. In sufficient water volume to cover 1,000 sqft. Can be applied as a band application or whole house application when the infestation is severe.	Follow label directions. Apply only when birds are NOT present. DO NOT contaminate feed, water or feeding and watering equipment with spray. Contains an IGR, pyrethroids and a synergist.

ANIMAL INSECT CONTROL

Animal	Pest Problem	Insecticide Formulation	Method and Rate	Restrictions/Remarks
POULTRY CAGED LAYER TREATMENTS (directly on birds)	External Parasites: Lice and Mites, including northern fowl mite	Sprays and Dusts		
		Rabon 50% WP (tetrachlorvinphos)	8 lb of 50% WP/100 gal of water. 1 gal/100 birds. Apply directly to birds; spray vent and fluff areas from below. Repeat when necessary.	DO NOT repeat more often than every 14 days.
		Permethrin Fly and Louse Dust, Prozap Insectrin dust (0.25% permethrin)	Apply 1 lb/100 birds, direct dust to the vent area.	May be applied to floors, roosts and interior surfaces at a rate of 1 lb per 40 sqft to control northern fowl mites and lice.
		Ravap EC (23% tetrachlorvinphos and 5.3% dichlorvos)	Mix 1 gal Ravap/50 gal water. 1 gal of finished spray per 100 birds. Apply directly to birds. Spray vent and fluff areas from below. For chickens on litter, spray as above and apply 1-2 gal of dilution/1,000 sq ft of litter surface. Also spray walls, roosts, cracks and crevices.	DO NOT repeat more often than every 14 days. Spray birds lightly.
		Permethrin II 10% EC and generics (permethrin)	1 qt/50 gal water. Spray 1-2 oz/bird at vent area. Cover or remove feed and water.	Repeat at 7-10 weeks if necessary. 14 days between last application and slaughter.
		GardStar 40% EC, Tengard SFR (permethrin)	1-4 oz/3.75 gal water. Treats 1,500 birds.	Use high-pressure spray. 1 gal coarse spray per 100 birds. Pay particular attention to vent area.
POULTRY HOUSES (for treatment of poultry facility)	Bed Bugs, Fowl Ticks	Atroban 11% EC (11% permethrin)	1 pt/25 gal water. Use 1 gal of finished spray per 100 birds.	One application should eliminate an infestation. For best results apply to vent area.
		Pyranha Stock Guard Concentrate (10% permethrin and 10% piperonyl butoxide)	Dilute 1.28 oz product per gallon of water.	Apply one gallon per 100 birds.
		Bifen I/T Insecticide/Termiticide, Talstar One Multi-insecticide (7.9% bifenthrin)	Mix according to label. Apply to cracks, crevices, walls, posts, nest boxes and mobile side curtains.	Follow label directions. DO NOT apply directly to birds. For occupied areas of poultry facility, apply to cracks and crevices ONLY. DO NOT contaminate feed, water or feeding and watering equipment with spray.
		Grenade ER, Cyonara 9.7 (9.7% lambda-cyhalothrin)	Mix according to label. Apply to cracks, crevices, walls, posts and cage frames.	Follow label directions. DO NOT apply in areas where birds are present. DO NOT contaminate feed, water or feeding and watering equipment with spray.
		Tempo 20 WP (cyfluthrin) 9.5-gram packet or 50-gram powerpack	Mix according to label. Apply to cracks and crevices.	Follow label directions. DO NOT apply when birds are present. DO NOT contaminate feed, water or feeding and watering equipment with spray.
		Tempo SC Ultra (11.8% beta-cyfluthrin)	Mix according to label. Apply to cracks and crevices.	Follow label directions. DO NOT apply when birds are present. DO NOT contaminate feed, water or feeding and watering equipment with spray.
		Pyranha Stock Guard Concentrate (10% permethrin and 10% piperonyl butoxide)	Dilute 1.28 oz product per gallon of water.	Spray crevices of roost poles, cracks in nests and walls where chicken mites and bed bugs hide.
		Ravap EC (23% tetrachlorvinphos and 5.3% dichlorvos)	Mix according to label. Apply to cracks and crevices.	Follow label directions.
		Rabon 50 WP	Mix according to label. Apply to cracks and crevices.	Follow label directions.
		Permethrin (various formulations)	Mix according to label. Apply to cracks and crevices.	Follow label restrictions and directions.

ANIMAL INSECT CONTROL

Animal	Pest Problem	Insecticide Formulation	Method and Rate	Restrictions/Remarks
POULTRY HOUSES (for treatment of poultry facility) (cont.)	House Flies and Flies around the premises	Sanitation, Biological Control and Integrated Pest Management (IPM)	Sanitation is critical to any fly control program in poultry facilities. IPM includes sanitation, insecticides (baits, contact insecticides, etc.), surveillance (monitoring and/or trapping) and biological control (conserving natural enemies and/or releases). Use insecticides judiciously to minimize impact on natural enemies and to prevent or delay insecticide resistance. Use a combination of management methods.	Waste removal and management is the first line of defense in any filth fly management program. Waste management includes both removal and moisture control. Minimizing the amount of moisture in waste will reduce fly breeding potential. Some producers have experienced reduced fly populations with releases of parasitic wasps. Parasite and/or insecticide use are not substitutes for a good sanitation and moisture control program.
		Larvicides and IGRs Vapona Concentrate Insecticide (40.2% dichlorvos) or Prozap Vapona 400E (41.4% dichlorvos)	Mix 2 oz in 1.5 gal water. Apply 1-2 qt/100 sq ft of manure.	Larvicides used on accumulated droppings will give some control, but removal or controlling the moisture in the droppings is preferable. Keep spray away from birds. DO NOT contaminate feed, poultry litter or feed troughs. DO NOT apply to poultry or cages. Well-timed spot treatment of heavy maggot infestations should eliminate the need for "blanket" applications on a routine basis. Repeat applications as needed. Sanitation, such as cleanup of spilled feed outside poultry houses, should not be overlooked. KEEP MANURE DRY. STOP WATER DRIPS. MOW WEEDS NEXT TO HOUSE.
	Fly Maggots (in droppings under caged layers)	Dimilin 2L, Cavalier 2L and Unforgiven (22% diflubenzuron)	For spot treatments: Mix 7.5 oz Dimilin SL to 15 gallons of water. Apply one quart per 10 square feet area of fly breeding material infested with fly eggs and larvae.	
		Tekko 10 (9.3% novoluron)	For spot treatments: Apply 3 oz Tekko 10 per 1,000 square feet of fly breeding material in sufficient volume to ensure coverage.	
		Neporex 2 SG (2% cyromazine)	Mix 1 lb Neporex 2 SG per gal of water. Apply as a coarse low-pressure spray on fly breeding sites with suitable spray equipment (hand-pressurized or power-operated sprayers). One gal of finished solution will treat 200 sq ft.	DO NOT apply directly to poultry or poultry feed. DO NOT feed treated manure to animals. Allow 1 day between last application and slaughter. DO NOT use Neporex 2 SG in conjunction with Larvadex-treated feed.
		Larvadex 1% premix (cyromazine)	Mix 1 lb of Larvadex 1% premix per ton of feed. Feed Larvadex continuously as directed for 4 to 6 weeks. Read label thoroughly before use.	DO NOT feed Larvadex-treated feed to broiler poultry. Larvadex-treated feed must be removed from layers at least 72 hours before slaughter.
		Rabon EC or WP (tetrachlorvinphos)	4 gal of 24.3% EC or 16 lb of 50% WP in 100 gal of water. Apply to droppings at rate of 1 gal/100 sq ft.	
		Ravap EC (23% tetrachlorvinphos and 5.3% dichlorvos)	Mix 1 gal Ravap EC in 25 gal water. Apply 1 gal of finished spray per 100 sq ft of manure.	
	Adult House Flies (and other premise flies)	Baits (ready-to-use) QuickBayt Fly Bait (0.5% imidacloprid and 0.1% muscalure (z)-9-tricosene) Ready-to-Use Fly Bait	Scatter 6 oz of bait/1,000 sq ft around the outside of poultry houses and in inaccessible areas of animal housing, or mix 1.5 oz/1 oz of water, mix thoroughly, let stand for 15 minutes or until a paste consistency and paint non-dusty fly resting areas inaccessible to animals.	Use only around the outside of poultry houses. In caged layer houses, apply only on the outside and in walkways. Place bait in areas inaccessible to animals. DO NOT allow bait to contact food or water. Can be used inside horse stables, broiler, turkey and caged layer houses, swine confinement buildings, dairy barns and milking parlors ONLY if used in bait stations. Bait stations must be placed at least 4 ft above ground level and in areas inaccessible to animals, pets or children.

ANIMAL INSECT CONTROL

Animal	Pest Problem	Insecticide Formulation	Method and Rate	Restrictions/Remarks
POULTRY HOUSES (for treatment of poultry facility) (cont.)	Adult House Flies (and other premise flies) (cont.)	Baits (ready to use) QuickBayt Spot Spray (10% imidacloprid and 0.1% muscalure (z)-9-tricosene)	Mix 16 oz per gallon of water.	For use in and around poultry, turkey and chicken houses. DO NOT apply to surfaces accessible to children or pets. DO NOT apply where animals can ingest product.
		Golden Malrin (1.1% methomyl and 0.049% (z)-9-tricosene)	Ready to use. Scatter 4 oz per 500 sq ft of area where flies congregate, rest or feed or use bait in any commercial bait station.	Use as a scatter bait only around the outside of animal housing areas and poultry facilities. Can be used on walkways in caged layer houses. Bait stations must be hung at least 4 ft from ground level. Scatter baits and bait stations must only be used in areas inaccessible to animals, pets or children. When using baits, DO NOT contaminate equipment, feed or water. Keep baits out of reach of birds, pets or children.
		QuikStrike Fly Scatter Bait (0.5% dinotefuran and 0.04% (z)-9-tricosene)	Scatter 4 oz/500 sq ft of fly breeding area or use bait in any commercial bait station.	Use as a scatter bait only around the outside of animal housing areas. Bait stations must be hung at least 4 ft from ground level. Scatter baits and bait stations must only be used in areas inaccessible to animals, pets or children.
		QuikStrike Fly Bait Spray (0.5% dinotefuran and 0.04% (z)-9-tricosene)	To spray on, mix 2 oz product with 16 oz of water to treat 250 sq ft. To paint on, mix 2 oz product with 3 oz of water to treat 250 sq ft.	Apply to fly resting areas such as walls, fences, window sills, posts, etc., typically 4 feet above the floor surface.
		Elector Bait (0.5% spinosad and 0.04% (z)-9-tricosene)	Scatter 12-16 oz/2,000 sq ft. Can also be used in bait stations or applied to hang boards/cards. Use 8-10 bait stations or hang boards/cards per 2,000 sq ft. See label for more detailed instructions on bait station and hang board/card use.	DO NOT allow Bait to contact food, feedstuffs or water. When using in bait stations, hang stations in areas inaccessible to children, livestock and pets. Bait stations or hang cards must be located at least 4 ft above the ground.
		Starbar Cyanarox Insecticidal Bait, Zyrox Fly Granular bait (0.5% cyantraniliprole)	Ready-to-use granular fly bait. Apply 3.2-6.4 oz granular bait/1,000 sq ft. Depending upon application site, product can be scattered or placed in bait stations.	DO NOT place bait in areas accessible to food-producing animals or animals being grown for food. DO NOT place bait in areas accessible to children and pets. Bait stations must be used if bait is applied inside residential structures, commercial establishments, food processing plants, restaurants and animal housing units. DO NOT apply bait outdoors when raining.
		Decimari Fly Bait (0.5% clothianidin and 0.5% pyriproxyfen)	Scatter 6.3 oz product per 1,000 sqft in areas inaccessible to children, pets and animals or use in bait station inaccessible to children, pets and animals.	Follow other label recommendations. May also be used as a paint-on application.
		QuikStrike (1% nithiazine) Fly Abatement Strip	Ready-to-use strip.	Hang 1 strip per 100-300 sq ft in enclosed area protected from rain. Observe safety restrictions.
		Starbar Aviator Fly Bait aerosol (0.5% acetamiprid and 0.05% Z-9 tricosine)	Ready to use	Do not apply directly to animals, food, feed handling and feed storage areas. Keep treatments out of the reach of children, pets and other animals
		Space Treatments Pyrethrins 0.3% to 5% plus Piperonyl Butoxide 1.5% to 25%	Ready-to-use oil sprays, aerosols, ULV concentrates and concentrates for dilution are available. Follow directions on label. Saturate the atmosphere with electric fogging gun for quick kill when adult flies are numerous.	Follow manufacturer's directions, ESPECIALLY FIRE HAZARD PRECAUTIONS. Can be used while birds are in houses.
		Vapona Concentrate Insecticide (40.2% dichlorvos and 3% related compounds equivalent to 43.2% Vapona)	Apply 1 pt of 1% spray/8,000 cu ft as mist or fog. To make a 1% solution, mix 1 gal concentrate to 50 gal water or 5 oz concentrate to 2 gal water.	Reduce air movement as much as possible. DO NOT apply directly to birds. DO NOT contaminate eggs, feed or water.

ANIMAL INSECT CONTROL

Animal	Pest Problem	Insecticide Formulation	Method and Rate	Restrictions/Remarks
POULTRY HOUSES (for treatment of poultry facility) (cont.)	Adult House Flies (and other premise flies) (cont.)	Residual Surface Sprays		
		Grenade ER, Cyonara 9.7, (9.7% lambda-cyhalothrin)	Apply to walls and ceilings. Mix 0.2- 0.4 oz/gal water to make a 0.015% to 0.03% dilution. Rates can be increased to a 0.06% dilution (0.8 oz/gal of water) if environmental conditions are severe or populations are high.	Apply dilution to horizontal and overhead surfaces where flies rest. DO NOT make applications in areas where birds are present. Allow to dry before reintroducing birds. DO NOT contaminate bird food, feed or water during application.
		Rabon 50% WP (tetrachlorvinphos)	Use 16 lb 50% WP/100 gal water. 1 gal/500 sq ft.	No need to remove birds from house. DO NOT apply to chickens.
		Pounce 25 WP (permethrin)	Mix 6 oz/11 gal water.	Apply 1 gallon solution/750 sq ft.
		Pyranha Stock Guard Concentrate (10% permethrin and 10% piperonyl butoxide)	Mix 2 to 8 oz product per gallon of water. For severe infestations use the higher rate.	Apply as directed on label. Treat walls, ceilings, moldings, screens, door and window frames and similar resting places.
		Atroban 11% EC (permethrin)	1 pt 11% EC to 10 gal water. 1 gal/750-1,000 sq ft.	Avoid contamination of feed and water.
		Ravap EC (23% tetrachlorvinphos and 5.3% dichlorvos)	1 gal Ravap EC to 25 gal water.	Apply 1 gallon diluted spray/1,000 sq ft.
		Also Permethrin (Ectiban, Insectrin, Permethrin Overtime)	Follow label mixing instructions.	DO NOT apply more often than once every two weeks.
		Talstar, Bifenthrin I/T 7.9F, Optashield CS (7.9% bifenthrin)	Mix with water and apply 0.33 to 1.0 oz product per 1,000 sq ft.	Target areas where flies rest such as ceilings, trusses, rafters, supports, walls, windows and vegetation.
		StandGuard 5.9 (5.9% gamma-cyhalothrin)	Mix 0.16 oz (5 mL)/gal of water.	Spray 1 gal of diluted spray to treat 500-1,000 sq ft fly resting surfaces.
		Elector PSP (44.2% Spinosad)	Mix 2 oz product per 10 gallons of water to treat 5,000 -10,000 sq ft.	Treat fly resting areas.
		Onslaught microencapsulated insecticide (6.4% esfenvalerate)	Mix 0.5 oz product/gallon of water. Application rates is 0.5 oz product/1000 sq ft.	Treat fly resting areas in sufficient water volume to treat 1000 sq ft. Remove animals from area before treatment.
	Fire Ants	Amdro Pro (hydramethylnon) (outside use only)	2-5 Tbsp/mound broadcast 1.0-1.5 lb/acre	Apply when ants are active and soil temperature is above 60 degrees F. DO NOT treat if rain is anticipated within 6 hours. Check with complex integrator before using insecticides inside the house.
		Extinguish Professional (methoprene) (outside use only)	3-5 Tbsp/mound broadcast 1.0-1.5 lb/acre	
		Extinguish Plus (methoprene and hydramethylnon) (outside use only)	3-5 Tbsp/mound broadcast 1.0-1.5 lb/acre	
		Esteem Ant Bait (pyriproxyfen) (outside use only)	2-4 Tbsp/mound or 1.5-2.0 lb/acre if broadcast.	
		Clinch Ant Bait (abamectin) (outside use only)	5-7 Tbsp/mound or 1.0 lb/acre if broadcast.	

ANIMAL INSECT CONTROL

Animal	Pest Problem	Insecticide Formulation	Method and Rate	Restrictions/Remarks	Minimum Days From Last Application to Slaughter
SHEEP AND GOATS (DO NOT treat animals under 3 months old, dairy goats or sick animals.)	Fleeceworms and Screwworms (Wool maggots and maggots in wounds)	Catron IV (0.5% permethrin)	Ready-to-use spray. Spray wound and surrounding area.	Check label for restrictions.	
		Prozap Screw Worm Aerosol (0.5% permethrin)			
	Lice, Keds and Ticks (In fall or spring after shearing)	Treat animals 3-6 months old lightly only. Read insecticide label for further instructions. Repeat after 2-3 weeks if needed. (DO NOT repeat within 1 week.) Treat during fall and winter.			
		GardStar 40% EC, Tengard SFR (permethrin)	4 oz/25 gal water. Treats 50-100 head.	Use high-pressure spray.	0
		Pyranha Stock Guard Concentrate (10% permethrin and 10% piperonyl butoxide)	Mix 2 to 8 oz product per gallon of water. For severe infestations use the higher rate.	Wet hair thoroughly.	
		Permethrin II 10% EC and generics (permethrin) (sheep only)	Check label for dosages.		0
		Permethrin CDS, Martin's Fly-Ban Synergized pour-on (7.4% permethrin, 7.4% p1peronyl butoxide)) (sheep only)	Apply 1 ml per 50 lbs BW along the backline. Do not apply more than 12 ml per animal.		0
		Ultra boss pour-on insecticide for cattle, sheep and goats (5% permethrin and 5% piperonyl butoxide)	Pour 1.5 ml per 50 lbs BW along the back. Do not apply more than 18 ml per animal.		0
		Python Dust (0.075% zeta-cypermethrin and 0.25% piperonyl butoxide)	Ready-to-use dust. Dust animals. Apply up to 2 oz per animal.		0
		Atroban (11% permethrin) (sheep only)	1 qt/50 gal water.	Use 1-2 qt/animal.	0
		Synergized DeLice (1% permethrin)	Ready-to-use pour-on.	Pour along back. Treatment at 14-day intervals.	0
	Nasal Bots	Ivomec Sheep Drench, Durvet Ivermectin Sheep Drench (0.08% ivermectin)	Administer orally at 3 mL per 26 lb body weight.	Formulated for sheep only. May cause severe reactions in other animals. DO NOT treat within 11 days of slaughter.	11

ANIMAL INSECT CONTROL

Animal	Pest Problem	Insecticide Formulation	Method and Rate	Restrictions/Remarks	Minimum Days From Last Application to Slaughter
SWINE	Sarcoptes Mange and Lice	GardStar 40% EC, Tengard SFR (permethrin)	4 oz/25 gal water. Treats 50-100 head.	Repeat at 14 days. Thoroughly wet or dip animals. Mange—spray pens thoroughly.	0
		Atroban 11% EC (permethrin)	1 qt/50 gal water. Use 1 pt of spray per animal.	DO NOT spray food or water.	5
		Ivomec 1% Injection (ivermectin)	1 mL/75 lb body weight.	Subcutaneous administration only. An Ivomec 0.27% formulation is available for grower and feeder pigs.	18
		Dectomax Injectable Solution (1% doramectin)	1 mL/75 lb body weight.	Intramuscular injection.	24
		Prolate/Lintox-HD (11.75% phosmet)	Mix 1 qt/25 gal water.	DO NOT treat pigs less than 3 months old.	1
		Swine Gard pour-on (10% permethrin)	Ready to use. Apply 3 mL per 100 lb of body weight up to a maximum of 15 mL. Pour across back of head and ears then apply down midline of neck and over shoulders.	DO NOT treat more often than every two weeks. For optimum control, two treatments 14 days apart may be required. Apply to swine 85 lb and over.	5
	Demodex Mange	No known treatments for swine.			
	Lice Only	Rabon 50% WP (tetrachlorvinphos)	Mix 4 lb/50 gal water or 1/2 lb/6 gal water.	Apply 1-2 qt per animal as a coarse spray. Wet animal entirely.	0
		Co-Ral Fly and Tick Spray (6.15% coumaphos)	Mix 5 oz/4 gal water. Spray animal until runoff.	DO NOT apply more frequently than 10 days.	10
		Co-Ral 1% Livestock dust (1.0% coumaphos)	1 oz/head.		0
		Pyranha Stock Guard Concentrate (10% permethrin and 10% piperonyl butoxide)	Mix 2 to 8 oz product per gallon of water. For severe infestations use the higher rate.	Wet hair thoroughly.	5
		Prozap Insectrin Dust, Permethrin Fly and Livestock Dust, Gardstar Garden and Poultry Dust (0.25% permethrin)	1 oz/animal.		5
		Rabon Dust (3% tetrachlorvinphos)	3-4 oz/animal.	In severe infestations, apply to bedding. Apply 1 lb/150 sq ft of bedding.	0

ANIMAL INSECT CONTROL

Animal	Pest Problem	Insecticide Formulation	Method and Rate	Restrictions/Remarks
SWINE BARNs (not on animals)	House Flies and Flies around the premises	Sanitation, Biological Control and Integrated Pest Management (IPM)	Sanitation is critical to any fly control program in swine operations. IPM includes sanitation, insecticides (baits, contact insecticides, etc.), surveillance (monitoring and/or trapping) and biological control (conserving natural enemies and/or releases). Use insecticides judiciously to minimize impact on natural enemies and to prevent or delay insecticide resistance. Use a combination of management methods.	Waste (spilled feed, wet feed, manure and bedding) removal and management is the first line of defense in any filth fly management program. Prompt removal and disposal (such as spreading on pastures, use of lagoons, etc.) of waste will reduce filth fly breeding sites and break the house fly life cycle. Some producers have experienced reduced fly populations with weekly releases of parasitic wasps beginning in April or May. Releases should be made in dry areas out of traffic and in areas where flies reproduce. Parasite and/or insecticide use are not a substitute for a good sanitation program.
		Adult Flies		
		Sprays Ravap EC (23% tetrachlorvinphos and 5.3% dichlorvos)	12 Tbsp/gal water.	Use 1 gal of diluted spray per 500-1,000 sq ft.
		Pounce 25 WP (25% permethrin)	6 oz/11 gal. Apply 1 gal/750 sq ft.	
		Pyranha Stock Guard Concentrate (10% permethrin and 10% piperonyl butoxide)	Mix 2 to 8 oz product per gallon of water. For severe infestations use the higher rate.	Apply as directed on label. Treat walls, ceilings, moldings, screens, door and window frames and similar resting places.
		Rabon 50% WP (tetrachlorvinphos)	1/2 lb/3 gal water.	
		Atroban 11% EC (permethrin)	1 pt/10 gal water.	Use 1 gal diluted spray per 750-1,000 sq ft.
		Vapona Concentrate Insecticide (R) (40.2% dichlorvos)	2 oz/1.5 gal water (0.5% dilution). 5 oz/2 gal water (1.0% dilution).	Apply 0.5% dilution as a space spray mist to open air space at the rate of 1 qt/8,000 cu ft or as a coarse surface spray to indoor surfaces at the rate of 1 qt /1,000 sq ft. For the 1.0% dilution, apply as above but only half the total volume of mixture. DO NOT use this product in areas where animals have received a direct organophos-phate application within 8 hours. If animals are present, ventilate treated area immediately following application. DO NOT contaminate water, feed or foodstuffs.
		Annihilator Polyzone (4.75% % deltamethrin)	Mix with water and apply 0.25- 1.5 oz product per 1,000 sqft.	Wet surfaces where flies rest. DO NOT spray animals, humans, animal feed or water. DO NOT apply more than once per week.
		Grenade ER, Cyonara 9.7 (9.7% lambda-cyhalothrin)	Mix 0.2-0.4 oz/gal water to make a 0.015% to 0.03% dilution.	Apply dilution to horizontal and overhead surfaces where flies rest. DO NOT make applications in areas where animals are present. Allow to dry before reintroducing animals or birds. DO NOT contaminate animal food, feed or water during application.
		Talstar P, Bifen I/T , (7.9% bifenthrin)	Mix with water and apply 0.33-1.0 oz product per 1,000 sq. ft.	Target areas where flies rest such as ceilings, trusses, rafters, supports, walls, windows and vegetation.
		Optimate CS (5.9% gamma-cyhalothrin)	Mix 0.16 oz (5 mL)/gal of water.	Spray 1 gal of diluted spray to treat 500-1,000 sq ft fly resting surfaces.
		Baits QuickBayt Fly Bait (0.5% imidacloprid and 0.1% muscalure (z)-9-tricosene) Ready-to-Use Fly Bait	Scatter 6 oz of bait/1,000 sq ft around the outside and inaccessible areas of swine confinement facilities, or mix 1.5 oz bait/1 oz water, mix thoroughly, let stand for 15 minutes and paint on non-dusty fly resting areas inaccessible to animals.	Use around the outside of animal housing structures. DO NOT allow bait to contact food or water. Can be used inside swine confinement buildings ONLY if used in bait stations. Bait stations must be placed at least 4 feet above ground level and in areas inaccessible to animals, pets or children.

ANIMAL INSECT CONTROL

Animal	Pest Problem	Insecticide Formulation	Method and Rate	Restrictions/Remarks
SWINE BARNS (not on animals) (cont.)	Adult Flies (cont.)	Baits QuickBayt Spot Spray (10% imidacloprid and 0.1% muscalure (z)-9-tricosene)	Mix 16 oz per gallon of water.	For use in and around swine confinement buildings. DO NOT apply on surfaces accessible to children or pets. DO NOT apply where animals can ingest product.
		Golden Malrin (1.1% methomyl and 0.049% (z)-9-tricosene)	Ready to use. Scatter 4 oz/500 sq ft of area where flies congregate, rest or feed, or use bait in any commercial bait station.	Use as a scatter bait only around the outside of animal housing areas or swine confinement buildings. Bait stations must be hung at least 4 ft above ground level. Scatter baits and bait stations must only be used in areas inaccessible to animals, pets or children.
		QuikStrike Fly Scatter Bait (0.5% dinotefuran and 0.04% (z)-9-tricosene)	Scatter 4 oz/500 sq ft of fly breeding area, or use bait in any commercial bait station.	Use as a scatter bait only around the outside of animal housing areas. Bait stations must be hung at least 4 ft from ground level. Scatter baits and bait stations must only be used in areas inaccessible to animals, pets or children.
		QuikStrike Fly Bait Spray (0.5% dinotefuran and 0.04% (z)-9-tricosene)	To spray on, mix 2 oz product with 16 oz of water to treat 250 sq ft. To paint on, mix 2 oz of product with 3 oz water to treat 250 sq ft.	Apply to fly resting areas such as walls, fences, window sills, posts, etc., typically 4 feet above the floor surface.
		Gordon's Fly Bait (0.5% spinosad and 0.04% (z)-9-tricosene)	Scatter 12-16 oz of Elector Bait/2,000 sq ft. Elector Bait can also be used in bait stations or applied to hang boards/cards. Use 8-10 bait stations or hang boards/cards per 2,000 sq ft. See label for more detailed instructions on bait station and hang board/card use.	DO NOT allow Elector Bait to contact food, feedstuffs or water. When using Elector in bait stations, hang stations in areas inaccessible to children, livestock and pets. Elector Bait stations or hang cards must be located at least 4 feet above the ground.
		Starbar Cyanarox Insecticidal Bait, Zyrox Fly Granular bait (0.5% cyantraniliprole)	Ready-to-use granular fly bait. Apply from 3.2-6.4 oz granular bait/1,000 sq ft. Depending upon application site, product can be scattered or placed in bait stations.	DO NOT place bait in areas accessible to food-producing animals or animals being grown for food. DO NOT place bait in areas accessible to children and pets. Bait stations must be used if bait is applied inside residential structures, commercial establishments, food processing plants, restaurants and animal housing units. DO NOT apply bait outdoors when raining.
		Decimari Fly Bait (0.5% clothianidin and 0.5% pyriproxyfen)	Scatter 6.3 oz product per 1,000 sq ft in areas inaccessible to children, pets and animals or use in bait station inaccessible to children, pets and animals.	Follow other label recommendations. May also be used as a paint-on application.
		Starbar Aviator Fly Bait aerosol (0.5% acetamiprid and 0.05% Z-9 tricosine)	Ready to use.	Do not apply directly to animals, food, feed handling and feed storage areas. Keep treatments out of the reach of children, pets and other animals
	Fly Maggots (fly breeding areas)	Neporex 2 SG (2% cyromazine)	Spray: Mix 1 lb Neporex 2 SG/gal of water. Apply as a coarse low-pressure spray on fly breeding sites with suitable spray equipment (hand-pressurized or power-operated sprayers). One gallon of finished solution will treat 200 sq ft. Treat manure surface and wet spots around feed and water troughs. Also apply 3 days after manure removal or when larvae are found. Scatter: Apply 1 lb Neporex 2 SG/ 200 sq ft. Apply after cleaning and prior to the installation of pigs on fly breeding sites where fly larvae are found.	DO NOT apply directly to livestock or livestock feed. DO NOT feed treated manure to animals. Allow at least 1 day between last application and harvest. May be used with slatted floors to treat areas where manure and other refuse accumulate to create fly breeding sites.
		Dimilin 2L, Unforgiven, Cavalier 2L (22% diflubenzuron)	For spot treatments: Mix 7.5 oz Dimilin SL to 15 gallons of water. Apply one quart per 10 square feet area of fly breeding material infested with fly eggs and larvae.	
		Tekko 10 (9.3% novoluron)	For spot treatments: Apply 3 oz Tekko 10 per 1,000 square feet of fly breeding material in sufficient volume to ensure coverage.	

FIELD CORN INSECTICIDE PERFORMANCE RATING, 2025

	Chemistry	Restricted Entry Interval (hours)	Restricted Use (R)	Chinch Bug	Fall Armyworm	Corn Rootworm	Cutworm	European Corn Borer	Flea Beetle	Grasshopper	Seed Corn Maggot	Southwestern Corn Borer	Green and Southern Green Stink Bug	Brown Stink Bug	Wireworm	Fire Ant
Axcess/Senator/Concur	NEO	12		8		6	1				8				5	5
Cruiser	NEO	12		8		6	1				8				5	5
Fortenza	DM	12														
Lumivia	DM										8					
Poncho	NEO		X	8		6	3				8				5	5
Ambush	SyP	12	X	7	5		8	6		7		5	7	4		
Asana XL/Adjourn	SyP	12	X	7	5		9	6		7		7	8	5		
Aztec/Defcon	SyP + OP	48	X	8		6	4				8					
Baythroid XL	SyP	12	X	7	5		9	6	6	8		7	8	5		
Besiege	DM + SyP	24	X	7	9		9	9	6	8		9	8	4		
Blackhawk	SP	4		0	7		7	7		1		8				
Counter	OP	48	X	8		6	0		6		8				6	
Bifenthrin/Discipline/Fanfare/Brigade	SyP	12	X	7	5		9	7	6	8		7	9	8		
Elevest	SyP + DM	12	X	7	9		9	9	6	8		9	9	8		
Force/Force EVO	SyP	0	X	6		6	5				5					
Hero	SyP	12	X	7	5		9	7	6	8		7	9	8		
Intrepid/Troubadour/Invertid/Turnstyle	IGR	4					7	8				8				
Intrepid Edge	IGR + SP	4			7		9	9				9				
Lambda Cy/Silencer/Warrior	SyP	24	X	7	5		9	6	6	8		6	8	4		
Lannate	Car	48	X	3	8		5	6		4		7				
Mustang Maxx	SyP	12	X	7	5		9	6	6	8		7	8	4		
Pounce/Perm-UP	SyP	12	X	7	5		8	6	6	8		6	6			
Prevathon/Vantacor	DM	4			9		9	9				9				
Proaxis/Declare	SyP	24	X	7	4		9	6	6	8		6	8	4		
Sevin/Carbaryl	Car	12	X	8	6		5	6	8	5		7				
Thimet/Phorate	OP	48	X			5	0				1					

Rating Scale: 0 = no control, 10 = excellent

The performance ratings in the chart are for comparison purposes only and are not necessarily a measure of percent control.

QUICK VIEW THRESHOLD GUIDE

Insect	Threshold	Scouting Procedure
Fall armyworm/Corn earworm	3-6 larvae per whorl	Examine 25-50 plants
Chinch bugs	when stand is threatened and chinch bugs are present.	
European corn borer	50% of plants showing damage with larvae present	
Southwestern corn borer	Pheromone Traps: First generation – 50 per week; Second generation – 100 per week. Field Scouting: 10% of plants showing damage with larvae present	
Stink bugs	10% of plants infested (< 2 feet tall) 5% of plants during early ear formation	Examine 25-50 plants (stink bugs tend to infest field borders first)

When planting into a cover crop, consider using a high seed treatment rate of 500 or above.

FIELD CORN INSECT CONTROL

Insect	Insecticide	Formulation/Acre	Lb ai/Acre	Acres/ Gallon	Application/Comments	Minimum Days From Last Application to Harvest	Restricted Entry Interval (REI) Hours
Corn Rootworm, Seed Corn Maggot, Wireworms, White Grubs	broflanilide Nurizma 2.5	0.05-0.07 oz/1,000 ft	0.7-1		In-furrow use only. Apply into open seed furrow. DO NOT apply more than 0.0445 lb ai/acre per season.		12
	clothianidin Poncho 600	0.25-1.25 mg ai/seed			Seed treatment – commercially available.		12
	cyantraniliprole Fortenza 5 FS	0.125-0.25 mg ai/kernel			Seed treatment. Fortenza is not labeled for control of corn rootworm.		12
	cyfluthrin + phostebupirim (R) Aztec or Defcon 2.1 G	6.7 oz/1,000 ft of row	0.12		Apply Aztec/Defcon in 7-inch band or in furrow.	30	48
	imidacloprid Senator/Axcess 5 FS Concur	1.34 mg ai/kernel 1.5 oz/42 lb seed			Seed treatment.		12
	phorate (R) Thimet/Phorate 20 G	6 oz/1,000 ft of row	1		Apply in 7-inch band behind the planter shoe directly in front of the press wheel. DO NOT apply Thimet or Phorate directly in furrow.	30	48
	tefluthrin (R) Force 3 G Force EVO	4-5 oz/1,000 ft of row 0.46-0.57 fl oz/1,000 ft	0.1-0.24		Apply in 7-inch band or in furrow. Apply in 7-inch T-band and incorporate or in furrow.		48
	terbufos (R) Counter 15 G	8 oz/1,000 ft of row	1		Apply in furrow or in 7-inch band behind planter shoe in front of the press wheel.		48
	thiamethoxam Cruiser 5 FS	1.25 mg ai/kernel			Seed treatment.		12
Cutworm Cutworm pressure is higher when planting into a cover crop. Consider increasing seed treatment rates when planting directly into a cover crop	beta-cyfluthrin (R) Baythroid XL 1 EC	0.8-1.6 oz	0.007-0.013	80-160		21	12
	bifenthrin (R) Brigade 2 EC (See Generic Insecticides)	2.1-6.4 oz	0.033-0.1	20-61		30	12
	cyantraniliprole Fortenza 5 FS	0.125-0.25 mg ai/kernal			Seed treatment.		12
	cyfluthrin (R) Tombstone 2 EC	0.8-1.6 oz	0.013-0.025	80-160		21	12
	esfenvalerate (R) Asana XL 0.66 EC (See Generic Insecticides)	3.2-9.6 oz	0.016-0.05	13-40	Direct spray to lower portion of plants and to soil around base of plant.	21	12
	gamma-cyhalothrin (R) Proaxis 0.5 CS Declare 1.25 CS	1.92-3.20 oz 0.77-1.28 oz	0.0075-0.0125	40-66.7 100-166		21	24
	lambda-cyhalothrin (R) Warrior II 2.08 CS (See Generic Insecticides)	0.96-1.6 oz	0.015-0.025	80-133		21	24
	permethrin (R) Ambush 2 EC Pounce 25 WP	6.4-12.8 oz 6.4-9.6 oz	0.1-0.2	10-20		prior to brown silk	12
	zeta-cypermethrin (R) Mustang Maxx 0.8 EC (See Generic Insecticides)	1.28-3.2 oz	0.008-0.02	40-100		30	12

FIELD CORN INSECT CONTROL

Insect	Insecticide	Formulation/Acre	Lb ai/Acre	Acres/ Gallon	Application/Comments	Minimum Days From Last Application to Harvest	Restricted Entry Interval (REI) Hours
Chinch Bug Treat when seedlings are dying to the point of reducing stand below an acceptable level and chinch bugs are found.	beta-cyfluthrin (R) Baythroid XL 1 EC	1.6-2.8 oz	0.013-0.022	45.7-80		21	12
	bifenthrin (R) Brigade 2 EC (See Generic Insecticides)	2.1-6.4 oz	0.033-0.1	20-61		30	12
	carbaryl Sevin 4L	2qt	2	2	Direct spray to base of plant. Use a minimum of 20 gal final spray volume per acre.	48 (grain) 14 (forage)	12
	esfenvalerate (R) Asana XL 0.66 EC (See Generic Insecticides)	5.8-9.6 oz	0.03-0.05	13-22		21	12
	gamma-cyhalothrin (R) Proaxis 0.5 CS Declare 1.25 CS	3.84 oz 1.54 oz	0.015	33 83		21	24
	lambda-cyhalothrin (R) Warrior II 2.08 CS (See Generic Insecticides)	1.92 oz	0.03	66.7		21	24
	terbufos (R) Counter 15 G	8 oz/1,000 ft of row	Do not exceed 1.3 lb		DO NOT use more than 8.7 lb of Counter per acre. Counter only controls early season, light to moderate populations of chinch bugs.		48
	zeta-cypermethrin + bifenthrin (R) Hero 1.24 EC	4-10.3 oz	0.04-0.1	12.4-32		30	12
Green and Southern Green Stink Bug Treat when 10% of plants are infested and plants are less than 2 ft tall. During early ear formation, treat when 5% of plants are infested. Consider using a higher seed treatment rate when planting into a cover crop to reduce potential stink bug damage.	beta-cyfluthrin (R) Baythroid XL 1 EC	1.6-2.8 oz	0.013-0.022	45.7-80		21	12
	bifenthrin (R) Brigade 2 EC (See Generic Insecticides)	2.1-6.4 oz	0.033-0.1	20-61		30	12
	gamma-cyhalothrin (R) Declare 1.25 CS Proaxis 0.5 CS	1.02-1.54 oz 2.56-3.84 oz	0.01-0.015	83-125.5 33-50		21	24
	lambda-cyhalothrin (R) Warrior II 2.08 CS (See Generic Insecticides)	1.28-1.92 oz	0.02-0.03	66.7-100		21	24
	zeta-cypermethrin (R) Mustang Maxx 0.8 EC (See Generic Insecticides)	2.7-4.0 oz	0.017-0.025	32-47		30	12

FIELD CORN INSECT CONTROL

Insect	Insecticide	Formulation/Acre	Lb ai/Acre	Acres/Gallon	Application/Comments	Minimum Days From Last Application to Harvest	Restricted Entry Interval (REI) Hours
Brown Stink Bug Treat when 10% of plants are infested and plants are less than 2 ft tall. During early ear formation, treat when 5% of plants are infested. Consider using a higher seed treatment rate when planting into a cover crop to reduce potential stink bug damage.	bifenthrin (R) Brigade 2 EC (See Generic Insecticides)	2.1-6.4 oz	0.033-0.1	20-61		30	12
	zeta-cypermethrin + bifenthrin (R) Hero 1.25 EC	4-10.3 oz	0.04-0.1	12.4-32		30	12
Fall Armyworm Apply insecticide when 3-6 larvae are found per whorl. Use a high volume of water (15-20 gpa).	bifenthrin + chlorantraniliprole (R) Elevest 2.22 SC	5.6-9.6 oz	0.098-0.167	13.3-23	DO NOT apply at intervals closer than 7 days apart.	30	12
	carbaryl Sevin XLR	2 qt	2	2		48 (grain) 14 (forage)	12
	chlorantraniliprole Prevathon 0.43 SC Vantacor 5 SC Shenzi 400 SC	14-20 oz 1.2-2.5 oz 1.7-3.8 oz	0.047-0.067	6.4-9.1 107-51 75.3-33.7	DO NOT apply at intervals closer than 7 days apart.	14	4
	lambda-cyhalothrin + chlorantraniliprole (R) Besiege	6-10 oz	0.06-0.097	12.8-21		21	24
	methomyl (R) Lannate 2.4 LV	0.75-1.5 pt	0.22-0.45	5.3-10.7		21 (ears and fodder) 3 (forage)	48
	spinosad Blackhawk	1.67-3.3 oz	0.038-0.075		DO NOT apply more than 8.3 oz of Blackhawk per year.	28 (grain) 7 (forage)	4
Corn Leaf Aphid Treat when aphids populations are high and excessive honeydew production is interfering with pollination.	esfenvalerate (R) Asana XL 0.66 EC (See Generic Insecticides)	5.8-9.6 oz	0.03-0.05	22-13	Corn leaf aphids generally do not cause yield loss unless honeydew production interferes with pollination or plants are under stress from other factors.	21	12
	flupyradifurone Sivanto Prime 1.67	7-14 oz	0.09-0.18	18.3-9.1		7 (forage) 21 (grain)	4
	lambda-cyhalothrin (R) Warrior II 2.08 CS (See Generic Insecticides)	1.28-1.92 oz	0.02-0.03	100-66.7		21	24
Corn Leafhopper	clothianidin Poncho 600	1.25 mg ai/kernel			Corn leafhopper was detected in Arkansas in late planted corn in 2024. This insect is unable to overwinter in Arkansas and may not be a problem in early planted corn. Consider a high seed treatment rate on late planted corn to minimize damage.		12
	thiamethoxam Cruiser 5 FS	1.25 mg ai/kernel					12

FIELD CORN INSECT CONTROL

Insect	Insecticide	Formulation/Acre	Lb ai/Acre	Acres/ Gallon	Application/Comments	Minimum Days From Last Application to Harvest	Restricted Entry Interval (REI) Hours
Flea Beetle Spray young plants when beetles become abundant. Treat only if infestation is heavy.	beta-cyfluthrin (R) Baythroid XL 1 EC	1.6-2.8 oz	0.013-0.022	45.7-80		21	12
	bifenthrin (R) Brigade 2 EC (See Generic Insecticides)	2.1-6.4 oz	0.033-0.1	20-61		30	12
	carbaryl Sevin XLR	1-2 qt	1-2	2-4		48 (grain) 14 (forage)	12
	terbufos (R) Counter 20 G	6 oz/1,000 ft of row					48
	zeta-cypermethrin (R) Mustang Maxx 0.8 EC (See Generic Insecticides)	2.72-4.0 oz	0.017-0.025	32-47		30	12
Grasshopper	bifenthrin (R) Brigade 2 EC (See Generic Insecticides)	2.1-6.4 oz	0.033-0.1	20-61		30	12
	bifenthrin + chlorantraniliprole (R) Elevest 2.22 SC	4.8-9.6 oz	0.084-0.167	13.3-26.7	DO NOT apply at intervals closer than 7 days apart.	30	12
	chlorantraniliprole Prevathon 0.43 SC Vantacor 5 SC Shenzi 400 SC	8-20 oz 0.7-1.7oz 1-2.5 oz	0.027-0.067	6.4-16 183-75 128-51.2	DO NOT apply at intervals closer than 7 days apart.	14	4
	esfenvalerate (R) Asana XL 0.66 EC (See Generic Insecticides)	5.8-9.6 oz	0.03-0.05	13-22		21	12
	gamma-cyhalothrin (R) Proaxis 0.5 CS Declare 1.25 CS	2.56-3.84 oz 1.02-1.54 oz	0.01-0.015	33-50 83-125.5		21	24
	lambda-cyhalothrin (R) Warrior II 2.08 CS (See Generic Insecticides)	1.28-1.92 oz	0.02-0.03	66.7-100		21	24
	lambda-cyhalothrin + chlorantraniliprole (R) Besiege	6-10 oz	0.06-0.098	12.8-21.3		21	24
	zeta-cypermethrin (R) Mustang Maxx 0.8 EC (See Generic Insecticides)	2.72-4.0 oz	0.017-0.025	32-47		30	12

FIELD CORN INSECT CONTROL

Insect	Insecticide	Formulation/Acre	Lb ai/Acre	Acres/ Gallon	Application/Comments	Minimum Days From Last Application to Harvest	Restricted Entry Interval (REI) Hours
European Corn Borer Early planting will help avoid problems with this insect. Treat in late whorl stage when 50% of plants have feeding damage (shotholes) with larvae present.	<i>Bt</i> corn hybrids				Field corn expressing the <i>Bt</i> toxin has proven to be very effective. Resistance to multiple <i>Bt</i> toxins has been detected in other parts of the country. Follow refuge requirements.		
	beta-cyfluthrin (R) Baythroid XL 1 EC	1.6-2.8 oz	0.013-0.022	45.7-80		21	12
	bifenthrin (R) Brigade 2 EC (See Generic Insecticides)	2.1-6.4 oz	0.033-0.1	20-61		30	12
	bifenthrin + chlorantraniliprole (R) Elevest 2.22 SC	5.8-9.6 oz	0.098-0.163	13.3-23	DO NOT apply at intervals closer than 7 days apart.	30	12
	chlorantraniliprole Prevathon 0.43 SC Vantacor 5 SC Shenzi 400 SC	14-20 oz 1.2-2.5 oz 1.7-3.8 oz	0.047-0.067	6.4-9.1 107-51 75.3-33.7	DO NOT apply at intervals closer than 7 days apart.	14	4
	esfenvalerate (R) Asana XL 0.66 EC (See Generic Insecticides)	7.8-9.6 oz	0.04-0.05	13-16		21	12
	gamma-cyhalothrin (R) Proaxis 0.5 CS Declare 1.25 CS	2.56-3.84 oz 1.02-1.54 oz	0.01-0.015	33-50 83-125.5	Use of insecticides applied to foliage for management of second-generation corn borers in early July has reduced stalk tunneling and lodging. However, yield increases have not been common with early-planted field corn.	21	24
	lambda-cyhalothrin (R) Warrior II 2.08 CS (See Generic Insecticides)	1.28-1.92 oz	0.02-0.03	66.7-100		21	24
	lambda-cyhalothrin + chlorantraniliprole (R) Besiege	6-10 oz	0.06-0.098	12.8-21.3		21	24
	methoxyfenozide Intrepid 2 F (See Generic Insecticides)	4.0-16 oz	0.06-0.12	8-32		21	4
	methoxyfenozide + spinetoram Intrepid Edge	4-12 oz	0.09-0.28	10.7-32		28	4
	permethrin (R) Ambush 2 EC Pounce 25 WP Pounce 1.5 G	6.4-12.8 oz 6.4-9.6 oz 6.7-13.3 lb	0.1-0.2	10-20	Apply Ambush or Pounce prior to ear formation. Granules are best for first-generation larvae. Use foliar sprays on second-generation larvae. Apply granules by aircraft or by ground equipment directing granules into whorls.	prior to brown silk	12
	spinosad Blackhawk	1.67-3.3 oz	0.038-0.075		DO NOT apply more than 8.3 oz of Blackhawk per year.	28 (grain) 7 (forage)	4
	zeta-cypermethrin (R) Mustang Maxx 0.8 EC (See Generic Insecticides)	2.72-4.0 oz	0.017-0.025	32-47		30	12
	zeta-cypermethrin + bifenthrin (R) Hero 1.24 EC	4-10.3 oz	0.04-0.1	12.4-32		30	12

FIELD CORN INSECT CONTROL

Insect	Insecticide	Formulation/Acre	Lb ai/Acre	Acres/Gallon	Application/Comments	Minimum Days From Last Application to Harvest	Restricted Entry Interval (REI) Hours
Southwestern Corn Borer Apply when 10% of plants show shothole feeding in whorl with larvae present. If using pheromone traps, make treatment at the following levels: 1st generation borers – 50 moths per week, 2nd generation borers – 100 moths per week. Plant early to avoid damage. Treatment is not necessary after plants reach R4 growth stage.	<i>Bt</i> corn hybrids				Field corn expressing the <i>Bt</i> toxin has proven to be very effective. Resistance to multiple <i>Bt</i> toxins has been detected in other parts of the country. Follow refuge requirements.	21	12
	beta-cyfluthrin (R) Baythroid XL 1 EC	1.6-2.8 oz	0.013-0.022	45.7-80			
	bifenthrin (R) Brigade 2 EC (See Generic Insecticides)	2.1-6.4 oz	0.033-0.1	20-61		30	12
	bifenthrin + chlorantraniliprole (R) Elevest 2.22 SC	5.8-9.6 oz	0.098-0.163	13.3-23	DO NOT apply at intervals closer than 7 days apart.	30	12
	carbaryl Sevin XLR	2 qt	2	2	Apply high-volume coarse spray so that spray will run into whorls.	48 (grain) 14 (forage)	12
	chlorantraniliprole Prevathon 0.43 SC	14-20 oz	0.047-0.067	6.4-9.1	Do not apply at intervals closer than 7 days apart.	14	4
	Vantacor 5 SC	1.2-2.5 oz		107-51			
	Shenzi 400 SC	1.7-3.8 oz		75.3-33.7			
	esfenvalerate (R) Asana XL 0.66 EC (See Generic Insecticides)	5.8-9.6 oz	0.03-0.05	13-22		21	12
	gamma-cyhalothrin (R) Proaxis 0.5 CS	2.56-3.84 oz	0.01-0.015	33-50		21	24
	Declare 1.25 CS	1.02-1.54 oz		83-125.5			
	lambda-cyhalothrin (R) Warrior II 2.08 CS (See Generic Insecticides)	1.28-1.92 oz	0.02-0.03	66.7-100		21	24
	lambda-cyhalothrin + chlorantraniliprole (R) Besiege	6-10 oz	0.06-0.098	12.8-21.3		21	24
	methoxyfenozide Intrepid 2 F (See Generic Insecticides)	4-16 oz	0.06-0.012	8-32		21	4
	methoxyfenozide + spinetoram Intrepid Edge	4-12 oz	0.09-0.28	10.7-32		28	4
	permethrin (R) Ambush 2 EC	6.4-12.8 oz	0.1-0.2	10-20	Apply Ambush or Pounce prior to ear formation.	prior to brown silk	12
	Pounce 25 WP	6.4-9.6 oz			Apply granules for first-generation larvae by aircraft or by ground equipment directing granules into whorls.		
	Pounce 1.5 G	6.7-13.3 lb			Sprays should be used for second-generation larvae.		
	spinosad Blackhawk	2.2-3.3 oz	0.05-0.075		DO NOT apply more than 8.3 oz of Blackhawk per year.	28 (grain) 7 (forage)	4
	zeta-cypermethrin (R) Mustang Maxx 0.8 EC (See Generic Insecticides)	2.7-4.0 oz	0.017-0.025	32-47		30	12
	zeta-cypermethrin + bifenthrin (R) Hero 1.24 EC	4-10.3 oz	0.04-0.1	12.4-32		30	12

FIELD CORN INSECT CONTROL

Insect	Insecticide	Formulation/Acre	Lb ai/Acre	Acres/Gallon	Application/Comments	Minimum Days From Last Application to Harvest	Restricted Entry Interval (REI) Hours
Organic Insecticide Options (OMRI approved)							
Caterpillar pests (European corn borer, southwestern corn borer, fall armyworm, cutworms, corn ear-worm)	<i>Bacillus thuringiensis</i>				Good coverage is essential to obtain control. Target applications at egg hatch or early instars. Multiple applications may be necessary.		
	Agree WG	2 lbs				0	4
	Biobit WP	2 lbs				0	4
	BT Now	3.5 pts		2.3		0	4
	Deliver WG	1.5 lbs				0	4
	Dipel 10 G	10lbs				0	4
	Javelin WG	1.5 lbs				0	4
	Leprotec	2.5 pts		3.2		0	4
	XenTari DF	2 lbs				0	4
	spinosad		0.05-0.1		Do not make more than 3 applications/year. Do not apply more than 0.188 lbs ai/acre per year. Use higher rate on larger worms. Time application on egg hatch for corn borers.	1 grain, 7 forage	4
	Entrust 80 WP	1 – 2 oz					
	Entrust 2 SC	3 – 6 fl oz		42.7-21.3			
Chinch bug, stink bugs, flea beetles, grasshoppers,	azadirachtin				Toxic to fish. Does not control adult insects. Follow-up applications may be necessary to obtain control. For chinch bug nymphs apply in 20 gpa by ground.	0	4
	Aza-Direct	1.35 pts		8-2.3		0	4
	AzaGuard	10-16 oz		12.8-8		0	4
	Ecozin Plus 1.2	15-30 oz		8.5-4.3		0	4
	Molt-X	10 oz		12.8		0	4
	Neemix 4.5	16 oz		8		0	4
	azadirachtin + pyrethrin				Toxic to aquatic organisms and bees. Do not allow to drift onto blooming crops or weeds while bees are foraging. Use higher rates on adult pests and large nymphs. Follow-up applications may be necessary to obtain control. For chinch bugs apply in 20 gpa by ground.	0	12
	Azera 0.21	16-56 oz		8-2.3			
	pyrethrin				Toxic to aquatic organisms and bees. Do not allow to drift onto blooming crops or weeds while bees are foraging. Use higher rates on adult pests and large nymphs. Follow-up applications may be necessary to obtain control. For chinch bugs apply in 20 gpa by ground.	0	12
	Pyganic 5.0	4.5-15.61 oz		28.4-8.2			
Slugs	Iron phosphate + spinosad						
	Bug-N-Sluggo	20-44 lbs				28	4

COTTON INSECTICIDE PERFORMANCE RATING, 2025

Rating Scale 0 = No control 10 = Excellent	Chemistry	Restricted Entry Interval (hours)	Restricted Use (R)	Thrips	Western Flower Thrips	Plant Bugs	Bollworm	Tobacco Budworm	Aphids**	Spider Mites**	Cutworm	Beet Armyworm	Fall Armyworm	Cabbage Looper	Soybean Looper	Saltmarsh Caterpillar	Green and Southern Green Stink Bug	Brown Stink Bug	Whitefly	Grasshopper
Aeris			X	8	6					5										
Gaucha	NEO	12		6	4					0										0
Admire/Alias/Imidacloprid	NEO	12		7	1	3	0	0	3	0	0	0	0	0	0	0	2	2	0	2
AgLogic	Car	48	X	9	9															
Asana XL/Adjourn	SyP	12	X	4	3	2	4	2	0	0	8	2	5	7	2	5	8	4	2	6
Bacillus thuringiensis	B	4		0	0	0	4	5	0	0	0	1	1	6	6	2	0	0	0	0
Baythroid XL	SyP	12	X	4	2	2	5	2		0	8	2	5	7	2	5	8	4	4	7
Belay	NEO					4														
Besiege	DM+SyP	24	X	4	2	2	8	9	0	0	9		9	9	5		8	4	2	7
Bidrin/Dicromax	OP	144	X	7	5	7	0	0	5	3	0	0	0	0	0	1	9	9	3	7
Bidrin XP II	OP+SyP	144	X	6	5	8	5	2	6	7	8	2	5	7	2	5	9	9	3	7
Blackhawk	SP	4		1	1	0	7	9	0	0	7	9	7	9	9	3	0	0	0	2
Brigadier	NEO+SyP	12	X	6	5	7	5	2	6	7	8	2	5	7	2	5	8	7	6	7
Brigade/Discipline/Fanfare	SyP	12	X	4	2	3	5	2		7	6	2	5	7	2	5	8	7	6	8
Carbine	FL	12		5	1	4	0	0	8	0	0	0	0	0	0	0	2	2	0	2
Centric	NEO	12		4	4	4	0	0	5	0	0	0	0	0	0	0	7	6	8	2
Comite	PRO	144		0	0	0	0	0	0	7	0	0	0	0	0	0	0	0	0	0
Confirm	IGR	4		0	0	0	4	4	0	0	2	8	8	7	7	8	0	0	0	0
Denim	AV	12	X	1	1	0	7	9	0	5	7	9	8	9	9	3	0	0	0	2
Diamond	IGR	12		1	1	8	4	4			1		8				4*	4*		
Dimethoate/Dimate	OP	48		3	2	5	0	0	5	3	0	0	0	0	0	1	5	4	3	6
Elevest	SyP + DM	12	X	4	2	3	8	9	0	7	9		9	9	5		8	7	6	7
Endigo	NEO+SyP	24	X	5	4	6	5	2	8	0	8	2	5	7	2	5	8	7	8	7
Holster	SyP	12	X	6	3	2	4	1	0	0	8	1	5	6	1	5	8	4	1	6
Intrepid	IGR	4		0	0	0	6	6	0	0	5	9	7	9	4	9	0	0	0	0
Intrepid Edge	IGR+SP	4		8	7		7	7					8	9	9	9				
Intruder/Strafer	NEO	12		6		5	0	0	8	0	0	0	0	0	0	0	1	1	9	0
Karate/Silencer/Lambda-Cy	SyP	24	X	4	2	2	5	2	0	0	8	2	5	7	2	5	8	4	2	7
Lannate	Car	72	X	1	0	3	4	4	5	0	5	4	7	7	7	4	5	3	0	6
Leverage 360	NEO+SyP	12	X	6	2	6	5	2	5	0	8	2	5	7	2	5	8	6	5	7
Mustang Maxx	SyP	12	X	4	3	2	5	2	0	0	8	3	5	7	2	5	8	7	2	7
Oberon	TET	12								9										
Orthene/Acephate	OP	24		5	5	8	5	5	4	0	6	3	4	7	4	3	9	7	5	8
Portal	METI	12								9										
PQZ	PAD	12							7											
Prevathon/Vantacor/Shenzi	DM	4				2	8	9					9	9	5		9	9	5	
Prolex/Declare	SyP	24	X	4	2	2	3	2	0	0	8	2	5	7	2	5	8	4	2	7
Radiant	SP	4		8	7															
Sefina	Pyr	12							6											
Sivanto	BU	4							6											
Steward	OX	12		0	0	4	7	9	0	0	5	9	8	9	8	5	3	3		0
Transform	sx					9			8											
Vydate C-LV	Car	48	X	3	1	5	0	0	1	0	0	0	0	0	0	0	8	7	0	6
Zeal, Stifle	ET	12								9										
Zoro/Abba/Agri-Mek/Epi-Mek	AV	12	X	0	0	0	0	0	0	8	0	0	0	0	0	0	0	0	0	0

*Effective on nymphs only.

**Cotton aphids and spider mites can be flared by use of broad spectrum insecticides such as synthetic pyrethroids.

QUICK VIEW THRESHOLD GUIDE

Insect	Threshold	Scouting Procedure
Tarnished plant bug (TPB)	3 TPB per 5 row feet or 2 TPB per 5 row feet (problem fields) or 8-12 per 100 sweeps from early squaring through cutout. After cutout (NAWF = 5), treat for 6 plant bugs per 5 row feet.	At least 2 drop cloth samples per area.
Tarnished plant bug (TPB) on ThryvOn cotton	6 TPB nymphs per 5 row feet or treat for 3 nymphs if small square set is below 85%. Treat for 8-12 TPB adults per 100 sweeps.	At least 2 drop cloth samples per area.
Bollworm (BW) and Tobacco budworm (TBW)	Non-Bt cotton: 1 BW or 1 TBW (< 0.25 inch) per 2 row feet Bollgard II/WideStrike/Twinlink: 25% eggs or 5% damaged fruit or 2-3 large (>0.25 inch) larva per 14 row feet. WideStrike III/Bollgard III/TwinLink Plus: 5% damaged fruit or 2-3 large (>0.25 inch) per larva 14 row feet.	At least 3.5 row feet whole-plant samples per area.
Thrips	2-5 thrips per plant and damage present. Thrips may be found on ThryvOn cotton, but do not cause economic damage.	At least 5 plants per area sampled with a cup or box.
Aphids	50% of plants infested with actively growing colonies present, if no predators are present	General visual observation, noting predator populations. See comments in aphid section.
Fall armyworm (FAW)	10-20 FAW per 100 plants	Examine as with BW and TBW, supplementing with drop cloth observations and counts in blooms.
Spider mites	50% of plants infested with actively growing colonies present	General visual observation, noting symptoms of feeding injury to leaves.
Stink bugs	1 stink bug per 6 row feet or 20% boll damage	At least 2 drop cloth samples per area or sample at least 25 quarter-sized bolls per area.

CAUTION: Do not allow acephate applications to drift onto adjacent rice fields. Acephate/Orthene is not labelled on rice.

INSECTICIDE TERMINATION GUIDE

Determine Date of Cutout using the earlier of Date of NAWF = 5 or Weather-restricted date (North AR: Aug. 8, Central AR: Aug. 14, South AR: Aug. 21)

Record daily heat units (DD60s) from Date of Cutout. (DD60s are calculated by subtracting 60 from the average daily temperature.)

Insect	Termination Rules	Crop termination recommendations are based on long-standing and ongoing COTMAN research conducted by University of Arkansas System Division of Agriculture scientists. Date of Cutout is the flowering date of the last economically significant boll population. If a field reaches physiological cutout [average number of nodes above white flower = 5 (NAWF = 5)] in late July or early August in Arkansas, then heat units are accumulated from the NAWF = 5 date. Otherwise, heat units are accumulated from a seasonal cutout date based on historical weather for that production region. Typically, a boll needs 850 DD60s to mature with acceptable size and quality. The weather-restricted, seasonal cutout date is the calendar date on which there is a 50% probability that the crop will have the benefit of late season temperatures sufficient to develop a mature boll. Seasonal cutout dates range across the state from Aug. 8 in northernmost parts of Arkansas (Clay County) to Aug. 21 in the most southern portions of the state (Ashley County).
Tarnished plant bug	Cutout + 250 DD60s	
Bollworm and Tobacco budworm	Cutout + 350 DD60s	
Stink bugs	Cutout + 450 DD60s	
Fall armyworm	Cutout + 500 DD60s	

COTTON INSECT CONTROL

Insect	Insecticide	Formulation/ Acre	Lb ai/Acre	Acres/ Gallon	Application/Comments	Minimum Days From Last Application to Harvest	Restricted Entry Interval (REI) Hours
Thrips Treat with foliar sprays when 1st or 2nd true leaf emerges with noticeable damage from thrips. On larger seedlings, treat for an average of 5 thrips per plant and damage that may cause delayed growth or stunting of plants.	ThryvOn Cotton				Cotton varieties with the ThryvOn trait are very effective at controlling thrips.		
	In Furrow acephate		0.75-1.0		Orthene-treated seed may require one or more foliar treatments for thrips control. Resistance to acephate has been detected in Arkansas. Consider rotating chemistry.		
	Acephate 90S IFS	0.83-1.1 lb				21	24
	Orthene 97 IFS	0.77-1.03 lb				21	24
	Orthene 90S IFS	0.83-1.1 lb				21	24
	aldicarb		0.5-0.75		DO NOT feed forage to livestock.		
	AgLogic 15G	3.5-5 lb				90	48
	imidacloprid				Seed treatment.		
	Gaucha 600	0.375 mg ai/seed					
	imidacloprid + thiodicarb (R)				Seed treatment.		
	Aeris	0.75 mg ai/seed					

COTTON INSECT CONTROL

Insect	Insecticide	Formulation/ Acre	Lb ai/Acre	Acres/ Gallon	Application/Comments	Minimum Days From Last Application to Harvest	Restricted Entry Interval (REI) Hours
Thrips (cont.)	Avicta Elite Cotton	See label.			Seed treatment.		
Treat with foliar sprays when 1st or 2nd true leaf emerges with noticeable damage from thrips. On larger seedlings, treat for an average of 5 thrips per plant and damage that may cause delayed growth or stunting of plants.	Foliar Sprays						
	acephate		0.5		Avoid tank-mixing organophosphate insecticides (acephate, Bidrin, dimethoate) with certain herbicides (Staple, Warrant, Dual, Liberty) as foliar burn may occur.	21	24
	Acephate 90 S	0.56 lb				21	24
	Orthene 97	0.52 lb			Reduced control with acephate has been observed in recent years.		
	(See Generic Insecticides)						
	dicrotophos (R)		0.2		DO NOT apply more than 3.2 oz pre-bloom.		
	Bidrin/Dicromax 8 EC	3.2 oz		40		30	144
	methoxyfenozide + spinetoram		0.07-0.14		Intrepid Edge will also control cutworm. DO NOT use without an adjuvant.		
	Intrepid Edge 3F	3-6 oz		21.3-42.7		28	4
	spinetoram		0.0117-0.0234		DO NOT use without an adjuvant.		
	Radiant 1 SC	1.5-3.0 oz		42.7-85.3		28	4
Western Flower Thrips	acephate		0.5		Avoid tank-mixing organophosphate insecticides with certain herbicides (Staple, Warrant, Dual, Liberty) as foliar burn may occur.	21	24
Treat with foliar sprays when 1st or 2nd true leaf emerges with noticeable damage from thrips. On larger seedlings, treat for an average of 5 thrips per plant and damage that may cause delayed growth or stunting of plants.	Acephate 90 S	0.56 lb				21	24
	Orthene 97	0.52 lb					
	(See Generic Insecticides)						
	methoxyfenozide + spinetoram		0.07-0.14		Intrepid Edge will also control cutworm. DO NOT use without an adjuvant.	28	4
	Intrepid Edge 3F	3-6 oz		21.3-42.7			
	spinetoram		0.012-0.023		DO NOT use without an adjuvant.		
	Radiant 1 SC	1.5-3.0 oz		42.7-85.3		28	4
Tarnished Plant Bug/Fleahopper	ThryvOn Cotton				Cotton varieties with the ThryvOn trait are effective at reducing damage from tarnished plant bug.		
Treat for 3 plant bugs per 5 row feet on normal fruiting fields. If small square set is less than 75%, treat for 2 plant bugs per 5 row feet. After last week of June in north Arkansas and the first week of July in south Arkansas, if small square set is less than 85%, treat for 2 plant bugs on 5 row feet. Treat for 8-12 per 100 sweeps when sampling with a sweep net. After cutout (NAWF=5), treat when 6 plant bugs per 5 row feet are found.	acephate		0.5-0.75		First two weeks of squaring, treat for plant bugs if square set is 75% or less and plant bugs are present.	21	24
	Acephate 90 S	0.56-0.83 lb					
	Orthene 97	0.57-0.77 lb					
	(See Generic Insecticides)						
	acetamiprid		0.13-0.15		DO NOT make more than 2 applications/season.		
	Strafer 70 WSP	3.0-3.5 oz				28	12
	dicrotophos (R)		0.5		DO NOT apply more than 3.2 oz pre-bloom.		
	Bidrin/Dicromax 8 EC	8.0 oz		16		30	144
	dimethoate		0.25				
	Dimethoate 4 E	8 oz		16		14	48
	imidacloprid						
	(See Generic Insecticides)						
	Admire Pro 4.6 SC	1.7 oz	0.062	75		14	12
	Imidacloprid 4 F	2 oz	0.062	64		14	12
	Alias/Couraze 4 F	2 oz	0.062	64		14	12
	Couraze 2 F	4 oz	0.0625	32		14	12
	Couraze 1.6 F	5 oz	0.0625	25.6		14	12

COTTON INSECT CONTROL

Insect	Insecticide	Formulation/ Acre	Lb ai/Acre	Acres/Gallon	Application/Comments	Minimum Days From Last Application to Harvest	Restricted Entry Interval (REI) Hours
Tarnished Plant Bug/Flea hopper (cont.) Treat for 3 plant bugs per 5 row feet on normal fruiting fields. If small square set is less than 75%, treat for 2 plant bugs per 5 row feet. After last week of June in north Arkansas and the first week of July in south Arkansas, if small square set is less than 85%, treat for 2 plant bugs on 5 row feet. Treat for 8-12 per 100 sweeps when sampling with a sweep net. After cutout (NAWF=5), treat when 6 plant bugs per 5 row feet are found.	oxamyl (R)		0.31-0.5		DO NOT graze or feed plants to livestock.		
	Vydate 3.77 CLV	10.5-17 oz		7.5-12.2		14	48
	thiamethoxam		0.044-0.0625				
	Centric 40 WG	1.75-2.5 oz				21	12
	sulfoxaflor		0.047-0.071		Follow pollinator warnings on label.	14	24
	Transform 50 WG	1.5-2.25 oz					
	Tank Mix Insecticide						
	novaluron		0.039-0.058				
	Diamond 0.83 EC	6-9 oz		14.2-21.3		30	12
Bollworm Non-Bt cotton: 1 BW or 1 TBW (< 0.25 inch) per 2 row feet. Bollgard II/WideStrike/Twinlink: 25% eggs or 5% damaged fruit or 2-3 large (>0.25 inch) larva per 14 row feet. WideStrike III/ Bollgard III/TwinLink Plus: 5% damaged fruit or 2-3 large (>0.25 inch) larvae per 14 row feet.	Pyrethroids (tank mix only)		0.012-0.013		In recent years, pyrethroids have shown reduced efficacy and can be expected to provide poor control. Pyrethroids should be tank-mixed with another chemistry.	0	12
	beta-cyfluthrin (R)	1.6-2.6 oz		49-80			
	Baythroid XL 1 EC						
	bifenthrin (R)		0.04-0.1				
	Brigade 2 EC	2.56-6.4 oz		20-50		14	12
	(See Generic Insecticides)						
	cyfluthrin (R)		0.025-0.041				
	Tombstone 2 EC	1.6-2.6 oz		49-80		0	12
	(See Generic Insecticides)						
	cypermethrin (R)		0.04-0.1				
	Holster 2.5 EC	2-5 fl oz		25-62.5		14	12
	esfenvalerate (R)		0.03-0.05				
	Asana XL 0.66 EC	5.8-9.6 oz		13-22		21	12
	(See Generic Insecticides)						
	gamma-cyhalothrin (R)		0.0125-0.02			21	24
	Proaxis 0.5 CS	3.2-5.12 oz		25-40			
	Declare 1.25 CS	1.28-2.05 oz		62.5-100			
	lambda-cyhalothrin (R)		0.025-0.04				
	Warrior II 2.08 CS	1.6-2.56 oz		50-80		21	24
	(See Generic Insecticides)						
	zeta-cypermethrin (R)		0.0165-0.025				
	Mustang Maxx 0.8 EC	2.64-4.0 oz		32-48		14	12
	(See Generic Insecticides)						

COTTON INSECT CONTROL

Insect	Insecticide	Formulation/ Acre	Lb ai/Acre	Acres/Gallon	Application/Comments	Minimum Days From Last Application to Harvest	Restricted Entry Interval (REI) Hours
Bollworm (cont.) Non-Bt cotton: 1 BW or 1 TBW (< 0.25 inch) per 2 row feet. Bollgard II/ WideStrike/Twinlink: 25% eggs or 5% damaged fruit or 2-3 large (>0.25 inch) larva per 14 row feet. WideStrike III/Bollgard III/TwinLink Plus: 5% damaged fruit or 2-3 large (>0.25 inch) larvae per 14 row feet.	Carbamates						
	methomyl (R)		0.45-0.675				
	Lannate 2.4 LV	1.5-2.25 pt		3.6-5.3	Lannate may redden cotton. If excessive, stop use or alternate with other insecticides. Use Lannate as an occasional spray in regular schedule but not more than every 10 days.	15	48
	Lannate 90 SP	0.5-0.75 lb					
	Other Classes of Insecticides						
	chlorantraniliprole		0.045-0.098			21	4
	Prevathon 0.43 SC	14-27 oz		4.1-9.7	Use higher rates with heavy infestations.		
	Vantacor 5 SC	1.2-2.5 oz		107-51			
	Shenzi 400 SC	1.7-3.8 oz		75.3-33.7			
	chlorantraniliprole + bifenthrin (R)		0.084-0.167			21	12
	Elevest 2.22 SC	5.6-9.6 oz		13.3-23			
	chlorantraniliprole + lambda-cyhalothrin (R)		0.417-0.835		Use higher rates with heavy infestations.	21	24
Tobacco Budworm Time insecticide application to egg hatch. Under heavy pressure, do not reduce rates. Treat for 7,000 (1 per 2 row ft) small larvae (less than 1/4-inch) per acre. If larger larvae begin to develop in fields, treat for 3,500 (1 per 4 row ft) larvae per acre. Terminate sprays after NAWF=5 + 350 heat units or 350 heat units past the last effective boll date for your area.	Besiege 1.25 SC	6.5-12.5 oz		10-20			
	emamectin benzoate		0.01-0.015				
	Denim 0.16 EC	8-12 oz		10.7-16		21	12
	indoxacarb		0.09-0.11				
	Steward 1.25 SC	9.2-11.3 fl oz		11-14		14	12
	methoxyfenozide + spinetoram		0.14-0.188		DO NOT apply at closer than 4-day intervals.	28	4
	Intrepid Edge 3 F	6-8 oz		16-21.3			
	spinosad		0.054-0.07		DO NOT apply more than 20 oz per year.		
	Blackhawk	2.4-3.2 oz				28	4
Tobacco Budworm	Bt Cotton				Cotton varieties expressing the Bt (<i>Bacillus thuringiensis</i>) protein are very effective against the tobacco budworm.		
	Bollgard II, WideStrike, WideStrike III, TwinLink, Bollgard III, TwinLink Plus						
	Carbamates						
	methomyl (R)		0.45-0.675				
	Lannate 2.4 LV	1.5-2.25 pt		3.6-5.3	Lannate may redden cotton. If excessive, stop use or alternate with other insecticides. Use Lannate as an occasional spray in regular schedule but not more than every 10 days.	15	48
	Lannate 90 SP	0.5-0.75 lb					
	Other Classes of Insecticides						
	bifenthrin + chlorantraniliprole (R)		0.084-0.167			21	12
	Elevest 2.22 SC	5.6-9.6 oz		13.3-23			
	chlorantraniliprole		0.045-0.098		Use higher rates with heavy infestations.		
	Prevathon 0.43 SC	14-27 oz		4.7-9.1		21	4
	Vantacor 5 SC	1.2-2.5 oz		107-51			
	Shenzi 400 SC	1.7-3.8 oz		75.3-33.7			
	emamectin benzoate		0.01-0.015				
	Denim 0.16 EC	8-12 oz		10.7-16		21	12

COTTON INSECT CONTROL

Insect	Insecticide	Formulation/ Acre	Lb ai/Acre	Acres/ Gallon	Application/Comments	Minimum Days From Last Application to Harvest	Restricted Entry Interval (REI) Hours
Tobacco Budworm (cont.)	indoxacarb Steward 1.25 SC	9.2-11.3 oz	0.09-0.11	11-14	Use higher rates with heavy infestations.	14	12
	lambda-cyhalothrin + chlorantraniliprole (R) Besiege 1.25 SC	6.5-12.5 oz	0.417-0.835	10-20		21	24
	methoxyfenozide + spinetoram Intrepid Edge 3 F	6-8 oz	0.14-0.188	16-21.3	DO NOT apply at closer than 4-day intervals.	28	4
	spinosad Blackhawk	2.4-3.2 oz	0.054-0.07		DO NOT apply more than 20 oz per year.	28	4
Aphid	Aphid Management and Control Treatment for aphids alone seldom results in a yield increase. 1. Resistance to neonicotinoid insecticides (imidacloprid, Intruder, Centric) has developed. Avoid unnecessary/automatic applications of these insecticides when aphids are present. 2. Threshold: When populations are building and aphid colonies are present on approximately 50% of the plants: a. If there are less than 0.3 lady beetle adults AND less than 0.2 lady beetle larvae (per row-ft), <u>treat</u> . b. If there are at least 0.3 lady beetle adults OR 0.2 lady beetle larvae (per row-ft), <u>do not treat, but resample within 7 days</u> . i. If aphid population is still increasing after 7 days, <u>treat</u> , otherwise continue normal sampling interval. 3. The aphid fungus is very effective in reducing aphid populations in early to mid-July. Fields should be checked for fungus before treatments are applied. If confident the fungus is present in 15% of the aphid population, do not treat.						
	acetamiprid Intruder/Strafer 70 WP	0.8-1.1 oz	0.035-0.05			28	12
	afidopyropen Sefina 0.42 DC	3 oz	0.01	42.7	Do not make more than 2 consecutive applications.	7	12
	flonicamid Carbine 50 WG	1.41-2.02 oz	0.044-0.063			30	12
	pyrifluquinazon PQZ 1.87 SC	2.4-3.2 oz	0.035-0.047	53-40	Do not make more than 2 applications per year.	7	12
	sulfoxaflor Transform 50 WG	0.75-1.0 oz	0.023-0.041		Follow pollinator warning on label. Do not make more than 4 applications of Transform per year.	14	24
Spider Mites Treat when 50% of plants are infested. Early- season spot treatments may be beneficial in preventing spread of mites across the field.	abamectin (R) Agri-Mek 0.7 SC (See Generic Insecticides)	1.75 - 3.5 fl oz	0.0096-0.019	49-98	If populations are not reduced by initial application, switch to another chemistry. Use lower rates early season when cotton is small. DO NOT apply more than 7 oz per season. Must be applied with a non-ionic surfactant in minimum of 5 gallons per acre. DO NOT graze.	20	12

COTTON INSECT CONTROL

Insect	Insecticide	Formulation/ Acre	Lb ai/Acre	Acres/Gallon	Application/Comments	Minimum Days From Last Application to Harvest	Restricted Entry Interval (REI) Hours
Spider Mites (cont.)	fenpyroximate Portal XLO 0.4EC	0.75-2 pt	0.0375-0.1	4-10.7	DO NOT apply more than 2 pints per season.	14	12
	bifenthrin (R) Brigade 2 EC (See Generic Insecticides)	3.8-6.4 oz	0.06-0.1	20-33	Avoid unnecessary use of pyrethroid insecticides as they can flare spider mite populations.	28	12
	etoxazole Zeal WDG Zeal 2.88 SC (See Generic Insecticides)	0.66-1.0 oz 1.33-2 oz	0.03-0.045	64-96		28 28	12 12
	propargite Comite 6.55	1.5-2 pt	1.23-1.64	4-5.3		50	144
	spiromesifan Oberon 2 SC	8-16 oz	0.125-0.25	8-16		30	12
Cutworm Treat when stand is reduced below 2-3 plants per row ft. Stale seedbed/no-till fields with cover crops and/or heavy spring weed pressure should be considered high-risk fields. Consider preventative pyrethroid applications for cutworm in these situations if a burn down herbicide is not applied at least 3 weeks prior to planting.	acephate Acephate 90 S Orthene 97 (See Generic Insecticides)	1.0 lb 0.93 lb	0.9		Maintain 2-3 plants per row ft. Cutworm control is most effective when ground applications are made and sprays are directed (banded) to the base and lower portion of the plant.	21	24
	beta-cyfluthrin (R) Baythroid XL 1 EC	0.8-1.6 oz	0.007-0.013	80-160	Stale seedbed/no-till fields, fields with cover crops and/or heavy spring weed pressure or fields with a history of cutworm problems should be considered high-risk fields. Consider preventative pyrethroid applications for cutworm in these situations utilizing a 1/3 band applicator behind the planter.	0	12
	bifenthrin (R) Brigade 2 EC (See Generic Insecticides)	2.56-6.4 oz	0.04-0.1	20-50		14	12
	cyantraniliprole Fortenza 5 FS	0.1 - 0.4 mg ai/ seed			Seed treatment.		12
	cyfluthrin (R) Tombstone 2 EC (See Generic Insecticides)	0.8-1.6 oz	0.013-0.025	80-160		0	12
	cypermethrin (R) Holster 2.5 EC	1.3-5.0 oz	0.025-0.1	25-100		14	12
	esfenvalerate (R) Asana XL 0.66 EC (See Generic Insecticides)	5.8-9.6 oz	0.03-0.05	13-22		21	12
	gamma-cyhalothrin (R) Proaxis 0.5 CS Declare 1.25 CS	1.92-2.56 0.77-1.02 oz	0.0675-0.01	25-40 125-166		21	24
	lambda-cyhalothrin (R) Warrior II 2.08 CS (See Generic Insecticides)	0.96-1.28 oz	0.015-0.02	100-133		21	24
	zeta-cypermethrin (R) Mustang Maxx 0.8 EC (See Generic Insecticides)	1.28-1.92 oz	0.008-0.012	67-100		14	12

COTTON INSECT CONTROL

Insect	Insecticide	Formulation/ Acre	Lb ai/Acre	Acres/Gallon	Application/Comments	Minimum Days From Last Application to Harvest	Restricted Entry Interval (REI) Hours
Beet Armyworm Apply treatment when 3-5 or more "hits" of small larvae occur per 100 ft of row.	bifenthrin + chlorantraniliprole (R) Elevest 2.22 SC	5.6-9.6 oz	0.084-0.167	13.3-23		21	12
	chlorantraniliprole Prevathon 0.43 SC	14-27 oz	0.045-0.098	4.1-9.7		21	4
	Vantacor 5 SC	1.2-2.5 oz		107-51			
	Shenzi 400 SC	1.7-3.8 oz		75.3-33.7			
	emamectin benzoate Denim 0.16 EC	6-8 oz	0.0075-0.01	4.7-9.1		21	12
	indoxacarb Steward 1.25 SC	9.2-11.3 fl oz	0.09-0.11	11-14		14	12
	lambda-cyhalothrin + chlorantraniliprole (R) Besiege 1.25 SC	6.5-12.5 oz	0.417-0.835	10-20		21	24
	methoxyfenozide Intrepid 2 F (See Generic Insecticides)	4-10 oz	0.06-0.16	12.8-32		14	4
	methoxyfenozide + spinetoram Intrepid Edge 3 F	6-8 oz	0.14-0.188	16-21.3	DO NOT apply at closer than 4-day intervals.	28	4
	spinosad Blackhawk	2.4-3.2 oz	0.054-0.07		DO NOT apply more than 20 oz of Blackhawk per year.	28	4
Fall Armyworm Treat for 10-20 fall armyworms per 100 plants. Terminate sprays after NAWF=5 + 500 heat units or 500 heat units past the last effective boll date for your area.	bifenthrin + chlorantraniliprole (R) Elevest 2.22 SC	5.6-9.6 oz	0.084-0.167	13.3-23		21	12
	chlorantraniliprole Prevathon 0.43 SC	14-27 oz	0.045-0.098	4.7-9.1		21	4
	Vantacor 5 SC	1.2-2.5 oz		107-51			
	Shenzi 400 SC	1.7-3.8 oz		75.3-33.7			
	emamectin benzoate Denim 0.16 EC	8-12 oz	0.01-0.015	10.7-16		21	12
	indoxacarb Steward 1.25 SC	9.2-11.3 oz	0.09-0.11	11-14		14	12
	lambda-cyhalothrin + chlorantraniliprole (R) Besiege 1.25 SC	6.5-12.5 oz	0.417-0.835	10-20		21	24
	methomyl (R) Lannate 2.4 LV	1.5-2.25 pt	0.45-0.675	3.6-5.3	Lannate may redden cotton. If excessive, stop use or alternate with other insecticides. Use Lannate as an occasional spray in regular schedule but not more than every 10 days.	15	48
	Lannate 90 SP	0.5-0.75 lb					
	methoxyfenozide Intrepid 2 F (See Generic Insecticides)	4-10 oz	0.06-0.16	12.8-32		14	4
	methoxyfenozide + spinetoram Intrepid Edge 3 F	6-8 oz	0.14-0.188	16-21.3	DO NOT apply at closer than 4-day intervals.	28	4
	novaluron Diamond 0.83 EC	6-12 oz	0.039-0.078	10.7-21.3		30	12
	spinosad Blackhawk	2.4-3.2 oz	0.054-0.07		DO NOT apply more than 20 oz of Blackhawk per year.	28	4

COTTON INSECT CONTROL

Insect	Insecticide	Formulation/ Acre	Lb ai/Acre	Acres/Gallon	Application/Comments	Minimum Days From Last Application to Harvest	Restricted Entry Interval (REI) Hours
Cabbage Looper Soybean Looper Economic damage seldom occurs; treat when 25% defoliation occurs and bolls are still being developed.	<i>Bacillus thuringiensis</i>	Check label.				0	4
	bifenthrin + chlorantraniliprole (R) Elevest 2.22 SC	5.6-9.6 oz	0.084-0.167	13.3-23		21	12
	chlorantraniliprole Prevathon 0.43 SC	20-29 oz	0.067-0.097	4.4-6.4		21	4
	Vantacor 5 SC	1.7-2.5 oz		75-51			
	Shenzi 400 SC	2.5-3.8 oz		51.2-33.7			
	emamectin benzoate Denim 0.16 EC	8-12 oz	0.01-0.015	10.7-16		21	12
	indoxacarb Steward 1.25 SC	6.7-9.2 fl oz	0.065-0.09	14-19		14	12
	lambda-cyhalothrin + chlorantraniliprole (R) Besiege 1.25 SC	10.5-12.5 oz	0.1-0.12	10-12		21	24
	methoxyfenozide Intrepid 2 F (See Generic Insecticides)	4-10 oz	0.06-0.16	12.8-32		14	4
	methoxyfenozide + spinetoram Intrepid Edge 3 F	4-8 oz	0.094-0.188	16-32	DO NOT apply at closer than 4-day intervals.	28	4
Stink Bugs (Green and Southern Green) Treat when stink bugs exceed 1 bug per 5 row feet or when 20% of medium bolls display internal signs of feeding and stink bugs are observed.	spinosad Blackhawk	2.4-3.2 oz	0.054-0.07		DO NOT apply more than 20 oz per year.	28	4
	acephate Acephate 90 Orthene 97 (See Generic Insecticides)	0.83 lb 0.77 lb	0.75			21	24
	beta-cyfluthrin (R) Baythroid XL 1 EC	1.6-2.6 oz	0.013-0.021	48-80		0	12
	bifenthrin (R) Brigade 2 EC (See Generic Insecticides)	3.8-6.4 oz	0.06-0.1	20-33		14	12
	cyfluthrin (R) Tombstone 2 EC (See Generic Insecticides)	1.6-2.6 oz	0.025-0.041	49-80		0	12
	dicrotophos (R) Bidrin/Dicromax 8 EC	4.8-8.0 oz	0.3-0.5	16-26.7	DO NOT apply more than 3.2 oz pre-bloom. DO NOT apply more than 16 oz after first bloom.	30	144
	esfenvalerate (R) Asana XL 0.66 EC (See Generic Insecticides)	5.8-9.6 oz	0.03-0.05	13-22		21	12
	lambda-cyhalothrin (R) Warrior II 2.08 CS (See Generic Insecticides)	1.6-2.56 oz	0.025-0.04	50-80		21	24

COTTON INSECT CONTROL

Insect	Insecticide	Formulation/Acre	Lb ai/Acre	Acres/Gallon	Application/Comments	Minimum Days From Last Application to Harvest	Restricted Entry Interval (REI) Hours
Stink Bugs (Green and Southern Green) (cont.) Terminate sprays after NAWF=5 + 450 heat units or 450 heat units past the last effective boll date for your area.	oxamyl (R) Vydate 3.77 CLV	13.6 oz	0.4	9.4	DO NOT graze or feed plants to livestock.	14	48
	zeta-cypemethrin (R) Mustang Maxx 0.8 EC (See Generic Insecticides)	2.64-3.6 oz	0.016-0.022	35.6-48.5		14	12
Brown Stink Bug Treat when stink bugs exceed 1 bug per 5 row feet or when 20% of medium bolls display internal signs of feeding and stink bugs are observed. Check at least 25-50 bolls per 40 acres.	acephate Acephate 90 S Orthene 97 (See Generic Insecticides)	0.83 lb 0.77 lb	0.75			21	24
	bifenthrin (R) Brigade 2 EC (See Generic Insecticides)	3.8-6.4 oz	0.06-0.1	20-33		14	12
	dicrotophos (R) Bidrin/Dicromax 8 EC	8 oz	0.5	16	DO NOT apply more than 3.2 oz pre-bloom. DO NOT apply more than 16 oz after first bloom.	30	144
	oxamyl (R) Vydate 3.77 CLV	13.6 oz	0.04	9.4	DO NOT graze or feed plants to livestock.	14	48
Whitefly Treat infested areas when 50% of the plants are infested.	acephate Acephate 90 S Orthene 97 (See Generic Insecticides)	0.56-1.1 lb 0.52-1.031 lb	0.5-1.0			21	24
	acetamiprid Intruder/Strafer 70 WP	1.7-2.3 oz	0.75-0.1			28	12
	bifenthrin (R) Brigade 2 EC (See Generic Insecticides)	3.8-6.4 oz	0.06-0.1	20-33		14	12
	flupyradifurone Sivanto 1.67 SL	10.5-14 oz	0.14-0.18	9.14-12.2	Do not apply more than 28 oz of Sivanto per acre per year.	14	4
	thiamethoxam Centric 40 WG (See Generic Insecticides)	2 oz	0.05			21	12

COTTON INSECT CONTROL

Insect	Insecticide	Formulation/ Acre	Lb ai/Acre	Acres/Gallon	Application/Comments	Minimum Days From Last Application to Harvest	Restricted Entry Interval (REI) Hours
Multiple Pests For control of multiple pests exceeding thresholds..	acephate + bifenthrin (R) Acenthrin 80 S	6-21 oz	0.3-1.05		Plant bugs, Bollworm, Stink Bugs, Whitefly.	21	24
	bifenthrin (R) + avermectin Athena 0.87 E	10-17 oz	0.068-0.116	7.5-12.8	Bollworm, Stink Bugs, Spider Mites.	20	12
	bifenthrin (R) + acetameprid Argyle 1.52 OD	5-9 oz	0.06-0.11	14-25.6	Aphids, Plant bugs, Bollworm, Stink Bugs, Whitefly.	28	12
	Savoy 1.8 EC	3.6-12.9 oz		9.9-35.6			
	bifenthrin + chlorantraniliprole (R) Elevest 2.22 SC	4.8-9.6 oz	0.084-0.167	26.7-13.3	Cutworms, Grasshoppers, Bollworm, Tobacco Budworm, Loopers, Beet Armyworm, Fall Armyworm, Stink Bugs.	21	12
	chloryrifos + lambda-cyhalothrin (R) Lambdafos 2.69 EC	16-42 oz	0.33-0.76	3.05-8	Plant bugs, Bollworm, Stink Bugs, Whitefly.	21	24
	cyantraniliprole + abamectin Minecto Pro	6-10 oz	0.064-0.11	12.8-21.3	Bollworm, Armyworms, Saltmarsh Caterpillar, Spider Mites.	20	12
	dicrotophos (R) + bifenthrin Bidrin XP II	8-12.8 oz	0.31-0.5	10-16	Plant bugs, Bollworm, Stink Bugs, Whitefly.	30	144
	gamma-cyhalothrin + spinosad (R) Consero 5.25 SC	2.8-4 oz	0.054-0.083	32-45	Bollworm, Tobacco Budworm, Green Stink Bugs, Armyworms, Loopers.	28	24
	imidacloprid/beta-cyfluthrin (R) Leverage 360 SC	2.8-3.2 oz	0.067-0.075	40-45.7	Plant bugs, Bollworm, Stink Bugs, Whitefly.	14	12
	imidacloprid/bifenthrin (R) Brigadier 2 SC	3.8-7.7 oz	0.06-0.12	16.6-33.7	Plant bugs, Bollworm, Stink Bugs, Whitefly.	14	12
	Swagger 1 SC	7.6-15.4 oz		8.3-16.8			
	Avenger 1 SC	7.6-15.4 oz		8.3-16.8			
	lambda-cyhalothrin + chlorantraniliprole (R) Besiege 1.25 SC	6.5-12.5 oz	0.417-0.835	10.24-19.7	Bollworm, Tobacco Budworm, Green Stink Bugs.	21	24
	lambda-cyhalothrin + thiamethoxam (R) Endigo 2.7 ZCX	4.5-5.5 oz	0.08-0.09	28.4-36.6	Plant bugs, Bollworm, Stink Bugs, Whitefly.	21	24
	novaluron + acetameprid Cormoran 1.51 DC	6-12 oz	0.06-0.12	10.7-21.3	Plant bugs, Fall Armyworm, Stink Bugs, Whitefly, Aphids.	30	12
	zeta-cypermethrin + bifenthrin + imidacloprid (R) Triple Crown 2.25	4.5-6.4 oz	0.079-0.112	20-28.4	Plant bugs, Bollworm, Stink Bugs, Whitefly.	14	12

FORAGES (ALFALFA AND PASTURE) INSECT CONTROL

Insect	Insecticide	Formulation/Acre	Lb ai/Acre	Acres/Gallon	Application/Comments	Restricted Entry Interval (hours)	Minimum Days From Last Application to Harvest
ALFALFA	beta-cyfluthrin (R) Baythroid XL 1 EC	1.6-2.8 oz	0.0125-0.022	45.5-80	DO NOT apply more than once per cutting.	12	7 alfalfa 0 pasture
Alfalfa Weevil (Usually 1 generation per year. Observed usually only on the first cutting.) Treat when 50% or more of tips show weevil feeding before full bud stage.	carbaryl 44% Carbaryl 4L Sevin XLR	1.5 pints	1.5	2.7	For alfalfa weevil larvae only, not effective on adult alfalfa weevils.	12	7 alfalfa 14 pasture
	dimethoate (R) Dimethoate 4 EC	1 pt	0.5	8	DO NOT apply to alfalfa in the bloom period. Make 1 application per cutting. Dimethoate is NOT LABELED for pastures.	48	10
	gamma-cyhalothrin (R) Proaxis 0.5 EC Declare 1.25 EC	2.56-3.84 oz 1.02-1.54 oz	0.01-0.015	33-50 83-125.5	DO NOT apply more than 0.015 lb ai per acre per cutting. DO NOT apply more than 0.06 lb ai per acre per season.	24	1 (forage) alfalfa 0 (forage) pasture 7 (hay)
	lambda-cyhalothrin (R) Warrior II 2.08 CS Other 1.0 CS formulations (See Generic Insecticides)	1.28-1.92 oz 2.56-3.84 oz	0.02-0.03	66.7-100 33-50	DO NOT apply more than 0.03 lb ai per acre per cutting. DO NOT apply more than 0.12 lb ai per acre per season.	24	1 (forage) alfalfa 0 (grazing) pasture 7 (hay)
	malathion Fyfanon/Malathion 5 EC	1 qt	1.25	4	Very short residual; control for 3-7 days; can be applied by ground rig.	12	5 alfalfa 0 pasture
	Methomyl (R) Lannate 90SP Lannate 2.4 LV	1 lb 3 pt	0.9	2.7	Highly toxic. DO NOT apply to dormant or semidormant alfalfa when temperature is below 50 degrees F.	48	7
	permethrin (R) Permethrin 3.2 EC Pounce 25 WP	4-8 oz	0.1-0.2	16-32	DO NOT apply more than 0.2 lb ai per acre per cutting. DO NOT apply when honeybees are actively foraging. Ambush and Pounce are NOT LABELED for pastures.	12	14 alfalfa
	phosmet Imidan 70 WP	1.33 lb	1.0		DO NOT apply to alfalfa during the bloom period. DO NOT apply more than once per cutting. Imidan is NOT LABELED for pastures.	5 days	7 alfalfa
	zeta-cypermethrin (R) Mustang Maxx 0.8 EC	2.24-4.0 oz	0.014-0.025	32-57		12	7 alfalfa 0 grasses

FORAGES (ALFALFA AND PASTURE) INSECT CONTROL

Insect	Insecticide	Formulation/Acre	Lb ai/Acre	Acres/Gallon	Application/Comments	Restricted Entry Interval (hours)	Minimum Days From Last Application to Harvest	
ALFALFA (cont.) Blister Beetle	carbaryl 44% Carbaryl 4L Sevin XLR Plus	1.5 pt	1.5	2.7	DO NOT apply during bloom.	12	7 alfalfa 14 pasture	
	gamma-cyhalothrin (R) Proaxis 0.5 EC Declare 1.25 EC	2.56-3.84 oz 1.02-1.54 oz	0.01-0.015	33-50 83-125.5	DO NOT apply more than 0.015 lb ai per acre per cutting. DO NOT apply more than 0.06 lb ai per acre per season.	24	1 (forage) alfalfa 0 (forage) pasture 7 (hay)	
	lambda-cyhalothrin (R) Warrior II 2.08 CS Other 1.0 CS formulations (See <i>Generic Insecticides</i>)	1.28-1.92 oz 2.56-3.84 oz	0.02-0.03	66.7-100 33-50	DO NOT apply more than 0.03 lb ai per acre per cutting. DO NOT apply more than 0.12 lb ai per acre per season.	24	1 (forage) alfalfa 0 (forage) pasture 7 (hay)	
Foliage Feeding Caterpillars: Fall Armyworm, Armyworm, Alfalfa Caterpillar, Webworms	beta-cyfluthrin (R) Baythroid XL 1EC	2.6-2.8 oz	0.02-0.022	45.7-49.2	DO NOT apply more than 0.089 lb ai per acre per cutting.	12	7 alfalfa 0 pasture	
	carbaryl 44% Carbaryl 4L Sevin XLR Plus	1.5 pt	1.5	2.7	DO NOT apply to alfalfa during bloom.	12	7 alfalfa 14 pasture	
	On seedling alfalfa, treat for 2 larvae per square foot.	chlorantraniliprole Prevathon Vantacor	14-20 oz 1.2-2.5 oz	0.047-0.067 0.047-0.098	6-9 51-107	DO NOT apply more than 0.2 lb ai per acre per crop.	4	0
	Caterpillars can cause yield loss in established alfalfa. Early harvest when yield justifies cutting can eliminate the need for an insecticide application.	chlorantraniliprole + lambda-cyhalothrin (R) Besiege	6-9 oz	0.059-0.088	14-21		24	1 forage 7 hay
		lambda-cyhalothrin (R) Warrior II 2.08 CS Other 1.0 CS formulations (See <i>Generic Insecticides</i>)	1.28-1.92 oz 2.56-3.84 oz	0.02-0.03	66.7-100 33-50	DO NOT apply more than 0.03 lb ai per acre per cutting. DO NOT apply more than 0.12 lb ai per acre per season.	24	1 (forage) alfalfa 0 (forage) pasture 7 (hay)
		methoxyfenozide Intrepid 2 F	4-8 oz	0.06-0.12	16-32	Livestock can graze on treated area immediately after application of Intrepid.	4	7 (hay) 0 (grazing)
		zeta-cypermethrin (R) Mustang Maxx 0.8 EC	2.8-4.0 oz	0.0175-0.025	32-45	No grazing restriction for grass forage or hay. DO NOT apply within 3 days for non-grass forage.	12	7 alfalfa 0 grasses 3 non-grass pasture
Potato Leafhopper	The treatment threshold for potato leafhoppers varies with the height of the alfalfa. For alfalfa 3 inches in height, the threshold is 4 per 20 sweeps; for 6-inch alfalfa, the threshold is 10 per 20 sweeps; and for 12-inch or greater alfalfa, the threshold is 40 per 20 sweeps. Before treating, consider yield potential and the age of the alfalfa stand.							
	beta-cyfluthrin (R) Baythroid XL 1EC	0.8-1.6 oz	0.0065-0.0125	80-160	DO NOT apply more than 0.089 lb ai per acre per cutting.	12	7 alfalfa 0 pasture	
	carbaryl 44% Carbaryl 4L Sevin XLR Plus	1.5 pt	1.5	2.7	DO NOT apply during bloom.	12	7 alfalfa 14 pasture	

FORAGES (ALFALFA AND PASTURE) INSECT CONTROL

Insect	Insecticide	Formulation/Acre	Lb ai/Acre	Acres/Gallon	Application/Comments	Restricted Entry Interval (hours)	Minimum Days From Last Application to Harvest
ALFALFA							
Potato Leafhopper (cont.)	The treatment threshold for potato leafhoppers varies with the height of the alfalfa. For alfalfa 3 inches in height, the threshold is 4 per 20 sweeps; for 6-inch alfalfa, the threshold is 10 per 20 sweeps; and for 12-inch or greater alfalfa, the threshold is 40 per 20 sweeps. Before treating, consider yield potential and the age of the alfalfa stand.						
	chlorantraniliprole + lambda-cyhalothrin (R) Besiege/Voliam Xpress	5-8 oz	0.049-0.078	16-25.6		24	1 forage 7 hay
	dimethoate (R) Dimethoate 4 EC Dimethoate 2.67 EC	0.5-1.0 pt 0.75-1.5 pt	0.25-0.5	8-16 5.3-10.6	DO NOT apply to alfalfa in the bloom period. Make 1 application per cutting. Dimethoate is NOT LABELED for pastures.	48	10
	lambda-cyhalothrin (R) Warrior II 2.08 CS Other 1.0 CS formulations (See <i>Generic Insecticides</i>)	0.96-1.60 oz 2.92-3.20 oz	0.015-0.025	80-133 40-44	DO NOT apply more than 0.03 lb ai per acre per cutting. DO NOT apply more than 0.12 lb ai per acre per season.	24	1 (forage) alfalfa 0 (forage) pasture 7 (hay)
	permethrin (R) Ambush 2 EC Pounce 25 WP	3.2-12.8 oz 6.4-12.8 oz	0.1-0.2	10-40 1.25-2.5/lb	DO NOT apply more than 0.2 lb ai per acre per cutting. DO NOT apply when honeybees are actively foraging. Ambush and Pounce are NOT LABELED for pastures.	12	14 alfalfa
	zeta-cypermethrin (R) Mustang Maxx 0.8 EC	2.24-4.0 oz	0.014-0.025	32-57		12	7 alfalfa 0 grasses 3 non-grass pasture
Grasshopper	beta-cyfluthrin (R) Baythroid XL 1EC	2.6-2.8 oz	0.02-0.022	45.7-49.2	DO NOT apply more than 0.089 lb ai per acre per cutting.	12	7 alfalfa 0 pasture
	chlorantraniliprole Prevathon 0.43 SC Vantacor	8-20 oz 0.7-1.7oz	0.027-0.067 0.027-0.067	6.4-16 75-183	DO NOT apply more than 0.2 lb ai per acre per year.	4	0 grazing 0 hay
	chlorantraniliprole + lambda-cyhalothrin (R) Besiege	6-10 oz	0.059-0.097	14-21		24	1 forage 7 hay
	lambda-cyhalothrin (R) Warrior II 2.08 CS Other 1.0 CS formulations (See <i>Generic Insecticides</i>)	1.28-1.92 oz 2.56-3.84 oz	0.02-0.03	66.7-100 33-50	DO NOT apply more than 0.03 lb ai per acre per cutting. DO NOT apply more than 0.12 lb ai per acre per season.	24	1 (forage) alfalfa 0 (forage) pasture 7 (hay)
	zeta-cypermethrin (R) Mustang Maxx 0.8 EC	2.8-4.0 oz	0.0175-0.025	32-45	No grazing restriction for grass forage or hay. DO NOT apply within 3 days for non-grass forage.	12	7 alfalfa 0 grasses 3 non-grass pasture

FORAGES (ALFALFA AND PASTURE) INSECT CONTROL

Insect	Insecticide	Formulation/Acre	Lb/ai/Acre	Acres/Gallon	Applications/Comments	Restricted Entry Interval (hours)	Minimum Days From Last Application to Harvest
PASTURE AND HAY MEADOWS (bermudagrass, fescue, Sorghum spp., cool season grasses, ryegrass, winter wheat, mixed grass) Fall Armyworm, Armyworm Control is usually needed when 2 or more worms per square foot. Sweep netting provides a good indication of the presence of fall armyworms but is not as reliable as other methods in determining the population level. Other indicator of fall armyworm presence include silver leaf tips, feeding damage and birds feeding in the field. Products containing anthranilic diamides, IGRs and the tank mix of diflubenzuron plus a pyrethroid exhibit longer residual activity than pyrethroids alone, spinosyns or the carbamate against armyworms.	<u>Anthranilic diamide</u>						
	chlorantraniliprole						
	Shenzi 400 SC	1.3-1.7 oz*	0.034-0.044	75-98	DO NOT apply more than 0.2 lb ai per acre per crop. *2(ee) recommendation rate for Shenzi, Vantacor and Coragen.	4	0 grazing 0 hay
	Vantacor	0.9-1.1 oz*	0.035-0.043	116-142			
	Coragen 1.67 SC	3.5-5.0 oz	0.045-0.065	25.6-36.6			
	<u>Anthranilic diamide + pyrethroid</u>						
	chlorantraniliprole + lambda-cyhalothrin (R)						
	Besiege/Voliam Xpress	6-9 oz	0.059-0.088	14-21	DO NOT apply more than 9 fl oz per acre per cutting.	24	7 hay 0 grazing
	<u>Pyrethroids</u>				Pyrethroids: Recent observed control with pyrethroids has been extremely variable; consider alternate insecticide class or tank mix with other products such as IGRs (see tank mix below)		
	cyfluthrin (R)						
	Tombstone 2 EC	1.6-1.9 oz	0.025-0.03	67.4-80	DO NOT apply more than 0.044 lb ai per 5-day interval.	12	0 grazing 0 hay
	lambda-cyhalothrin (R)						
	Warrior II 2.08 CS	1.28-1.92 oz	0.02-0.03	66.7-100	DO NOT apply more than 0.03 lb ai per acre per cutting. DO NOT apply more than 0.09 lb ai per acre per season.	24	7 hay 0 grazing
	Other 1.0 CS formulations (See <i>Generic Insecticides</i>)	2.56-3.84 oz		33-50			
	beta-cyfluthrin (R)						
	Baythroid XL 1EC	1.6-2.8 oz	0.013-0.022	45.7-49.2	DO NOT apply more than 0.089 lb ai per acre per cutting.	12	0 grazing 0 hay
	zeta-cypermethrin (R)						
	Mustang Maxx 0.8 EC	2.8-4.0 oz	0.0175-0.025	32-45	No grazing restriction for grass forage or hay. DO NOT apply within 3 days for non-grass forage.	12	0 grasses 3 non-grass pasture
	Respect 0.8 EC	2.8-4.0 oz		32-45			
	<u>Insect Growth Regulator (IGR)</u>						
	methoxyfenozide (22.6%)						
	Intrepid 2 F and generics - Troubadour 2F, WithStand, TurnStyle	4-8 oz	0.06-0.12	16-32	Livestock can graze on treated area immediately after application of Intrepid.	4	7 hay 0 grazing
	<u>Spinosyn</u>						
	spinosad						
	Blackhawk	1.1-2.2 oz	0.033-0.066	7.3-14.6/lb	No grazing restriction (spray should dry before cattle graze in treated areas). Entrust is OMRI listed for organic production.	4	3 hay 0 grazing
	Tracer	1-2 oz		64-128			
	Entrust	0.63-1.25 oz		12-25/lb			
	Entrust SC	2-4 oz		32-64			
	<u>Carbamate</u>						
	carbaryl						
	Sevin XLR Plus	2-3 pt	1.0-1.5	2.7-4.0	Sevin does not kill armyworms quickly. Allow 2-3 days for control to become effective. Must remove cattle. DO NOT apply to alfalfa during bloom.	12	14
	Carbaryl 4L						
	<u>Tank mix</u>						
	Dimilin 2I or Unforgiven (22% diflubenzuron) plus one of the pyrethroids listed above.	2 oz/acre	0.062	32	Follow the more stringent grazing restriction of the pyrethroid. For example lambda-cyhalothrin has no grazing restriction for grazing and 7 days post-harvest restriction for hay. Add crop oil to the tank mix.		7 hay 0 grazing
	Ex. 1.0 CS lambda-cyhalothrin	2.56- 3.84 oz	0.02-0.03	33-50			

FORAGES (ALFALFA AND PASTURE) INSECT CONTROL

Insect	Insecticide	Formulation/Acre	Lb/ai/Acre	Acres/Gallon	Applications/Comments	Restricted Entry Interval (hours)	Minimum Days From Last Application to Harvest
PASTURE AND HAY MEADOWS (bermudagrass, fescue, Sorghum spp, cool season grasses, ryegrass, winter wheat, mixed grass) (cont.)	lambda-cyhalothrin (R) Warrior II 2.08 CS	1.28-1.92 oz	0.02-0.03	66.7-100	DO NOT apply more than 0.03 lb ai per acre per cutting.	24	7 hay 0 grazing
	Other 1.0 CS formulations (See Generic Insecticides)	2.56-3.84 oz		33-50	DO NOT apply more than 0.09 lb ai per acre per season.		
Chinch Bugs	beta-cyfluthrin (R) Baythroid XL 1EC	1.6-2.8 oz	0.013-0.022	45.7-49.2	DO NOT apply more than 0.089 lb ai per acre per cutting.	12	0 hay 0 grazing
	zeta-cypermethrin (R) Mustang Maxx 0.8 EC	2.8-4.0 oz	0.0175-0.025	32-45	No grazing restriction for grass forage or hay. DO NOT apply within 3 days for non-grass forage.	12	0 grasses 3 non-grass
	Chlorantraniliprole + lambda-cyhalothrin (R) Besiege/Voliam Xpress	6-9 oz	0.059-0.088	14-21	DO NOT apply more than 9 fl oz per acre per cutting.	24	7 hay 0 grazing
PASTURE AND HAY MEADOWS (bermudagrass ONLY)	Various pyrethroid formulations labeled for application in forages are effective in controlling bermudagrass stem maggot (BSM) adults. Rates labeled for control of armyworms are effective against BSM when applied at the appropriate time. No currently available products are effective against BSM larvae occurring in the grass stem.						
Bermudagrass stem maggot (Adults ONLY)	lambda-cyhalothrin (R) Warrior II 2.08 CS	1.28-1.92 oz	0.02-0.03	66.7-100	DO NOT apply more than 0.03 lb ai per acre per cutting.	24	7 hay 0 grazing
	Other 1.0 CS formulations (See Generic Insecticides)	2.56-3.84 oz		33-50	DO NOT apply more than 0.09 lb ai per acre per season.		
	zeta-cypermethrin (R) Mustang Maxx 0.8 EC	2.8-4.0 oz	0.0175-0.025	32-45	No grazing restriction for grass forage or hay. DO NOT apply within 3 days for non-grass forage.	12	0 grasses 3 non-grass
Bermudagrass stem maggot control is directed at the egg-laying adults. Correct timing of an insecticide application is crucial to obtain effective control of BSM adults. For maximum efficacy, insecticide application should be made seven to ten days following bermudagrass hay harvest. The seven to ten day interval allows for the emergence of adults that pupated at the time of cutting and for application before the grass canopy gets too thick to allow insecticide penetration of the canopy where the adults occur. Adults BSM are easily killed, so the low rate of a pyrethroid insecticide labeled for use against armyworms on pasture or hay is effective (ex. lambda-cyhalothrin). Control of BSM in moderately grazed bermudagrass is usually unnecessary.							
PASTURE AND HAY MEADOWS (Sorghum spp. forage and hybrids ONLY)	sulfoxaflor (50%) Transform WG	0.75-1.5 oz	0.023-0.046		Follow pollinator warning on label. Do not apply 3 days before bloom or until seed set. Do not apply more than two applications per year.	4	7 – grazing, forage, fodder and hay
	flupyradifurone (17.9%) (1.67 lb ai/gal product) Sivanto Prime	4.0-7.0 oz	0.052-0.09	18-32	7 day pre-harvest interval for forage, 14 d pre-harvest interval for dried stover or straw, per Section 24(c). Do not apply more than 28 ounces per season.	24	7 forage 14 dried stover or straw
Sugarcane aphid							
PASTURE AND HAY MEADOWS (Small grains (used as cool season annuals)	See small grains section.						
Aphids							

FORAGES (ALFALFA AND PASTURE) INSECT CONTROL

Insect	Insecticide	Formulation/Acre	Lb/ai/Acre	Acres/Gallon	Applications/Comments	Restricted Entry Interval (hours)	Minimum Days From Last Application to Harvest
PASTURE AND HAY MEADOWS (bermudagrass, fescue, Sorghum spp, cool season grasses, rye grass, winter wheat, mixed grass) Grasshopper	22% diflubenzuron (R) Dimilin 2L	2 oz	0.031	64	Apply when grasshoppers are small (1/2 inch). Once grasshoppers reach 4th instar nymphs, survival increases. Allow at least 1 day after treatment before cutting hay. DO NOT exceed a total of 2 fl oz Dimilin 2L or Unforgiven per acre per cutting DO NOT exceed a total of 6 fl oz Dimilin 2L or Unforgiven per acre per year.	12	1
	Unforgiven	2 oz		64			
	beta-cyfluthrin (R) Baythroid XL 1EC	2.6-2.8 oz	0.02-0.022	45.7-49.2	DO NOT apply more than 0.022 lb ai per 5-day interval.	12	0 grazing 0 hay
	chlorantraniliprole Prevathon 0.43 SC	8-16 oz*	0.027-0.054	8-16	DO NOT apply more than 0.2 lb ai per acre per crop.	4	0 grazing 0 hay
	Vantacor	0.7-1.7	0.027-0.066	75-182	*2(ee) recommendation rate for Prevathon.		
	chlorantraniliprole + lambda-cyhalothrin (R) Besiege/Voliam Xpress	6-9 oz	0.059-0.088	14-21	DO NOT apply more than 9 fl oz per acre per cutting.	24	7 hay 0 grazing
	cyfluthrin (R) Tombstone 2 EC	2.6-2.8 oz	0.04-0.044	45.7-49.2	DO NOT apply more than 0.044 lb ai per 5-day interval.	12	0 grazing 0 hay
	lambda-cyhalothrin (R) Warrior II 2.08 CS Other 1.0 CS formulations (See <i>Generic Insecticides</i>)	1.28-1.92 oz 2.56-3.84 oz	0.02-0.03	66.7-100 33-50	DO NOT apply more than 0.03 lb ai per acre per cutting. DO NOT apply more than 0.09 lb ai per acre per season.	24	7 hay 0 grazing
Red Imported Fire Ant	zeta-cypermethrin (R) Mustang Maxx 0.8 EC	2.8-4.0 oz	0.0175-0.025	32-45	No grazing restriction for grass forage or hay. DO NOT apply within 3 days for non-grass forage.	12	0 grasses 3 non-grass pasture
	hydramethylnon (Amdro Pro)	2-5 Tbsp/mound 1.0-1.5 lb/A			Mound-to-mound treatment rate. Broadcast rate.	12	7 hay 0 grazing
	hydramethylnon + methoprene (Extinguish Plus)	3-5 Tbsp/mound 1.0-1.5 lb/A			Apply ALL FIRE ANT BAITS when ants are active and soil temperature is above 60 degrees F. DO NOT treat if rain is anticipated within 6 hours. DO NOT cut and bale hay treated with Amdro Pro or Extinguish Plus until 7 days after application.	12	7 hay 0 grazing
	pyriproxyfen (Esteem)	2-4 Tbsp/mound 1.5-2 lb/A			DO NOT harvest hay within 24 hours of treatment with Esteem.	12	1 hay 0 grazing
	S-Methoprene (Extinguish)	3-5 Tbsp/mound 1.0-1.5 lb/A			Mound-to-mound treatment rate. Broadcast rate.	4	0 hay 0 grazing
	Advion Fire Ant Bait (indoxacarb)	4 Tbsp/mound 1.5 lb/A			Mound-to-mound treatment rate. Broadcast rate Advion can ONLY be used in fenced pastures grazed by companion animals (DO NOT USE IN PASTURES GRAZED BY ANIMALS INTENDED FOR MEAT OR MILK). DO NOT APPLY TO FORAGE INTENDED FOR HAY PRODUCTION.	4	

PEANUT INSECT CONTROL

Insect	Insecticide	Formulation/Acre	Lb ai/Acre	Acres/Gallon	Application/Comments	Minimum Days From Last Application to Harvest	Restricted Entry Interval (hours)
Thrips Treat with foliar insecticides when 25% of newly emerged leaflets show damage from thrips.	acephate Orthene 97	6-12 oz	0.375-0.75		DO NOT graze or feed vines treated with Acephate.	14	24
	gamma-cyhalothrin (R) Proaxis 0.5 CS	2.56-3.84 oz	0.01-0.015	33.3-50		14	24
	Declare 1.25 CS	1.02-1.54 oz		83-125		14	24
	imidacloprid Admire Pro 4.6 F (at planting)	7-10.5 fl oz	0.04-0.38		Apply in-furrow at planting.	14	12
	Admire Pro 4.6 F (foliar)	1.2 oz	0.043	107	Do not apply while bees are foraging.	14	12
	lambda-cyhalothrin (R) Warrior II 2.08 CS	1.28-1.92 oz	0.02-0.03	66.6-100	DO NOT graze or feed vines treated with Warrior.	14	24
	(See Generic Insecticides)		0.038-0.075				
	phorate (R) Thimet 20 G	5.5 oz/1,000 ft of row			DO NOT graze or feed vines to livestock.	90	48
Threecornered Alfalfa Hopper	beta-cyfluthrin (R) Baythroid XL 1 EC	1.8-2.4 oz	0.014-0.019	53.3-71		14	12
	bifenthrin (R) Brigade 2 EC	2.1-6.4 oz	0.033-0.1	20-61	DO NOT graze or feed vines to livestock.	14	12
	(See Generic Insecticides)						
	carbaryl Sevin XLR or 4 F	1 qt	1	4	DO NOT apply during bloom.	14	12
	esfenvalerate (R) Asana XL 0.66 EC	2.9-5.8 oz	0.015-0.03	22-44	DO NOT graze or feed vines to livestock.	21	12
	(See Generic Insecticides)						
Potato Leaf Hopper	lambda-cyhalothrin (R) Warrior II 2.08 CS	0.96-1.6 oz	0.01-0.026	80-133	DO NOT graze or feed vines treated with Warrior.	14	24
	(See Generic Insecticides)						
	acephate Orthene 97	0.77 lb	0.75		DO NOT graze or feed vines treated with Acephate.	14	24
	carbaryl Sevin XLR or 4 F	1 qt	1	4	DO NOT apply during bloom.	14	12
	esfenvalerate (R) Asana XL 0.66 EC	2.9-5.8 oz	0.015-0.03	22-44	DO NOT graze or feed vines to livestock.	21	12
	(See Generic Insecticides)						
	gamma-cyhalothrin (R) Proaxis 0.5 CS	1.92-3.2 oz	0.0075-0.0125	40-66.7		14	24
	Declare 1.25 CS	0.77-1.28 oz		100-167		14	24
	lambda-cyhalothrin (R) Warrior II 2.08 CS	0.96-1.6 oz	0.015-0.025	80-133	DO NOT graze or feed vines to livestock.	14	24
	(See Generic Insecticides)						
	methomyl (R) Lannate 2.4 LV	12 oz	0.35	10.6	DO NOT graze or feed vines to livestock.	21	48

PEANUT INSECT CONTROL

						Minimum Days From Last Application to Harvest	Restricted Entry Interval (hours)
Insect	Insecticide	Formulation/Acre	Lb ai/Acre	Acres/Gallon	Application/Comments		
Cutworm	beta-cyfluthrin (R) Baythroid XL 1 EC	1.0-1.8 oz	0.008-0.014	71-128		14	12
	bifenthrin (R) Brigade 2 EC (See Generic Insecticides)	2.1-6.4 oz	0.033-0.1	20-61	DO NOT graze or feed vines to livestock.	14	12
	carbaryl Sevin XLR or 4 F	2 qt	2.0	2	DO NOT apply during bloom.	1	12
	chlorantraniliprole Prevathon 0.43 SC	20 oz	0.067	6.4		1	4
	esfenvalerate (R) Asana XL 0.66 EC (See Generic Insecticides)	5.8-9.6 oz	0.03-0.05	13-22	DO NOT graze or feed vines to livestock.	21	12
	gamma-cyhalothrin (R) Proaxis 0.5 CS Declare 1.25 CS	1.92-3.2 oz 0.77-1.28 oz	0.0075-0.0125	40-66.7 100-166		14 14	24 24
	indoxacarb Steward 1.25 SC	9.2-11.3 oz	0.09-0.11	11-14		14	12
	lambda-cyhalothrin (R) Warrior II 2.08 CS (See Generic Insecticides)	0.96-1.6 oz 2.1-6.4 oz	0.015-0.025	80-133	DO NOT graze or feed vines to livestock.	14	24
	zeta-cypermethrin (R) Mustang Maxx 0.8 EC (See Generic Insecticides)	1.28-4.0 oz	0.008-0.025	32-100	DO NOT graze or feed vines to livestock.	7	12
Corn Earworm Consider treatment when total worms exceed 4 per row foot and foliage loss exceeds 15%.	beta-cyfluthrin (R) Baythroid XL 1 EC	1.8-2.4 oz	0.014-0.019	53.3-71		14	12
	bifenthrin (R) Brigade 2 EC (See Generic Insecticides)	2.1-6.4 oz	0.033-0.1	20-60	DO NOT graze or feed vines to livestock.	14	12
	bifenthrin + chlorantraniliprole (R) Elevest 2.22 SC	5.6-9.6 oz	0.098-0.167	13.3-23	DO NOT graze or feed vines to livestock.	14	12
	carbaryl Sevin XLR or 4 F	2-3 pt	1.0-1.5	2.7-4.0	DO NOT apply during bloom.	14	12
	chlorantraniliprole Prevathon 0.43 SC Vantacor 5 SC	14-20 oz 1.2-2.5 oz	0.047-0.067	6.4-9 51.2-85.3		1	4
	esfenvalerate (R) Asana XL 0.66 EC (See Generic Insecticides)	2.9-5.8 oz	0.015-0.03	22-44	DO NOT graze or feed vines to livestock.	21	12

PEANUT INSECT CONTROL

Insect	Insecticide	Formulation/Acre	Lb ai/Acre	Acres/Gallon	Application/Comments	Minimum Days From Last Application to Harvest	Restricted Entry Interval (hours)
Corn Earworm (cont.)	gamma-cyhalothrin (R)		0.01-0.015			14	24
	Proaxis 0.5 CS	2.56-3.84		33.3-50		14	24
	Declare 1.25 CS	1.02-1.54 oz		83-125			
	indoxacarb		0.09-0.11				
	Steward 1.25 SC	9.2-11.3 oz		11-14		14	12
	lambda-cyhalothrin (R)		0.02-0.03		DO NOT graze or feed vines to livestock.		
	Warrior II 2.08 CS	1.28-1.92 oz		66.6-100		14	24
	(See Generic Insecticides)						
	lambda-cyhalothrin + chlorantraniliprole (R)		0.06-0.1			14	24
Beet Armyworm Consider treatment when total worms exceed 4 per row foot and foliage loss exceeds 15%.	Besiege 1.25 SC	6-10 oz		13-21			
	methomyl (R)		0.22-0.9		DO NOT graze or feed vines to livestock.		
	Lannate 2.4 LV	0.75-3 pt		2.6-10.6		21	48
	methoxyfenozide + spinetoram		0.0975-0.187		DO NOT graze or feed vines to livestock.		
	Intrepid Edge 3 F	4-8 oz		16-32		7	4
	zeta-cypermethrin (R)		0.02-0.025		DO NOT graze or feed vines to livestock.		
	Mustang Maxx 0.8 EC	3.2-4.0 oz		32-40		7	12
	chlorantraniliprole		0.047-0.067				
	Prevathon 0.43 SC	14-20 oz		6.4-9		1	4
Fall Armyworm Consider treatment when total worms exceed 4 per row foot and foliage loss exceeds 15%.	Vantacor 5 SC	1.2-2.5 oz		51.2-85.3			
	indoxacarb		0.09-0.11				
	Steward 1.25 SC	9.2-11.3 oz		11-14		14	12
	lambda-cyhalothrin + chlorantraniliprole (R)		0.1		DO NOT graze or feed vines to livestock.		
	Besiege 1.25 SC	10 oz		13		14	24
	methomyl (R)		0.45-0.9		DO NOT graze or feed vines to livestock.		
	Lannate 2.4 LV	1.5-3.0 pt		2.7-5.3		21	48
	methoxyfenozide		0.09-0.16				
	Intrepid 2 F	6-10 oz		13-21.3		7	4
Fall Armyworm Consider treatment when total worms exceed 4 per row foot and foliage loss exceeds 15%.	methoxyfenozide + spinetoram		0.0975-0.187		DO NOT graze or feed vines to livestock.		
	Intrepid Edge 3 F	4-8 oz		16-32		7	4
	spinosad		0.038-0.075				
	Blackhawk	1.7-3.3 oz				14	4
	bifenthrin + chlorantraniliprole (R)		0.098-0.157		DO NOT graze or feed vines to livestock.		
	Elevest 2.22 SC	5.6-9.6 oz		13.3-23		14	12
	carbaryl				DO NOT apply during bloom.		
	Sevin XLR or 4 F	1-1.5 qt	1.0-1.5	2.7-4		14	12
	chlorantraniliprole		0.047-0.067				
Fall Armyworm Consider treatment when total worms exceed 4 per row foot and foliage loss exceeds 15%.	Prevathon 0.43 SC	14-20 oz		6.4-9		1	4
	Vantacor 5 SC	1.2-2.5 oz		51.2-85.3			

PEANUT INSECT CONTROL

Insect	Insecticide	Formulation/Acre	Lb ai/Acre	Acres/Gallon	Application/Comments	Minimum Days From Last Application to Harvest	Restricted Entry Interval (hours)
Fall Armyworm (cont.) Consider treatment when total worms exceed 4 per row foot and foliage loss exceeds 15%.	indoxacarb Steward 1.25 SC	9.2-11.3 oz	0.09-0.11	11-14		14	12
	lambda-cyhalothrin + chlorantraniliprole (R) Besiege 1.25 SC	6-10 oz	0.06-0.1	13-21	DO NOT graze or feed vines to livestock.	14	24
	methomyl (R) Lannate 2.4 LV	0.75-3 pt	0.22-0.9	2.6-10.6	DO NOT graze or feed vines to livestock.	21	48
	methoxyfenozide + spinetoram Intrepid Edge 3 F	4-8 oz	0.0975-0.187	16-32	DO NOT graze or feed vines to livestock.	7	4
	spinosad Blackhawk	1.7-3.3 oz	0.038-0.075			14	4
Velvetbean Caterpillar Consider treatment when total foliage loss exceeds 15% and worms are present.	beta-cyfluthrin (R) Baythroid XL 1 EC	1.0-1.8 oz	0.008-0.014	71-128		14	12
	bifenthrin (R) Brigade 2 EC (See Generic Insecticides)	2.1-6.4 oz	0.033-0.1	20-61	DO NOT graze or feed vines to livestock.	14	12
	bifenthrin + chlorantraniliprole (R) Elevest 2.22 SC	4.8-9.6 oz	0.084-0.167	13.3-26.7	DO NOT graze or feed vines to livestock.	14	12
	carbaryl Sevin XLR or 4 F	2 pt	1	4	DO NOT apply during bloom.	14	12
	chlorantraniliprole Prevathon 0.43 SC Vantacor 5 SC	14-20 oz 1.2-2.5 oz	0.047-0.067	6.4-9 51.2-85.3		1	4
	esfenvalerate (R) Asana XL 0.66 EC (See Generic Insecticides)	2.9-5.8 oz	0.015-0.03	22-44	DO NOT graze or feed vines to livestock.	21	12
	gamma-cyhalothrin (R) Proaxis 0.5 CS Declare 1.25 CS	1.92-3.2 oz 0.77-1.28 oz	0.0075-0.0125	40-66.7 100-166		14 14	24 24
	lambda-cyhalothrin (R) Warrior II 2.08 CS (See Generic Insecticides)	0.96-1.6 oz	0.015-0.025	80-133	DO NOT graze or feed vines to livestock.	14	24
	lambda-cyhalothrin + chlorantraniliprole (R) Besiege 1.25 SC	6-10 oz	0.06-0.1	13-21	DO NOT graze or feed vines to livestock.	14	24
	methoxyfenozide + spinetoram Intrepid Edge 3 F	4-8 oz	0.0975-0.187	16-32	DO NOT graze or feed vines to livestock.	7	4
	zeta-cypermethrin (R) Mustang Maxx 0.8 EC (See Generic Insecticides)	3.2-4.0 oz	0.02-0.025	32-40	DO NOT graze or feed vines to livestock.	7	12

PEANUT INSECT CONTROL

Insect	Insecticide	Formulation/Acre	Lb ai/Acre	Acres/Gallon	Application/Comments	Minimum Days From Last Application to Harvest	Restricted Entry Interval (hours)
Red-Necked Peanut Worm Treat when 50% of plants are infested.	bifenthrin (R) Brigade 2 EC (See Generic Insecticides)	2.1-6.4 oz	0.033-0.1	20-61	DO NOT graze or feed vines to livestock.	14	12
	bifenthrin + chlorantraniliprole (R) Elevest 2.22 SC	4.8-9.6 oz	0.084-0.167	13.3-26.7	DO NOT graze or feed vines to livestock.	14	12
	esfenvalerate (R) Asana XL 0.66 EC (See Generic Insecticides)	2.9-5.8 oz	0.015-0.03	22-44	DO NOT graze or feed vines to livestock.	21	12
	gamma-cyhalothrin (R) Proaxis 0.5 CS Declare 1.25 CS	1.92-3.2 oz 0.77-1.28 oz	0.0075-0.0125	40-66.7 100-166		14 14	24 24
	lambda-cyhalothrin (R) Warrior II 2.08 CS (See Generic Insecticides)	0.96-1.6 oz	0.015-0.025	80-133	DO NOT graze or feed vines to livestock.	14	24
	lambda-cyhalothrin + chlorantraniliprole (R) Besiege 1.25 SC	6-10 oz	0.06-0.1	13-21	DO NOT graze or feed vines to livestock.	14	24
	methoxyfenozide + spinetoram Intrepid Edge 3 F	4-8 oz	0.0975-0.187	16-32	DO NOT graze or feed vines to livestock.	7	4
	zeta-cypermethrin (R) Mustang Maxx 0.8 EC (See Generic Insecticides)	3.2-4.0 oz	0.02-0.025	32-40	DO NOT graze or feed vines to livestock.	7	12
Lesser Cornstalk Borer	bifenthrin + chlorantraniliprole (R) Elevest 2.22 SC	5.6-9.6 oz	0.098-0.167	13.3-23	DO NOT graze or feed vines to livestock.	14	12
	chlorantraniliprole (R) Vantacor 5 FS	1.2-2.5 oz	0.047-0.098	51.2-106.7		1	4
	lambda-cyhalothrin + chlorantraniliprole (R) Besiege 1.25 SC	10 oz	0.1	13	DO NOT graze or feed vines to livestock.	14	12
Southern Corn Rootworm	No effective products currently labeled for rescue treatments						
Spider Mite	bifenthrin (R) Brigade 2 EC (See Generic Insecticides)	5.12-6.4 oz	0.08-0.1	25-60	DO NOT graze or feed vines to livestock.	14	12
	propargite Comite 6.55 EC Omite 30 W	32 oz 5 lbs	1.64	4	DO NOT graze or feed vines to livestock.	14 14	48 48
	fenpyroximate Portal XLO 0.4 EC	1 - 2 pts	0.5 - 0.1	8 - 4	DO NOT make more than 2 applications/year. Do not apply at intervals closer than 14 days apart.	1	12

RICE INSECTICIDE PERFORMANCE RATING, 2025

Insecticide	Chemistry	Restricted Entry Interval (hours)	Restricted Use (R)	Chinch Bug	Fall Armyworm	True Armyworm	Short Horned Grasshopper	Rice Stink Bug	Rice Water Weevil (adult)	Rice Water Weevil (egg)	Rice Water Weevil (larva)	Midge Larvae	Rice Stalk Borer	Aphids (Greenbug, Bird Oat Cherry Aphid)	Grape Colaspis	Billbug
Cruiser	NEO	12		6		2			6		7				8	3
Demacor X-100	DM	4		1	8	8			1		8		8		2	6
Fortenza	DM	12			8	8					8				3	6
NipsIt Inside	NEO	12		6					6		7				8	3
Vantacor	DM	4									7					
Belay	NEO	12		7					7					8		
Dimilin 2L	IGR	12	X		7				0	7				0		
Lambda-Cy/Warrior	SyP	24	X	7	6	8	7	5	7			6	5	8		
Malathion	OP	12		1	2	5	6	5						4		
Mustang Maxx	SyP	12	X	7	6	8	7	5	7				5	8		
Proaxis/Declare	SyP	24	X	7	6	8	7	5	7				5	8		
Tenchu	NEO	12			5			8								

Rating Scale: 0 = no control, 10 = excellent

The performance ratings in the chart are for comparison purposes only and are not necessarily a measure of percent control.

QUICK VIEW THRESHOLD GUIDE

Insect	Threshold	Scouting Procedure
Chinch Bug	Treat when bugs are causing plant injury and bugs are present.	Check seedling rice, particularly fields bordering wheat.
Fall Armyworm, True Armyworm	No treatment is warranted for rice between seedling and 2-3 tiller, unless armyworms are feeding on the growing point. For May and June plantings, armyworms should be treated when defoliation exceeds 40% at 5-6 tiller and 20% at green ring. Higher yield loss has been observed for later plantings. Late season, treat when armyworms are present and head cutting is occurring.	Early season watch rice bordering wheat for migration of true armyworms into field (damage can occur quickly when armyworms move in).
Grasshopper	Treat when damage is evident.	Watch field borders, particularly near grassy areas.
Greenbug	2 to 3 greenbugs per plant on 1- to 2-leaf stage rice.	General visual observation.
Stink Bug	10 stink bugs per 10 sweeps after 75% panicle emergence. Terminate insecticide applications at 60% hard dough. For more information see MP192, <i>Rice Production Handbook</i> .	Sample for stink bugs during the morning hours or late evening. Stink bug levels are difficult to estimate during high daytime temperatures.
Rice Water Weevil	50% to 60% of new leaves show feeding scars and adults are present.	Inspect the youngest leaf on 20-40 plants at 4 locations in the field. Avoid areas with thin stand. DO NOT count older leaves with scars.

CAUTION: Do not allow acephate applications to adjacent crops such as soybean or cotton to drift onto rice. Acephate/Orthene is not labelled on rice.

RICE INSECT CONTROL

Insect	Insecticide	Formulation/Acre	Lb ai/Acre	Acres/ Gallon	Application/Comments	Minimum Days From Last Application to Harvest	Restricted Entry Interval (REI) Hours
Chinch Bug Treat when chinch bugs are causing plant injury and bugs are present. Flooding prior to treatment will move chinch bugs up from the soil onto the plants and increase chances of control. Flooding alone may not control chinch bugs.	chlothianidin Belay 2.13 F	4.5 oz	0.075	28.4	DO NOT apply after 3rd tillar initiaion. DO NOT apply to rice that has NipsIt Inside seed treatment. Hold water for 14 days after treatment.		12
	gamma-cyhalothrin (R) Proaxis 0.5 CS Declare 1.25 CS	3.2-5.12 oz 1.28-2.05 oz	0.0125-0.02	25-40 62-100	DO NOT release flood water within 7 days after application.	21 21	24 24
	lambda-cyhalothrin (R) Warrior II 2.08 CS (See Generic Insecticides)	1.6-2.56 oz	0.025-0.04	50-80	DO NOT release flood water within 7 days after application.	21	24
	zeta-cypermethrin (R) Mustang Maxx 0.8 EC (See Generic Insecticides)	2.64-4 oz	0.0165-0.025	32-40	DO NOT release flood water within 7 days after application.	14	12
Fall Armyworm, True Armyworm No treatment is warranted for rice between seedling and 2-3 tiller, unless armyworms are feeding on the growing point. For May and June plantings, armyworms should be treated when defoliation exceeds 40% at 5-6 tiller and 20% at green ring. Higher yield loss has been observed for later plantings. Late season, treat when armyworms are present and head cutting is occurring.	gamma-cyhalothrin (R) Proaxis 0.5 CS Declare 1.25 CS	3.2-5.12 oz 1.28-2.05 oz	0.0125-0.02	25-40 62-100	DO NOT release flood water within 7 days after application.	21 21	24 24
	lambda-cyhalothrin (R) Warrior II 2.08 CS (See Generic Insecticides)	1.6-2.56 oz	0.025-0.04	50-80	DO NOT release flood water within 7 days after application. Inconsistent control has been observed with lambda-cyhalothrin in recent years.	21	24
	zeta-cypermethrin (R) Mustang Maxx 0.8 EC (See Generic Insecticides)	3.2-4.0 oz	0.02-0.025	32-40	DO NOT release flood water within 7 days after application.	14	12
Short-Horned Grasshopper	gamma-cyhalothrin (R) Proaxis 0.5 CS Declare 1.25 CS	3.2-5.12 oz 1.28-2.05 oz	0.0125-0.02	25-40 62-100	DO NOT release flood water within 7 days after application.	21 21	24 24
	lambda-cyhalothrin (R) Warrior II 2.08 CS (See Generic Insecticides)	1.6-2.56 oz	0.025-0.04	50-80	DO NOT release flood water within 7 days after application.	21	24
	zeta-cypermethrin (R) Mustang Maxx 0.8 EC (See Generic Insecticides)	3.2-4.0 oz	0.02-0.025	32-40	DO NOT release flood water within 7 days after application.	14	12

RICE INSECT CONTROL

Insect	Insecticide	Formulation/Acre	Lb ai/Acre	Acres/ Gallon	Application/Comments	Minimum Days From Last Application to Harvest	Restricted Entry Interval (REI) Hours
Rice Stink Bug During first 2 weeks of panicle emergence treat for 5 stink bugs per 10 sweeps, treat for 10 stink bugs per 10 sweeps thereafter. Terminate insecticide applications at 60% hard dough.	dinotefuran Tenchu 20 SG	7.5-10.5 oz	0.094-0.13			7	12
	malathion Malathion 57% EC	1-1.5 pt	0.625-0.94	5.3-8.0		7	12
	gamma-cyhalothrin (R) Proaxis 0.5 CS	3.2-5.12 oz	0.0125-0.02	25-40	DO NOT release flood water within 7 days after application.	21	24
	Declare 1.25 CS	1.28-2.05 oz		62-100		21	24
	lambda-cyhalothrin (R) Warrior II 2.08 CS (See Generic Insecticides)	1.6-2.56 oz	0.025-0.04	50-80	DO NOT release flood water within 7 days after application.	21	24
	zeta-cypermethrin (R) Mustang Maxx 0.8 EC (See Generic Insecticides)	2.64-4.0 oz	0.0165-0.025	32-48.5	DO NOT release flood water within 7 days after application.	14	12
Rice Water Weevil (Adults) Treat based on leaf scar treatment threshold. For drill seeded rice, make applications within 10 days after permanent flood. For water seeded rice apply within 7 days after permanent flood. In some cases, pre-flood applications of insecticides provide better control of rice water weevil than post-flood applications. Pre-flood applications should only be made if permanent flood is being established 35 days after planting for rice treated with either NipsIt or CruiserMaxx insecticides.	chlothianidin Belay 2.13 F	4.5 oz	0.075	28.4	DO NOT apply after 3rd tillar initiaion. DO NOT apply to rice that has NipsIt Inside seed treatment. Hold water for 14 days after treatment.		12
	gamma-cyhalothrin (R) Proaxis 0.5 CS	3.2-5.12 oz	0.0125-0.02	25-40	DO NOT release flood water within 7 days after application.	21	24
	Declare 1.25 CS	1.28-2.05 oz		62-100		21	24
	lambda-cyhalothrin (R) Warrior II 2.08 CS (See Generic Insecticides)	1.6-2.56 oz	0.025-0.04	50-80	DO NOT release flood water within 7 days after application.	21	24
	zeta-cypermethrin (R) Mustang Maxx 0.8 EC (See Generic Insecticides)	2.64-4 oz	0.0165-0.025	32-48.5	DO NOT release flood water within 7 days after application.	14	12
Rice Water Weevil (Eggs) For drill seeded rice, make applications within 10 days after permanent flood. For water seeded rice apply within 7 days after permanent flood.	diflubenzuron (R) Dimilin 2 L	12-16 fl oz	0.125-0.25	8.0-10.6	DO NOT release flood water within 14 days after application. DO NOT apply to fields adjacent to crayfish farming.	80	12

RICE INSECT CONTROL

Insect	Insecticide	Formulation/Acre	Lb ai/Acre	Acres/ Gallon	Application/Comments	Minimum Days From Last Application to Harvest	Restricted Entry Interval (REI) Hours
Rice Water Weevil (Larvae)	chlorantraniliprole Dermacor X-100	1.5-6.0 oz/100 lb seed (see label)	0.06-0.08				4
	Vantacor 5 FS	2-2.5 oz	0.078-0.098		Apply as a broadcast spray to soil. Must be applied prior to emergence.		
	clothianidin NipsIt Inside 5 FS	1.92 oz/100 lb seed	0.075/100 lb seed		Use only on dry-seeded rice. DO NOT spray crop with another neonicotinoid insecticide after using NipsIt Inside. DO NOT use near fish or crawfish farms.		12
	cyantraniliprole Fortenza 5 FS	3.47 oz/100 lb seed	0.13/100 lb seed		DO NOT use treated fields for aquaculture of edible fish or crustaceans. Fortenza treated rice cannot be soaked or pre-germinated before seeding.	28	12
	thiamethoxam Cruiser 5 FS	0.03 mg ai/seed			DO NOT plant or sow Cruiser-treated seed by aerial application. Cruiser is NOT labeled for use in water-seeded rice. DO NOT use treated fields for aquaculture of edible fish or crustaceans. DO NOT exceed 120 lb seed per acre.		12
Midge Larvae	Midges can be a problem in water-seeded rice. To avoid midge problems, use presprouted seed, promptly apply seed as soon as field is flooded and avoid seeding during cool weather. There are currently no insecticides available for midge control in rice.						
Rice Stalk Borer	chlorantraniliprole Dermacor X-100	1.5-6.0 oz/100 lb seed (see label)	0.06-0.08				4
	cyantraniliprole Fortenza 5 FS	3.47 oz/100 lb seed	0.13/100 lb seed		Use only on dry-seeded rice. DO NOT use treated fields for aquaculture of edible fish or crustaceans.		12
	gamma-cyhalothrin (R) Proaxis 0.5 CS Declare 1.25 CS	3.2-5.12 oz 1.28-2.05 oz	0.0125-0.02	25-40 62-100	DO NOT release flood water within 7 days after application.	21 21	24 24
	lambda-cyhalothrin (R) Warrior II 2.08 CS (See Generic Insecticides)	1.92-2.56 oz	0.03-0.04	50-67	DO NOT release flood water within 7 days after application.	21	24
Aphids, Greenbug, Birdcherry-Oat Aphid Apply when 2-3 greenbugs per plant are found on one- to two-leaf stage rice.	clothianidin Belay 2.13F	4.5 oz	0.075	28.4	DO NOT apply after 3rd tiller initiation. DO NOT apply to rice that has NipsIt Inside seed treatment. Hold water for 14 days after treatment.		12
	gamma-cyhalothrin (R) Proaxis 0.5 CS Declare 1.25 CS	3.2-5.12 oz 1.28-2.05 oz	0.0125-0.02	25-40 62-100	DO NOT release flood water within 7 days after application.	21 21	24 24
	lambda-cyhalothrin (R) Warrior II 2.08 CS (See Generic Insecticides)	1.6-2.56 oz	0.025-0.04	50-80	DO NOT release flood water within 7 days after application.	21	24
	zeta-cypermethrin (R) Mustang Maxx 0.8 EC	3.2-4.0 oz	0.02-0.025	32-40	DO NOT release flood water within 7 days after application.	14	12
Grape Colaspis	thiamethoxam Cruiser 5 FS	0.03 mg ai/seed			DO NOT plant or sow Cruiser-treated seed by aerial application. Cruiser is NOT labeled for use in water-seeded rice. DO NOT use treated fields for aquaculture of edible fish or crustaceans. DO NOT exceed 120 lb seed per acre.		12
	clothianidin NipsIt Inside 5 FS	1.92 oz/100 lb seed	0.075/100 lb seed		Use only on dry-seeded rice. DO NOT spray crop with another neonicotinoid insecticide after using NipsIt Inside. DO NOT use near fish or crawfish farms.		12
Billbug (Row Rice) Blank heads may still occur.	chlorantraniliprole Dermacor X-100	1.5-6.0 oz/100 lb seed (see label)	0.06-0.08				4
	cyantraniliprole Fortenza 5 FS	3.47 oz/100 lb seed	0.13/100 lb seed		Use only on dry-seeded rice. DO NOT use treated fields for aquaculture of edible fish or crustaceans.		12

SMALL GRAIN INSECTICIDE PERFORMANCE RATING, 2025
(Barley, Wheat, Oats and Rye)

Insecticide	Chemistry	Restricted Entry Interval (hours)	Restricted Use (R)	Armyworm	Greenbug/Aphid	Grasshopper	Hessian Fly	Cereal Leaf Beetle
Cruiser	NEO	12			8		7	
Gaucho/Axcess/Senator	NEO	12			8		7	
NipsIt Inside/Poncho	NEO	12			8		7	
Dimethoate	OP	48			7	6		
Baythroid XL	SyP	12	X	8	8	7		7
Lannate	Car	48	X	7	7	3		8
Malathion/Fyfanon	OP	12		3	6	6		8
Mustang Maxx/Respect	SyP	12	X	8	8	7		7
Proaxis/Declare	SyP	24	X	8	8	7		7
Sevin	Car	12		6	0			7
Blackhawk	SP	4		7	0	2		
Karate/Silencer/Lambda-Cy/Warrior	SyP	24	X	8	8	7		7
Transform	SX	24			9			

Rating Scale: 0 = no control, 10 = excellent

The performance ratings in the chart are for comparison purposes only and are not necessarily a measure of percent control.

QUICK VIEW THRESHOLD GUIDE

Insect	Threshold	Scouting Procedure
Armyworm, Army Cutworm	Fall infestation: 6 larvae per square foot. Spring infestation: Head cutting and larvae present.	Inspect area at base of plants under leaves and debris in 4 spots in the field.
Cereal Leaf Beetle	1 beetle per stem.	Examine 25 plants in 4 spots (100/field)
Grasshopper	When substantial damage is occurring.	Examine plants in 4 spots in field.
Greenbug	Plants up to 6 inches – 50 per row foot. 6 to 10 inches – 200 per row foot. 10 to 20 inches – 300 per row foot. 30+ inches – 800 per row foot.	Examine plants in 4 spots in field.

SMALL GRAIN INSECT CONTROL
(Barley, Wheat, Oats and Rye)

Insect	Insecticide	Formulation/Acre	Lb ai/Acre	Acres/Gallon	Application/Comments	Minimum Days From Last Application to Harvest (PHI)	Restricted Entry Interval (REI) Hours
Armyworm Army Cutworm For fall infestation, treat when populations reach 6 larvae per square foot. Apply when larvae are present and head cutting is occurring after wheat has reached milk/soft dough stage. Consider application in heading wheat prior to milk stage if most leaves are destroyed and larvae are observed in the panicles (>20 larvae/sq ft.).	beta-cyfluthrin (R)		0.008-0.014			30 (grain)	
	Baythroid XL 1 EC	1.0-1.8 oz		71-128		3 (grazing)	12
	carbaryl		1-2			48 (grain)	12
	Sevin XLR or 4F	1-2 qt		2-4		14 (grazing)	12
	gamma-cyhalothrin (R)		0.01-0.015				
	Proaxis 0.5 CS	2.56-3.84 oz		33.3-50	Labeled on wheat only.	14	24
	Declare 1.25 CS	1.02-1.54 oz		83-125	Labeled on wheat only.	14	24
	lambda-cyhalothrin (R)		0.015-0.025				
	Warrior II 2.08 CS	1.28-1.92 oz		67-100		14	24
	(See Generic Insecticides)						
Greenbug and Other Aphids	spinosad		0.038-0.075			21 (grain)	
	Blackhawk	1.7-3.3 oz				0 (grazing)	4
	zeta-cypermethrin (R)		0.011-0.025				
	Mustang Maxx 0.8 EC	1.76-4.0 oz		32-73		14	12
	(See Generic Insecticides)						
	Greenbug Treatment Level:						
	Number per						
	Plant Height						
	4-6 inches						50
	6-10 inches						200
	dimethoate		0.375				
	Dimethoate 4 E	0.75 pt		10.6	Labeled on wheat only.	35 (grain)	48
	malathion						
	Fyfanon 5 lb	1.5 pt	1	5.3		7	12
	beta-cyfluthrin (R)		0.014-0.019			30 (grain)	12
	Baythroid XL 1 EC	1.8-2.4 oz		53-71		3 (grazing)	
	gamma-cyhalothrin (R)		0.01-0.015				
	Proaxis 0.5 CS	2.56-3.84 oz		33.3-50		14	24
	Declare 1.25 CS	1.02-1.54 oz		83-125.5		14	24
	lambda-cyhalothrin (R)		0.015-0.025				
	Warrior II 2.08 CS	1.28-1.92 oz		67-100		14	24
	(See Generic Insecticides)						
	sulfaxaflor		0.023-0.047				
	Transform 50 WG	0.75-1.5 oz			Do not make more than 2 applications per crop.	14 (grain)	24
	zeta-cypermethrin (R)		0.02-0.025				
	Mustang Maxx 0.8 EC	3.2-4.0 oz		32-40		14	12
	(See Generic Insecticides)						

SMALL GRAIN INSECT CONTROL
(Barley, Wheat, Oats and Rye)

Insect	Insecticide	Formulation/Acre	Lb ai/Acre	Acres/Gallon	Application/Comments	Minimum Days From Last Application to Harvest (PHI)	Restricted Entry Interval (REI) Hours
Grasshopper Treat when damage is occurring.	beta-cyfluthrin (R) Baythroid XL 1 EC	1.8-2.4 oz	0.014-0.019	53-71		30 (grain) 3 (grazing)	12
	dimethoate Dimethoate 4 E	0.75 pt	0.375	10.6	Labeled on wheat only.	35 (grain) 14 (grazing)	48
	gamma-cyhalothrin (R) Proaxis 0.5 CS	2.56-3.84 oz	0.01-0.015	33-50	Labeled on wheat only.	14	24
	Declare 1.25 CS	1.02-1.54 oz		83-125	Labeled on wheat only.	14	24
	lambda-cyhalothrin (R) Warrior II 2.08 CS (See Generic Insecticides)	1.28-1.92 fl oz	0.015-0.025	67-100		14	24
	malathion Fyfanon 5 EC (See Generic Insecticides)	1.5 pt	1	5.3		7	12
	zeta-cypermethrin (R) Mustang Maxx 0.8 EC (See Generic Insecticides)	3.2-4.0 oz	0.02-0.025	32-40		14	12
Hessian Fly (Wheat)	At planting treatments:				Preventative treatment for Hessian fly is not typically recommended in Arkansas. Hessian fly can be controlled by cultural methods:		
	clothianidin NipsIt Inside 5 FS	1.79 oz/100 lb seed			a. Burn wheat stubble and disc under.		12
	Poncho 600	1.79 oz/100 lb seed			b. Destroy volunteer wheat.		
	imidacloprid Gaucho 600 F	1.2-2.4 oz/100 lb seed			c. Plant late in fall, mid October or early November.		12
	Access 5 F	1.2-2.4 oz/100 lb seed			d. Plant resistant varieties.		12
	Senator 5 FS	1.2-2.4 oz/100 lb seed			e. Consider a seed treatment if wheat is planted early.		12
	thiamethoxam Cruiser 5 FS	0.75-1.33 oz/100 lb					12
	Foliar Applied Treatments:				Foliar treatments should only be used on early planted wheat if an insecticide seed treatment was not used. Target adults and/or eggs shortly after plants emerge (2-3 leaf stage).		
	lambda-cyhalothrin (R) Warrior II 2.08 CS (See Generic Insecticides)	1.28-1.92 oz	0.015-0.03	66.7-100		14	24
	gamma-cyhalothrin (R) Proaxis 0.5 CS	2.56-3.84 oz	0.01-0.015	33.3-50		14	24
	Declare 1.25 CS	1.02-1.54 oz		83-125.5			
Cereal Leaf Beetle Treat when an average of 1 beetle per stem is found.	beta-cyfluthrin (R) Baythroid XL 1 EC	1.0-1.8 oz	0.008-0.014	71-128		30 (grain) 3 (grazing)	12
	gamma-cyhalothrin (R) Proaxis 0.5 CS	2.56-3.84 oz	0.01-0.015	33-50	Labeled on wheat only.	14	24
	Declare 1.25 CS	1.02-1.54 oz		83-125	Labeled on wheat only.	14	24
	lambda-cyhalothrin (R) Warrior II 2.08 CS (See Generic Insecticides)	1.28-1.92 fl oz	0.015-0.025	67-100		14	24
	zeta-cypermethrin (R) Mustang Maxx 0.8 EC (See Generic Insecticides)	1.76-4.0 oz	0.011-0.025	32-73		14	12

GRAIN SORGHUM INSECTICIDE PERFORMANCE RATING, 2025

	Chemistry	Restricted Entry Interval (hours)	Restricted Use (R)	Chinch Bug	Sorghum Webworm	Corn Earworm	Fall Armyworm	Fire Ants	Greenbug/Yellow Sugarcane Aphid/ Corn Leaf Aphid	Sugarcane Aphid	Sorghum Midge	Stink Bug
Cruiser	NEO	12		8				7	7	8		
Gaucho/Axcess/Senator	NEO	12		8				7	7	8		
NipsIt Inside/Poncho	NEO	12		7					7	8		
Asana XL/Adjourn	SyP	12	X	7	5	4	4		8	0	8	7
Baythroid XL	SyP	12	X	7	5	5	4		8	0	8	7
Besiege	DM+SyP	24	X	7	9	9	9		8	0	8	7
Blackhawk	SP	4			7	8	8	0	0	0	7	0
Dimethoate	OP	48		5	4		5		8	3	8	5
Karate Z/Silencer/Lambda-Cy/Warrior	SyP	24	X	7	5	5	4		8	0	8	7
Heligen	NPV	4				7						
Lannate	Car	48	X	5	8	8	8		7	3	6	5
Mustang Maxx/Respect	SyP	12	X	7	5	5	4		8	0	8	7
Prevathon/Vantacor/Shenzi	DM	4			9	9	9					
Proaxis/Declare	SyP	24	X	7	5	5	4		8	0	8	7
Sefina	Pyr.	12	X							7		
Sevin/Carbaryl	Car	12		7	7	6	7		5		6	5
Sivanto	BU	4								9		
Transform	SX	24							9	8		

Rating Scale: 0 = no control, 10 = excellent

The performance ratings in the chart are for comparison purposes only and are not necessarily a measure of percent control.

QUICK-VIEW THRESHOLD GUIDE

Insect	Threshold	Scouting Procedure
Sugarcane Aphid	25% infestation with at least 50 aphids per leaf	Scout field edges first – watch closely for expanding infestations
Whorl Feeders	3-6 larvae per whorl	Examine 25 plants in 4 spots (100/field)
Chinch Bug	When stand is threatened	Watch for yellowing/reddening and/or twisting of leaves Check under leaf sheath near soil line for chinch bugs
Greenbug	Plants up to 6 inches – visible damage with colonies present 6 inches to preboot – treat before entire leaves die Preboot to hard dough – treat when 2 or more entire leaves die	Examine 25 plants in 4 spots (100/field)
Yellow Sugarcane Aphid	1 aphid per seedling	Examine 25 plants in 4 spots (100/field)
Sorghum Midge	1 adult midge per head when 25%-30% of plants are flowering	
Corn Earworm/Fall Armyworm	1 larvae 1/2-inch long or longer per head	
Sorghum Webworm	5 larvae per head	
Stink Bug	5 per head from flowering to soft dough 16 per head during hard dough	

GRAIN SORGHUM INSECT CONTROL

Insect	Insecticide	Formulation/Acre	Lb ai/Acre	Acres/ Gallon	Application/Comments	Minimum Days From Last Application to Harvest	Restricted Entry Interval (REI) Hours
Soil Pests	clothianidin						
Seed Corn Maggot, White Grubs, Wireworms, Southern Corn Rootworm	Poncho 600	5.1-6.4 oz/100 lb seed					12
	NipsIt Inside 5 F	5.1-6.4 oz/100 lb seed					12
	imidacloprid				Do not graze or feed to livestock within 45 days of planting.		
	Gaucha 5 FS	6.4 oz/100 lb seed					12
	Axcess 5 FS	6.4 oz/100 lb seed					12
	Senator 5 FS	6.4 oz/100 lb seed					12
	thiamethoxam						
	Cruiser 5 FS	5.1-7.6 oz/100 lb seed					12
Chinch Bug	At Planting Treatments:						
On seedling grain sorghum (6" or less), apply foliar sprays when stand is threatened. On taller plants, apply controls when immature and adult bugs infest 75% of the plants.	clothianidin						
	Poncho 600	5.1-6.4 oz/100 lb seed					12
	NipsIt Inside 5 F	5.1-6.4 oz/100 lb seed					12
	imidacloprid				Do not graze or feed to livestock within 45 days of planting.		
	Gaucha 5 FS	6.4 oz/100 lb seed					12
	Axcess 5 FS	6.4 oz/100 lb seed					12
	Senator 5 FS	6.4 oz/100 lb seed					12
	thiamethoxam						
	Cruiser 5 FS	5.1-7.6 oz/100 lb seed					12
Use 20-30 gal of water per acre for foliar treatments. Direct sprays toward infested areas.	Foliar-Applied Treatments:						
	beta-cyfluthrin (R)		0.019-0.022			14	12
	Baythroid XL 1 EC	2.0-2.8 oz		45.7-98.5			
	carbaryl		1.0-2.0			21 (grain)	
	Sevin 4L	1-2 qt		4-2		14 (forage)	12
	esfenvalerate (R)		0.03-0.05				
	Asana XL 0.66 EC	5.8-9.6 oz		13-22		21	12
	(See Generic Insecticides)						
	gamma-cyhalothrin 1.25 CS (R)		0.015				
	Proaxis 0.5 CS	3.84 oz		33		30	24
	Declare 1.25 CS	1.54 oz		83		30	24
	lambda-cyhalothrin (R)		0.03				
	Warrior II 2.08 CS	1.92 oz		67		30	24
	(See Generic Insecticides)						
	zeta-cypermethrin (R)		0.02-0.025			14 (grain & forage)	
	Mustang Maxx 0.8 EC	3.2-4.0 oz		32-40		45 (fodder)	12
	(See Generic Insecticides)						
Sugarcane Aphid	At Planting Treatments:						
	clothianidin						
	Poncho 600	5.1-6.4 oz/100 lb seed					12
	NipsIt Inside 5 F	5.1-6.4 oz/100 lb seed					12
	flupyradifurone		0.13-0.36				
	Sivanto Prime 1.67	10-28 oz		12.8-4.6	Apply as an in-furrow spray at planning. May be used on sweet sorghum grown for syrup.	45	4
	imidacloprid				Do not graze or feed to livestock within 45 days of planting.		
	Gaucha 5 FS	6.4 oz/100 lb seed					12
	Axcess 5 FS	6.4 oz/100 lb seed					12
	Senator 5 FS	6.4 oz/100 lb seed					12
	thiamethoxam						
	Cruiser 5 FS	5.1 oz/100 lb seed					12

GRAIN SORGHUM INSECT CONTROL

Insect	Insecticide	Formulation/Acre	Lb ai/Acre	Acres/Gallon	Application/Comments	Minimum Days From Last Application to Harvest	Restricted Entry Interval (REI) Hours
Sugarcane Aphid (cont.)	Foliar-Applied Treatments:						
	flupyradifurone Sivanto 1.67 SL	4.0-7.0 oz	0.052-0.09	18.3-32	DO NOT apply more than 28 oz per acre per season. DO NOT use on sweet sorghum.	21 (grain) 7 (forage)	4
	sulfoxaflor Transform 50 WG	0.75-1.5 oz	0.023-0.047		DO NOT use on sweet sorghum. Do not apply at intervals closer than 14 days apart. Do not apply 3 days before bloom or until after seed set.	14 (grain) 7 (forage)	24
	afidopyropen Sefina 0.42 DC	6oz	0.02	21.3	May be used on sweet sorghum.	14 (grain) 7 (forage)	12
Greenbug, Corn Leaf Aphid, Yellow Sugarcane Aphid	At Planting Treatments:				Cruiser, Gaucho, Axxess, Senator, NipsIt and Poncho will give early-season suppression of chinch bugs and aphids.		
	clothianidin Poncho 600	5.1-6.4 oz/100 lb seed					12
	NipsIt Inside 5 F	5.1-6.4 oz/100 lb seed					12
	imidacloprid Gaucho 5 FS	6.4 oz/100 lb seed			Do not graze or feed to livestock within 45 days of planting.		12
	Axxess 5 FS	6.4 oz/100 lb seed					12
	Senator 5 FS	6.4 oz/100 lb seed					12
	thiamethoxam Cruiser 5 FS	5.1-7.6 oz/100 lb seed					12
	Foliar-Applied Treatments:						
	dimethoate Dimethoate 4 E	0.5-1.0 pt	0.25-0.5	8-16		28	48
	Dimethoate 2.67 E	0.75-1.5 pt		5.3-10.7		28	48
	sulfoxaflor Transform 50 WG	0.75-1.5 oz	0.023-0.047		DO NOT use on sweet sorghum. Do not apply at intervals closer than 14 days apart. Do not apply 3 days before bloom or until after seed set.	14 (grain) 7 (forage)	24
Sorghum Midge Apply controls when 25%-30% of heads have begun to flower (yellow anthers) and the number of midge adults found averages one per head. If adults are found in similar number in 3-5 days after treatment and sorghum is still blooming, treat again.	beta-cyfluthrin (R) Baythroid XL 1 EC	1.0-1.3 oz	0.008-0.01	45.7-80		14	12
	dimethoate Dimethoate 4 E	0.25-0.5 pt	0.125-0.25	16-32		28	48
	Dimethoate 2.67 E	6-12 oz		10.7-21.3		28	48
	esfenvalerate (R) Asana XL 0.66 EC	2.9-5.8 oz	0.015-0.03	22-44		21	12
	(See Generic Insecticides)						
	gamma-cyhalothrin 1.25 CS (R) Proaxis 0.5 CS	1.92-2.56 oz	0.0075-0.01	50-66.7		30	24
	Declare 1.25 CS	0.77-1.02 oz		125-167		30	24
	lambda-cyhalothrin (R) Warrior II 2.08 CS	0.96-1.28 oz	0.015-0.02	100-133		30	24
	(See Generic Insecticides)						

GRAIN SORGHUM INSECT CONTROL

Insect	Insecticide	Formulation/Acre	Lb ai/Acre	Acres/Gallon	Application/Comments	Minimum Days From Last Application to Harvest	Restricted Entry Interval (REI) Hours
Sorghum Midge (cont.)	lambda-cyhalothrin + chlorantraniliprole (R) Besiege	5-6 oz	0.05-0.06	21-25.6		21	24
	methomyl (R) Lannate 2.4 LV	0.75-1.5 pt	0.22-0.45	5.3-10.6		14	48
	spinosad Blackhawk (See Generic Insecticides)	1.5-3.3 oz	0.034-0.075			21	4
	zeta-cypermethrin (R) Mustang Maxx 0.8 EC (See Generic Insecticides)	1.28-4.0 oz	0.008-0.025	32-100		14 (grain & forage) 45 (fodder)	12
Corn Earworm	Carbamates methomyl (R) Lannate 2.4 LV	0.75-1.5 pt	0.22-0.45	5.3-10.6		14	48
Whorl Stage: treat when 3-6 worms per plant.	carbaryl Sevin XLR	1-2 qt	1-2	4-2		21 (grain) 14 (forage)	12
Heading: 1 worm per head, 1/2 inch in size.	Other Chemistry chlorantraniliprole Prevathon Vantacor 5 SC Shenzi 400 SC	14-20 oz 1.2-2.5 oz 1.7-3.8 oz	0.047-0.098	6.4-9.14 107-51 75.3-33.7		14	4
	lambda-cyhalothrin + chlorantraniliprole (R) Besiege	6-10 oz	0.06-0.097	12.8-21		21	24
	nucleopolyhedrovirus Heligen	0.7-1.4 oz		91.4-183	Apply before reaching economic threshold targeting small larvae. Applications on large larvae often result in poor control. Larvae stop feeding within 1-3 days and die within 3-9 days. See publication AG1306 for more information.	0	4
	spinosad Blackhawk	1.67-3.3 oz	0.038-0.075			21	4
Fall Armyworm, Sorghum Webworm	carbaryl Sevin XLR	1-2 qt	1-2	2-4	Heading: Fall Armyworm – Treat when numbers exceed an average of 1 larvae per head, 1/2 inch in size, in maturing sorghum.	21 (grain) 14 (forage)	12
Whorl Stage: treat when 3-6 worms per plant.	chlorantraniliprole Prevathon Vantacor 5 SC Shenzi 400 SC	14-20 oz 1.2-2.5 oz 1.7-3.8 oz	0.048-0.098	6.4-9.14 107-51 75.3-33.7		14	4
Heading: 1 fall armyworm per head, 1/2-inch or larger in size. 5 sorghum webworms per head	methomyl (R) Lannate 2.4 LV	0.75-1.5 pt	0.022-0.45	5.3-10.7	Sorghum Webworm: Treat when an average of 5 small larvae are found per head. Use higher rate for sorghum webworm.	14	48
	spinosad Blackhawk	1.67-3.3 oz	0.038-0.075			21	4

GRAIN SORGHUM INSECT CONTROL

Insect	Insecticide	Formulation/Acre	Lb ai/Acre	Acres/Gallon	Application/Comments	Minimum Days From Last Application to Harvest	Restricted Entry Interval (REI) Hours
Stink Bugs Treat when 5 bugs per head from flowering to soft dough are found, or when 16 per head at hard dough are found.	beta-cyfluthrin (R)		0.01-0.022			14	12
	Baythroid XL 1 EC	1.3-2.8 oz		45.7-98.5			
	gamma-cyhalothrin 1.25 CS (R)		0.01-0.015			21	24
	Proaxis 0.5 CS	2.56-3.84 oz		33-50			
	Declare 1.25 CS	1.02-1.54 oz		83-125			
	lambda-cyhalothrin (R)		0.02-0.03			21	24
	Warrior II 2.08 CS (See Generic Insecticides)	1.28-1.92 oz		66.7-100			
	lambda-cyhalothrin + chlorantraniliprole (R)		0.06-0.097				
	Besiege	6-10 oz		12.8-21		21	24
	zeta-cypermethrin (R)		0.011-0.025			14 (grain & forage)	
	Mustang Maxx 0.8 EC (See Generic Insecticides)	1.76-4.0 oz		32-73		45 (fodder)	12
Fire Ants	imidacloprid				Do not graze or feed to livestock within 45 days of planting.		
	Gaucho 5 FS	6.4 oz/100 lb seed					12
	Axcess 5 FS	6.4 oz/100 lb seed					12
	Senator 5 FS	6.4 oz/100 lb seed					12
	thiamethoxam				Seed treatment.		12
	Cruiser 5 FS	5.1-7.6 oz/100 lb seed					

SOYBEAN INSECTICIDE PERFORMANCE RATING, 2025

Rating Scale: 0 = no control 10 = excellent	Chemistry	Restricted Entry Interval (Hours)	Restricted Use (R)	Stem Feeders			Defoliators									Defoliators and Pod Feeders				Pod Feeders		
				Cutworm	Kudzu Bug	Threecornered Alfalfa Hopper	Blister Beetle	Garden Webworm	Grasshopper	Green Cloverworm	Saltmarsh Caterpillar	Soybean Looper	Cabbage Looper	Spider Mite	Velvetbean Caterpillar	Bean Leaf Beetle	Beet Armyworm	Yellowstriped Fall Armyworm	Corn Earworm	Green Stink Bug	Brown Stink Bug	Red Banded Stink Bug
Admire/Imidacloprid	NEO	12																		3	4	4
Cruiser	NEO	12				7										5						
Gaucho	NEO	12				5										5						
Intego Suite	NEO	12				5										5						
Agri-Mek	AV	12	X											8								
Ambush/Pounce	SyP	12	X			7	6	7	4	8	4	1	6	0	8	3	3	7	4	5	5	
Asana XL/Adjourn	SyP	12	X	8	6	8	8	8	7	9	5	1	8	0	9	3	3	7	4	7	5	
Bacillus thuringiensis	B	4		0		0	0	5	0	8	3	7	7	0	8	0	2	0	2	0	0	
Baythroid XL	SyP	12	X	8	6	8	8	8	6	9	5	3	8	0	9	3	3	7	4	7	5	5
Belay	NEO	12			6											7				7	6	7
Besiege	DM+SyP	24	X	8	9	8	8	9	7	9	9	6	9		9	5	9	9	9	7	5	5
Blackhawk	SP	4		7	0	0	0	8	2	9	5	7	9	0	9	3	8	7	6	1	1	
Brigade/Discipline/Fanfare	SyP	12	X	9	9	9	8	7	7	9	6	3	8	8	9	7		8	4	9	7	7
Denim	AV	12	X	7					2	9	3	8	8	5			9	8	7			
Dimethoate	OP	48		0	6	6	5	5	7	3	1	2	2	4	3	8	2	4	2	8	4	3
Elevest	SyP+DM	12	X	9	9	9	8	9	7	9	9	6	9	8	9	7	9	9	9	9	7	7
Endigo ZCX	NEO+SyP	24	X	8	9	8	8	8	7	9	5	3	8	0	9	7	3	7	5	9	8	7
Heligen	NPV	4																	7			
Hero	SyP	12	X	9	9	9	8	7	7	9	6	3	8	8	9	6		8	4	9	8	6
Intrepid	IGR	4						8		8	9	5	8	0	8		8	8	5			
Intrepid Edge	IGR+SP	4								9	9	8	8		8		8	8	8			
Karate/Silencer/Lambda-Cy/Warrior	SyP	24	X	8	9	8	8	8	7	9	5	3	8	0	9	4	3	7	4	7	5	5
Lannate 2.4 LV	Car	48	X	2		5	5	8	6	9	4	7	8	0	9	6	7	7	6	7	5	
Leverage	NEO+SyP	12	X	8	6	8	8	8	7	9	5	3	8	0	9	7	3	7	4	9	7	7
Mustang Maxx/Respect	SyP	12	X	8	8	8	8	8	7	9	5	3	8	0	9	5	3	7	4	7	6	5
Orthene/Acephate	OP	24	X		6				8				7			7				8	8	7
Prevathon/Vantacor	DM	4	X					9	8	9	9	6	9		9		9	9	9			
Prolex/Declare	SyP	24	X	8	7	8	7	8	7	9	5	3	8	0	9	4	3	7	4	7	5	
Sevin	Car	12		5	6	3	8	3	7	8	5	1	1	0	8	7	3	6	6	5	4	
Spear-LEP	GSO	4										4						2	6			
Steward	OX	12		9	0	0	0	8	0	9	5	8	9	0	4	2	8	8	8	1	1	

The performance ratings in the chart are for comparison purposes only and are not necessarily a measure of percent control.

SOYBEAN INSECT CONTROL

Equivalent Economic Threshold Conversion Between Drop Cloth and Sweepnet

Insect	Sampling Method Used at Four Random Areas Per 40 Acres			
	Drop Cloth	Sweepnet		
	Number/5 Foot of Row	Number/25 Sweeps	Number/50 Sweeps	Number/100 Sweeps
Stink bugs – up to R6 growth stage	5	9	18	36
Stink bugs – R6 to R6.5 growth stage (DO NOT treat after R6.5.)	10	18	36	72
Red Banded stink bug – up through R6.5 (Raise threshold to 10 from R6.5-R7) (DO NOT treat after R7 if weather conditions are favorable.)		4	8	16
Soybean looper, cabbage looper, velvetbean caterpillar, armyworm complex ¹	5	29	58	116
Kudzu bug	20 nymphs	25 nymphs	50 nymphs	100 nymphs

¹Threshold numbers in association with 40 percent defoliation before bloom and 25 percent after bloom. Number represents medium and large larvae.

CAUTION: Do not allow acephate applications to drift onto adjacent rice fields. Acephate/Orthene is not labelled on rice.

Corn Earworm Dynamic Threshold

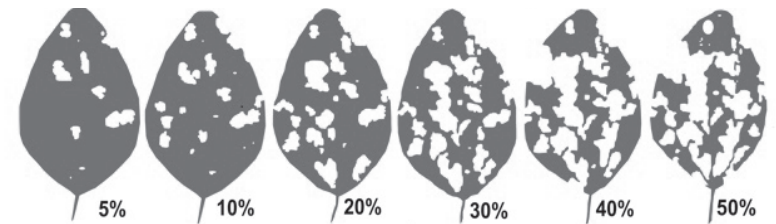
The tables below are the result of a collaborative research effort between five states in the Mid-South including three locations in Arkansas. To determine the treatment level, estimate the potential value of the crop and the cost of the insecticide application. For example; if the crop value is \$8/bushel and the cost of control is \$14/acre, the sweepnet threshold would be 8.6 earworm per 25 sweeps.

Crop value (\$/bu)	Larvae/25 sweeps						
	Control costs (\$/acre)						
	8	10	12	14	16	18	20
6	6.5	8.2	9.8	11.4	13.1	14.7	16.3
7	5.6	7.0	8.4	9.8	11.2	12.6	14.0
8	5.0	6.1	7.4	8.6	9.8	11.0	12.3
9	5.0	5.4	6.5	7.6	8.7	9.8	10.9
10	5.0	5.0	5.9	6.9	7.8	8.8	9.8
12	5.0	5.0	5.0	5.7	6.5	7.4	8.2
13	5.0	5.0	5.0	5.3	6.0	6.8	7.5
15	5.0	5.0	5.0	5.0	5.2	5.9	6.5

Crop value (\$/bu)	Larvae/row foot						
	Control costs (\$/acre)						
	8	10	12	14	16	18	20
6	0.9	1.1	1.3	1.5	1.7	2.0	2.2
7	0.7	0.9	1.1	1.3	1.5	1.7	1.9
8	0.7	0.8	1.0	1.1	1.3	1.5	1.6
9	0.6	0.7	0.9	1.0	1.2	1.3	1.4
10	0.6	0.7	0.8	0.9	1.0	1.2	1.3
12	0.6	0.6	0.7	0.8	0.9	1.0	1.1
13	0.6	0.6	0.6	0.7	0.8	0.9	1.0
15	0.6	0.6	0.6	0.6	0.7	0.8	0.9

Equivalent Rates of Insecticides Containing Chlorantraniliprole			
Product	Formulation lb ai/gal	Oz of chlorantraniliprole per acre equivalent	
Prevathon	0.43 lb	14 oz	20 oz
Vantacor	5 lb	1.2 oz	1.7 oz
Shenzi	3.33 lb	1.8 oz	2.6 oz
Besiege	0.835 lb	7.2 oz	10.3 oz
Elevest	0.89 lb	6.8 oz	9.6 oz

Defoliation Levels on Soybean Leaves



SOYBEAN INSECT CONTROL

Insect	Insecticide	Formulation/Acre	Lb ai/Acre	Acres/Gallon	Application/Comments	Minimum Days From Last Application to Harvest	Restricted Entry Interval (REI) Hours
Cutworm Treat when infestation threatens to reduce stand to less than 4-6 plants per row foot.	beta-cyfluthrin (R) Baythroid XL 1 EC	0.8-1.6 oz	0.007-0.013	80-160	DO NOT apply more than 0.3 lb ai of Brigade per season. DO NOT apply again for 30 days.	21	12
	bifenthrin (R) Brigade 2 EC (See Generic Insecticides)	2.1-6.4 oz	0.033-0.1	20-61		18	12
	cyfluthrin (R) Tombstone 2 EC (See Generic Insecticides)	0.8-1.6 oz	0.013-0.025	80-160		45	12
	carbaryl Sevin XLR or 4F	1.0-1.5 qt	1.0-1.5	2.7-4.0		21	12
	esfenvalerate (R) Asana XL 0.66 EC (See Generic Insecticides)	5.8-9.6 oz	0.03-0.05	13-22		21	12
	gamma-cyhalothrin (R) Proaxis 0.5 CS Declare 1.25 CS	1.92-3.2 oz 0.77-1.28 oz	0.0075-0.0125	40-66.7 100-167		45	24
	lambda-cyhalothrin (R) Warrior II 2.08 CS (See Generic Insecticides)	0.96-1.6 oz	0.015-0.025	80-133		30	24
	indoxacarb Steward 1.25 SC	5.6-11.3 oz	0.055-0.11	11.5-22.8		21	12
	zeta-cypermethrin (R) Mustang Maxx 0.8 EC (See Generic Insecticides)	1.28-4.0 oz	0.008-0.025	32-100		21	12
Kudzu Bug Treat when 4 nymphs per row foot or 25 nymphs per 25 sweeps are found.	acephate (R) Orthene/Acephate 97 S	0.75-1.0 lb	0.73-0.97		DO NOT apply more than 0.4 lb ai of Hero per season. DO NOT apply again for 30 days.	14	24
	bifenthrin (R) Brigade 2 EC (See Generic Insecticides)	6.4 oz	0.1	20		18	12
	lambda-cyhalothrin (R) Warrior II 2.08 CS (See Generic Insecticides)	1.92 oz	0.03	67		30	24
	gamma-cyhalothrin (R) Proaxis 0.5 CS Declare 1.25 CS	3.2-3.84 oz 1.28-1.54 oz	0.0125-0.015	40-66.7 83-100		45	24
	zeta-cypermethrin (R) Mustang Maxx 0.8 EC (See Generic Insecticides)	4.0 oz	0.025	32		21	12
	zeta-cypermethrin + bifenthrin (R) Hero 1.24 EC	6.4-10.3 oz	0.062-0.1	12.4-20		21	12

SOYBEAN INSECT CONTROL

Insect	Insecticide	Formulation/Acre	Lb ai/Acre	Acres/Gallon	Application/Comments	Minimum Days From Last Application to Harvest	Restricted Entry Interval (REI) Hours
Threecornered Alfalfa Hopper Economic damage is unlikely when plants are greater than 10" tall. Damage usually occurs when plants are less than 10" tall. Apply when 50% of the plants are girdled or if fewer than 4-6 ungirdled plants per row foot remain in conventional rows, 30" to 38" and hopper nymphs are still present.	beta-cyfluthrin (R) Baythroid XL 1 EC	1.6-2.8 oz	0.012-0.022	45-80		21	12
	clothianidin Belay 2.13 EC	3-6 oz	0.05-0.1	21.3-42.7		21	12
	cyfluthrin (R) Tombstone 2 EC (See Generic Insecticides)	1.6-2.8 oz	0.025-0.044	46-80		45	12
	esfenvalerate (R) Asana XL 0.66 EC (See Generic Insecticides)	5.8-9.6 oz	0.03-0.05	13-22		21	12
	gamma-cyhalothrin (R) Proaxis 0.5 CS Declare 1.25 CS	1.92-3.2 oz 0.77-1.28 oz	0.0075-0.0125	40-66.7 100-167		45	24
	lambda-cyhalothrin (R) Warrior II 2.08 CS (See Generic Insecticides)	0.96-1.6 oz	0.015-0.025	80-133		30	24
	imidacloprid Gaucha 600 Senator 600 Axxess 5 FS	1.6 oz/100 lb seed 1.6 oz/100 lb seed 1.6 oz/100 lb seed			Seed treatment. DO NOT graze or feed livestock on forage or hay.	12	12
	thiamethoxam Cruiser 5 FS Warden CX	1.28 oz/100 lb seed 3.38 oz/100 lb seed			Seed treatment.		12
	zeta-cypermethrin (R) Mustang Maxx 0.8 EC (See Generic Insecticides)	2.8-4.0 oz	0.0175-0.025	32-45.7		21	12
	zeta-cypermethrin + bifenthrin (R) Hero 1.24 EC	4.0-10.3 oz	0.04-0.1	12.4-32	DO NOT apply more than 0.4 lb ai of Hero per season. DO NOT apply again for 30 days.	21	12
	beta-cyfluthrin (R) Baythroid XL 1 EC	1.0-1.8 oz	0.008-0.014	71-128		21	12
	bifenthrin (R) Brigade 2 EC (See Generic Insecticides)	2.1-6.4 oz	0.033-0.1	20-61	DO NOT apply more than 0.3 lb ai of Brigade per season. DO NOT apply again for 30 days.	18	12
Blister Beetle Before bloom, treat when 40% defoliation occurs. After bloom, treat when 25% defoliation occurs.	carbaryl Sevin XLR or 4F	2 qt	2	2		21	12
	cyfluthrin (R) Tombstone 2 EC (See Generic Insecticides)	1.6-2.8 oz	0.025-0.044	45.7-80		45	12

SOYBEAN INSECT CONTROL

Insect	Insecticide	Formulation/ Acre	Lb ai/Acre	Acres/Gallon	Application/Comments	Minimum Days From Last Application to Harvest	Restricted Entry Interval (REI) Hours
Blister Beetle (cont.) Before bloom, treat when 40% defoliation occurs. After bloom, treat when 25% defoliation occurs.	gamma-cyhalothrin (R)		0.0075-0.0125				
	Proaxis 0.5 CS	1.92-3.2 oz		40-66.7		45	24
	Declare 1.25 CS	0.77-1.28 oz		100-167		45	24
	lambda-cyhalothrin (R)		0.015-0.025				
	Warrior II 2.08 CS (See Generic Insecticides)	0.96-1.6 oz 2.1-6.4 oz		80-133	DO NOT graze or feed hay to livestock. DO NOT exceed 20 fl oz per acre per season.	30	24
	zeta-cypermethrin (R)		0.008-0.025				
	Mustang Maxx 0.8 EC (See Generic Insecticides)	1.28-4.0 oz		32-100		21	12
	zeta-cypermethrin + bifenthrin (R)		0.04-0.1		DO NOT apply more than 0.4 lb ai of Hero per season. DO NOT apply again for 30 days.	21	12
	Hero 1.24 EC	4.0-10.3 oz		12.4-32			
Defoliating Caterpillars (Garden Webworm, Green Cloverworm, Saltmarsh Caterpillar, Cabbage Looper, Velvetbean Caterpillar, Silver-Spotted Skipper)	acephate (R)		0.75-1.0		Acephate is not labeled for garden webworm, saltmarsh caterpillar or silver-spotted skipper. DO NOT apply more than 1.5 lb ai acephate per season.	14	24
	Orthene/Acephate 90 S	0.83-1.1 lb					
	Orthene/Acephate 97 S	0.75-1.0 lb					
	Bacillus thuringiensis	Check label.					4
	beta-cyfluthrin (R)		0.014-0.019		Rate can be dropped to 0.8 oz for green cloverworm.		
	Baythroid XL 1 EC	1.8-2.4 oz		53.3-71		21	12
	bifenthrin (R)		0.033-0.1		DO NOT apply more than 0.3 lb ai of Brigade per season. DO NOT apply again for 30 days.		
	Brigade 2 EC (See Generic Insecticides)	2.1-6.4 oz		20-61		18	12
	bifenthrin + chlorantraniliprole (R)		0.098-0.167			18	12
	Elevest 2.22 SC	5.6-9.6 oz		13.3-23			
	carbaryl		1.0-1.5				
	Sevin XLR or 4F	2-3 pt		2.7-4		21	12
	chlorantraniliprole				Vantacor and Shenzi are is not labeled for silver-spotted skipper.		
	Vantacor 5 SC	1.2-2.5 oz	0.047-0.098	51-106.7		1	4
	Shenzi 400 SC	1.7-3.8 oz		33.7-75.3			
	cyfluthrin (R)		0.025-0.044				
	Tombstone 2 EC (See Generic Insecticides)	1.6-2.8 oz		45.7-80		45	12
	emamectin benzoate		0.0078-0.0156				
	Denim 0.16EC	8-12 oz		16-10.7		28	48

SOYBEAN INSECT CONTROL

Insect	Insecticide	Formulation/ Acre	Lb ai/Acre	Acres/ Gallon	Application/Comments	Minimum Days From Last Application to Harvest	Restricted Entry Interval (REI) Hours
Defoliating Caterpillars (cont.)	esfenvalerate (R) Asana XL 0.66 EC (See Generic Insecticides)	2.9-5.8 oz	0.015-0.03	22-44	For cabbage looper, raise rate to 5.8-9.6 oz Asana XL is not labeled for garden webworm or silver-spotted skipper.	21	12
	gamma-cyhalothrin (R) Proaxis 0.5 CS Declare 1.25 CS	1.92-3.2 oz 0.77-1.28 oz	0.0075-0.0125	40-66.7 100-167	Higher rate of 1.28-1.54 oz/acre required for garden webworm and silver-spotted skipper.	45	24
	indoxacarb Steward 1.25 SC	5.6-11.3 oz	0.055-0.11	11.5-22.8	Rate for green cloverworm, saltmarsh caterpillar and cabbage looper can be lowered to 4.6 oz Will provide suppression of velvetbean caterpillar. Steward is not labeled for silver-spotted skipper.	21	12
	lambda-cyhalothrin (R) Warrior II 2.08 CS (See Generic Insecticides)	1.28-1.92 oz	0.02-0.03	66.6-100	For garden webworm and silver-spotted skipper, raise rate to 1.6-1.92 oz/acre.	30	24
	lambda-cyhalothrin + chlorantraniliprole (R) Besiege 1.25	6-10 oz	0.06-0.1	13-21	DO NOT graze or feed hay to livestock. DO NOT exceed 20 fl oz per acre per season. Use 8-10 oz for silver-spotted skippers.	30	24
	methomyl (R) Lannate 2.4 LV	0.75-3 pt	0.22-0.9	5.3-10.6	Lannate is not labeled for garden webworm.	14	48
	methoxyfenozide Intrepid 2 F (See Generic Insecticides)	4-8 oz	0.0625-0.125	16-32	Intrepid is not labeled for silver-spotted skipper.	14	12
	methoxyfenozide + spinetoram Intrepid Edge 3F	4-6.4	0.0975-0.187	20-32	DO NOT make more than 4 applications per year.	28	4
	permethrin (R) Ambush 2.0 E Pounce 25 W	3.2-12.8 oz 3.2-12.8 oz	0.05-0.2	20-40	Use higher rates for garden webworm. Not labeled for silver-spotted skipper.	60	12
	spinosad Blackhawk	1.1-2.2 oz	0.025-0.05		Blackhawk is not labeled for garden webworm or silver-spotted skipper. Raise rate to 1.7-2.2 oz for saltmarsh caterpillar. DO NOT apply more than 8.3 oz of Blackhawk per year. DO NOT feed treated forage to meat or dairy animals.	28	4
	zeta-cypermethrin (R) Mustang Maxx 0.8 EC (See Generic Insecticides)	2.8-4.0 oz	0.0175-0.025	32-45.7	For saltmarsh caterpillar and silver-spotted skipper, the rate can be lowered to 1.28 oz Raise rate to 3.2-4 oz for cabbage loopers.	21	12
	zeta-cypermethrin + bifenthrin (R) Hero 1.24 EC	4.0-10.3 oz	0.04-0.1	12.4-32	DO NOT apply more than 0.4 lb ai of Hero per season. DO NOT apply again for 30 days. For green cloverworm and silver-spotted skipper, rate can be dropped to 2.6-6.1 oz.	21	12

SOYBEAN INSECT CONTROL

Insect	Insecticide	Formulation/Acre	Lb ai/Acre	Acres/Gallon	Application/Comments	Minimum Days From Last Application to Harvest	Restricted Entry Interval (REI) Hours
Grasshopper Before bloom, treat when 40% defoliation occurs. After bloom, treat when 25% defoliation occurs.	beta-cyfluthrin (R) Baythroid XL 1 EC	2.0-2.8 oz	0.016-0.022	45-64		21	12
	bifenthrin (R) Brigade 2 EC (See Generic Insecticides)	2.1-6.4 oz	0.033-0.1	20-61	DO NOT apply more than 0.3 lb ai of Brigade per season. DO NOT apply again for 30 days.	18	12
	bifenthrin + chlorantraniliprole (R) Elevest 2.22 SC	4.8-9.6 oz	0.084-0.167	13.3-26		18	12
	chlorantraniliprole Vantacor 5 SC Shenzi 400 SC	0.7-1.7 oz 1-2.5 oz	0.027-0.067	183-75 128-51.2	Make no more than 4 applications per year. For best results, add MSO at 1% v/v.	1	4
	cyfluthrin (R) Tombstone 2 EC (See Generic Insecticides)	2.0-2.8 oz	0.031-0.044	68-80		45	12
	diflubenzuron (R) Dimilin 2L (See Generic Insecticides)	2 oz	0.031	64	Apply Dimilin when majority of grasshoppers have reached the 2nd to 3rd nymphal stage. Dimilin is not effective against adults.	21	
	dimethoate Dimethoate 4 E	1 pt	0.5	8		21	48
	esfenvalerate (R) Asana XL 0.66 EC (See Generic Insecticides)	5.8-9.6 oz	0.03-0.05	13-22		21	12
	gamma-cyhalothrin (R) Proaxis 0.5 CS Declare 1.25 CS	3.2-3.84 oz 1.28-1.54 oz	0.0125-0.015	40-66.7 83-100		45 45	24 24
	lambda-cyhalothrin (R) Warrior II 2.08 CS (See Generic Insecticides)	1.6-1.92 oz	0.025-0.03	67-80		30	24
	lambda-cyhalothrin + chlorantraniliprole (R) Besiege 1.252	8.0-10.0 oz	0.08-0.098	12.8-16	DO NOT graze or feed hay to livestock. DO NOT exceed 20 fl oz per acre per season.	30	24
	zeta-cypermethrin (R) Mustang Maxx 0.8 EC (See Generic Insecticides)	3.2-4.0 oz	0.02-0.025	32-40		21	12
	zeta-cypermethrin + bifenthrin (R) Hero 1.24 EC	2.6-6.1 oz	0.025-0.06	21-49.2	DO NOT apply more than 0.4 lb ai of Hero per season. DO NOT apply again for 30 days.	21	12

SOYBEAN INSECT CONTROL

Insect	Insecticide	Formulation/Acre	Lb ai/Acre	Acres/Gallon	Application/Comments	Minimum Days From Last Application to Harvest	Restricted Entry Interval (REI) Hours
Soybean Looper Before bloom, treat for 40% defoliation and loopers present. After bloom, treat for 25% defoliation plus 6-8 worms per row foot. Terminate treatment when soybeans reach R6.5 growth stage.	<i>Bacillus thuringiensis</i>	Check label.			<i>Bacillus thuringiensis</i> works effectively against insecticide-resistant or susceptible populations of soybean loopers and requires 3-4 days to kill larvae.		4
	bifenthrin + chlorantraniliprole (R) Elevest 2.22 SC	5.6-9.6 oz	0.098-0.167	13.3-23		18	12
	chlorantraniliprole Vantacor 5 SC Shenzi 400 SC	1.25-2.5 oz 1.7-3.8 oz	0.047-0.067	107-51 75.3-33.7	Make no more than 4 applications per year. For best results, add MSO at 1% v/v. In recent years, chlorantraniliprole has shown reduced efficacy and may result in poor control.	1	4
	emamectin benzoate Denim 0.16 EC	8-12 oz	0.0078-0.0156	16-10.7		28	48
	indoxacarb Steward 1.25 SC	5.6-11.3 oz	0.055-0.11	11.3-22.8		21	12
	lambda-cyhalothrin + chlorantraniliprole (R) Besiege 1.252	10.0 oz	0.098	12.8	DO NOT graze or feed hay to livestock. DO NOT exceed 20 fl oz per acre per season.	30	24
	methomyl (R) Lannate 2.4 LV	1.5-3 pt	0.45-0.9	2.7-5.3		14	48
	methoxyfenozide Intrepid 2 F (See Generic Insecticides)	4-8 oz	0.0625-0.125	16-32	In recent years, methoxyfenozide has shown reduced efficacy and may result in poor control.	14	12
	methoxyfenozide + spinetoram Intrepid Edge 3F	4-6.4 oz	0.094-0.15	20-32	DO NOT make more than 4 applications per year.	28	4
	spinosad Blackhawk	1.1-2.2 oz	0.025-0.05		DO NOT apply more than 8.3 oz of Blackhawk per year. DO NOT feed forage to meat or dairy animals.	28	4
Spider Mites	abamectin Agri-Mek 0.7 S (See Generic Insecticides)	1.75-3.5 oz	0.01-0.019	36.6-73		28	12
	bifenthrin (R) Brigade 2 EC (See Generic Insecticides)	5.12-6.4 oz	0.08-0.1	20-25	DO NOT apply more than 0.3 lb ai of Brigade per season. DO NOT apply again for 30 days.	18	12
	dimethoate Dimethoate 4 E	1 pt	0.5	8		21	48
Bean Leaf Beetle Before bloom, treat when 40% defoliation occurs. After bloom, treat when 25% defoliation occurs and beetles are present. Terminate treatment when soybeans reach R6.5 growth stage. Tank mixing different chemistries has been shown to increase control.	acephate (R) Orthene/Acephate 90 S Orthene/Acephate 97 S	0.83-1.1 lb 0.75-1.0 lb	0.75-1.0		DO NOT apply more than 1.5 lb ai of acephate per season.	14	24
	beta-cyfluthrin (R) Baythroid XL 1 EC	1.6-2.8 oz	0.013-0.022	45.7-80		21	12
	beta-cyfluthrin + imidacloprid (R) Leverage 360	2.8 oz	0.066	45.7		21	12
	bifenthrin (R) Brigade 2 EC (See Generic Insecticides)	2.1-6.4 oz	0.033-0.1	20-61	DO NOT apply more than 0.3 lb ai of Brigade per season. DO NOT apply again for 30 days.	18	12

SOYBEAN INSECT CONTROL

Insect	Insecticide	Formulation/Acre	Lb ai/Acre	Acres/Gallon	Application/Comments	Minimum Days From Last Application to Harvest	Restricted Entry Interval (REI) Hours
Bean Leaf Beetle (cont.)	carbaryl		0.5				
	Sevin XLR or 4F	1 pt		8		21	12
	clothianidin		0.05-0.11				
	Belay 2.13	3-6 oz		21.3-42.7	DO NOT apply Belay within 45 days after planting seed treated with neonicotinoid seed treatments (imidacloprid, thiamethoxam). DO NOT apply at intervals less than 7 days apart. DO NOT graze or feed forage to livestock.	21	12
	cyfluthrin (R)		0.025-0.044				
	Tombstone 2 EC (See Generic Insecticides)	1.6-2.8 oz		45.7-80		45	12
	dimethoate		0.5				
	Dimethoate 4 E	1 pt		8		21	48
	esfenvalerate (R)		0.03-0.05				
	Asana XL 0.66 EC (See Generic Insecticides)	5.8-9.6 oz		13-22		21	12
	gamma-cyhalothrin (R)		0.0075-0.0125				
	Proaxis 0.5 CS	1.92-3.2 oz		40-66.7		45	24
	Declare 1.25 CS	0.77-1.28 oz		100-167			
	lambda-cyhalothrin (R)		0.015-0.025				
	Warrior II 2.08 CS (See Generic Insecticides)	0.96-1.6 oz		80-133		30	24
	imidacloprid				Gaucho and Cruiser will suppress early-season bean leaf beetles.		12
Armyworm Complex (Yellowstriped, Fall and Beet Armyworm) Before bloom, treat when 40% defoliation occurs and an active population.	Gaucho 600	1.6 oz/100 lb seed					
	Axcess 5 FS	1.6 oz/100 lb seed					
	Senator 600	1.6 oz/100 lb seed					
	thiamethoxam						
	Cruiser 5 FS	1.28 oz/100 lb seed					12
	Warden CX	3.38 oz/100 lb seed					
	methomyl (R)		0.3-0.45				
	Lannate 2.4 LV	1-1.5 pt		5.3-8		14	48
	zeta-cypermethrin (R)		0.0175-0.025				
	Mustang Maxx 0.8 EC (See Generic Insecticides)	2.8-4.0 oz		32-45.7		21	12
	zeta-cypermethrin + bifenthrin (R)		0.04-0.1		DO NOT apply more than 0.4 lb ai of Hero per season. DO NOT apply again for 30 days.		
	Hero 1.24 EC	4.0-10.3 oz		12.4-32		21	12
	PYRETHROIDS (Baythroid, Brigade, Tombstone, Proaxis, Declare, Warrior, Mustang Maxx, Hero) are not effective against beet armyworm. DO NOT USE.						
	beta-cyfluthrin (R)		0.013-0.022				
	Baythroid XL 1 EC	1.6-2.8 oz		45.7-80		21	12
	bifenthrin (R)		0.033-0.1				
	Brigade 2 EC (See Generic Insecticides)	2.1-6.4 oz		20-61		18	12
	bifenthrin + chlorantraniliprole (R)		0.098-0.167				
	Elevest 2.22 S	5.6-9.6 oz		22.8-13.3		18	12
	chlorantraniliprole		0.047-0.067				
	Vantacor 5 SC	1.2-2.5 oz		107-51		1	4
	Shenzi 400 SC	1.7-3.8 oz		75.3-33.7			

SOYBEAN INSECT CONTROL

Insect	Insecticide	Formulation/ Acre	Lb ai/Acre	Acres/ Gallon	Application/Comments	Minimum Days From Last Application to Harvest	Restricted Entry Interval (REI) Hours
Armyworm Complex (Yellowstriped, Fall and Beet Armyworm) (cont.)	cyfluthrin (R) Tombstone 2 EC (See Generic Insecticides)	1.6-2.8 oz	0.025-0.044	45.7-80		45	12
	emamectin benzoate (R) Denim 0.16 EC	8-12 oz	0.0078-0.0156	16-10.7	For beet armyworm lower rate range to 6-8 oz.	28	48
	gamma-cyhalothrin (R) Proaxis 0.5 CS Declare 1.25 CS	3.2-3.84 oz 1.28-1.54 oz	0.0125-0.015	40-33.3 83-100		45	24
	lambda-cyhalothrin (R) Warrior II 2.08 CS (See Generic Insecticides)	1.6-1.92 oz	0.025-0.03	69-83		30	24
	lambda-cyhalothrin + chlorantraniliprole (R) Besiege 1.252	8.0-10.0 oz	0.08-0.098	12.8-16	DO NOT graze or feed hay to livestock. DO NOT exceed 20 fl oz per acre per season.	30	24
	indoxacarb Steward 1.25 SC	4.6-11.3 oz	0.045-0.11	11.3-27.8		21	12
	methomyl (R) Lannate 2.4 LV	1-1.5 pt	0.3-0.45	5.3-8		14	48
	methoxyfenozide Intrepid 2 F (See Generic Insecticides)	4-8 oz	0.0625-0.125	16-32		14	12
	methoxyfenozide + spinetoram Intrepid Edge 3F	4-6.4	0.094-0.15	20-32	DO NOT make more than 4 applications per year.	28	4
	spinosad Blackhawk	1.67-3.3 oz	0.038-0.075		DO NOT apply more than 8.3 oz of Blackhawk per year. DO NOT feed treated forage to meat or dairy animals.	28	4
	zeta-cypermethrin (R) Mustang Maxx 0.8 EC (See Generic Insecticides)	3.2-4.0 oz	0.02-0.025	32-40		21	12
	zeta-cypermethrin + bifenthrin (R) Hero 1.24 EC	4.0-10.3 oz	0.04-0.1	12.4-32	DO NOT apply more than 0.4 lb ai of Hero per season. DO NOT apply again for 30 days.	21	12
Fire Ant (Red Imported, Black Imported and hybrid)	Fire ant colonies are often concentrated near field edges and fire ant foraging distance tends to be greater in soybean fields than other sites such as pastures and turf. Trials using outside perimeter and turnrow fire ant bait applications have demonstrated significant reduction in fire ant abundance within soybean fields.						
	Fire ant foraging is reduced when soil temperature is below 60 °F. To confirm fire ants are actively foraging place small pieces of hot dogs in areas you plan on treating. If after 30 minutes the hot dog pieces are covered by fire ants, fire ants are foraging and will pick up the fire ant bait.						
	Accurate fire ant bait applications using ground equipment are best achieved using a Herd® GT-77 fire ant bait applicator attached to an ATV.						
	Extinguish Plus Fire Ant Bait (0.365% hydramethylnon and 0.25% (S)-methoprene)	1.5 lbs	0.005 h 0.004 (S)	0.75	Outside perimeter and turnrows ONLY. Do not apply Extinguish Plus within the field. Do not apply if rain is anticipated within 6 hours.	N/A	12
	Extinguish Professional Fire ant Bait (0.5% (S)-methoprene)	1-1.5 lbs	0.005- 0.0075	0.75-1.0	Within field and outside perimeter and turnrow application. Do not apply if rain is anticipated within 6 hours. Do not irrigate treated fields for 24 hours after application.	0	4
	Esteem Ant Bait (0.50% pyriproxyfen)	1.5-2.0 lbs	0.0075-0.01	0.5-0.75	Within field applications and outside perimeter and turnrow application. Do not apply if rain is anticipated within 2-4 hours. Do not irrigate treated fields for 24 hours after application.	24	12

SOYBEAN INSECT CONTROL

Insect	Insecticide	Formulation/Acre	Lb ai/Acre	Acres/ Gallon	Application/Comments	Minimum Days From Last Application to Harvest	Restricted Entry Interval (REI) Hours
Corn Earworm and Tobacco Budworm Before bloom, treat when 40% defoliation occurs. After bloom, use threshold table.	<u>Synthetic Pyrethroids</u>	In recent years, pyrethroids have shown reduced efficacy and can be expected to provide poor to moderate control. Consider tank-mixing another chemistry when using a pyrethroid.					
	beta-cyfluthrin (R) Baythroid XL 1 EC	1.6-2.8 oz	0.013-0.022	45.7-80	DO NOT use synthetic pyrethroids on populations of tobacco budworm. Tobacco budworm is resistant to this chemistry.	21	12
	bifenthrin (R) Brigade 2 EC (See Generic Insecticides)	2.1-6.4 oz	0.033-0.1	20-61	DO NOT apply more than 0.3 lb ai of Brigade per season. DO NOT apply again for 30 days.	18	12
	cyfluthrin (R) Tombstone 2 EC (See Generic Insecticides)	1.6-2.8 oz	0.025-0.044	45.7-80		45	12
	gamma-cyhalothrin (R) Proaxis 0.5 CS Declare 1.25 CS	1.92-3.2 oz 0.77-1.28 oz	0.0075-0.0125	40-66.7 100-166		45	24
	lambda-cyhalothrin (R) Warrior II 2.08 CS (See Generic Insecticides)	1.28-1.92 oz	0.02-0.03	67-100		30	24
	esfenvalerate (R) Asana XL 0.66 EC (See Generic Insecticides)	5.8-9.6 oz	0.03-0.05	13-22		21	12
	permethrin (R) Ambush 2.0 E Pounce 25 W	6.4-12.8 oz 6.4-12.8 oz	0.1-0.2	10-20	Permethrin: DO NOT graze treated areas or harvest for forage or hay. DO NOT make more than 2 applications per season.	60	12
	zeta-cypermethrin (R) Mustang Maxx 0.8 EC (See Generic Insecticides)	2.8-4.0 oz	0.0175-0.025	32-45.7		21	12
	zeta-cypermethrin + bifenthrin (R) Hero 1.24 EC	4.0-10.3 oz	0.04-0.1	12.4-32	DO NOT apply more than 0.4 lb ai of Hero per season. DO NOT apply again for 30 days.	21	12
	<u>Carbamates</u> carbaryl Sevin XLR or 4F	1-3 pt	0.5-1.5	2.7-8		21	12
	methomyl (R) Lannate 2.4 LV	0.75-1.5 pt	0.225-0.45	5.3-10.7		14	48
	<u>Other Chemistry</u> nucleopolyhedrovirus Heligen	1-1.6 oz		80-128	Apply before reaching economic threshold targeting small larvae. Applications to large larvae often result in poor control. Larvae stop feeding within 1-3 days and die within 3-9 days. Refer to publication AG1306 for more information.	0	4
	bifenthrin + chlorantraniliprole (R) Elevest 2.22 SC	5.6-9.6 oz	0.098-0.167	13.3-23		18	12
	chlorantraniliprole Vantacor 5 SC Shenzi 400 SC	1.2-2.5 oz 1.7-3.8 oz	0.047-0.067	107-51 75.3-33.7	Make no more than 4 applications per year.	1	4
	GS-omega/kappa-Htx-Hv1a Spear-LEP 0.17	1-2 pts	0.021-0.042	8-4	Apply in a minimum of 20 gpa by ground or 5 gpa by air.	0	4

SOYBEAN INSECT CONTROL

Insect	Insecticide	Formulation/Acre	Lb ai/Acre	Acres/Gallon	Application/Comments	Minimum Days From Last Application to Harvest	Restricted Entry Interval (REI) Hours
Corn Earworm and Tobacco Budworm (cont.)	Other Chemistry						
	emamectin benzoate Denim 0.16 EC	8-12 oz	0.0078-0.0156	16-10.7		28	48
	indoxacarb Steward 1.25 SC	5.6-11.3 oz	0.055-0.11	11.5-22.8		21	12
	lambda-cyhalothrin + chlorantraniliprole (R) Besiege 1.252	8.0-10.0 oz	0.08-0.098	12.8-16	DO NOT graze or feed hay to livestock. DO NOT exceed 20 fl oz per acre per season.	30	24
	methoxyfenozide + spinetoram Intrepid Edge 3F	4-6.4	0.094-0.15	20-32	DO NOT make more than 4 applications per year.	28	4
	spinosad Blackhawk	1.67-2.2 oz	0.038-0.05		DO NOT apply more than 8.3 oz of Blackhawk per year. DO NOT feed treated forage to meat or dairy animals.	28	4
ROOT FEEDER Grape Colaspis	chlothianidin Intego Suite	3.37 oz/100 lb seed					
	imidacloprid Gaucho 600	1.6 oz/100 lb seed			A seed treatment can be beneficial in areas where grape colaspis has historically been a problem.		
	Axxess 5 FS	1.6 oz/100 lb seed					12
	Senator 600	1.6 oz/100 lb seed					
	thiamethoxam Cruiser 5 FS Warden CX	1.28 oz/100 lb seed 3.2 oz/100 lb seed					12
Green Stink Bug, Southern Green Stink Bug, Red Shouldered Stink Bug Treat when an average of 1 stink bug per row foot is found using a shake sheet or 9 stink bugs per 25 sweeps up to R6 growth stage. Double threshold (18 per 25 sweeps) from R6 to R6.5 growth stage and terminate sprays after R6.5, keeping application-to-harvest interval restrictions in mind.	acephate (R) Orthene/Acephate 90 S Orthene/Acephate 97 S	0.56-1.1 lb 0.50-1.0 lb	0.5-1.0		DO NOT apply more than 1.5 lb ai acephate per season.	14	24
	beta-cyfluthrin (R) Baythroid XL 1 EC	1.5-2.8 oz	0.013-0.022	45.7-80		21	12
	beta-cyfluthrin + imidacloprid (R) Leverage 360	2.8 oz	0.066	45.7		21	12
	bifenthrin (R) Brigade 2 EC (See Generic Insecticides)	2.1-6.4 oz	0.033-0.1	20-61	DO NOT apply more than 0.3 lb ai of Brigade per season. DO NOT apply again for 30 days.	18	12
	bifenthrin + chlorantraniliprole (R) Elevest 2.22 SC	5.6-9.6 oz	0.098-0.167	13.3-23		18	12
	clothianidin Belay 2.13	3-6 oz	0.05-0.1	21.3-42.7	DO NOT apply Belay treatments less than 7 days apart. DO NOT apply more than 12 oz per acre.	21	12
	cyfluthrin (R) Tombstone 2 EC (See Generic Insecticides)	1.6-2.8 oz	0.025-0.044	45.7-80		45	12
	esfenvalerate (R) Asana XL 0.66 EC (See Generic Insecticides)	5.8-9.6 oz	0.03-0.05	13-22		21	12

SOYBEAN INSECT CONTROL

Insect	Insecticide	Formulation/Acre	Lb ai/Acre	Acres/Gallon	Application/Comments	Minimum Days From Last Application to Harvest	Restricted Entry Interval (REI) Hours
Green Stink Bug, Southern Green Stink Bug, Red Shouldered Stink Bug (cont.) Treat when an average of 1 stink bug per row foot is found using a shake sheet or 9 stink bugs per 25 sweeps up to R6 growth stage. Double threshold (18 per 25 sweeps) from R6 to R6.5 growth stage and terminate sprays after R6.5, keeping application-to-harvest interval restrictions in mind.	gamma-cyhalothrin (R) Proaxis 0.5 CS	3.2-3.84 oz	0.0125-0.015	40-66.7		45	24
	Declare 1.25 CS	1.28-1.54 oz		83-100			
	lambda-cyhalothrin (R) Warrior II 2.08 CS	1.6-1.92 oz	0.025-0.03	67-80		30	24
	(See Generic Insecticides)						
	lambda-cyhalothrin + chlorantraniliprole (R) Besiege 1.252	8.0-10.0 oz	0.08-0.098	12.8-16	DO NOT graze or feed hay to livestock. DO NOT exceed 20 fl oz per acre per season.	30	24
	lambda-cyhalothrin + thiamethoxam (R) Endigo ZCX 2.706	4.0-4.5 oz	0.08-0.09	28.4-32		30	24
	zeta-cypermethrin (R) Mustang Maxx 0.8 EC	3.2-4.0 oz	0.02-0.025	32-40		21	12
Brown Stink Bug Treat when an average of 1 stink bug per row foot is found using a shake sheet or 9 stink bugs per 25 sweeps up to R6 growth stage. Double threshold (18 per 25 sweeps) from R6 to R6.5 growth stage and terminate sprays after R6.5, keeping application-to-harvest interval restrictions in mind.	(See Generic Insecticides)						
	zeta-cypermethrin + bifenthrin + imidacloprid (R) Triple Crown 2.25	4.8 oz	0.084	33	DO NOT apply again for 30 days.	21	12
	zeta-cypermethrin + bifenthrin (R) Hero 1.24 EC	4.0-10.3 oz	0.04-0.1	12.4-32	DO NOT apply more than 0.4 lb ai of Hero per season. DO NOT apply again for 30 days.	21	12
	acephate (R) Orthene/Acephate 90 S	0.56-1.1 lb	0.5-1.0		DO NOT apply more than 1.5 lb ai acephate per season.	14	24
	Orthene/Acephate 97 S	0.5-1.0 lb					
	bifenthrin (R) Brigade 2 EC	2.1-6.4 oz	0.033-0.1	20-61	DO NOT apply more than 0.3 lb ai of Brigade per season. DO NOT apply again for 30 days.	18	12
	(See Generic Insecticides)						
Redbanded Stink Bug Treat when an average of 4 stink bugs per 25 sweeps up to R6.5 growth stage.	clothianidin Belay 2.13	4-6 oz	0.05-0.1	21.3-42.7	DO NOT apply Belay treatments less than 7 days apart. DO NOT apply more than 12 oz per acre.	21	12
	lambda-cyhalothrin + thiamethoxam (R) Endigo ZCX 2.7	4.0-4.5 oz	0.08-0.09	28.4-32		30	24
	zeta-cypermethrin + bifenthrin + imidacloprid (R) Triple Crown 2.25	4.8 oz	0.084	33	DO NOT apply again for 30 days.	21	12
	acephate (R) Orthene/Acephate 90 S	1.1 lb	1.0		DO NOT apply more than 1.5 lb ai acephate per season. DO NOT tank mix acephate with sodium chlorate. Tank mixing with sodium chlorate may result in explosion of fire.	14	24
	Orthene/Acephate 97 S	1.0 lb					
	bifenthrin (R) Brigade 2 EC	6.4 oz	0.1	20	DO NOT apply more than 0.3 lb ai of Brigade per season. DO NOT apply again for 30 days.	18	12
	(See Generic Insecticides)						
	clothianidin Belay 2.13	4-6 oz	0.07-0.1	21.3-32	DO NOT apply Belay treatments less than 7 days apart. DO NOT apply more than 12 oz per acre.	21	12

SOYBEAN INSECT CONTROL

Insect	Insecticide	Formulation/ Acre	Lb ai/ Acre	Acres/ Gallon	Application/Comments	Minimum Days From Last Application to Harvest	Restricted Entry Interval (REI) Hours
Redbanded Stink Bug (cont.) Treat when an average of 10 bugs per 25 sweeps from R6.5 to R7. Terminate insecticide applications at R7 if weather conditions are favorable.	lambda-cyhalothrin + thiamethoxam (R) Endigo ZCX 2.7	4.0-4.5 oz	0.08-0.09	28.4-32		30	24
	beta-cyfluthrin + imidacloprid (R) Leverage 360	2.8 oz	0.066	28.32		21	12
	Tank Mix Options With Bifenthrin						
	acephate (R) Orthene 97S	0.5 lb	0.5		Tank mix Orthene, Belay or Imidacloprid with 5.12 fl oz of bifenthrin (Brigade 2EC or generic) per acre. Tank mixes have proven to give superior control.	18	24
	clothianidin Belay 2.13	3 oz	0.05	42.7		21	12
	imidacloprid Imidacloprid 4F Imidacloprid 2F (See Generic Insecticides)	1.5 oz 3 oz	0.047	85.3 42.7		21	12
Multiple Pests For control of multiple pests exceeding thresholds.	acephate + bifenthrin (R) Acenthrin 80 S	8-21 oz	0.4-1.05		Bollworm, Cutworm, Grasshopper, Bean Leaf Beetle, Stink Bugs, Cabbage Looper, Green Cloverworm, Velvetbean Caterpillar, Kudzu Bug, Spider Mites, Garden Webworm	14	24
	acetamiprid + bifenthrin (R) Justice 1.8 EC	2.5-5.0 oz	0.035-0.07	25.6-51.2	Bollworm, Cutworm, Grasshopper, Bean Leaf Beetle, Stink Bugs, Cabbage Looper, Green Cloverworm, Velvetbean Caterpillar, Kudzu Bug, Spider Mites, Garden Webworm	30	12
	bifenthrin (R) + acetameprid Argyle 1.52 OD	5-9 oz	0.06-0.11	14-25.6	Bollworm, Cutworm, Grasshopper, Bean Leaf Beetle, Stink Bugs, Cabbage Looper, Green Cloverworm, Velvetbean Caterpillar, Kudzu Bug, Spider Mites, Garden Webworm	30	12
	bifenthrin + chlorantraniliprole Elevest 2.22 SC	4.8-9.6 oz	0.084- 0.167	26.7-13	Bollworm, Tobacco Budworm, Cutworm, Grasshopper, Bean Leaf Beetle, Stink Bugs, Loopers, Green Cloverworm, Velvetbean Caterpillar, Kudzu Bug, Garden Webworm, Saltmarsh Caterpillar	18	12
	gamma-cyhalothrin (R) + spinosad Consero 5.25 SC	2-4 oz	0.08-0.16	32-64	Bollworm, Tobacco Budworm, Cutworm, Grasshopper, Green Stink Bugs, Cabbage Looper, Green Cloverworm, Velvetbean Caterpillar, Garden Webworm	28	24
	imidacloprid + beta-cyfluthrin (R) Leverage 360 SC	2.8 oz	0.067	45.7	Bollworm, Cutworm, Grasshopper, Bean Leaf Beetle, Stink Bugs, Cabbage Looper, Green Cloverworm, Velvetbean Caterpillar, Kudzu Bug, Garden Webworm	21	12
	lambda-cyhalothrin (R) + chlorantraniliprole Besiege 1.25 SC	5-10 oz	0.49-0.98	12.8-25.6	Bollworm, Tobacco Budworm, Cutworm, Grasshopper, Bean Leaf Beetle, Green Stink Bugs, Loopers, Green Cloverworm, Velvetbean Caterpillar, Kudzu Bug, Garden Webworm, Saltmarsh Caterpillar	30	24
	lambda-cyhalothrin (R) + thiamethoxam Endigo ZCX 2.7	3.5-5 oz	0.07-0.1	25.6-36.6	Bollworm, Cutworm, Grasshopper, Bean Leaf Beetle, Stink Bugs, Cabbage Looper, Green Cloverworm, Velvetbean Caterpillar, Kudzu Bug, Garden Webworm	30	24
	zeta-cypermethrin + bifenthrin + imidacloprid (R) Triple Crown 2.25	3.5-4.8 oz	0.061- 0.084	33-36.6	Bollworm, Cutworm, Grasshopper, Bean Leaf Beetle, Stink Bugs, Cabbage Looper, Green Cloverworm, Velvetbean Caterpillar, Kudzu Bug, Spider Mites, Garden Webworm	21	12

EDAMAME INSECT CONTROL

Insect	Insecticide	Formulation/Acre	Lb ai/Acre	Acres/Gallon	Application/Comments	Minimum Days From Last Application to Harvest	Restricted Entry Interval (REI) Hours
Cutworm	bifenthrin (R) Brigade 2 EC (See Generic Insecticides)	2.1-6.4 oz	0.033-0.1	20-61	DO NOT apply more than 0.2 lb ai of Brigade per season. DO NOT apply again for 30 days.	3	12
	gamma-cyhalothrin (R) Proaxis 0.5 CS Declare 1.25 CS	1.92-3.2 oz 0.77-1.28 oz	0.0075-0.0125	40-66.7 100-167	DO NOT apply more than 0.06 lb ai per season.	7 succulent, 21 dried	24
	lambda-cyhalothrin (R) Warrior II 2.08 CS (See Generic Insecticides)	0.96-1.6 oz	0.015-0.025	80-133	DO NOT apply more than 0.06 lb ai per season.	7 succulent, 21 dried	24
	zeta-cypermethrin (R) Mustang Maxx 0.8 EC	1.28-4.0 oz	0.008-0.025	32-100	DO NOT apply more than 0.15 lb ai per season.	1 succulent, 21 dried	12
Kudzu Bug	bifenthrin (R) Brigade 2 EC (See Generic Insecticides)	6.4 oz	0.1	20	DO NOT apply more than 0.2 lb ai of Brigade per season. DO NOT apply again for 30 days.	3	12
	lambda-cyhalothrin (R) Warrior II 2.08 CS (See Generic Insecticides)	1.92 oz	0.03	67	DO NOT apply more than 0.06 lb ai per season.	7 succulent, 21 dried	24
	gamma-cyhalothrin (R) Proaxis 0.5 CS Declare 1.25 CS	3.2-3.84 oz 1.28-1.54 oz	0.0125-0.015	40-66.7 83-100	DO NOT apply more than 0.06 lb ai per season.	7 succulent, 21 dried	24
	zeta-cypermethrin (R) Mustang Maxx 0.8 EC	4.0 oz	0.025	32	DO NOT apply more than 0.15 lb ai per season.	1 succulent, 21 dried	12
	zeta-cypermethrin + bifenthrin (R) Hero 1.24 EC	4.0 -10.3 oz	0.04-0.1	12.4-32	DO NOT apply more than 0.266 lb ai of Hero per season. DO NOT apply again for 5 days.	3	12
Threecornered Alfalfa Hopper	gamma-cyhalothrin (R) Proaxis 0.5 CS Declare 1.25 CS	1.92-3.2 oz 0.77-1.28 oz	0.0075-0.0125	40-66.7 100-167	DO NOT apply more than 0.06 lb ai per season.	7 succulent, 21 dried	24
	lambda-cyhalothrin (R) Warrior II 2.08 CS (See Generic Insecticides)	0.96-1.6 oz	0.015-0.25	80-133	DO NOT apply more than 0.06 lb ai per season.	7 succulent, 21 dried	24
	lambda-cyhalothrin + chlorantraniliprole (R) Besiege 1.252	5.0-8.0 oz	0.049-0.08	16-25.6	DO NOT graze or feed hay to livestock. DO NOT exceed 20 fl oz per acre per season.	7 succulent, 21 dried	24
	imidacloprid Gaucho 600 Senator 600 Axxess 5 FS	1.6 - 3.2 oz/100 lb seed 1.6 - 3.2 oz/100 lb seed 1.6 - 3.2 oz/100 lb seed			Seed treatment. DO NOT graze or feed livestock on forage or hay.	12	12
	thiamexthoxam Cruiser 5 FS Warden CX	1.28 oz/100 lb seed 3.38 oz/100 lb seed			Seed treatment.		12 12
	zeta-cypermethrin (R) Mustang Maxx 0.8 EC	2.8-4.0 oz	0.0175-0.025	32-45.7	DO NOT apply more than 0.15 lb ai per season.	1 succulent, 21 dried	12
	zeta-cypermethrin + bifenthrin (R) Hero 1.24 EC	4.0-10.3 oz	0.04-0.1	12.4-32	DO NOT apply more than 0.266 lb ai of Hero per season. DO NOT apply again for 5 days.	3	12

EDAMAME INSECT CONTROL

Insect	Insecticide	Formulation/ Acre	Lb ai/Acre	Acres/ Gallon	Application/Comments	Minimum Days From Last Application to Harvest	Restricted Entry Interval (REI) Hours
Blister Beetle	bifenthrin (R)		0.033-0.1				
	Brigade 2 EC (See Generic Insecticides)	2.1-6.4 oz		20-61	DO NOT apply more than 0.2 lb ai of Brigade per season. DO NOT apply again for 30 days.	3	12
	carbaryl		2				
	Sevin XLR or 4F	2 qt		2		21	12
	gamma-cyhalothrin (R)		0.0075-0.0125		DO NOT apply more than 0.06 lb ai per season.		
	Proaxis 0.5 CS	1.92-3.2 oz		40-66.7		7 succulent, 21 dried	24
	Declare 1.25 CS	0.77-1.28 oz		100-167			
	lambda-cyhalothrin (R)		0.015-0.025		DO NOT apply more than 0.06 lb ai per season.	7 succulent, 21 dried	24
	Warrior II 2.08 CS (See Generic Insecticides)	0.96-1.6 oz 2.1-6.4 oz		80-133			
Defoliating Caterpillars (Garden webworm, green cloverworm, saltmarsh caterpillar, cabbage looper, velvetbean caterpillar, silver- spotted skipper)	lambda-cyhalothrin + chlorantraniliprole (R)						
	Besiege 1.252	8.0-10.0 oz		32-45.7		7 succulent, 21 dried	24
	zeta-cypermethrin (R)		0.008-0.025		DO NOT apply more than 0.15 lb ai per season.		
	Mustang Maxx 0.8 EC	1.28-4.0 oz		32-100		1 succulent, 21 dried	12
	zeta-cypermethrin 0.8 EC + bifenthrin (R)		0.04-0.1		DO NOT apply more than 0.266 lb ai of Hero per season.		
	Hero 1.24 EC	4.0-10.3 oz		12.4-32	DO NOT apply again for 5 days.	3	12
	<i>Bacillus thuringiensis</i>	0.5 - 2 lb/a					4
	bifenthrin (R)		0.033-0.1		DO NOT apply more than 0.2 lb ai of Brigade per season. DO NOT apply again for 30 days.	3	12
	Brigade 2 EC (See Generic Insecticides)	2.1-6.4 oz		20-61			
	bifenthrin + chlorantraniliprole		0.098-0.167			18	12
	Elevest 2.22 SC	5.6-9.6 oz		23-13			
	carbaryl		1.0-1.5				
	Sevin XLR or 4F	2-3 pt		2.7-4		21	12
Defoliating Caterpillars (Garden webworm, green cloverworm, saltmarsh caterpillar, cabbage looper, velvetbean caterpillar, silver- spotted skipper)	chlorantraniliprole		0.047-0.067				
	Prevathon 0.43	14-20 oz		6.4-9.14		1	4
	Vantacor 5 SC	1.25-2 oz		107-51			
	Shenzi 400SC	1.7-3.8 fl oz					
	Coragen	3.5-7.5 fl oz					
	gamma-cyhalothrin (R)		0.0075-0.0125		DO NOT apply more than 0.06 lb ai per season.		
	Proaxis 0.5 CS	1.92-3.2 oz		40-66.7	Higher rate of 1.28-1.54 oz/acre required for garden webworm and silver-spotted skipper.	7 succulent, 21 dried	24
	Declare 1.25 CS	0.77-1.28 oz		100-167			
	lambda-cyhalothrin (R)		0.02-0.03		DO NOT apply more than 0.06 lb ai per season.		
	Warrior II 2.08 CS (See Generic Insecticides)	1.28-1.92 oz		66.6-100	For garden webworm and silver-spotted skipper, raise rate to 1.6-1.92 oz/acre.	7 succulent, 21 dried	24
	lambda-cyhalothrin + chlorantraniliprole (R)		0.06-0.1		DO NOT graze or feed hay to livestock. DO NOT exceed 20 fl oz per acre per season. Use 8-10 oz for silver-spotted skippers.	7 succulent, 21 dried	24
	Besiege 1.252	6-10 oz		13-21			
	methoxyfenozide		0.0625-0.250		Intrepid is not labeled for silver-spotted skipper.		
Defoliating Caterpillars (Garden webworm, green cloverworm, saltmarsh caterpillar, cabbage looper, velvetbean caterpillar, silver- spotted skipper)	Intrepid 2F	4-16 oz		16-32	DO NOT exceed more than 1 lb ai of Intrepid per season.	7	7
	Spinosad				Do not make more than two consecutive applications of Group 5 insecticides		
	Entrust SC (OMRI)	4-6 fl oz				28	4
	zeta-cypermethrin (R)		0.0175-0.025		DO NOT apply more than 0.15 lb ai per season. For saltmarsh caterpillar and silver-spotted skipper, the rate can be lowered to 1.28 oz. Raise rate to 3.2-4 oz for cabbage loopers.		
	Mustang Maxx 0.8 EC	2.8-4.0 oz		32-45.7		1 succulent, 21 dried	12
Defoliating Caterpillars (Garden webworm, green cloverworm, saltmarsh caterpillar, cabbage looper, velvetbean caterpillar, silver- spotted skipper)	zeta-cypermethrin + bifenthrin (R)		0.04-0.1		DO NOT apply more than 0.266 lb ai of Hero per season.		
	Hero 1.24 EC	4.0-10.3 oz		12.4-32	DO NOT apply again for 5 days. For green cloverworm and silver-spotted skipper, rate can be dropped to 2.6-6.1 oz.	3	12

EDAMAME INSECT CONTROL

Insect	Insecticide	Formulation/Acre	Lb ai/Acre	Acres/Gallon	Application/Comments	Minimum Days From Last Application to Harvest	Restricted Entry Interval (REI) Hours
Grasshoppers	bifenthrin (R) Brigade 2 EC (See Generic Insecticides)	2.1-6.4 oz	0.033-0.1	20-61	DO NOT apply more than 0.2 lb ai of Brigade per season. DO NOT apply again for 30 days.	3	12
	bifenthrin + chlorantraniliprole Elevest 2.22 SC	4.8-9.6 oz	0.084-0.167	26.7-13		18	12
	chlorantraniliprole Prevathon 0.43 Vantacor 5 SC Shenzi 400SC Coragen	8-20 oz 0.7-1.7 oz 1.0-2.5 fl oz 2.0-5.0 fl oz	0.027-0.067	6.4-9.14 183-75	See label for grasshopper remarks. See label for grasshopper remarks.	1	4
	gamma-cyhalothrin (R) Proaxis 0.5 CS Declare 1.25 CS	3.2-3.84 oz 1.28-1.54 oz	0.0125-0.015	40-66.7 83-100	DO NOT apply more than 0.06 lb ai per season.	7 succulent, 21 dried	24
	lambda-cyhalothrin (R) Warrior II 2.08 CS	1.6-1.92 oz	0.025-0.03	67-80	DO NOT apply more than 0.06 lb ai per season.	7 succulent, 21 dried	24
	lambda-cyhalothrin + chlorantraniliprole (R) Besiege 1.252	8.0-10.0 oz	0.08-0.098	12.8-16	DO NOT graze or feed hay to livestock. DO NOT exceed 20 fl oz per acre per season.	7 succulent, 21 dried	24
	zeta-cypermethrin (R) Mustang Maxx 0.8 EC	3.2-4.0 oz	0.02-0.025	32-40	DO NOT apply more than 0.15 lb ai per season.	1 succulent, 21 dried	12
	zeta-cypermethrin + bifenthrin (R) Hero 1.24 EC	2.6-6.1 oz	0.025-0.06	21-49.2	DO NOT apply more than 0.266 lb ai of Hero per season. DO NOT apply again for 5 days.	3	12
Soybean Looper	<i>Bacillus thuringiensis</i>	Check label.			<i>Bacillus thuringiensis</i> works effectively against insecticide-resistant or susceptible populations of soybean loopers and requires 3-4 days to kill larvae.		4
	bifenthrin + chlorantraniliprole Elevest 2.22 SC	5.6-9.6 oz	0.098-0.167	23-13		18	12
	chlorantraniliprole Prevathon 0.43 Vantacor 5 SC Shenzi 400SC Coragen	14-20 oz 1.2-2.5 oz 1.7-3.8 fl oz 3.5-7.5 fl oz	0.047-0.067	6.4-9.14 107-51		1	4
	lambda-cyhalothrin + chlorantraniliprole (R) Besiege 1.252	10.0 oz	0.098	12.8	DO NOT graze or feed hay to livestock. DO NOT exceed 20 fl oz per acre per season.	7 succulent, 21 dried	24
	methoxyfenozide Intrepid 2 F	4-8 oz	0.0625-0.125	16-32	DO NOT exceed more than 1 lb ai of Intrepid per season.	7	12
	Spinosad Entrust SC (OMRI)	4-6 fl oz			Do not make more than two consecutive applications of Group 5 insecticides	28	4
Spider Mites	abamectin Agri-Mek 0.7 SC	1.75-3.5 oz	0.01-0.019	73-36.6	Do not allow livestock to graze on treated plants.	7	12
	bifenthrin (R) Brigade 2 EC (See Generic Insecticides)	5.12-6.4 oz	0.08-0.1	20-25	DO NOT apply more than 0.2 lb ai of Brigade per season. DO NOT apply again for 30 days.	3	12

EDAMAME INSECT CONTROL

Insect	Insecticide	Formulation/Acre	Lb ai/Acre	Acres/Gallon	Application/Comments	Minimum Days From Last Application to Harvest	Restricted Entry Interval (REI) Hours
Bean Leaf Beetle	bifenthrin (R) Brigade 2 EC (See Generic Insecticides)	2.1-6.4 oz	0.033-0.1	20-61	DO NOT apply more than 0.2 lb ai of Brigade per season. DO NOT apply again for 30 days.	3	12
	carbaryl Sevin XLR or 4F	1 pt	0.5	8		21	12
	gamma-cyhalothrin (R) Proaxis 0.5 CS Declare 1.25 CS	1.92-3.2 oz 0.77-1.28 oz	0.0075-0.0125	40-66.7 100-167	DO NOT apply more than 0.06 lb ai per season.	7 succulent, 21 dried	24
	lambda-cyhalothrin (R) Warrior II 2.08 CS (See Generic Insecticides)	0.96-1.6 oz	0.015-0.025	80-133	DO NOT apply more than 0.06 lb ai per season.	7 succulent, 21 dried	24
	imidacloprid Gaucho 600 Axxess 5 FS Senator 600	1.6 - 3.2 oz/100 lb seed 1.6 - 3.2 oz/100 lb seed 1.6 - 3.2 oz/100 lb seed	0.3-0.45		Gaucho and Cruiser will suppress early-season bean leaf beetles.		12
	thiamexthoxam Cruiser 5 FS Warden CX	1.28 oz/100 lb seed 3.38 oz/100 lb seed					12
	zeta-cypermethrin (R) Mustang Maxx 0.8 EC	2.8-4.0 oz	0.0175-0.025	32-45.7	DO NOT apply more than 0.15 lb ai per season.	1 succulent, 21 dried	12
	zeta-cypermethrin + bifenthrin (R) Hero 1.24 EC	4.0-10.3 oz	0.04-0.1	12.4-32	DO NOT apply more than 0.266 lb ai of Hero per season. DO NOT apply again for 5 days.	3	12
	PYRETHROIDS (Brigade, Prolex, Proaxis, Karate, Mustang Maxx, Hero) are not effective against beet armyworm. DO NOT USE.						
	bifenthrin (R) Brigade 2 EC (See Generic Insecticides)	2.1-6.4 oz	0.033-0.1	20-61	DO NOT apply more than 0.2 lb ai of Brigade per season. DO NOT apply again for 30 days.	3	12
Armyworm Complex (Yellow-striped, Fall and Beet Armyworm)	bifenthrin + chlorantraniliprole Elevest 2.22 SC	5.6-9.6 oz	0.098-0.167	23-13		18	12
	chlorantraniliprole Prevathon 0.43 Vantacor 5 SC Shenzi 400SC Coragen	14-20 oz 1.2-2.5 oz 1.7-3.8 fl oz 3.5-7.5 fl oz	0.047-0.067	6.4-9.14 107-51		1	4
	gamma-cyhalothrin (R) Proaxis 0.5 CS Declare 1.25 CS	3.2-3.84 oz 1.28-1.54 oz	0.0125-0.015	40-66.7 83-100	DO NOT apply more than 0.06 lb ai per season.	7 succulent, 21 dried 7 succulent, 21 dried	24 24
	lambda-cyhalothrin (R) Warrior II 2.08 CS (See Generic Insecticides)	1.6-1.92 oz	0.025-0.03	69-83	DO NOT apply more than 0.06 lb ai per season.	7 succulent, 21 dried	24
	lambda-cyhalothrin + chlorantraniliprole (R) Besiege 1.252	8.0-10.0 oz	0.08-0.098	12.8-16	DO NOT graze or feed hay to livestock. DO NOT exceed 20 fl oz per acre per season.	7 succulent, 21 dried	24
	methoxyfenozide Intrepid 2 F	4-8 oz	0.0625-0.125	16-32	DO NOT exceed more than 1 lb ai of Intrepid per season.	7	12

EDAMAME INSECT CONTROL

Insect	Insecticide	Formulation/Acre	Lb ai/Acre	Acres/Gallon	Application/Comments	Minimum Days From Last Application to Harvest	Restricted Entry Interval (REI) Hours
Armyworm Complex (Yellow-striped, Fall and Beet Armyworm) (cont.)	Spinosad				Do not make more than two consecutive applications of Group 5 insecticides	28	4
	Entrust SC (OMRI)	4-6 fl oz					
	zeta-cypermethrin (R)		0.02-0.025		DO NOT apply more than 0.15 lb ai per season.		
	Mustang Maxx 0.8 EC	3.2-4.0 oz		32-40		1 succulent, 21 dried	12
	zeta-cypermethrin + bifenthrin (R)		0.04-0.1		DO NOT apply more than 0.266 lb ai of Hero per season. DO NOT apply again for 5 days.		
	Hero 1.24 EC	4.0-10.3 oz		12.4-32		3	12
Corn Earworm and Tobacco Budworm	In recent years, pyrethroids have shown reduced efficacy and can be expected to provide poor to moderate control. Consider tank-mixing another chemistry when using a pyrethroid. DO NOT use synthetic pyrethroids on populations of tobacco budworm. Tobacco budworm is resistant to this chemistry.						
	Synthetic Pyrethroids						
	bifenthrin (R)		0.0331-0.1		DO NOT apply more than 0.2 lb ai of Brigade per season. DO NOT apply again for 30 days.		
	Brigade 2 EC	2.1-6.4 oz		20-61		3	12
	(See Generic Insecticides)						
	gamma-cyhalothrin (R)				DO NOT apply more than 0.06 lb ai per season.		
	Proaxis 0.5 CS	1.92-3.2 oz	0.0075-0.0125	40-66.7		7 succulent, 21 dried	24
	Declare 1.25 CS	0.77-1.28 oz		100-167			24
	lambda-cyhalothrin (R)		0.02-0.03		DO NOT apply more than 0.06 lb ai per season.		
	Warrior II 2.08 CS	1.28-1.92 oz		67-100		7 succulent, 21 dried	24
	(See Generic Insecticides)						
	zeta-cypermethrin (R)		0.0175-0.025		DO NOT apply more than 0.15 lb ai per season.		
	Mustang Maxx 0.8 EC	2.8-4.0 oz		32-45.7		1 succulent, 21 dried	12
	zeta-cypermethrin + bifenthrin (R)		0.04-0.1		DO NOT apply more than 0.266 lb ai of Hero per season. DO NOT apply again for 5 days.		
	Hero 1.24 EC	4.0-10.3 oz		12.4-32		3	12
	Carbamates						
	carbaryl		0.5-1.5				
	Sevin XLR or 4F	1-3 pt		2.7-8		21	12
	Other Chemistry						
	chlorantraniliprole		0.047-0.067		Make no more than 4 applications per year.		
	Prevathon 0.43	14-20 oz		6.4-9.14		1	4
	Vantacor 5 SC	1.2-2.5 oz		107-51			
	Shenzi 400SC	1.7-3.8 fl oz					
	Coragen	3.5-7.5 fl oz					
	lambda-cyhalothrin + chlorantraniliprole (R)		0.08-0.98				
	Besiege 1.252	8.0-10.0 oz		12.8-16		7 succulent, 21 dried	24
	nucleopolyhedrovirus				Apply before reaching economic threshold targeting small larvae. Applications to large larvae often result in poor control. Larvae stop feeding within 1-3 days and die within 3-9 days. Refer to pub. AG1306 for more information.		
	Heligen	1-1.6 oz		80-128		0	4
	Spinosad				Do not make more than two consecutive applications of Group 5 insecticides		
	Entrust SC (OMRI)	4-6 fl oz				28	4

EDAMAME INSECT CONTROL

Insect	Insecticide	Formulation/Acre	Lb ai/Acre	Acres/Gallon	Application/Comments	Minimum Days From Last Application to Harvest	Restricted Entry Interval (REI) Hours
ROOT FEEDER Grape Colaspis	imidacloprid Gaucho 600 Access 5 FS Senator 600	1.6 oz/100 lb seed 1.6 oz/100 lb seed 1.6 oz/100 lb seed			A seed treatment can be beneficial in areas where grape colaspis has historically been a problem.		12
	thiamexthoxam Cruiser 5 FS Warden CX	1.28 oz/100 lb seed 3.2 oz/100 lb seed					12
Green Stink Bug, Southern Green Stink Bug, Red Shouldered Stink Bug	bifenthrin (R) Brigade 2 EC (See Generic Insecticides)	2.1-6.4 oz	0.330-0.33-0.1	20-61	DO NOT apply more than 0.2 lb ai of Brigade per season. DO NOT apply again for 30 days.	3	12
	gamma-cyhalothrin (R) Proaxis 0.5 CS Declare 1.25 CS	3.2-3.84 oz 1.28-1.54 oz	0.0125-0.015	40-66.7 83-100	DO NOT apply more than 0.06 lb ai per season.	7 succulent, 21 dried	24
	lambda-cyhalothrin (R) Warrior II 2.08 CS (See Generic Insecticides)	1.6-1.92 oz	0.025-0.03	67-80	DO NOT apply more than 0.06 lb ai per season.	7 succulent, 21 dried	24
	lambda-cyhalothrin + chlorantraniliprole (R) Besiege 1.252	8.0-10.0 oz	0.08-0.098	12.8-16	DO NOT graze or feed hay to livestock. DO NOT exceed 20 fl oz per acre per season.	7 succulent, 21 dried	24
	zeta-cypermethrin (R) Mustang Maxx 0.8 EC	3.2-4.0 oz	0.02-0.025	32-40	DO NOT apply more than 0.15 lb ai per season. DO NOT apply more than 0.266 lb ai of Hero per season.	1 succulent, 21 dried	12
	zeta-cypermethrin +bifenthrin (R) Hero 1.24 EC	4.0-10.3 oz	0.04-0.1	12.4-32	DO NOT apply again for 5 days.	3	12
Brown Stink Bug	bifenthrin (R) Brigade 2 EC (See Generic Insecticides)	2.1-6.4 oz	0.330-0.33-0.1	20-61	DO NOT apply more than 0.2 lb ai of Brigade per season. DO NOT apply again for 30 days.	3	12
Redbanded Stink Bug	bifenthrin (R) Brigade 2 EC (See Generic Insecticides)	2.1-6.4 oz	0.330-0.33-0.1	20-61	DO NOT apply more than 0.2 lb ai of Brigade per season. DO NOT apply again for 30 days.	3	12
	imidacloprid Imidacloprid 4F Imidacloprid 2F (See Generic Insecticides)	1.4 oz 2.8 oz	0.13	91.4 45.7	DO NOT apply more than 0.13 lb ai of Imidacloprid per season.	21	12
Multiple Pests	bifenthrin + chlorantraniliprole Elevest 2.22 SC	4.8-9.6 oz	0.084-0.167	26,7-13	Bollworm, Tobacco Budworm, Cutworm, Grasshopper, Bean Leaf Beetle, Stink Bugs, Loopers, Green Cloverworm, Velvetbean Caterpillar, Kudzu Bug, Garden Webworm, Saltmarsh Caterpillar	18	12
	lambda-cyhalothrin (R) + chlorantraniliprole Besiege 1.25 SC	5-10 oz	0.49-0.98	12.8-25.6	Bollworm, Tobacco Budworm, Cutworm, Grasshopper, Bean Leaf Beetle, Green Stink Bugs, Loopers, Green Cloverworm, Velvetbean Caterpillar, Kudzu Bug, Garden Webworm, Saltmarsh Caterpillar	7 succulent, 21 dried	24

SUNFLOWER INSECT CONTROL

Insect	Insecticide	Formulation/Acre	Lb ai/Acre	Acres/Gallon	Application/Comments	Minimum Days From Last Application to Harvest	Restricted Entry Interval (REI) Hours
Sunflower Head Moth	<i>Bacillus thuringiensis</i>	Check label.				0	4
	chlorantraniliprole		0.047-0.098			1	4
	Prevathon 0.43 SC	14-20 oz		6.4-9.14			
	Vantacor 5 SC	1.2-2.5 oz		51-107			
	Shenzi 400SC	1.7-3.8 fl oz					
	Coragen	3.5-7.5 fl oz					
	lambda-cyhalothrin + chlorantraniliprole		0.049-0.098		Do not apply during bloom while bees are foraging.	45	24
	Besiege 1.252	5-10 oz		12.8-25.6			
	beta-cyfluthrin (R)		0.016-0.022		Do not apply during bloom while bees are foraging.	30	12
	Baythroid XL 1 EC	2.0-2.8 oz		45.5-64			
Cutworm Treat at 1 or more cutworms per sq ft or if plant stand losses are approaching the lower limits for optimum plant population.	esfenvalerate (R)		0.03-0.05		DO NOT exceed 0.2 lb ai per acre of Asana or Adjourn per season. Do not apply during bloom while bees are foraging" to esfenvalerate comments section.	28	12
	Asana XL 0.66 EC	5.8-9.6 oz		13-22			
	(See Generic Insecticides)						
	gamma-cyhalothrin (R)		0.01-0.015		Do not apply during bloom while bees are foraging.	45	24
	Proaxis 0.5 CS	2.56-3.84 oz		33-50			
	Declare 1.25 CS	1.02-1.54 oz		83-125.5			
	lambda-cyhalothrin (R)		0.02-0.03		DO NOT exceed 0.12 lb ai per acre of Warrior, Silencer or Lambda-Cy per season after bloom initiation. DO NOT apply as an ULV spray. Do not apply during bloom while bees are foraging.	45	24
Cutworm Treat at 1 or more cutworms per sq ft or if plant stand losses are approaching the lower limits for optimum plant population.	Warrior II 2.08 CS	1.28-1.92 oz		66.7-100			
	(See Generic Insecticides)						
	zeta-cypermethrin (R)		0.014-0.025		Do not apply during bloom while bees are foraging.	30	12
	Mustang Maxx 0.8 EC	2.24-4.0 oz		32-57			
	(See Generic Insecticides)						
	beta-cyfluthrin (R)		0.007-0.013			30	12
Cutworm Treat at 1 or more cutworms per sq ft or if plant stand losses are approaching the lower limits for optimum plant population.	Baythroid XL 1 EC	0.8-1.6 oz		80-160			
	esfenvalerate (R)		0.03-0.05			28	12
	Asana XL 0.66 EC	5.8-9.6 oz		13-22			
	(See Generic Insecticides)						
	gamma-cyhalothrin (R)		0.0075-0.0125			45	24
	Proaxis 0.5 CS	1.92-3.2 oz		40-67			
Cutworm Treat at 1 or more cutworms per sq ft or if plant stand losses are approaching the lower limits for optimum plant population.	Declare 1.25 CS	0.77-1.28 oz		100-166			
	lambda-cyhalothrin (R)		0.015-0.025		DO NOT exceed 0.12 lb ai per acre of Karate, Silencer or Lambda-Cy per season after bloom initiation. DO NOT apply as an ULV spray.	45	24
	Warrior II 208 CS	0.96-1.6 oz		80-133			
	(See Generic Insecticides)						
	zeta-cypermethrin (R)		0.014-0.025			30	12
Cutworm Treat at 1 or more cutworms per sq ft or if plant stand losses are approaching the lower limits for optimum plant population.	Mustang Maxx 0.8 EC	2.24-4.0 oz		32-57			
	(See Generic Insecticides)						

STORED GRAIN INSECT CONTROL

STORED GRAIN INSECTICIDE PERFORMANCE RATING, 2025

Rating Scale: 0 = no control 10 = excellent	Chemistry	IRAC Code	Length of Residual Activity (Months)	Restricted Use (R)	Rice Weevil Maize Weevil	Sawtoothed Grain Beetle	Red Flour Beetle	Confused Flour Beetle	Indian Meal Moth
Actellic	OP	1B	24	X	9	9	6	8	
Bacillus thuringiensis	MD	11A	2		0	0	0	0	7
Centynal	SyP	3A	4-12	X	7	7	7	6	
Diacon IGR	IGR	7A	2		4	5	4	4	
Diacon IGR Plus	IGR+SyP	7A + 3A	4-6		6	5	7	7	
Malathion	OP	1B	24		9	9	5	5	
Sensat	SP	5	4						
Silocon dioxide	MD	UNM	6		5	4			

The performance ratings in the chart are for comparison purposes only and are not necessarily a measure of percent control.

Type Treatment	Insect	Insecticide	Rate	Application/Comments
Preventive treatments for bins (empty bins, walls, ceilings, beams, outside storage, foundations and grain-handling equipment)	Beetles and Moths	Centynal 0.42 Malathion 5 EC Suspend 0.42 SC Tempo Ultra 1 SC	(Rate/1,000 sq ft) 0.25-1.5 oz/ gal water 5.12 oz/gal water 0.25-1.5 oz/ gal water 0.27-0.54 oz/gal water	Clean bins before application. Use malathion for wooden or metal bins. Malathion will not control Indian meal moth. Malathion is NOT labeled for rice storage facilities. DO NOT APPLY DIRECTLY TO GRAIN.
Preventive treatment sprays for grain	Beetles and Moths	Actellic 5 E Centynal 0.41 EC Sensat Diacon-D Diacon IGR 2.5 Max Kill Dusta-Cide (Malathion) 6% Dust Silicon dioxide (Insecto, Dryacide)	9.2-12.3 oz/30 tons grain (1,071 bushels) (Rate/1,000 bushels) Barley – 7.75-15.5 fl oz Corn, Popcorn, Rye – 9-18 fl oz Oats – 5.15-10.3 fl oz Rice – 7.2-14.4 fl oz Sorghum – 8-16 fl oz Wheat – 9.6-19.2 fl oz (Rate/1,000 bushels) Barley – 8.2 fl oz Corn, Sorghum – 9.8 fl oz Oats – 5.9 fl oz Wheat – 10.5 fl oz 8-10 lb/1,000 bushels (Rate/1,000 bushels) Barley, Rice – 3-6 fl oz Corn, Sorghum, Wheat – 3.5-7 fl oz Oats, Peanut, Sunflower – 2-4 fl oz 10 lb/1,000 bushels (wheat, corn, oats, rye or barley) 1-2 lbs per ton of grain	Shelled corn and grain sorghum only. Use higher rates if grain will be in storage for longer than 6 months. Adding PBO (piperonyl butoxide) at a ratio of 1 part Centynal to 1.5 parts PBO can increase control when beetles show tolerance or resistance. Effective against all grain-infesting moths as well as confused flour beetle and flat grain beetle. Provides suppression only of other weevils and beetles. Diacon is a growth regulator and does not control adults but is effective against larvae. Malathion is not labeled for rice or sorghum. Apply as grain is being loaded or moved into final storage for protection from beetles and moths. OMRI certified for organic production. Excessive use may lower grain grade and may reduce test weight.

STORED GRAIN INSECT CONTROL

Type Treatment	Insect	Insecticide	Rate	Application/Comments
Surface treatment (inside bins and grain treatment)	Beetles and Moths	Max Kill Dusta-Cide (Malathion) 6% Dust	5 lb/1,000 sq ft	Apply as top-dress on grain bin surface for protection against moths and beetles. Malathion is not labeled for rice or sorghum. May be reapplied 60 days after first application.
		Sensat	2.6 fl oz/1,000 sq ft	Effective against all grain-infesting moths as well as confused flour beetle and flat grain beetle. Provides suppression only for other weevils and beetles.
		Diacon-D Diacon IGR 2.5	8 lb/1,000 sq ft 1/30 fl oz (1 mL)/1,000 sq ft	Diacon is a growth regulator and does not control adults but is effective against larvae.
		Silicon dioxide (Insecto, Dryacide)	2-3 lbs/1,000 sq ft	OMRI certified for organic production. Excessive use may lower grain grade and may reduce test weight.
	Moths only	<i>Bacillus thuringiensis</i> (Dipel, SOK-Bt, etc.)	Follow label directions.	Apply as a top-dress for protection against moths only. Incorporate into top 4 inches. OMRI certified for organic production.
Grain fumigation	Beetles and Moths	Aluminum Phosphide (R) (Phostoxin, Fumitoxin, Gastoxin, Fumex, Killz-All, Phosfume, Weevil-Cide)	Silos and Concrete Bins 200-900 pellets/1,000 bu 40-180 tablets/1,000 bu 10 pellets/ton 6 tablets/ton (check label also)	Grain surface should be level. Apply in gas-tight bins when grain temperature is 60°F or higher. Leave for at least 3 days, preferably 5 days. DO NOT fumigate when temperatures are below 40°F. Use higher rates when infestations are high and/or temperatures are low.
			Butler-Type Bins 450-900 pellets/1,000 bu 90-180 tablets/1,000 bu	Always use a gas mask and never fumigate alone. Fumigated grain should be aerated thoroughly before feeding.
			Space Treatments pellets: 100-725/1,000 cubic ft tablets: 20-145/1,000 cubic ft	Use a self-contained breathing apparatus and a safety rope. Seal all buildings and storage bins airtight before fumigation. Fumigation is not recommended for storage bins not equipped with fans for aeration.
			Bagged Grain or Feed 150-450 pellets/1,000 cubic ft 30-90 tablets/1,000 cubic ft	Be careful under hot, humid conditions when using aluminum phosphide because phosphine gas may be released quickly under these conditions. Phosphine needs at least 72 hours to kill some immature insects.
				Special training and precautions are needed before using aluminum phosphide. For more information on treatment using aluminum phosphide: http://www.degeschamerica.com/ .
HOME STORAGE Protection of small quantities of grain for home storage to be eaten	Beetles and Moths	Heat oven until center of grain is 120 degrees F.	30 minutes	Place in a tight container. Temperature should be checked with meat thermometer. DO NOT use heat on seed to be planted.
		Cold or freezer treatment at 0 degrees F.	4 days	Place container in deep freeze.

HONEY BEE HIVE MANAGEMENT

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Pest/Disease	Treatment	Rate	Application	Precautions and Remarks
Varroa Mites	Formic Acid 46.7% (Formic Pro, Mite Away Quick Strip)	2 strips per colony for 14 days OR 1 strip per colony for 10 days, followed by a second strip for an additional 10 days.	Apply only when daytime high temperatures are between 50° and 85°F during week of application. Follow label directions for specific product.	Material is extremely caustic. Applicators should wear coveralls, long sleeves, long pants, acid-resistant gloves (PVC, neoprene, nitrile) and protective eyewear. Wear approved respirator with organic vapor cartridge. Do not open hives without PPE for 72 hours after application. Safe to apply during the honey flow.
	Thymol (ApiGuard, Thymovar, ApilifeVar)	Dosage prepackaged by manufacturer; follow label directions for bulk packaging.	Follow label directions for specific product.	DO NOT use during the honey flow. Remove product at least 30 days prior to honey harvest. Treatments are most effective during broodless periods. Use when daytime high temperatures are between 68° and 86°F. Do not use when temperatures are above 90°F. Thymol products are temperature sensitive; read and follow guidelines on specific product labels.
	Oxalic Acid Dihydrate (Apibioxal, EZ-OX, VarroSan)	Liquid: up to 50 ml medicated syrup per hive body	Dissolve 35 g of oxalic acid dihydrate in 1 liter of 1:1 sugar syrup (warm syrup to completely dissolve crystals). Use syringe to trickle 5 ml of solution directly onto adult bees in each occupied bee space in each brood box.	Do not apply as liquid to any colony more than once per year during broodless period; this method may cause some bee mortality or overwintering bee loss.
		Vapor: 2 grams crystals per hive body	Seal all upper entrances, ventilation and cracks; smoke bees up from the bottom board; place 2 grams oxalic acid crystals into vaporizer; insert the vaporizer apparatus through the bottom entrance and cover entrance with towel; apply heat until all oxalic acid has sublimated.	Follow vaporizer manufacturer's directions for use. Oxalic acid can damage bee brood, and will not control varroa mites in capped cells. Most effective in late fall or early spring when little or no brood is present.
		Extended release strips: 1 strip for each 2.5 frames of brood	Fold strip in half and insert wrapped over top bars of brood frames, equally spaced around brood nest.	Remove strips 42-56 days after placement (3 full brood cycles). Most effective when little or no brood is present. CAUTION: Oxalic acid should be used only outdoors. Wear protective goggles, dust/mist filter, chemically resistant gloves, long-sleeved shirt, pants, shoes, and socks whenever handling, mixing, applying or cleaning up oxalic acid dehydrate. Also wear a respirator fitted with organic acid filter whenever applying with a vaporizer. Use only material labeled for use in honey bee colonies.
	Potassium Salt of Hop Beta Acids (HopGuard 3)	1 strip per 5 frames of bee brood	Open folded strips and place over top bars of brood frames, hanging within colony cluster. Apply up to 6 strips per year per hive, based on need. Bees will destroy and remove cardboard strips.	Use when daytime temperature is above 50°F. For best results, apply when no brood is present in the colony. If used while brood is present, application may need to be repeated 3 times at 2-week intervals. Do not apply to frames in honey supers; safe to use during honey flow if all label guidelines are followed.

HONEY BEE HIVE MANAGEMENT

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Pest/Disease	Treatment	Rate	Application	Precautions and Remarks
Varroa Mites (cont.)	Amitraz (Apivar, Amiflex)	Apivar: 1 strip/5 frames of bees in brood chamber, with at least 2 frames between strips	Hang strip between frames in brood nest. Treat for minimum of 42 days and maximum of 56 days. Remove strips and discard. DO NOT reuse strips. Use chemical-resistant gloves to handle strips.	If hives are treated in the spring, prior to the first honey flow, strips must be removed at least 14 days prior to adding honey supers. Fall treatment can be applied as soon as honey supers are removed.
		Amiflex: 6 ml gel per brood chamber	Apply 3 ml gel onto wooden strips placed across tops of brood frames.	Remove wooden supports and remaining gel after 7 days, dispose as instructed on label. For high infestations, wait 7 days, apply second dose for additional 7 days. Honey supers can be replaced immediately following removal of excess material.
	Fluvalinate (Apistan)	1 strip/5 frames of bees in brood chamber	Hang strip between frames in brood nest. Treat for minimum of 42 days and maximum of 56 days. Remove strips and discard. DO NOT reuse strips. Use chemical-resistant gloves to handle strips.	Treat hives in spring before first honey flow or in late summer or fall after surplus honey has been removed. Supers may be returned to hive following treatment. Never consume or sell contaminated honey. Many mite populations are resistant to this product.
Tracheal Mites	Menthol 99.94% granules in packet (Menthol, Mite-A-Thol)	1.8 oz (50 grams)/colony	Place packet on top bars when daytime high temperature is above 70° and below 80°F; place on bottom board if temperature is above 80°F. Remove packet after 10-12 weeks and discard.	Remove product at least 4 weeks prior to spring honey flow to prevent honey contamination. In the fall, remove surplus honey prior to treatment. DO NOT use product when temperature is below 60°F. Use of fumigants for varroa mites (formic acid, thymol) is effective against tracheal mites as well.
	1:2 Shortening-sugar patties	1 patty (thoroughly mix 1 part vegetable shortening with 2 parts granulated sugar)	Place 1 flattened patty (approx. 1/3 cup) on top bars above brood nest when brood is being reared in hive.	Grease patties do not kill tracheal mites, but may slow their spread within a hive by interfering with mite host-finding ability. Check often, as patties are extremely attractive to small hive beetles.
Nosema	Bioclohexylammonium fumagillin (Fumadil-B, Fumagilin-B)	Mix with syrup according to manufacturer's product label directions for number of hives needing treatment.	Mix with sugar syrup and feed to honey bees. Feed 2 gallons of syrup for fall treatment; 1 gallon syrup for spring treatment.	DO NOT use during honey flow. Stop treatment at least 4 weeks prior to addition of any honey supers. May not be effective against <i>Nosema cerana</i> .
	Nozevit	1 mL (20 drops) per 12 fluid ounces of light syrup.	Feed medicated syrup to each hive 2 times, 10 days apart, in the spring and/or the fall.	DO NOT use during honey flow. Stop treatment at least 4 weeks prior to addition of any honey supers. [Nozevit is NOT a medication or an antibiotic; it is a feeding supplement which, in some cases, appears to lower the overall spore count in Nosema-infected bees.]

HONEY BEE HIVE MANAGEMENT

Pest/Disease	Treatment	Rate	Application	Precautions and Remarks
Small Hive Beetles	Under-hive beetle traps (Freeman Beetle Trap, IPK Trap, West Beetle Trap)	1 trap per hive	Level hive in all directions. Replace or modify bottom board to hold plastic or metal tray. Fill tray with vegetable oil, mineral oil, or soapy water.	Trap will accumulate hive debris (dust, wax, pollen, mites) in addition to beetles; check tray regularly and replace liquid as needed.
	In-hive beetle traps (Beetle Jail, Beetle Blaster, Beetle Eaters, Hood Trap)	Up to 2 per hive body	For traps with one chamber, fill reservoir one half to three quarters full with vegetable or mineral oil. Place between top bars of frames near outside walls of hive body. For traps with multiple chambers, add apple cider vinegar or other bait in addition to oil.	Oils coat and suffocate beetles but are not attractive, baits attract beetles but do not kill them; baitable traps are recommended. Inspect traps frequently and replace oil/bait. Bees may cover trap openings with propolis. Beetle bait recipe: combine 1 cup water, ½ cup apple cider vinegar, ¼ cup sugar, and the peel of 1 ripe banana (chopped in small pieces); allow to ferment 1-2 days.
	Permethrin (Gardstar 40% EC)	5 ml per gallon of water	Thoroughly drench soil in area 18-24 inches wide in front of each hive. Apply late in evening when few bees are active.	Mow grass/vegetation around hives prior to application. Apply only after high numbers of beetle larvae have been found in a hive. Soil drench kills only adult beetles emerging from soil; does not prevent adults flying from other areas. Permethrin is HIGHLY TOXIC TO HONEY BEES; do not contaminate hives or other surfaces that bees may contact. Apply with sprinkler can, never with pressure sprayer.
American Foulbrood	Oxytetracycline hydrochloride (Terramycin Pre-Mix, Tetra Bee Mix, Tetroxy)	Mix 8.75 grams of Oxytetracycline powder with 1 pound of powdered sugar, or use pre-mixed product.	Apply 1 ounce (2 tablespoons), 3 times, at 4 to 5 day intervals to the tops of the frames in the brood chamber. Dust the mixture onto the tops of frames, around the edges of the brood chamber to avoid powder killing uncapped brood.	DO NOT use during honey flow. Stop treatment at least 6 weeks prior to addition of any honey supers. Requeening hive, or caging queen for 10 days, to break brood cycle at time of application will increase effectiveness of treatment.
	Tylosin (Tylan)	Mix 2 teaspoons product with 1/4 cup powdered sugar.	Apply approx. 3 tablespoons, 3 times, at 4-5 day intervals to the top of the frames in the brood chamber. Dust the mixture onto the tops of frames, around the edges of the brood chamber to avoid powder killing uncapped brood.	Tylosin is recommended for use when foulbrood is found to be resistant to other treatments. Use only under the supervision of a state apiary inspector. <i>NOTE: As of January 1, 2017, federal law requires a written prescription or veterinary feed directive from a licensed veterinarian to purchase veterinary antibiotics.</i> <i>NOTE: AFB is extremely contagious. Antibiotics cannot cure AFB-infected honey bees. Destruction of infected colonies (bees and hives) by burning is mandatory. Apiary should be quarantined; all other colonies in the apiary should be treated with antibiotic, then inspected again in 4 weeks. If AFB is suspected, contact state apiary inspector.</i>

HONEY BEE HIVE MANAGEMENT

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Pest/Disease	Treatment	Rate	Application	Precautions and Remarks
European Foulbrood	Oxytetracycline hydrochloride (Terramycin Pre-Mix, Tetra Bee Mix, Tetroxy)	Mix 8.75 grams of Oxytetracycline powder with 1 pound of powdered sugar, or use pre-mixed product.	Apply 1 ounce (2 tablespoons), 3 times, at 4 to 5 day intervals to the tops of the frames in the brood chamber. Dust the mixture onto the tops of frames, around the edges of the brood chamber to avoid powder killing uncapped brood.	DO NOT use during honey flow. Stop treatment at least 6 weeks prior to addition of any honey supers. Requeening hive, or caging queen for 10 days, to break brood cycle at time of application will increase effectiveness of treatment.
	Tylosin (Tylan)	Mix 2 teaspoons product with 1/4 cup powdered sugar.	Apply approx. 3 tablespoons, 3 times, at 4-5 day intervals to the top of the frames in the brood chamber. Dust the mixture onto the tops of frames, around the edges of the brood chamber to avoid powder killing uncapped brood.	Tylosin is recommended for use when foulbrood is found to be resistant to other treatments. Use only under the supervision of a state apiary inspector. <i>NOTE: As of January 1, 2017, federal law requires a written prescription or veterinary feed directive from a licensed veterinarian to purchase veterinary antibiotics.</i>
Greater Wax Moth (Fumigation of Stored Bee Hive Supers and Other Beekeeping Equipment)	Paradichlorobenzene 100% (Para Moth)	3 oz crystals for a stack of up to 5 hive bodies	Sprinkle crystals on paper or cardboard, placed on top bars of the uppermost hive body in stack. Cover tightly, using tape to seal gaps between hive bodies if necessary. Stacks should be inspected every two to three weeks, add more crystals if needed.	Use in well-ventilated area. Never use on a live colony of honey bees or on combs of un-extracted honey. Not usually necessary after first freeze of fall season. Unstack supers and allow to thoroughly air out for at least 2 weeks prior to placing back on hive.
	Glacial Acetic Acid (80%)	150 mL (2/3 cup) per stack of up to 5 hive bodies	Soak an absorbent pad (such as cotton wool) with acetic acid and place on top bars of topmost super; cover tightly. Use tape to seal gaps between hive bodies if necessary. Stacks should be inspected every two to three weeks and treatment repeated if necessary.	Never use on a live colony of honey bees. Repeated use of acetic acid can cause corrosion of metal parts such as wires, nails and frame rests.
	Aluminum phosphide Phostoxin Weevil-cide	150-225 pellets/1,000 cu ft 30-40 tablets/1,000 cu ft	NOTE: Special license, training and precautions are needed for purchase or use of aluminum phosphide. Read and follow all label directions. Wear proper PPE at all times.	Honey from treated hives or supers may only be used for bee food, not for human consumption or sale.

APPLE/PEAR SPRAY SCHEDULE—COMMERCIAL

Insect	Material and Formulation	Amount to Use/Acre	Remarks/Precautions	Days to Harvest
BY MARCH 15 Initiate Oriental Fruit Moth and San Jose Scale Scouting Program	Place 2 or 3 Oriental fruit moth pheromone traps in in orchard interior at eye level and check twice weekly to record date of first consistent moth emergence (late March) = OFM biofix date . Be sure to keep trap bottoms clean and replace lures monthly or every two months for long life lures. After OFM biofix date, begin calculating number of daily degree days (DD) using base 45°F = DD = (maximum daily temperature + minimum daily temperature) / 2 – 45. Place 2 or 3 San Jose scale pheromone traps in orchard interior in tops of trees known to have a live SJS infestation (conspicuous red spots on apples last year). Record first date from mid-March to mid-April when you capture SJS males on traps = SJS biofix date.			
GREEN TIP TO ½" GREEN	Superior oil plus one of the following:	2%	Where San Jose scale is a main target of oil sprays, the best timing is at green tip, but delaying oil application until half-inch green will give better control of mites. DO NOT use Captan within 2 weeks or Sulfur within 30 days before or after an oil application. Apply Supracide before any blossoms open.	
San Jose Scale Aphid Eggs	Supracide 2E (R)	1.5-0.5-4 pt 3-12 pt	For rates less than 2 pt Supracide per 100 gal, tank mix with an oil. Use Esteem with Superior spray oil at recommended rate at half-inch green to control scale and rosy apple aphid.	See text
Spotted Tentiform Leafminer	Esteem 35WP	3-5 oz		45
TIGHT CLUSTER TO PINK				
Rosy Apple Aphid	Asana XL (R)	4.8-14.5 fl oz	Time of application is critical in achieving control.	21
	Assail 70WP	1.1-1.7 oz	Use prebloom and post bloom spray timings recommended by State Extension Services	7
	Beleaf 50SG	2-2.8 oz	Weekly from tight cluster to late May, check five fruit clusters in interior of each of 20 susceptible trees	21
	Danitol 2.4EC (R)	10.7-21.3 oz	(look at Ida Red or Golden Delicious) for rosy apple aphids inside curled leaves.	14
	Permethrin	4-10 fl oz	Do not apply after petal fall	See text
	Sivanto 200 SL	7-10.5 fl oz	Caution: In some blocks, rosy apple aphid was resistant to Ambush and Asana.	14
Tarnished Plant Bugs and Stink Bugs	Vydate L (R)	4-8 pt	Caution: Use of pyrethroids (Ambush, Asana, Baythroid, Danitol, Decis, Pounce, Proaxis and Warrior) may kill natural enemies triggering outbreaks of woolly apple aphid, mites, San Jose scale and Comstock mealybug.	14
	Asana XL (R)	4.8-14.5 fl oz		21
	Avaunt 30 WDG	5-6 oz	Avaunt is for tarnished plant bug only.	14
	Baythroid XL 1 EC (R)	2-2.4 fl oz	Keeping the orchard groundcover free of flowering broadleaf weeds will also lessen the bug population and keep pollinators in the fruit trees.	7
	Beleaf 50 SG	2-2.8 fl oz	Beleaf is for plant bugs, not stink bugs.	21
	Besiege (R)	6-12 fl oz		21
	Danitol 2.4 EC (R)	10.7-21.3 fl oz	Avoid applications when honey bees are actively foraging by applying during the early morning or evening hours.	14
	Mustang Maxx 0.8 EC (R)	1.28-4 fl oz	Pounce for Tarnished Plant Bug only. Do not apply after petal fall.	14
	Pounce 25 WP (R)	6.4-16 oz		See text
	Proaxis 0.5 EC (R)	2.6-5.1 fl oz		21
Spotted Tentiform Leafminer	Warrior II (R)	1.28-2.56 fl oz		21
	Same as GREEN TIP TO ½" GREEN or		The need for insecticide against leafminer at this time is questionable, because the number of mines rarely exceeds threshold level of one per leaf.	
	Altacor 35 WDG	2.5-4.0 oz		5
	Assail 30SG	2.5 oz		7
	Esteem 35WP	3-5 oz		45
Plum Curculio dispersal	Intrepid 2F	8-12 fl oz	First generation: Apply at pink to petal fall. Second, third generation: Apply at early egg hatch for each generation.	14
	Plum curculio (PC) adults disperse from overwintering sites in adjacent woods into the orchard and begin feeding on and egg laying in fruit between 100-400 degree-days (DD) accumulated after temperatures exceed 70°F for two days in late March = PC biofix date . After PC biofix date, begin daily accumulation of DD to predict the dispersal period by calculating number of daily DD using base 50°F = DD = (maximum daily temperature + minimum daily temperature) / 2 – 50.			

APPLE/PEAR SPRAY SCHEDULE—COMMERCIAL

Insect	Material and Formulation	Amount to Use/Acre	Remarks/Precautions	Days to Harvest
BY APRIL 1				
Initiate Scouting Programs for Plum Curculio	Tie a gray plum curculio pyramid trap to each of 4 perimeter apple tree trunks adjacent to woods (PC overwintering site) and check twice weekly for plum curculio adults. The spray threshold is one PC adult per trap per week.			
Codling Moth	Place 2 or 3 codling moth pheromone traps in upper third of tree canopy in orchard interior and check twice weekly to record first consistent moth emergence in early to mid-April = CM biofix date .			
San Jose Scale crawlers	After appropriate biofix dates, begin accumulating DD (base 50°F for CM and PC and base 51°F for SJS) to predict spray periods (hatch) by calculating number of daily DD using proper base = DD = (maximum daily temperature + minimum daily temperature) / 2 – base .			
BLOOM				
SAVE THE BEES!				
DO NOT SPRAY INSECTICIDES/MITICIDES DURING BLOOM.				
PETAL FALL	Oil	0.5%-1%	DO NOT use oil if temperature exceeds 90°F.	
European Red Mite	Acramite 50 WS	0.75-1 lb		7
Twospotted Spider Mite	Agri-Mek 0.7 SC (R)	2.25-4.25 oz		28
	Haisello SC	4-8 fl oz		45
	Envidor 2 SC	16-18 fl oz	Spray threshold: Apply when mites exceed threshold of 2.5 mites per leaf.	7
	Kanemite 15 SC	21-31 fl oz	Caution: DO NOT use Captan or Sulfur within two weeks of the oil application.	14
	Nealta	13.7 fl oz	Savey is most effective if applied after petal fall or first cover.	7
	Nexter 75 WP	6.6-10.67 oz	Use low rate of Nexter for European red mite or high rate for twospotted mite.	25
	Onager 1 EC	12-24 fl oz	Use low rate of Acramite for twospotted mite or high rate for European red mite.	28
	Portal	2 pt	Agri-Mek is most effective if applied before leaves harden off.	14
	Savey 50 DF	3-6 oz		28
	Zeal 72 WP	2-3 oz		14
Plum Curculio	Avaunt 30 WDG	5-6 oz	Spray trees as plum curculio adults move into orchard between 100-400 DD accumulated after second day	14
Leafrollers	Imidan 70 W	2.1-5.3 lb	in late March when temperatures exceed 70°F.	7
Oriental Fruit Moth			Adult moths and plum curculio enter the orchards from late March to late April. Cool weather during this time may extend plum curculio adult feeding and egg laying of both species into early May. After petal fall, look for plum curculio feeding damage on fruit, especially along orchard perimeter adjacent to woods (overwintering site).	
			Peak hatch of redbanded leafroller usually coincides with petal fall. Control at this time helps prevent late-season problems. If plum curculio pressure has been severe and Imidan is applied to control it, use 5.3 lb per acre.	
Leafrollers	Products listed above for three species combined or			
	Altacor 35 WDG	2.5-4.5 oz		5
	Confirm 2 F	20 fl oz	The use of a spreader-sticker to maximize uniform coverage and distribution of the spray material is recommended.	14
	Delegate 25 WG	4.5-7.0 oz		7
	Entrust 2 SC	4-10 fl oz		7
	Exirel	8.5-17 fl oz		3
	Intrepid 2 F	8-16 fl oz		14
	Proclaim (R)	3.2-4.8 oz	It is recommended that application be made in combination with a Horticultural spray oil (not a dormant oil) or a nonionic surfactant as directed by the product manufacturer.	14
	Rimon 0.83 EC	20-50 fl oz		14
	Shenzi 700 WG	1.3-2.2 oz		5
Plum Curculio	Products listed above for three species combined or			
	Actara 25W	4.5-5.5 oz	Make application immediately following petal fall. Additional applications of a different insecticide may be necessary if pest pressure continues. Highly toxic to bees.	35
	Assail 30 SG	8 oz		7
	Belay	6 fl oz		7
	Exirel	13.5-20.5 fl oz	For best performance, use with an effective adjuvant.	3
	Surround WP (OMRI*)	25-50 lb		0
	Verdepryn 100SL	5.5-11 fl oz	Apply at higher rates (8.2 to 11 fl oz/A) for best results.	7
	Voliam Flexi	6-7 oz	Make application immediately following petal fall.	35

APPLE/PEAR SPRAY SCHEDULE—COMMERCIAL

Insect	Material and Formulation	Amount to Use/Acre	Remarks/Precautions	Days to Harvest
PETAL FALL				
Oriental Fruit Moth	Products listed above for three species combined or Altacor 35 WDG Assail 30 SG Belay Besiege (R) Delegate 25 WG Entrust 2 SC (OMRI) Exirel Intrepid 2 F Rimon 0.83 EC Shenzi 700 WG	2.5-4.5 oz 5-8 oz 6 fl oz 6-12 fl oz 4.5-7.0 oz 6-10 fl oz 10-17 fl oz 12-16 fl oz 20-40 fl oz 1.3- 2.2 oz	Closely follow regional spray recommendations for oriental fruit moth treatments based upon biofix dates and pheromone trap catches. Oriental fruit moth larvae must be controlled before they penetrate the fruit.	5 7 7 21 7 7 3 14 14 5
Stink Bugs Tarnished Plant Bug	See TIGHT CLUSTER TO PINK		Randomly inspect 100 fruit for feeding punctures by either stink bugs or tarnished plant bugs.	
White Apple Leafhopper	Actara 25W Admire Pro Agri-Mek Assail 30 SG Closer 2 SC Danitol 2.4EC (R) Exirel	2-2.75 fl oz 1.4-2.8 fl oz 2.25-4.25 fl oz 2.5-4.0 oz 1.5-2.75 fl oz 10.6-21.3 fl oz 8.5-17 fl oz	Spray threshold = 1 or more white apple leafhopper nymphs per leaf. Leafhoppers are usually below this spray threshold in Arkansas. Admire Pro is a foliar application. Apply when thresholds are reached in a minimum volume of 40 gal/A.	14 7 28 7 7 14 3
Spotted Tentiform Leafminer (larvae)	See TIGHT CLUSTER TO PINK		The need for insecticide against spotted tentiform leafminer is questionable, because the number of mines in Arkansas rarely exceeds the spray threshold level of two mines per leaf.	
Aphid	See TIGHT CLUSTER TO PINK or Beleaf 50 SG Closer 2 SC Esteem 35 WP Movento 2 SC Azera (OMRI)	2-2.8 oz 1.5-2.75 fl oz 3-5 oz 6-9 fl oz 2-3.5 pt	If an insecticide is not applied for rosy apple aphid at pink or if live aphids are still present, an insecticide should be applied. Not labeled for woolly apple aphid.	21 7 45 7 0
FIRST COVER				
Codling Moth Oriental Fruit Moth	Imidan or Assail as listed at PETAL FALL for plum curculio or Altacor 35 WDG Confirm 2F Delegate 25 WG Exirel Intrepid 2F Rimon 0.83 EC Verdepryn 100SL	2.5-4.5 oz 20 fl oz 4.5-7 oz 8.5-17 fl oz 12-16 fl oz 20-40 fl oz 5.5 - 11 fl oz	Time applications of Intrepid or Rimon before Oriental fruit moth egg hatch at 200-400 DD or for codling moth between 50-100 DD following biofix. Repeat applications in 14- to 17-day intervals. For codling moth larvae, spray for each generation starting at 250 DD (May), 1250 DD (June) and 2250 DD (late July). For Oriental fruit moth, spray for each generation at 400-700 DD (late April), 1300-1700 DD (late May, after 2300 DD (late June) and every 10 to 14 days thereafter if you continue to see new fruit damage (red ring with frass). Use 8.5 – 10 fl oz for low pressure infestations. Use 16 fl oz for codling moth. Use the higher rates of 8.2 to 11 fl oz for heavy infestations.	5 14 7 3 14 14 7

APPLE/PEAR SPRAY SCHEDULE—COMMERCIAL

Insect	Material and Formulation	Amount to Use/Acre	Remarks/Precautions	Days to Harvest
FIRST COVER (cont.)				
Codling Moth larvae	Carpovirusine (OMRI)	6.8-13.5 fl oz	Use in non-chlorinated water. Apply one of the codling moth granulosis virus formulation (Carpovirusine, Cyd-X HP, Madex or Virosoft) sprays only in orchards with low to moderate populations of codling moth. Time virus application against newly hatched codling moth larvae. Repeat sprays at interval of 7-9 days during codling moth hatch periods. After application, you may see stings and frass on fruit skins but rarely see live larvae in fruit. Note: Refrigerate virus formulations until used. Resistance management: Alternate Entrust sprays with applications of granulosis virus against codling moth.	1
	Cyd-X HP (OMRI)	0.5-3 fl oz		0
	Madex (OMRI)	0.5-3 fl oz		0
	Virosoft CP4	2.0-3.2 fl oz		0
Oriental Fruit Moth and Leafroller larvae	Biobit HP (OMRI)	0.5-2.0 lb	Apply weekly as necessary during hatch period.	0
	Deliver (OMRI*)	0.5-2.0 lb	Resistance management: Alternate Entrust sprays with applications of <i>Bt</i> formulations against Oriental fruit moth or leafrollers.	0
San Jose Scale crawlers	Admire Pro 4.6 F	2.8 fl oz	Admire Pro is a foliar application.	7
	Assail 30 SG	8 oz	Spray foliage when you see scale crawlers on several double-sticky tapes wrapped around scale-infested branches. By 300 DD since first catch of San Jose scale males on pheromone traps, wrap sticky tape traps on limbs and check twice weekly for crawlers.	7
	Centaur 70 WDG	34.5 oz		14
	Esteem 35W	4-5 oz		45
	Movento 2 SC	6-9 fl oz		7
	Sivanto 200 SL	10.5-14 fl oz		14
SECOND COVER AND SUMMER COVER SPRAYS				
San Jose Scale	See FIRST COVER			
Plum Curculio	See PETAL FALL		Plum curculio sprays are justified when you detect new fruit feeding damage in perimeter trees after 1200 DD (usually in early June) has accumulated since the PC biofix in late March.	
Spray in Mid-August			Beginning in early August, weekly monitoring fruit weekly for new surface stings and frass, apply insecticide: SpinTor or Entrust or <i>Bt</i> or virus.	
Oriental Fruit Moth and Codling Moth	SpinTor 2SC	6-10 fl oz	SpinTor may only be used if the requirements of 205.206(e) are met, which require the use of preventive, mechanical, physical, and other pest, weed, and disease management practices.	7
	Entrust 2 SC (OMRI*)	6-10 fl oz		7
Oriental Fruit Moth	Biobit HP (OMRI*)	0.5-2.0 lb	In conventional orchards, SpinTor will control Oriental fruit moth, codling moth and leafrollers as will other compounds listed in FIRST COVER . In organic blocks, from August to harvest, rotate weekly applications of Entrust with <i>Bt</i> formulations (Biobit, Deliver or Javelin) to control Oriental fruit moth or granulosis virus (Cyd-X, Virosoft and Virusine) to control codling moth.	0
	Deliver (OMRI*)	0.5-2.0 lb		0
Codling Moth	Cyd-X HP (OMRI*)	1-5.3 fl oz		0
	Virosoft CP4 (OMRI*)	2-3.2 fl oz		0
	Carpovirusine (OMRI*)	6.8-13.5 fl oz		1
White Apple Leafhopper	See PETAL FALL		Leafhoppers generally are not a problem in Arkansas. Spray threshold = one or more nymphs per leaf in late July to early August. Treatment at this time will eliminate the need to treat for adults immediately before harvest.	
Spotted Tentiform Leafminer	See PETAL FALL		Spray threshold = two mines per leaf of spotted tentiform leafminer larvae (<i>June to July</i>). Spray threshold = four mines per leaf of spotted tentiform leafminer larvae (<i>August</i>).	
Green Apple Aphid	See PETAL FALL		Spray threshold = 50% terminals infested with aphids. Control is most important on young trees and dwarf plantings. Admire Pro is a foliar spray for this aphid.	

APPLE/PEAR SPRAY SCHEDULE—COMMERCIAL

Insect	Material and Formulation	Amount to Use/Acre	Remarks/Precautions	Days to Harvest
SECOND COVER AND SUMMER COVER SPRAYS				
Spray in Mid-August				
Woolly Apple Aphid	Admire Pro 4.6 F	7-10.5 fl oz	Aboveground infestations of woolly apple aphid are of greatest concern for younger trees. Apply Admire Pro by chemigation into the root zone. DO NOT apply Admire Pro pre-bloom or during bloom when bees are foraging.	21
	Beleaf 50 SG	2-2.8 fl oz		21
	Diazinon AG 600 (R)	12.75 fl oz/100 gal		21
	Movento 2 SC	6-9 fl oz		7
European Red Mite Twospotted Spider Mite	Same as PETAL FALL or Vydate L (R)		Agri-Mek is not as effective once leaves harden off.	
		2-4 pt	Vydate can cause fruit thinning if used within 30 days of bloom.	14
Japanese Beetle Green June Beetle	Assail 30 SG	5-8 oz	DO NOT make more than two applications of Assail per season and use a 14-day interval spray. DO NOT exceed 5.3 oz Assail per season. DO NOT exceed 16 fl oz (0.5 lb ai) Sevin per acre per season.	7
	Danitol 2.4 EC (R)	16-21.3 fl oz		14
	Imidan 70 WP	2.1-5.3 lb		7
	Mustang Maxx 0.8 EC (R)	1.28-4 fl oz	May only be used if the requirements of 205.206(e) are met, which require the use of preventive, mechanical, physical, and other pest, weed, and disease management practices.	14
	Azera	2-3.5 pt		0
	Proaxis 0.5 EC (R)	2.5-5.1 fl oz	DO NOT use on Comice Pears and other known sensitive pear varieties.	21
	Surround WP (OMRI)	25-50 lb		0
	Sevin XLR (4 EC)	1.5-3.0 qt		3
	Warrior II (R)	1.28-2.56 fl oz		21
	Neemix 4.5 (OMRI*)	4-16 fl oz		0
RED IMPORTED FIRE ANTS (ALL FIRE ANT BAITS) – Apply when ants are active and soil temperature is above 60°F. DO NOT treat if rain is anticipated within 6 hours.				
Bearing Apples	Pyriproxyfen (Esteem)	2-4 Tbsp/mound 1.5-2.0 lb/acre	Mound-to-mound treatment rate. Broadcast rate.	
	S-Methoprene (Extinguish)	3-5 Tbsp/mound 1-1.5 lb/acre	Mound-to-mound treatment rate. Broadcast rate. This product is an insect growth regulator (IGR). Apply 3 to 4 weeks prior to harvest date of production.	
Non-Bearing Apples	Hydramethylnon (Amdro Pro)	2-5 Tbsp/mound 1-1.5 lb/acre	Mound-to-mound treatment rate. Broadcast rate.	
	Pyridine (Distance)	1-4 Tbsp/mound 1-1.5 lb/acre	Mound-to-mound treatment rate. Broadcast rate.	
	S-Methoprene (Extinguish)	3-5 Tbsp/mound 1.0-1.5 lb/acre	Mound-to-mound treatment rate. Broadcast rate. This product is an IGR.	
	S-methoprene + hydramethylnon (Extinguish Plus)	3-5 Tbsp/mound 1.0-1.5 lb/acre	Mound-to-mound treatment rate. Broadcast rate. This product is an IGR plus a toxicant.	

*OMRI = Organic Materials Review Institute lists compounds approved for organic production.

APPLE/PEAR SPRAY SCHEDULE—COMMERCIAL

Conventional Agriculture Suppliers	Address/Online URL	Phone and Fax
AlphaScents (traps and lures)	Online: http://www.alphascents.com	Ph: 503-342-8611 Fax: 314-271-7297
Forestry Suppliers, Inc. (sprayers, hand lens, weather stations, thermometers, waterproof notebooks, stake flags)	205 West Rankin Street, P.O. Box 8397 Jackson, MS 39284-8397 Online: http://www.forestry-suppliers.com	Ph: 800-647-5368 Fax: 800-543-4203
Great Lakes IPM, Inc. (hand lens, traps, lures, codling moth virus, mating disruption, max/min thermometers, soil probes, refractometers)	10220 East Church Road, Vestaburg, MI 48891 Online: http://www.greatlakesipm.com	Ph: 989-268-5693 Ph: 800-235-0285 Fax: 989-268-5311
Gempler's (hand lens, mating disruption dispensers, traps, lures, weather stations, thermometers, pH meters, refractometers, fruit hardness meters)	P.O. Box 270, Mt. Horeb, WI 53572 Online: http://www.gemplers.com	Ph: 800-382-8473 Fax: 800-551-1128
ISCA Technologies, Inc. (traps, lures, mating disruption)	1230 W. Spring Street, P.O. Box 5266, Riverside, CA 92507 Online: http://www.iscatech.com/	Ph: 951-686-5008 Fax: 815-346-1722
QC Supply (traps, bait stations, insect control)	P.O. Box 581, 574 Road 11, Schuyler, NE 68661-0581 Online: http://www.qcsupply.com	Ph: 800-433-6340 Fax: 402-352-8825
DoMyOwnPestControl (some organic products)	4260 Communications Drive, Norcross, GA 30093 Online: http://www.domyownpestcontrol.com	Ph: 866-581-7378 Fax: 770-779-5398
Organic Agriculture Resources List	Address/Online URL	Phone and Fax
Marbleseed Upper Midwest Organic Resource Directory (list of organic pest control suppliers)	P.O. Box 339, Spring Valley, WI 54767 Online: www.marbleseed.org/about	Ph: 888-906-6737 (toll free)
Organic Resources (Suppliers of Pest Management)	Dr. Kathleen Delate, Depts. of Agronomy/Horticulture, 106 Horticulture Hall Iowa State University, Ames, IA 50011 Online: http://extension.agron.iastate.edu/organicag/	Ph: 515-294-7069 Fax: 515-294-0730
Organic Agriculture Suppliers	Address/Online URL	Phone and Fax
AgBio, Inc. (insect traps, lures, flathead borer trap, organic pesticides)	9915 Raleigh Street, Westminster, CO 80031 Online: http://www.agbio-inc.com	Ph: 303-469-9221 Fax: 303-469-9598
NovaSource (Surround Crop Protectant)	2255 N. 44th Street, Suite 300, Phoenix, AZ 85008-3279 Online: https://www.novasource.com/en/products/surround	Ph: 800-525-2803
Gardens Alive (beneficial insects, soil amendments, cover crops, traps, pest controls: Surround Crop Protectant)	5100 Schenley Place, Lawrenceburg, IN 47025 Online: http://www.gardensalive.com	Ph: 513-354-1482 Ph: 513-354-1483 Fax 513-354-1484
Peaceful Valley Farm and Garden Supply, Inc. (organic farming supplies, CM trap, seeds, plants, soil amendments, pest control: JMS Stylet oil, Isomate CTT, Dipel, Entrust, Pyganic, Surround Kaolin clay, M-Pede Insecticidal Soap, and parasitic nematodes)	P.O. Box 2209, 125 Clydesdale Court, Grass Valley, CA 95945 Online: http://www.groworganic.com	Ph: 888-784-1722
Planet Natural (trap and lures, organic pesticides, beneficial insects)	1612 Gold Avenue, Bozeman, MT 59715 Online: http://www.planetnatural.com	Ph: 800-289-6656 Fax: 406-587-0223
Rincon-Vitova Insectaries, Inc. (beneficial insects)	P.O. Box 1555, Ventura, CA 93002-1555 Online: http://www.rinconvitova.com	Ph: 800-248-2847 Fax: 805-643-6267
Seven Springs Farm (Pest Controls: Copper, Bt-Javelin, Dipel, Neemix, Pyganic, Entrust, M-Pede, Surround Crop Protectant)	426 Jerry Lane, Check, VA 24072 Online: http://www.7springsfarm.com	Ph: 800-540-9181

BLACKBERRY/RASPBERRY INSECT CONTROL—COMMERCIAL

Insect	Material and Formulation	Amount to Use/Acre	Remarks/Precautions	Days to Harvest
LATE OCTOBER/EARLY NOVEMBER OR LATE MARCH (DORMANT)				
Raspberry Crown Borer	Altacor 35WDG	3-4.5 oz	Apply Brigade, Hero, or Altacor after egg hatch ends from late October to early November or wait to apply in late March. Apply Brigade as a soil drench to the crown of plants in minimum of 50 gallons water per acre prior to significant rainfall event. Apply Hero as a soil drench to crown of plant with 200 gallons water per acre. Time the application of Altacor when 1/2 inch of rainfall is forecast or move into plant root zone with 1/2 inch/acre of irrigation water.	3
	Brigade 2 EC (R)	6.4 fl oz		3
	Brigade WSB (R)	16 oz		3
	Hero (R)	10.3 fl oz		3
DELAYED DORMANT				
Rednecked Cane Borer	Cultural control		If less than 5% of fruiting canes have galls, then during winter, prune out galled fruiting canes, burn or shred these infested canes to kill overwintering larvae.	
PREBLOOM				
Strawberry Clipper	Actara 25W (not rated)	3 oz	When the first flower appears, begin randomly checking 100 clusters for clipped buds or tap flower clusters over a white paper plate to detect adult strawberry clipper weevils (1/10 inch long with snout). If more than 1% of buds are clipped or you find 1 adult weevil, apply insecticide and reapply at 10-day intervals as long as bud clipping or weevils occur. Treatment is not often necessary.	3
	Aza-Direct (OMRI*)	1-3.5 pt		0
	Danitol 2.4 EC (R)	10.7 -16 fl oz		3
	Sevin 4F	1-2 qt		7
Spider Mites	Delegate WG	3-6 oz	Applications of Sevin and pyrethroids can cause mite flare-ups.	1
	Acramite 50WS	0.75-1 lb		1
	Agri-Mek SC	1.75-3.5 fl oz		7
	Aza-Direct (OMRI*)	3.5 pt		4 hours
	Portal	2 pt		1
	Savey 50DF	4-6 oz		3
	Zeal	2-3 ozt		0
EARLY BLOOM THROUGH BLOOM			SAVE THE BEES!! DO NOT APPLY INSECTICIDES DURING BLOOM!!	
POST-BLOOM TO HARVEST				
Rednecked Cane Borer	Admire Pro (4.6F)	10.5-14 fl oz	DO NOT apply prebloom, during bloom or when bees are foraging. If more than 5% fruiting canes have galls, apply Admire Pro by either chemigation into root zone or by a basal soil drenching in a minimum of 500 gallons solution per acre.	7
Spotted-Wing Drosophila**			<u>Days of residual activity:</u>	
	Danitol 2.4EC (R)	16-21.33 fl oz	7 days	3
	Delegate 25WG	3-6 oz	7 days	1
	Exirel	13.5-20.5 fl oz	5 days	1
	Verdepryn	8.2-11 fl oz	5 days	1
	Malathion 8F	2-4 pt	7 days	1
	Mustang Maxx (R)	4 fl oz	5-7 days	1
	Entrust 2SC (OMRI*)	4-6 oz	3-5 days	1
	Pyganic 1.4 (OMRI*)	16-64 fl oz	0-2 days	0

*OMRI = Organic Materials Review Institute lists compounds approved for organic production.

****Spotted-Wing Drosophila (SWD)** is a new invasive insect pest that was detected in ripening and ripened fruit in many Midwest states, including Arkansas, in 2013. The SWD larvae feed inside and damage ripening soft-skinned fruit, especially **blackberry, blueberry, raspberry and strawberry**. See the Arkansas SWD fact sheet: <https://www.uaex.uada.edu/publications/PDF/FSA-7079.pdf>. Begin monitoring for adult spotted-wing drosophila (SWD) in green fruit stage. Consider starting the (SWD) spray schedule when adults are first caught. Normal spray schedules should start 10 days prior to the first picking regardless of adult (SWD) trap catch. See the fact sheet 'Monitoring Spotted-Wing Drosophila in Arkansas' <https://www.uaex.uada.edu/publications/pdf/FSA7088.pdf> for more information. Fruit monitoring using a salt water drench can be an effective tool for determining whether spotted-wing drosophila (SWD) control efforts are effective. See the fact sheet 'Monitoring Spotted-Wing Drosophila in Arkansas' linked above.

BLACKBERRY/RASPBERRY INSECT CONTROL—COMMERCIAL

Insect	Material and Formulation	Amount to Use/Acre	Remarks/Precautions	Days to Harvest
POST-BLOOM TO HARVEST (cont.)				
Stink Bugs	Actara 25W	3 oz	DO NOT exceed 6 oz Actara per acre per season. If leaf bronzing is occurring and mites are present, apply a foliar spray of Danitol. DO NOT exceed 12.8 fl oz Brigade per acre per season.	3
	Azera (OMRI*)	2-3.5 pt		0
	Bifenthrin 2 EC (R)	6.4 fl oz		3
	Brigade 2 EC (R)	6.4 fl oz		3
	Danitol 2.4 EC (R)	10 2/3 oz - 16 fl oz		3
Spider Mites	Acramite 50WS	0.75-1 lb	Apply miticide if scouting detects between 1 and 5 spider mites per leaf.	1
	Agri-Mek SC	1.75-3.5 fl oz		7
	Bifenthrin 2 EC (R)	6.4 fl oz		3
	Brigade 2 EC (R)	6.4 fl oz		3
	Danitol 2.4 EC (R)	16 fl oz		3
	Kanemite 15 SC	31 fl oz	DO NOT make more than 1 application of Savey per year.	1
	Portal	2 pt		1
	Savey DF	4-6 oz		3
	Zeal	2-3 oz		0
	JMS Stylet Oil (OMRI*)	3-6 qt		0
	M-Pede (OMRI*)	2 gal/100 gal		0
	Deliver (OMRI*)	2 lb		0
Leafrollers			M-Pede may cause plant injury if plants are drought stressed or temperatures exceed 90°F.	
Japanese Beetle Green June Beetle	Assail 30SG	4.5-5.3 oz	Mid-June to late July, check for foliage feeding by Japanese beetle or fruit feeding by green June beetle and spray weekly as needed with 7-day minimum interval between applications.	1
	Assail 70WP	1.9-2.3 oz		1
	Danitol 2.4 EC (R)	10 2/3-16 fl oz		3
	Sevin 4F	2 qt		7
	Malathion 5EC	1.25-2.5 lb		1
	Malathion 8F EC	1-4 pt		1
	Pyganic 1.4 (OMRI*)	16-64 fl oz		0
	Surround WP (OMRI*)	25-50 lb		0
Sap Beetles	Assail 30 SG	4.5-5.3 oz	After harvest, you can suppress Japanese beetle foliar feeding by applying enough Surround to white-wash the foliage. Reapply Surround as needed to maintain white-washed appearance. Supplemental controls may be needed for complete insect control.	
			Sanitation: Strawberry sap beetles are best controlled by timely and complete (“clean”) picking of over-ripe and damaged berries. Keep berries off the ground.	1
			Bait buckets can be used to detect and reduce local population of sap beetles: Fill a small, screened 4 oz specimen cup with over-ripe berries (your culls). Place cup of berries inside a 1 quart deli cup trap that has a lid with several 1/5-inch holes. Then add a beetle drowning mixture of 9 parts apple cider vinegar and 1 part ethanol. These traps may prove useful for intercepting dispersing beetles from woods to plantings of ripening berries, reduce beetle numbers in the harvested berries and aid in timing insecticide application. Empty beetles from bait buckets on a daily basis.	

BLACKBERRY/RASPBERRY INSECT CONTROL—COMMERCIAL

Insect	Material and Formulation	Amount to Use/Acre	Remarks/Precautions	Days to Harvest
POST-BLOOM TO HARVEST (cont.)				
Broad Mites***	Agri-Mek SC (R)	3.5 fl oz	A maximum of two applications of Agri-mek SC, one application of Magister SC, and two applications of Portal are allowable each year. Prioritize Portal during harvest, as it has a 1-day PHI. When populations persist after a single application, rotate to a different product to help prevent resistance. Agri-Mek SC must be mixed with a non-ionic surfactant activator type wetting, spreading and/or penetrating spray adjuvant at 0.1-0.5% v/v. By late May, begin weekly scouting for first damage (leaf bronzing and/or cupping) and presence of broad mites on underside of terminal leaflets, especially in primocane-fruiting cultivars. Use a 20x or 30x hand lens to see white, oval, spotted eggs and oval, white (immature) to amber adult broad mites. Apply miticide only if/when you detect new terminal leaf damage and leaflet samples average between one to five active broad mites per leaflet.	7
	Magister SC	32-36 fl oz		7
	Portal	2 pt		1
***Broad Mites: The broad mite damages terminal leaves, flowers and fruit on citrus, peppers, tomatoes and recently became a pest of blackberries, especially primocane-fruiting cultivars. This mite feeds by piercing the bud, leaf or flower. This feeding injects a toxin that stunts growth, curls and bronzes leaves and often kills terminal and lateral leaf and flower buds (looks like fire blight). This mite overwinters mostly in blackberry leaf litter, and to lesser extent under blackberry bud scales and in the soil. Eggs are oval and spotted (0.08 mm long), and the broad mites are oval and vary from small white immature to amber adults (0.2 mm). Primocane-fruiting blackberry cultivars usually have floricanes pruned to ground, removed and burned by bud break. This practice produces a late-summer to fall crop. From late-May through fall in Arkansas, you can find a buildup of broad mite numbers on terminal leaves of emerging primocanes. Broad mites have damaged floricanes-fruiting blackberry cultivars. These mite-infested floricanes blocks appear to have delayed bud break and low vigor in spring. Broad mites can be found on terminal floricanes leaves from April until after mid-summer harvest when floricanes are usually removed.				
RED IMPORTED FIRE ANTS (ALL FIRE ANT BAITS) – Apply when ants are active and soil temperature is above 60 degrees F. DO NOT treat if rain is anticipated within 6 hours.				
	S-Methoprene (Extinguish)	3-5 Tbsp/mound 1.0-1.5 lb/acre	Mound-to-mound treatment rate. Broadcast rate. This product is an insect growth regulator (IGR). Apply 3 to 4 weeks prior to harvest date of production.	

BLUEBERRY INSECT CONTROL—COMMERCIAL

Insect	Material and Formulation	Amount to Use/Acre	Remarks/Precautions	Days to Harvest
BUD SWELL				
Scale	Apply dormant oil if scale present			
Climbing Cutworm Bagworms	Sevin XLR	1 1/2-2 qt	During dormant pruning, clip off bagworms on plants and adjacent juniper/cedar trees. Destroy these bags so larvae do not hatch next June and disperse to and defoliate blueberry plants. At bud swell, begin checking plants daily for damaged buds or check after dusk for climbing cutworms feeding on the buds. Spray weekly as long as damage is occurring or climbing cutworms are present.	7
FRUIT FEEDING INSECT PESTS OF BLUEBERRY ARE RARE IN ARKANSAS.				
PETAL FALL				
			Scout berries for signs of worm feeding before using insecticides.	
Cherry Fruitworm	Asana XL (R)	4.8-9.6 fl oz	Asana repels bees; do not apply within 7 days of pollination.	14
Cranberry Fruitworm	Assail 30SG	4.5-5.3 oz	Apply insecticide against cherry fruitworm at petal fall and 10 days later.	1
Eastern Tent Caterpillar	Avaunt	3.5-6 oz	Apply insecticide against cranberry fruitworm 10 days and 20 days after petal fall.	7
Leafroller (usually not a problem)	Confirm 2F	16 fl oz		14
	Danitol 2.4 (R)	10 2/3-16 oz		3
	Delegate	3-6 oz		3
	Imidan 70W	1 1/3 lb		3
	Intrepid	10-16 fl oz		7
	Knack 0.83EC	16 fl oz		7
	Malathion 5EC	2 pt		1
	Mustang Maxx (R)	4 fl oz		1
	Rimon 0.83EC	20-30 fl oz	Rimon is for cranberry fruitworm control.	8
	Sevin XLR	1.5-2 qt		7
	Success	4-6 fl oz		3
	Entrust 2SC (OMRI*)	4-6 fl oz		1
	Deliver (OMRI*)	2 lb		0
	Verdepryn	8.2-11 fl oz		1
	Altacor	3-4.5 fl oz		1
	Shenzi 700 WG	1.5-2.2 oz		1
FIRST AND SECOND COVER				
Fruitworms			See PETAL FALL	
Plum Curculio	Brigade (R, WSB)	5.3-16 oz	In the last couple of years, plum curculio adults and larvae were observed causing damage in blueberry fruit.	1
	Danitol (R)	10.6-16 oz		3
	Imidan 70W	1.3 lb		3
	Malathion 8	1.5-2.5 pt		1
	Surround (OMRI*)	25-50 lb		0
	Altacor	3-4.5 fl oz		1
Bagworms	Deliver (OMRI*)	2 lb	During the first or second week of June, check planting for newly hatched bagworms (very localized near bagworm-infested junipers or other trees) and either remove by hand or spray.	0
	Entrust (OMRI*)	1.25-2.0 oz		3

BLUEBERRY INSECT CONTROL—COMMERCIAL

Insect	Material and Formulation	Amount to Use/Acre	Remarks/Precautions	Days to Harvest
THIRD AND ADDITIONAL COVERS				
Blueberry Maggot			Blueberry maggot larvae and adults have not been observed in Arkansas.	
Flatheaded Apple Tree Borer	Sevin XLR	11/2-2 qt	In late April, set out emerald ash borer purple sticky traps in vertical orientation along the wooded perimeter of the blueberry planting being attacked by this borer. Check purple traps weekly for adult flatheaded borers. Apply insecticide to canes at three-week intervals from first to last capture of adult borers on purple traps or adults observed on blueberry canes. DO NOT make more than five applications of Imidan per acre per year.	7
	Imidan 70W	1.3 lb		3
POST-BLOOM TO HARVEST				
Leafrollers	Deliver (OMRI*)	0.25-1.5 lb	Leafrollers are usually NOT a problem in blueberries in Arkansas. Deliver is a formulation of <i>Bacillus thuringiensis</i> var <i>kurstaki</i> (Bt).	0
	Entrust 2SC (OMRI*)	2 fl oz		1
Japanese Beetle	Actara 25WB	4 oz	Mid-June to late July, check for foliar feeding by Japanese beetle or fruit feeding by green June beetle. Spray weekly as needed with seven-day minimum interval between applications.	3
Green June Beetle	Assail 30SG	4.5-5.3 oz		1
	Malathion	1-4 pt		3
	Sevin 4F	1-2 qt		7
	Surround WP (OMRI*)	25-50 lb	After harvest, you can suppress Japanese beetle foliar feeding by applying enough Surround to white-wash the foliage. Reapply Surround as needed to maintain white-washed appearance. Supplemental controls may be needed to complete insect control.	0
Yellownecked Caterpillars	See PETAL FALL			
Fall Webworm	Fruitworm sprays		In July and August, check twice weekly for groups of fall webworms defoliating limbs inside a web or groups of yellownecked caterpillars defoliating whole plants. Usually, these pests are localized, so hand removal and destruction of caterpillars provides adequate control.	
Spotted-Wing Drosophila**			Days of residual activity:	
	Danitol 2.4EC (R)	10.6-21.33 fl oz	7 days	3
	Delegate 25WG	3-6 oz	7 days	3
	Exirel	13.5-20.5 fl oz	5 days	3
	Malathion 8EC	1-4 pt	7 days	1
	Mustang Maxx (R)	4 fl oz	7 days	1
	Entrust 2SC (OMRI*)	4-6 oz	3-5 days	1
	Pyganic 1.4 (OMRI*)	16-64 fl oz	0-2 days	0
	Imidan	1.3 lb	7 days	3
	Brigade WSB	16oz	7 days	1
	Verdepryn	8.2-11 fl oz	5 days	1
	Lannate LV	12-24 fl oz	7 days	3
RED IMPORTED FIRE ANTS (ALL FIRE ANT BAITS) – Apply when ants are active and soil temperature is above 60 degrees F. DO NOT treat if rain is anticipated within 6 hours. Target applications in early Spring and late Fall to suppress populations of fire ants for fruiting season.				
	S-Methoprene (Extinguish)	3-5 Tbsp/mound 1.0-1.5 lb/acre	Mound-to-mound treatment rate. Broadcast rate. This product is an insect growth regulator (IGR). Apply 3 to 4 weeks prior to harvest date.	

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****Spotted-Wing Drosophila (SWD)** is a new invasive insect pest that was detected in ripening and ripened fruit in many Midwest states, including Arkansas, in 2013. The SWD larvae feed inside and damage ripening soft-skinned fruit, especially **blackberry, blueberry, raspberry and strawberry**. See the Arkansas SWD fact sheet: <https://www.uaex.uada.edu/publications/PDF/FSA-7079.pdf>. Begin monitoring for adult spotted-wing drosophila (**SWD**) in green fruit stage. Consider starting the (**SWD**) spray schedule when adults are first caught. Normal spray schedules should start 10 days prior to the first picking regardless of adult (**SWD**) trap catch. See the fact sheet 'Monitoring Spotted-Wing Drosophila in Arkansas' <https://www.uaex.uada.edu/publications/pdf/FSA7088.pdf> for more information. Fruit monitoring using a salt water drench can be an effective tool for determining whether spotted-wing drosophila (**SWD**) control efforts are effective. See the fact sheet 'Monitoring Spotted-Wing Drosophila in Arkansas' linked above.

CHERRY/PEACH/PLUM INSECT CONTROL—COMMERCIAL

Insect	Material and Formulation	Amount to Use/Acre	Remarks/Precautions	Days to Harvest
DELAYED DORMANT				
Mites	Superior oil	6.5 gal	Apply after leaves drop in the fall or before buds swell in the spring.	
San Jose Scale	Superior oil plus Assail 30 SG Esteem 35WP	6.4 gal 5.3-8 oz 4-5 oz	Esteem applied with oil at delayed dormant is reported to provide very good scale control. Esteem does not kill adult scale, but suppresses hatch of eggs they lay. Therefore, in season use of Esteem may not protect fruit from blemishes by scale (small red dots develop around young scale).	7 14
PINK				
Tarnished Plant Bug	See PETAL FALL			
BLOOM				
SAVE THE BEES! DO NOT APPLY INSECTICIDES DURING BLOOM.				
BY MARCH 15				
Initiate Oriental Fruit Moth and San Jose scale Scouting Program	Place 2 or 3 Oriental fruit moth pheromone traps in orchard interior and check twice weekly to record first consistent moth emergence (late March) = OFM biofix . Keep trap bottoms clean and replace lures monthly or every two months for long-life lures. After OFM biofix date, begin calculating number of daily degree days (DD) using base 45°F = DD = (maximum daily temperature + minimum daily temperature) / 2 – 45.			
	Place 2 San Jose scale pheromone traps in orchard interior in tops of trees known to have a live SJS infestation (conspicuous red spots on apples last year) and record first date in early to mid-April when you consistently capture SJS males on traps = SJS biofix . Remove scale trap in May. After specific biofix dates, begin accumulating DD (base 51°F for SJS) to predict crawler spray periods (hatch).			
Plum curculio dispersal	Plum curculio adults disperse from overwintering sites in adjacent woods into orchard and begin feeding on and laying eggs in fruit between 100-400 DD accumulated after temperatures exceed 70°F for two days in late March = PC biofix . After PC biofix date, begin accumulating DD to predict dispersal period by calculating number of daily DD using base 50°F = DD = (maximum daily temperature + minimum daily temperature) / 2 – 50.			
BY LATE MARCH				
Initiate Plum Curculio and Lesser Peachtree Borer*** Scouting Programs	Tie gray plum curculio pyramid trap to each of 3 or 4 perimeter orchard tree trunks adjacent to woods (overwintering site) and check twice weekly for plum curculio adults. Place 2 lesser peachtree borer pheromone traps in interior trees and check weekly to record moth flight beginning and peaks. Keep peachtree borer trap bottoms clean and replace lures monthly or every two months for long-life lures. After specific biofix dates, begin accumulating DD (base 50°F for CM) to predict spray periods (hatch). Calculate number of daily degree days (DD) using proper base = DD = (maximum daily temperature + minimum daily temperature) / 2 – base.			
PETAL FALL				
Tarnished Plant Bug	Belay	6 fl oz	Stink bug and plant bug catfacing are worse where control of flowering weeds is poorest. Keep spring flowering broadleaf weeds mowed regularly to reduce orchard attractiveness to stink bugs and tarnished plant bugs.	21
Stink Bugs	Baythroid XL (R)	2-2.4 fl oz	Use of pyrethroids (Asana, Baythroid, Mustang Maxx, Pounce, Proaxis, Renounce, Warrior) will kill mite predators and cause mite outbreaks.	7
	Besiege (R)	6-12 fl oz	DO NOT use Imidan on sweet cherries. Use Imidan in blocks with scale infestations.	14
	Imidan 70W	2-4.25 lb		14
	Mustang Maxx (R)	1.28-4 fl oz		14
	Sevin XLR	2-3 qt		3
	Warrior (R)	1.28-2.56 fl oz		14
Lesser Peachtree Borer***	REFER TO LATE MARCH AND SECTION ON BORERS.			

CHERRY/PEACH/PLUM INSECT CONTROL—COMMERCIAL

Insect	Material and Formulation	Amount to Use/Acre	Remarks/Precautions	Days to Harvest	
SHUCK SPLIT TO 7-10 DAYS AFTER					
Oriental Fruit Moth	Actara 25WP	4.5-5.5 oz	Oriental fruit moth egg hatch period for each generation occurs so many DD after OFM biofix: 400-700 DD (late April), 1300-1700 DD (late May) and after 2300 DD. Belay can be applied 2 times per season against scale, stink bugs and plum curculio.	14	
	Altacor 35 WDG	3-4.5 oz		10	
	Asana XL (R)	4.8-14.5 fl oz		14	
	Assail 30 SG	5.3-8 oz		7	
	Besiege (R)	6-12 fl oz	DO NOT use Imidan on sweet cherries. Use Imidan in blocks with scale infestations.	14	
	Delegate 25 WG	6-7 oz		7	
	Exirel	10-20.5 fl oz		3	
	Imidan 70W	2-4.25 lb		7	
	Intrepid 2 F	10-16 fl oz		7	
	Rimon EC	20-40 fl oz		8	
	Entrust 2SC (OMRI*)	4-8 fl oz		14	
	Deliver (OMRI*)	0.5-2 lb		0	
	Shenzi 700WG	1.5 -2.2 oz		10	
	Plum Curculio	Products listed in PETAL FALL or		Plum curculio: Apply insecticide after shuck split if greater than 1 plum curculio adult per 4 traps per week or begin sprays when you first detect fruit feeding damage in perimeter trees.	
		Apta	21-27 fl oz		14
Avaunt 30 WG		5-6 oz	14		
Besiege (R)		6-12 fl oz	14		
Imidan 70 WP		2.13-4.25 lb	14		
San Jose Scale	Admire Pro (foliar)	1.4-2.8 fl oz	Time spray against San Jose scale crawlers. Monitor for crawlers by wrapping double-stick tape around scale-infested limbs in early May. Inspect the tape weekly for yellow crawlers. The crawler period persists 2 to 3 weeks in May. Apply crawler spray at 10-day intervals as long as crawlers are detected.	7	
	Assail 30 SG	5.3-8 oz		7	
	Belay	6 fl oz		21	
	Centaur 70W	34.5 oz		14	
	Esteem 35 WP	4-5 oz		14	
	Movento	6-9 fl oz		7	
	Aza-Direct (OMRI*)	1-2 pt		0	
	BY MAY 1				
Initiate Peachtree Borer*** Scouting Program	REFER TO SECTION ON BORERS.		Place 2 peachtree borer pheromone traps on interior trees. These traps will indicate when moth flight begins and peaks. Delay peachtree borer trunk drench spray until you consistently catch peachtree borers in traps for at least two weeks.		
European Red Mite Twospotted Spider Mite	Acramite 50 WS	0.75-1 lb	Mite spray thresholds: Miticide spray recommended if mites exceed 2.5 mites per leaf in May, 5 mites per leaf in June and 7.5 mites per leaf in July. Repeat spray once 10 days later if live mites still exceed threshold. Use low rate of Acramite for twospotted mite or high rate for European red mite. Acramite can only be applied once per season. Agri-Mek is most effective if applied before leaves harden off. Apollo is most effective on eggs and newly hatched nymphs. Limit use to one Apollo application per year.	3	
	Agri-Mek 0.7 SC	2.25-4.25 fl oz		21	
	Apollo 4 SC (R)	2-8 oz		21	
	Envior 2 SC	16-18 fl oz	Use low rate of Nexter for European red mite or high rate for twospotted mite.	7	
	Nexter 75 WP	4.4 oz-10.7oz		7	
	Onager 1 EC	12-24 fl oz		7	
	Zeal 72WP	2-3 fl oz		7	
	Portal	2 pints		7	
			Apply using a minimum of 80 gallons of water per acre. Do not make more than 2 applications per year.		

CHERRY/PEACH/PLUM INSECT CONTROL—COMMERCIAL

Insect	Material and Formulation	Amount to Use/Acre	Remarks/Precautions	Days to Harvest
BY MAY 1	REFER TO SECTION ON BORERS			
Oriental Fruit Moth	SEE SHUCK SPLIT			
Plum Curculio	SEE SHUCK SPLIT		Plum curculio: Egg hatch of 2nd and 3rd generation Oriental fruit moth occurs from 1400-1700 DD (late May) and after 2300 DD have accumulated since the OFM biofix in mid-March. Plum curculio sprays are justified when you detect new fruit feeding damage in perimeter trees after 1200 DD (usually in early June) have accumulated since the PC biofix in late March.	
PREHARVEST				
Oriental Fruit Moth	Assail 30 SG	5.3-8 oz		7
Japanese Beetle	Admire Pro (foliar)	1.4-2.8 fl oz		7 (0 peach)
(late June to August)	Exirel	10-20.5 fl oz		3
Green June Beetle	Sevin XLR	3phi 2-3 qts	Sevin is suggested here since it can be used one day before harvest. Sevin and pyrethroid formulations may encourage mite outbreaks. Recommend spray against Oriental fruit moths if you averaged more than 5 mites per trap since the last spray.	7
(July to August)	Aza-Direct (OMRI*)	1-2p		0
Spotted-Wing Drosophila**	Malathion	2.4 pt		7
	Sevin XLR (not rated)	2-3 qt		7
	Entrust (not rated)	4-8 fl oz		7
	Pyganic 5 EC (OMRI*)	4.5-17 fl oz		0
SPECIAL PROBLEM/PEST OF CHERRY AND MAYBE LATE PEACHES				
*OMRI = Organic Materials Review Institute lists compounds approved for organic production.				
**** Spotted-Wing Drosophila (SWD) is a new invasive insect pest that was detected in ripening and ripened fruit in many Midwest states, including Arkansas, in 2013. The SWD larvae feed inside and damage ripening soft-skinned fruit, especially blackberry, blueberry, raspberry and strawberry . See the Arkansas SWD fact sheet: https://www.uaex.uada.edu/publications/PDF/FSA-7079.pdf . Begin monitoring for adult spotted-wing drosophila (SWD) in green fruit stage. Consider starting the (SWD) spray schedule when adults are first caught. Normal spray schedules should start 10 days prior to the first picking regardless of adult (SWD) trap catch. See the fact sheet 'Monitoring Spotted-Wing Drosophila in Arkansas' https://www.uaex.uada.edu/publications/pdf/FSA7088.pdf for more information. Fruit monitoring using a salt water drench can be an effective tool for determining whether spotted-wing drosophila (SWD) control efforts are effective. See the fact sheet 'Monitoring Spotted-Wing Drosophila in Arkansas' linked above.				
*** BORERS OF TREES – The peachtree borer and lesser peachtree borer often infest peach, apricot, cherry and plum trees. The lesser peachtree borer lays eggs on bark near scaffold wounds where larvae hatch and bore into wounds. This species appears to have two generations per year. This attack further weakens limbs. The peachtree borer lays eggs near trunk base and larva bores in trunk below the soil line. Some of the regularly applied insecticide cover sprays aid in suppressing lesser peachtree borers. However, adequate control of both pests requires a drench spray of the trunk and/or scaffold limbs. Pheromone traps are available to monitor moth emergence of both pests. Where lesser peachtree borers have been a problem, spray 7-14 days after moth emergence begins in April and repeat in June for second generation hatch.				
**** All Chlorpyrifos products are banned on all food crops as of March 2022. Trunk drenches or sprays with these products will no longer be a means for control of peachtree borer or lesser peachtree borer. For more information on alternatives see the SE Peach IPM guide https://secure.caes.uga.edu/extension/publications/files/pdf/B%201171_18.PDF				
Lesser Peachtree Borer***	Asana XL (R)	4.8-14.5 fl oz	Where lesser peachtree borer has been a light to moderate problem, apply insecticide once at the peak of the second moth flight (in June or July). Where lesser peachtree borer has been a moderate to heavy problem, make two applications: one 7 to 14 days after emergence of first-generation moths begins (spray mid-April to mid-May) and the second at the peak of the second generation moth flight (often in June or July).	14
	Mustang Maxx (R)	1.28-4 fl oz		14
	Pounce 25 WP (R)	6.4-16 oz	Use only Pounce, Ambush or Warrior on plums.	14
	Warrior (R)	2.56-5.12 fl oz		14
Peachtree Borer***	Asana XL (R)	4.8-14.5 fl oz		14
	Besiege (R)	6-12 fl oz		14
	Warrior II (R)	1.28-2.5 fl oz		14

CHERRY/PEACH/PLUM INSECT CONTROL—COMMERCIAL

Insect	Material and Formulation	Amount to Use/Acre	Remarks/Precautions	Days to Harvest
GRANULATE AMBROSIA BEETLE – The granulate ambrosia beetle <i>Xylosandrus crassiusculus</i> (Mot.) is a relatively new pest in Arkansas and can cause significant damage in nursery, landscape and orchard settings. Female beetles bore into the sapwood of stems and young trees. Though attracted to damaged, stressed or transplanted trees, the granulate ambrosia beetle also attacks seemingly healthy, thin-barked hardwoods or branches from 1.0-2.5 inches in diameter (sometimes larger). Visible symptoms include wilted foliage and strands of boring dust protruding from small holes. These insects make galleries directly into the heartwood of the tree, which they inoculate with an ambrosia fungus (<i>Ambrosiella</i> spp.) which is used as their food source. In addition, they can introduce or create entry points for pathogenic fungi such as <i>Fusarium</i> spp. Death is more likely related to these pathogenic fungi that block xylem vessels. Young infested trees often die, while more established trees may survive. Infestations can be identified by toothpick-like strands of boring dust protruding up to 1.5 inches from the host plant. The strands are produced by the female beetle as she excavates her gallery. The strands are fragile and are easily broken off by wind or rain leaving only pencil-lead sized holes. Heavily infested plants or plant parts should be removed and destroyed. Once trees are infested, the beetle cannot be killed within the plant, and fungicides are ineffective against the fungus. Protective sprays on trunks may be attempted on susceptible nearby plants. Trunk/limb sprays of a labeled insecticide containing a pyrethroid insecticide may be effective as a preventative, but multiple applications of the pyrethroids may have to be made during the time the beetles are active. Always read and follow label directions for the insecticide used. Keep trees healthy and avoid any unnecessary tree stress (drought, injury, nutrition, etc.). Check trees frequently beginning early March and treat accordingly. Use ethyl alcohol based traps to monitor for adult beetles in the spring (see UA Extension Fact Sheet FSA-7064). Use a protective insecticide as soon as beetle activity starts.				
RED IMPORTED FIRE ANTS (ALL FIRE ANT BAITS) – Apply when ants are active and soil temperature is above 60 degrees F. DO NOT treat if rain is anticipated within 6 hours.				
Non-Bearing Trees	Hydramethylnon (Amdro Pro)	2-5 Tbsp/mound 1.0-1.5 lb/acre	Mound-to-mound treatment rate. Broadcast rate.	
	Pyridine (Distance)	1-4 Tbsp/mound 1.0-1.5 lb/acre	Mound-to-mound treatment rate. Broadcast rate. This is an IGR.	
	S-methoprene + hydramethylnon (Extinguish Plus)	3-5 Tbsp/mound 1.0-1.5 lb/acre	Mound-to-mound treatment rate. Broadcast rate. This product is an IGR plus a toxicant.	

GRAPE INSECT CONTROL—COMMERCIAL

Insect	Material and Formulation	Amount to Use/Acre	Remarks/Precautions	Days to Harvest
DORMANT				
Grape Scale	Look for weakened vines with loose trunk bark, peel bark off and check for grape scale. Flag vines that have live grape scale. See BUD SWELL about scale oil spray and PREBLOOM TO BLOOM for timing grape scale crawler spray.			
BUD SWELL				
Grape Scale	Superior oil (70 sec viscosity)	4 gal	Spray trunk and cordons of scale-infested vines by bud swell.	0
Flea Beetle	Altacor 35 WDG (not rated)	3-4.5 oz	During bud swell, scout at least twice weekly for feeding holes in buds, or during daylight, check for presence of bluish-black flea beetle adults on buds or inspect buds after dusk for presence of cutworms. Spray weekly as long as there is more than 1% new bud damage.	14
Climbing Cutworm	Baythroid XL (R)	2.4-3.2 fl oz		3
	Danitol 2.4EC (R)	5 1/3-10 2/3 fl oz		21
	Delegate 25 WG	3-5 oz		7
	Sevin XLR	1-2 qt		7
	Success	4-8 fl oz		7
	Entrust 2SC (OMRI*)	4-6 fl oz		3
	Deliver (OMRI*)	0.5-1 lb		0
BUD BREAK				
Flea Beetle Climbing Cutworm	See BUD SWELL SPRAY			
BY APRIL 1				
Initiate grape berry moth scouting program	Place 3 grape berry moth pheromone traps at eye level on perimeter trees of woods adjacent to vineyard (overwintering site of grape berry moth) and check twice weekly to record first consistent moth emergence (mid April) = GBM biofix . Be sure to keep trap bottoms clean and replace lures monthly or every two months for long-life lures. After GBM biofix date, begin calculating number of daily degree days (DD) using base 47°F = DD = (maximum daily temperature + minimum daily temperature) / 2 – 47.			
PREBLOOM TO BLOOM				
Honeybees	Since insects do not pollinate grapes, there is no danger to honeybees at this time unless they are working on blooming weeds in the vineyard. Mow drive row before spraying grapes to eliminate blooms on weeds in drive row.			
Flea Beetle Larvae	See BUD SWELL		Check for presence of flea beetle larvae on leaves any time between 4 to 10 inches of shoot growth and bloom.	
Rose Chafer	Assail 30 SG	2.5-5.3 oz	Check for rose chafer on clusters during and after bloom.	3
	Assail 70 WP	1.1-2.3 oz		3
	Danitol 2.4 EC (R)	10 2/3 -21.3 floz		21
	Imidan 70W	1 1/2-2 1/8 lb		14
	Sevin XLR	1-2 qt		7

GRAPE INSECT CONTROL—COMMERCIAL

Insect	Material and Formulation	Amount to Use/Acre	Remarks/Precautions	Days to Harvest
BY MAY 15				
Grape Berry Moth (eggs)	Intrepid 2F See SHATTER for other formulations	8-16 fl oz	Move grape berry moth pheromone traps into the vineyard interior. Grape berry moth larvae usually hatch and feed on perimeter grape clusters from mid-May to early June or from 400-800 DD since GBM biofix in April. Begin weekly inspections of 100-200 clusters in the perimeter and second row for new berry moth larvae tunneling under the berry skin (damaged berry skin appears pink to purple). Spray the perimeter vines in May to early June, if greater than 1% clusters damaged by berry moth. Intrepid is an insect growth regulator that provides control of grape berry moth if first applied just before initiation of grape berry moth hatch (200-300 DD) and reapplied 10 days later.	30
Foliar Grape Phylloxera	Admire Pro	7-14 oz	Grape phylloxera crawlers produce second generation foliar galls in May. These crawlers mature and produce additional generations of crawlers on susceptible cultivars including Catawba, Cayuga White, Chambourcin, Chardonnay, Delaware, Norton/Cynthiana, Reliance, Vignoles and Vidal). Apply insecticide in May against grape phylloxera crawlers when you first see expanding terminal leaves on susceptible vines with a rash-like appearance (new leaf galls forming). For Admire Pro to be effective against grape phylloxera, it must be applied to soil around vines and watered in by irrigation or rain in early April to move systemically up trunk into leaves (see BUD BREAK).	30
Spider Mites	Assail 30 SG	2.5-5.3 oz	Use of Induce® adjuvant only with Movento is prohibited once fruit are present due to adverse plant compatibility.	3
	Danitol 2.4EC (R)	10 2/3-21 1/3 fl oz		21
	Movento	6-8 oz		7
	Agri-Mek 0.7 SC (R)	1.75-3.5 fl oz plus nonionic surfactant	Spider mite flare-ups may occur due to road dust coating grape leaves. Apply miticide between 1 and 5 spider mites per leaf.	28
	Acramite 50WS	0.75-1.0 lb	Make no more than 2 applications of Vendex per season no closer than 21 days apart.	14
	Nealta 1.67 SC	13.7 fl oz		14
Leafhopper	Pyramite	3.3 oz (dilute rate)		7
	Vendex 50WP	1.0-2.5 lb		28
	JMS Stylet Oil (OMRI*)	1-2 gal	Phytotoxicity: DO NOT apply sulfur within 10 days of JMS Stylet Oil application, but you can repeat oil spray every 10-14 days.	0
	M-Pede (OMRI*)	2 gal/100 gal	Phytotoxicity: M-Pede should not be applied to <i>Vitis vinifera</i> or <i>Calmeria</i> grapes. M-Pede may cause plant injury if plants are drought stressed or temperatures exceed 90°F or burned by sulfur if applied within 3 days of sulfur application. M-Pede may alter the waxy bloom of grape and affect quality rating of table grapes.	0
	Portal	2 pints	Do not make more than 2 applications per year.	14
Leafhopper	See SHATTER			
	Assail 30 SG	2.5-5.3 oz	DO NOT make more than two applications per season at 14-day interval.	3
SHATTER				
Grape Berry Moth (newly hatched) Leafrollers	Deliver (OMRI*)	2 lb	Grape berry moth: Spray if greater than 1% of clusters in perimeter vines are damaged by grape berry moth.	0

GRAPE INSECT CONTROL—COMMERCIAL

Insect	Material and Formulation	Amount to Use/Acre	Remarks/Precautions	Days to Harvest				
SHATTER (cont.)								
Rose Chafer	Actara WG	1.5-3.5 oz	Actara has a 14-day minimum interval between applications. DO NOT make more than two applications per season at 14-day interval.	5				
Grape Curculio	Admire Pro	1.0-1.4 fl oz	Admire Pro used as a foliar spray against sucking insects: leafhoppers and grape mealy bugs. Grape curculio (the legless larvae that feed in berries from mid-June into July): These larvae have recently attacked grape blocks receiving only a perimeter spray against grape berry moth. Starting on June 15, check clusters weekly in the unsprayed vineyard interior for new berry damage by these legless larvae.	0				
Japanese Beetle								
Leafrollers	Altacor 35 WDG	2-4.5 oz	Leafhopper: Inspect leaves in four locations for white stippling by leafhopper. If stippled, inspect underside of 5 leaves on each of 5 vines in 4 locations for presence of leafhoppers. Spray if greater than 5 leafhopper nymphs found per leaf.	14				
Leafhoppers								
Grape Mealy Bug	Assail 30 SG Assail 70WP Avaunt DG Brigade 2 EC (R) Danitol 2.4 EC (R) Entrust 2SC Imidan 70W Intrepid 2F Sevin XLR Sivanto 200 SL Shenzi 700WG	2.5-5.3 oz 1.1-2.3 oz 5-6 oz 3.2-6.4 oz 10.6-21.3 fl oz 4-8 fl oz 1 1/3-2 1/8 lb 8-16 fl oz 1-2 qt 7-10.5 fl oz 1.0-2.2 oz	Sivanto is applied to foliage. See label for species controlled.	3 3 7 30 21 3 14 30 7 0 14				
FIRST COVER TO VERASION								
Grape Berry Moth					See SHATTER	Spray whole vineyard if greater than 1% of clusters damaged by grape berry moth. Second- and third-generations of grape berry moth hatch in mid to late June (1330-1700 DD), and after mid-July (2300 DD) or continue weekly inspections of 100 to 200 clusters in the perimeter and second row for new grape berry moth larvae tunneling.		
Rose Chafer					Assail 30SG	2.5-5.3 oz	Leafhopper usually is not a problem in Arkansas. You can inspect underside of leaves weekly and spray if you detect more than 10 nymphs per leaf.	3
Leafhopper					Movento	6-8 fl oz	Use of Induce® adjuvant only with Movento is prohibited once fruit are present due to adverse plant compatibility.	7
Grape Mealybug								
					Sevin XLR	1-2 qt		7
VERASION TO HARVEST								
					See SHATTER			
Grape Berry Moth							Spray whole vineyard if greater than 1% of clusters damaged by grape berry moth.	
Japanese Beetle					See SHATTER		Continue weekly monitoring for insect pests. Apply insecticides as needed.	
Leafhopper					Danitol 2.4 EC (R)	10.67-21.33 fl oz	Japanese Beetle: This is a pest that was introduced to Northwest Arkansas in the late 1990s and became an economic pest defoliating grapes and other fruits and ornamentals by 2002. Late June and July, Japanese beetles will defoliate most of the canopy of susceptible grapes on Norton, Vidal, Vignoles, Chambourcin, Cabernet Franc and others. Weekly insecticide sprays are required to prevent foliar damage.	21
					Mustang Maxx (R)	4.0 fl oz		1

GRAPE INSECT CONTROL—COMMERCIAL

Insect	Material and Formulation	Amount to Use/Acre	Remarks/Precautions	Days to Harvest
VERASION TO HARVEST				
Grape Berry Moth Japanese Beetle Leafhopper	Sevin XLR	2 qt		7
	Surround WP (OMRI*)	25-50 lbs	Surround applied to white-washed foliage will suppress/prevent Japanese beetle defoliation but should be reapplied as often as needed to keep vines white-washed, especially after a rain. Surround is approved for organic production.	0
Multicolored Asian Lady Beetle**	Belay 2.13SC	2-4 fl oz	See Multicolored Asian Lady Beetle**. Scout vineyards several days before harvest to determine the abundance of multicolored Asian lady beetle. Additional insecticides (including Baythroid and Mustang Maxx) have short pre-harvest intervals, and although not labeled specifically for this pest, they have been effective in trials and vineyard use.	0/30
	Scorpion 35SL	2-5 fl oz (foliar) 9-10.5 fl oz (soil)	Restriction: Regardless of application method, do not apply more than a total of 20.9 fl oz/A of SCORPION 35 SL INSECTICIDE (0.529 lb ai/A) per season. See label.	28
	Venom 70SG	5-7.5 (0.219-0.328 lb ai/A)		28
Green June Beetle	Sevin XLR	2 qt	In July and early August, green June beetles will feed on and damage ripening fruit. Apply spray in July when first beetles enter the vineyard. Reapply as needed (weekly).	7
Grape Root Borer			All Chlorpyrifos containing products are banned for use on all food crops as of March 2022. Soil drenches or sprays with these products will no longer be a means for control of Grape Root Borer. See the SE grape IPM guide for information about alternatives https://smallfruits.org/files/2021/02/2021-Bunch-Grape-Spray-Guide.pdf .	35
	Cultural Control		Cultural tactic: Maintain weed-free area under vines. Use a grape root borer pheromone trap to detect first moth emergence. Use grape hoe at first catch of grape root borer moths and repeat 1 month later to pile soil to 4- to 6-inch depth and 1-foot width on both sides of trunk. Mounded soil needs to be removed by September 1. This practice will greatly suppress moth ability to emerge from the soil.	
Spotted-Wing Drosophila	So far, no reports of fly larvae in grape berries		See blackberry and raspberry, blueberry and strawberry sections in MP144.	

*OMRI = Organic Materials Review Institute lists compounds approved for organic production.

****Multicolored Asian Lady Beetle** (MALB), a late season vineyard inhabitant, can significantly reduce wine quality. These beetles are attracted to ripening grapes as a source of sugars in late summer and fall. They may congregate, often by the hundreds or thousands, in and among grape clusters from August through October. Although they may cause direct yield loss, they more often reduce wine quality when sufficient numbers become trapped in the harvested grapes and are crushed along with the grapes at the winery. MALB secretes a defense chemical when they are stressed. This defense chemical causes wine to smell “dirty” (a musty, damp odor), masking the flavors and smells of the grapes. As few as two MALB per lug of grapes can alter wine flavor and bouquet enough to be detected. Excessive numbers of MALB in grape clusters are most common in late-ripening varieties such as Cabernet Franc, Cabernet Sauvignon, Chambourcin, Riesling, Vidal and Vignoles, but earlier grapes that are prone to cracking can also be infested. Scout vineyards several days before harvest to determine the abundance of MALB.

HOME ORCHARD SPRAY SCHEDULE

Insect	Material and Formulation	Amount to Use in 3 Gal Sprayer*	Spray and Time of Application	Trees to Receive Application	Days to Harvest
Scales, Aphids and Spider Mites	Superior Oil	7.6 fl oz	Apply a 2% oil solution during dormant stage before buds swell in spring.	Apple, Pear, Stone fruits	0
PINK TO ½” GREEN					
Rosy Apple Aphid	Greenlight Conquest Conc.	6 oz	At pink, look weekly for curling leaves around the fruit clusters and for rosy apple aphids on underside of curling leaves.	Apple	1
Spider Mites	Malathion	9 Tbsp	Apply spray to underside of leaves when you see 1 or more mites per leaf.	Apple, Pear, Stone fruits	3
	M-Pede (OMRI**)	5 Tbsp			
	JMS Stylet Oil (OMRI**)	7.6 Tbsp			
BLOOM			SAVE THE BEES!! DO NOT APPLY INSECTICIDES DURING BLOOM.		
PETAL FALL (90% of petals have fallen)					
Plum Curculio San Jose Scale Codling Moth	Fruit Tree Spray mix: Sevin + Malathion + Captan or Surround (OMRI**)	4.5-7.5 Tbsp 0.75-1.5 lb	Pick up fruit drops weekly and bury them to kill plum curculio larvae inside the fruit. This practice helps lessen the plum curculio population in following years. In April and May, maintain a white-washed appearance of canopy with a spray of Surround to suppress plum curculio damage of fruit. Codling moth only attacks apple and pear.	Apples, Pear, Stone fruits	14 0
Codling Moth (newly hatched larvae on apple or pear)	<u>Virus formulations</u> Carpovirusine (OMRI**) CYD-X (OMRI**) Virosoft CP4 (OMRI**)	1-2.4 tsp 0.5-1 tsp 0.5 tsp	Apply to tree as soon as first codling moth entry hole or insect frass is seen on fruit. Apply weekly as necessary during hatch period. Keep the virus formulation refrigerated to keep the virus alive.	Apple and pear	1 0 0
Oriental Fruit Moth (newly hatched larvae)	Entrust 2SC (OMRI**) <u>Formulations of <i>Bt</i> bacteria</u> Biobit HP (OMRI**) Deliver (OMRI**)	1-1.5 tsp 0.5-1 Tbsp 0.5-2 Tbsp	Oriental fruit moth and leafrollers: Apply to tree as soon as first Oriental fruit moth entry hole or insect frass is seen on fruit. Apply weekly as necessary during hatch period.	Apples, Stone fruits	7 0 0
FIRST COVER (10-14 days after PETAL FALL)					
Plum Curculio Codling Moth	Fruit Tree Spray mix: Sevin + Malathion + Captan or Surround (OMRI**)	4.5-7.5 Tbsp 0.75-1.5 lb	Surround should be reapplied as often as needed to keep plants white-washed, especially after a rain or as new foliage emerges.	Apple, Pear, Stone fruits	14 0
SECOND COVER (10-14 days after FIRST COVER)					
Plum Curculio Codling Moth San Jose Scale	Fruit Tree Spray mix: Sevin + Malathion + Captan or	4.5-7.5 Tbsp	Mites and scale can be suppressed with M-Pede or JMS Stylet Oil when applied at 2 to 3 week intervals starting in early May. Or, place Japanese fruit bags around pome or stone fruits when they reach 1/2 inch diameter a couple weeks after petal fall. These bags will prevent disease and insect damage to pome and stone fruits. Remove outer bag 3 weeks before harvest to develop full fruit color.	Apple, Stone fruits	14
	M-Pede (OMRI**) or	5 Tbsp			0
	JMS Stylet Oil (OMRI**) or	7.6 Tbsp			0
	Surround (OMRI**) or	0.75-1.5 lb			0
	Japanese Fruit Bags (OMRI**)				0

HOME ORCHARD SPRAY SCHEDULE

Insect	Material and Formulation	Amount to Use in 3 Gal Sprayer*	Spray and Time of Application	Trees to Receive Application	Days to Harvest
THIRD COVER (10-14 days after SECOND COVER)					
Codling Moth Plum Curculio San Jose Scale Flatheaded Apple Tree Borer	Fruit Tree Spray mix: Sevin + Malathion + Captan or Surround (OMRI**)	4.5-7.5 Tbsp 0.75-1.5 lb	In late April, begin applying insecticide to trunks at three-week intervals to suppress flatheaded apple tree borer.	Apple, Pear, Stone fruits	14 0
Japanese Beetle	Surround (OMRI**)	0.75-1.5 lb	All July , maintain a white-washed appearance of canopy with spray of Surround to suppress Japanese beetle defoliation of canopy (white clay residue on fruit can be washed off). Or, apply weekly sprays of Sevin to prevent canopy defoliation (spray top third of tree).	Apples, Blackberries, Raspberries, Cherries, Grapes, Stone fruits	0
	Sevin	9 Tbsp			7
Spotted-Wing Drosophila***	Greenlight Conquest Conc.	6 oz	Monitor: Set up monitoring traps a couple weeks before harvest begins (see online information listed below). Cultural tactic: A week before harvest begins, cover fruiting plants with fine netting (0.98 mm) such as floating row cover to exclude flies before they lay eggs on fruit.	Blackberry, Blueberry, Cherry, Raspberry, Strawberry	1
	Malathion	9 Tbsp	Sprays: If fly numbers are high and other methods are not providing adequate control, use insecticides registered for home use, such as spinosyns (Entrust), pyrethrins (Pyganic), malathion and carbaryl (Sevin) reapplied on 5- to 7-day intervals.		3
	Sevin	9 Tbsp			7
	Pyganic (OMRI)	6-12 Tbsp			0
	Entrust (OMRI**)	1-1.5 tsp			7

SPECIAL PROBLEM/PEST OF BLACKBERRY, BLUEBERRY, CHERRY, RASPBERRY AND STRAWBERRY

***Conversions:** 1 fl oz = 2 tablespoons (T); or 1 fl oz = 6 teaspoons (t)

****OMRI** = Organic Materials Review Institute lists compounds approved for organic production.

*****Spotted-Wing Drosophila (SWD)** is a new invasive insect pest that was detected in ripening and ripened fruit in many Midwest states, including Arkansas, in 2013. The SWD larvae feed inside and damage ripening soft-skinned fruit, especially **blackberry, blueberry, raspberry and strawberry**. See the Arkansas SWD fact sheet: <https://www.uaex.uada.edu/publications/PDF/FSA-7079.pdf>. Begin monitoring for adult spotted-wing drosophila (**SWD**) in green fruit stage. Consider starting the (**SWD**) spray schedule when adults are first caught. Normal spray schedules should start 10 days prior to the first picking regardless of adult (**SWD**) trap catch. See the fact sheet 'Monitoring Spotted-Wing Drosophila in Arkansas' <https://www.uaex.uada.edu/publications/pdf/FSA7088.pdf> for more information. Fruit monitoring using a salt water drench can be an effective tool for determining whether spotted-wing drosophila (**SWD**) control efforts are effective. See the fact sheet 'Monitoring Spotted-Wing Drosophila in Arkansas' linked above.

HOME ORCHARD SPRAY SCHEDULE

Organic Agriculture Suppliers	Address/Online URL	Phone and Fax
Marbleseed (best list of organic suppliers)	P.O. Box 339, Spring Valley, WI 54767 Online: https://www.marbleseed.org/about	Ph: 888-906-6737 (toll free)
Organic Agriculture Resources list	Dr. Kathleen Delate, Depts. of Agronomy/Horticulture, 106 Horticulture Hall Iowa State University, Ames, IA 50011 Online: http://extension.agron.iastate.edu/organicag/	Ph: 515-294-7069 Fax: 515-294-0730
AgBio, Inc. (flathead apple tree borer trap, insect traps and lures, Pyganic)	9915 Raleigh Street, Westminster, CO 80031 Online: http://www.agbio-inc.com	Ph: 303-469-9221 Fax: 303-469-9598
Ag Resource, Inc. (irrigation and production supplies, soil amendments, pest controls, equipment)	35268 State Highway 34, Detroit Lakes, MN 56501 Online: http://www.agresourceincmn.com/	Ph: 218-847-9351 Ph: 800-288-6650
NovaSource (Surround Crop Protectant)	2255 N. 44th Street, Suite 300, Phoenix, AZ 85008-3279 Online: https://www.novasource.com/en/products/surround	Ph: 800-525-2803
Gardens Alive (beneficial insects, soil amendments, pet care, cover crops, Codling moth trap, pest controls: Oil-Away™ Supreme Insecticidal Oil, Surround at Home® Crop Protectant)	5100 Schenley Place, Lawrenceburg, IN 47025 Online: http://www.gardensalive.com	Ph: 513-354-1482 Ph: 513-354-1483 Fax 513-354-1484
Peaceful Valley Farm and Garden Supply, Inc. (organic farming supplies, Codling moth trap, seeds, plants, soil amendments, pest control: Cyd-X, JMS Stylet oil, Dipel, Entrust, Pyganic, Surround Crop Protectant, M-Pede Insecticidal Soap)	P.O. Box 2209, 125 Clydesdale Court, Grass Valley, CA 95945 Online: http://www.groworganic.com	Ph: 888-784-1722 Ph: 530-272-4769
Rincon-Vitova Insectaries, Inc. (distributors of beneficial insects for controlling pests biologically)	P.O. Box 1555, Ventura, CA 93002 Online: www.rinconvitova.com	Ph: 805 643-5407 Ph: 800-248-2847 Fax: 805-643-6287
Seven Springs Farm (Pest Controls: Copper, Bt-Javelin, Neemix, Pyganic, Entrust, M-Pede, Surround Crop Protectant)	426 Jerry Lane NE – Check, VA 24072 Online: http://www.7springsfarm.com	Ph: 540-651-3228 Ph: 800-540-9181
Orchard Valley Supply (6" x 7" green outside x red inside color coated paper bag for maturing/protecting apples. Also known as Japanese Fruit Bags. Sold in bundles of 100.)	1104 East Mead, Yakima, WA 98903 Online: https://orchardvalleysupply.com/	Ph: 1-888-755-0098 Fax: 509-453-1258

PECAN INSECT CONTROL—COMMERCIAL

Disclaimer: Not all recommended formulations are listed below. Additional formulations, each with Class/Mode of Action information, can be found online on Pecan IPM PIPE where you click “Toolbox,” click “Insecticides Search,” and then search for recommended insecticides by pest name (conventional or approved for organic) at <https://pecan.agpestmonitor.org/ipmtoolbox/>.

Insect	Material and Formulation	Amount to Use/Acre	Remarks/Precautions	Days to Harvest
Obscure Scale	Superior oil emulsion	3 gal	Apply 1%-2% horticultural oil spray November-December and again in February. Scale populations build slowly but can reach damaging levels before becoming obvious.	
Phylloxera	Centric 40 WG	2.0-2.5 oz	Native trees and improved varieties vary in susceptibility to phylloxera. This insect is not highly mobile, and infestations are often limited to a few trees. Treatments should be applied to those trees previously infested and those adjacent to them. There are many generic formulations available of imidacloprid. Control must be initiated at bud break (April). A hand lens should be used to confirm that phylloxera are present. Marking infested trees that have galls in May will facilitate identification of potential treatment sites next year.	14
	Movento	6-9 fl oz		7
	Trimax Pro	1.3-2.6 oz		7
	Warrior (R)	1.28-2.56 fl oz		14
	Imidacloprid (various)	1.3-2.6 fl oz		7
	Province II (R)	1.28-2.56 oz		14
Pecan Nut Casebearer	Belay SC	3-6 fl oz	Be careful using pyrethroids (IRAC 3A) because they kill natural enemies of aphids and mites resulting in outbreaks. Longer residual activity may be expected with the insect growth regulators (Confirm and Intrepid). First-generation larvae are the most damaging and generally occur in May. Timing of sprays requires monitoring adult moths in pheromone traps and following accumulated temperature models. Sprays are warranted when 2% to 4% of the clusters are infested or damaged. To see when to begin inspecting clusters in your orchard, go online on to the Pecan IPM PIPE web site on Pecan Nut Casebearer Risk Map at https://pecan.agpestmonitor.org/pecan-nut-casebearer-risk-map/	21
	Dimilin 2L	8-16 oz		28
	Intrepid 2 F	4-8 oz		7
	Mustang Maxx (R)	3.2-4.0 fl oz		7
	Warrior (R)	1.28-2.56 fl oz		14
	Entrust (OMRI*)	4-10 fl oz		1
	Belt	3-4 fl oz		14
	Altacor 35 WDG	2-4.5 oz		10
	Delegate	4.5-7 oz		1
	Confirm 2F	8-16 fl oz		14
Spittle Bug	Shenzi 700WG	1.0-2.2 oz		10
	Trimax Pro	1.3-2.6 fl oz		7
Yellow or Black Pecan Aphids	Assail 30SG	2.5-9.6 oz	Black aphids are more damaging than yellow aphids because they inject a toxin between leaf veins causing an area up to 1/4 inch in diameter to turn brown and die. Treatments are recommended when there is an average of one black aphid per compound leaf or 25 yellow aphids per compound leaf. Leaf samples should be randomly collected from different trees throughout the orchard. Aphid treatment is strongly discouraged before July. Use 7 oz of Provado for black aphids. Separate applications for yellow aphids are generally not recommended.	14
	Belay SC	3-6 fl oz		21
	Centric 40 WG	2.5 oz		14
	Fulfill 50 WG	4 oz		14
	Movento	6-9 oz		7
	Mustang Maxx (R)	3.2-4.0 oz		7
	Nexter	4.4-10.7 oz		7
	Warrior (R)	1.28-2.56 fl oz		14
	Closer 2SC	1.5-2.75 fl oz		7
Pecan Weevil	Asana XL (R)	4.8-14.5 oz	The majority of weevils emerge from soil after a heavy rain as early as August 15, especially on sandy soils. Treatments are generally warranted in infested orchards in late August. Monitoring circle traps on trunks will detect emerging adults and aid timing of treatments. Multiple applications may be required. Pecans are most susceptible to injury from gel stage to shuck split. Sevin is best for weevils alone but is not effective against aphids, mites or stink bugs and may cause mite problems.	21
	Imidan 70 WP	2-3 1/8 lb		14
	Mustang Maxx (R)	3.2-4.0 oz		7
	Sevin	2-5 qts		14
	Warrior (R)	2.56-5.12 oz		14
	Brigade (R, WSB)	12.8-32 oz		21
	Province (R)	2.56-5.12 fl oz		14
	Grizzly Z (R)	2.56-5.12 fl oz		14
	Lambda-CY EC (R)	2.56-5.12 fl oz		14
	Hero (R)	10.3 oz		21

PECAN INSECT CONTROL—COMMERCIAL

Disclaimer: Not all recommended formulations are listed below. Additional formulations, each with Class/Mode of Action information, can be found online on Pecan IPM PIPE where you click “Toolbox,” click “Insecticides Search,” and then search for recommended insecticides by pest name (conventional or approved for organic) at <https://pecan.agpestmonitor.org/ipmtoolbox/>.

Insect	Material and Formulation	Amount to Use/Acre	Remarks/Precautions	Days to Harvest
Stink Bugs	Imidan 70 WP	2-3 1/8 lb	Stink bugs are mobile pests that build populations on many broadleaf plants. Problems are often associated with orchards next to soybean. Some states recommend treatment when populations exceed one insect per 40 terminals. If stink bugs are present from water through dough stages, apply treatments to minimize stink bug feeding and pecan nut damage.	14
	Mustang Maxx (R)	3.2-4.0 oz		7
	Warrior (R)	1.28-2.56 fl oz		14
Leaffooted Bugs	Same as Stink Bug			
	Brigade (R, 2EC)	3.2-12.8 fl oz		21
	Bifenthrin	3.2-12.8 fl oz		21
	Fanfare (R)	3.2-12.8 fl oz		21
	Sniper (R)	3.2-12.8 fl oz		21
	Endigo ZC (R)	5-6 fl oz		14
	Girzzly Z (R)	2.56-5.12 fl oz		14
	Silencer (R)	2.56-5.12 fl oz		14
Hickory Shuckworm	Intrepid 2 F	4-8 oz	Treatments are warranted in orchards with a history of shuckworm infestation. Multiple applications may be required. Pecans are most susceptible to hickory shuckworm after the gel stage. Sampling is very difficult, although adult moths can be monitored using commercially available pheromone traps. Once traps begin catching shuckworm moths, growers can begin weekly inspections of nuts for egg cemented to the shuck in a creamy white substance.	7
	Entrust (OMRI*)	1.25-2.5 oz		1
	Confirm 2F	8-16 fl oz		14
	Intrepid Edge	4.0-6.4 fl oz		7
	Altacar	2.0-4.5 fl oz		10
	Belt	3-4 fl oz		14
	Shenzi 700WG	1.0-2.2 oz		10
Mites	Acramite 50WS	12-16 oz	Mites are usually more of a problem in hot, dry periods or outbreaks occur after application of a pyrethroid or Sevin insecticides that kill the natural mite predators. Treat when leaf discoloration is noted and an average of 8 or more mites are found per compound leaf. Portal may only be applied once per season (do not apply by air).	14
	Evidor 2SC	14-18 oz		7
	Portal	2 pt		14
	Zeal	2-3 oz		28
Fall Webworm	Intrepid 2 F	4-8 oz		7
Walnut Caterpillar	Sevin	2-5 qts	Sevin may cause mite problems to increase.	14
	Dipel (OMRI*)	0.5-2.0 lb		0
	Entrust (OMRI*)	4-10 fl oz	Entrust is for fall webworm only.	1
RED IMPORTED FIRE ANTS (ALL FIRE ANT BAITS) – Apply when ants are active and soil temperature is above 60 degrees F. DO NOT treat if rain is anticipated within 6 hours.				
Non-Bearing Trees	Hydramethylnon (Amdro Pro)	2-5 Tbsp/mound 1.0-1.5 lb/acre	Mound-to-mound treatment rate. This is an IGR. Broadcast rate.	
	S-Methoprene (Extinguish)	3-5 Tbsp/mound 1.0-1.5 lb/acre	Mound-to-mound treatment rate. This is an IGR. Broadcast rate.	
	Pyriproxyfen (Esteem)	2-4 Tbsp/mound 1.5-2.0 lb/acre	Mound-to-mound treatment rate. This is an IGR. Broadcast rate.	
	S-methoprene + hydramethylnon (Extinguish Plus)	3-5 Tbsp/mound 1.0-1.5 lb/acre	Mound-to-mound treatment rate. This is an IGR and a toxicant. Broadcast rate.	
	Pyridine (Distance)	1-4 Tbsp/mound 1.0-1.5 lb/acre	Mound-to-mound treatment rate. This is an IGR. Broadcast rate.	
	Pyriproxyfen (Esteem)	2-4 Tbsp/mound 1.5-2.0 lb/acre	Mound-to-mound treatment rate. This is an IGR. Broadcast rate.	
Bearing Trees	Pyriproxyfen (Esteem)	2-4 Tbsp/mound 1.5-2.0 lb/acre	Mound-to-mound treatment rate. This is an IGR. Broadcast rate.	

*OMRI = Organic Materials Review Institute lists compounds approved for organic production.

STRAWBERRY INSECT CONTROL

Insect	Material and Formulation	Amount to Use/Acre	Remarks/Precautions	Days to Harvest
PREBLOOM				
Strawberry Clipper	Brigade WSB (R)	6.4-32 oz	Begin checking for clipped buds when the first flower appears. If clipped buds are found, apply insecticide and repeat spray at 10-day intervals as long as bud clipping continues.	0
	Danitol 2.4EC (R)	16-21.3fl oz		2
	Sevin 4F	1-2 qt		7
Tarnished Plant Bug	Admire Pro	1.3 fl oz	Admire Pro as a foliar spray of spittlebug.	7
	Assail 30 SG	4-6.9 oz	Do not make more than 2 applications per calendar year.	1
	Transform WG	1.5-2.25 oz		1
Spittlebug	Assail 30 SG	4-6.9 oz	DO NOT apply Assail more than twice per season.	1
	Beleaf 50 SG	2.8 oz		0
	Brigade WSB (R)	6.4-32 oz		0
	Danitol 2.4EC (R)	10.67 fl oz	Rimon is labeled against tarnished plant bug but not spittle bug. If spittlebugs are a problem, spray when buds first become visible and make a second application just before the first blossoms open.	2
	Rimon 0.83EC	9-12 fl oz		1
	Sevin 4F	1.5 -2 qt		7
Spider Mites	Acramite 50 WS	0.75-1.0 lb	Label allows up to two applications of Acramite or Kanemite per season.	1
	Agri-Mek 0.7 SC (R)	3.5 fl oz		3
	Danitol 2.4EC (R)	10 2/3 oz		2
	Kanemite 15 SC	21-31 fl oz	Minimize road dust to prevent spider mite buildup.	1
	Nealta 1.67SC	13.7 fl oz		1
	Oberon 2 SC	12-16 fl oz		3
	Portal 0.4 EC	2 pt	JMS Stylet-oil is approved for organic production. Release predatory mites for biological control of spider mites. Predator mites can be released when prey mite levels are between 1-5 mites per leaf. In general, release 2-3 predatory mites per plant when mite populations are low.	1
	Savey 50 DF	6 oz		3
	Zeal 72 WSP	2-3 oz		1
	JMS Stylet Oil (OMRI*)	1-2 gal		0
	Predator Mites	Ask state fruit entomologist		
Cyclamen Mite	Agri-Mek 0.7 SC	3.5 fl oz	Suppression only and apply in sufficient water to obtain good coverage onto the crown of the plant.	3
	Portal 0.4 EC	2 pt	Portal is restricted to 2 applications of no more than 4 pints per crop cycle.	1
EARLY BLOOM THROUGH BLOOM			SAVE THE BEES!! DO NOT APPLY INSECTICIDES DURING BLOOM.	
POST-BLOOM TO HARVEST				
Aphids	Actara WG	1.5-3.0 oz	DO NOT exceed 14 fl oz per acre per season.	3
	Admire Pro	10.5-14 fl oz		14
Leafrollers	Deliver (OMRI*)	0.25-1.5 lb	Deliver contains <i>Bacillus thuringiensis</i> var. <i>kurstaki</i> (Bt) formulation.	1
	Entrust 2SC (OMRI*)	4-6 fl oz		1
	Radiant SC	6-10 fl oz		1
	Coragen 1.67 SC	3.5-7.5 fl oz		1

STRAWBERRY INSECT CONTROL

Insect	Material and Formulation	Amount to Use/Acre	Remarks/Precautions	Days to Harvest
Spotted-Wing Drosophila**			<u>Days of residual activity:</u>	
	Brigade WSB (R)	5.3-16 oz		0
	Danitol 2.4EC (R)	16 fl oz	7 days	3
	Malathion	1.5-2.0 pt	7 days	3
	Entrust 2SC (OMRI*)	4-6 oz	5-7 days	1
	Radiant 1SC	6-10 fl oz	7 days	1
	Pyganic 1.4 (OMRI*)	16-64 fl oz	0-2 days	0
Flower Thrips	Entrust 2SC (OMRI*)	4-6 fl oz		1
	Radiant SC	6-10 fl oz		1
POST-HARVEST				
White Grubs of Japanese Beetle	Admire Pro	7-10.5 fl oz	Admire Pro and Platinum should be a post-harvest soil surface application followed by 0.25 inch of rain or overhead irrigation. DO NOT exceed 32 fl oz per acre per season of Alias or 12 fl oz per acre per season for Platinum.	14
Adult Japanese Beetles	Alias 2 F	16-24 fl oz		14
	Coragen	3.5-7.5 fl oz		1
	Platinum	5-12 oz		50
	Sevin 4F	1-2 qt		7
	Shenzi 400SC	1.7-3.8 fl oz	See label for remarks.	1
RED IMPORTED FIRE ANTS (ALL FIRE ANT BAITS) – Apply when ants are active and soil temperature is above 60 degrees F. DO NOT treat if rain is anticipated within 6 hours.				
	S-Methoprene (Extinguish)	3-5 Tbsp/mound 1.0-1.5 lb/acre	Mound-to-mound treatment rate. Broadcast rate. This product is an insect growth regulator (IGR). Apply 3 to 4 weeks prior to harvest date.	
	Pyriproxyfen (Esteem)	2-4 Tbsp/mound 1.5-2.0 lb/acre	Mound-to-mound treatment rate. Broadcast rate.	

*OMRI = Organic Materials Review Institute lists compounds approved for organic production.

****Spotted-Wing Drosophila (SWD)** is a new invasive insect pest that was detected in ripening and ripened fruit in many Midwest states, including Arkansas, in 2013. The SWD larvae feed inside and damage ripening soft-skinned fruit, especially **blackberry, blueberry, raspberry and strawberry**. See the Arkansas SWD fact sheet: <https://www.uaex.uada.edu/publications/PDF/FSA-7079.pdf>. Begin monitoring for adult spotted-wing drosophila (SWD) in green fruit stage. Consider starting the (SWD) spray schedule when adults are first caught. Normal spray schedules should start 10 days prior to the first picking regardless of adult (SWD) trap catch. See the fact sheet 'Monitoring Spotted-Wing Drosophila in Arkansas' <https://www.uaex.uada.edu/publications/pdf/FSA7088.pdf> for more information. Fruit monitoring using a salt water drench can be an effective tool for determining whether spotted-wing drosophila (SWD) control efforts are effective. See the fact sheet 'Monitoring Spotted-Wing Drosophila in Arkansas' linked above.

HEMP INSECT CONTROL

Insect	Material and Formulation	Amount to Use/Acre	Remarks/Precautions	Days to Harvest
Caterpillar Pests	AzaMax 1.2%	42 oz		0
	Chrysogen	1-2.4 oz	Controls cabbage looper and soybean looper only.	0
	Crymax WDG	0.5-2 lbs		0
	Gemstar LC	4-10 oz	Controls corn earworm and tobacco budworm only.	0

VEGETABLE INSECT CONTROL RECOMMENDATIONS (COMMERCIAL)

Crop	Insect	Insecticide	Formulation Per Acre	Lb ai/Acre	Application	Remarks/Precautions	Days to Harvest
ASPARAGUS	Asparagus beetle, Japanese beetle, Grasshoppers	acetamiprid Assail 30 SG	2.5 oz	0.048			1
		carbaryl Sevin XLR Sevin 4F	1 qt 1 qt	1.0	When damage occurs.	DO NOT apply during bloom.	1
		malathion Malathion 57% EC	2 pt	1.25			1
		methomyl (R) Lannate 2.4 LV Lannate 90 SP	1.5-3 pt 1/2-1 lb	0.45-0.9			1
		permethrin (R) Pounce 25 WP	3.2-6.4 oz	0.05-0.1			1
		spinetoram Radiant 1 SC	4-8 oz	0.03-0.063		After harvest of ferns only.	3
		spinosad SpinTor 2 SC	4-6 oz	0.062-0.094		For protection of ferns only.	60
	Beet armyworm, Cutworms, Yellow-striped armyworm	<i>Bacillus thuringiensis</i> Biobit, Dipel, Javelin, etc.	See label for rates.				0
		chlorantraniliprole Coragen 1.67 SC Shenzi 400SC Coragen eVo	3.5-7.5 fl oz 1.7-3.8 fl oz 1.2-2.5 fl oz	0.045-0.098 0.047-0.098		DO NOT use an adjuvant with Coragen.	1
		Cyantraniliprole Exirel 0.83 EC	7-13.5 fl oz	0.45-0.88			1
		methomyl (R) Lannate 2.4 LV Lannate 90 SP	1 1/2-3 pt 1/2-1 lb	0.45-0.9	When damage occurs.		1
	(snap or lima)	acetamiprid Assail 30 SG	2.5-5.3 oz	0.048-0.10			7
		bifenthrin (R) Brigade 2 EC	2.6-6.4 fl oz	0.04-0.1			3
		carbaryl Sevin XLR Sevin 4F	1/2-1 qt 1/2-1 qt	0.5-1	When damage occurs.	DO NOT apply during bloom.	3
		esfenvalerate (R) Asana XL 0.66 EC	2.9-5.8 oz	0.015-0.03		Asana is not registered on lima beans.	3
		gamma-cyhalothrin Proaxis 0.5EC	2.56-3.84 oz	0.01-0.015			7
		lambda-cyhalothrin (R) Warrior II	1.28-1.92 oz	0.02-0.03			7
		methomyl (R) Lannate 90 SP	0.5 lb	0.45			1
		Novaluron Rimon 0.83 EC	9-12 oz	0.058-0.077		Controls immature mexican bean beetles only.	1
		zeta-cypermethrin (R) Mustang Maxx 0.8 EC	3.2-4.0 oz	0.02-0.025			1

VEGETABLE INSECT CONTROL RECOMMENDATIONS (COMMERCIAL)

Crop	Insect	Insecticide	Formulation Per Acre	Lb ai/Acre	Application	Remarks/Precautions	Days to Harvest
BEANS (snap or lima) (cont.)	Cabbage looper	<i>Bacillus thuringiensis</i> Agree WG		2		Loopers rarely require management on Arkansas snap bean.	
		chlorantraniliprole Shenzi 400SC	1.7-3.8 fl oz	0.045-0.098		Do not apply more than 5.1 fl oz Coragen eVo insect control or 0.2 lb a.i. of chlorantraniliprole containing products per acre per crop.	1
		Coragen	3.5-7.5 fl oz				
		Coragen eVo	1.2 – 2.5 fl oz (foliar)	0.047 - 0.098			
		chlorantraniliprole + lambda-cyhalothrin (R) Besiege	10 fl oz	0.10		For Colorado Potato beetle only.	7 (succulent) 21(dried)
		esfenvalerate (R) Asana XL 0.66 EC	5.8-9.6 oz	0.03-0.05		Asana is not registered on lima beans.	3
		methomyl (R) Lannate 90 SP Lannate 2.4 LV	0.5-1 lb 1 1/2-3 pt	0.45-0.9			3
		methoxyfenozide Intrepid 2F	8-16 oz	0.16-0.25			7
	Corn earworm	bifenthrin (R) Brigade 2 EC	2.6-6.4 fl oz	0.04-0.1		In spring planted snap bean, scouting (300 sweeps per 50 acres) can be used to reduce insecticide applications.	3
		carbaryl Sevin 5% D	40 lb	2.0	When first pods are 1 inch long and weekly thereafter.	Fall-planted snap beans will generally require corn earworm management. DO NOT apply during bloom.	3
		chlorantraniliprole Coragen 1.67 SC Shenzi 400SC Coragen eVo	3.5-7.5 fl oz 1.7-3.8 fl oz 1.2 – 2.5 fl oz (foliar)	0.045-0.098 0.047 - 0.098		Do not apply more than 5.1 fl oz Coragen eVo insect control or 0.2 lb a.i. of chlorantraniliprole containing products per acre per crop.	1
		chlorantraniliprole + lambda-cyhalothrin (R) Besiege	6-10 fl oz	0.06-0.10		For Colorado Potato beetle only.	7 (succulent) 21(dried)
		Cyantraniliprole Exirel 0.83 EC	7-13.5 fl oz	0.45-0.88			1
		esfenvalerate (R) Asana XL 0.66 EC	5.8-9.6 oz	0.03-0.05		DO NOT feed treated vines. Asana is not registered on lima beans.	3
		gamma-cyhalothrin Proaxis 0.5EC	2.56-3.84 oz	0.01-0.015			7
		lambda-cyhalothrin (R) Warrior II	1.28-1.92 oz	0.02-0.03			7
		methomyl (R) Lannate 90 SP Lannate 2.4 LV	0.5 lb 1 1/2 pt	0.45			1
		methoxyfenozide Intrepid 2F	10-16 oz	0.16-0.25			7
		spinetoram Radiant 1 SC	4-8 oz	0.03-0.063			3 (succulent); 28 (dried)
		spinosad Blackhawk	1.7-3.3 oz	0.04-0.07			3 (succulent); 28 (dried)
		zeta-cypermethrin (R) Mustang Maxx 0.8 EC	3.2-4.0 oz	0.02-0.025			1

VEGETABLE INSECT CONTROL RECOMMENDATIONS (COMMERCIAL)

Crop	Insect	Insecticide	Formulation Per Acre	Lb ai/Acre	Application	Remarks/Precautions	Days to Harvest
BEANS (snap or lima) (cont.)	Corn earworm (cont.)	zeta-cypermethrin + bifenthrin (R) Hero	10.3 oz	0.1			3
	European corn borer	chlordaniliprole Coragen 1.67 SC	3.5-7.5 fl oz	0.045-0.098		Corn borers rarely require management on Arkansas snap bean. Do not apply more than 5.1 fl oz Coragen eVo insect control or 0.2 lb a.i. of chlordaniliprole containing products per acre per crop.	1
		Shenzi 400SC	1.7-3.8 fl oz				
		Coragen eVo	1.2 – 2.5 fl oz (foliar)	0.047 - 0.098			
		Cyantraniliprole Exirel 0.83 EC	7-13.5 fl oz	0.45-0.88			1
		zeta-cypermethrin + bifenthrin (R) Hero	10.3 oz	0.1			3
	Mites	abamectin Agri-Mek SC	1.75-3.5 fl oz	0.01-0.05	For control of spider mites.	DO NOT make more than 2 applications. Must be mixed with an adjuvant.	7
		acequinocyl Kanemite 15 SC	31 fl oz	0.3		DO NOT make more than 2 applications.	7
		fenpyroximate Portal 0.4 EC	2 pt	0.1		Snap bean only. DO NOT make more than 2.	1 (Snap bean)
		bifenthrin (R) Brigade 2 EC	6.4 fl oz	0.1			3
		dimethoate Dimethoate 4EC	1 pt	0.5			0
	Seedcorn maggot, Wireworms	bifenthrin Empower 1.15 G	3.5-8.7 lb		Distribute 4.5-7.0 oz of the granules evenly in 1,000 row feet over the top of the row at planting time (30-inch row minimum).	Apply preplant broadcast in the top 1 to 3 inches of soil.	9
		phorate (R) Thimet 20G		7.6		DO NOT feed foliage of treated beans. DO NOT place Thimet in contact with seed.	
	Stink bugs	bifenthrin (R) Brigade 2 EC	2.6-6.4 fl oz	0.04-0.1			3
		lambda-cyhalothrin (R) Warrior II	1.28-1.92 oz	0.02-0.03			7
		zeta-cypermethrin (R) Mustang Maxx 0.8 EC	3.2-4.0 oz	0.02-0.025			1
		zeta-cypermethrin + bifenthrin (R) Hero	10.3 oz	0.1			3
BEETS	Flea beetles, webworms	carbaryl Sevin 4F	1 qt	1.0	When insects appear in damaging numbers.	DO NOT apply during bloom.	7
		Sevin XLR Plus	1 qt				
		imidacloprid Prey 1.6 F	3.5 oz	0.044			7
		zeta-cypermethrin (R) Mustang Maxx 0.8 EC	1.8-4.0 oz	0.011-0.025			1

VEGETABLE INSECT CONTROL RECOMMENDATIONS (COMMERCIAL)

Crop	Insect	Insecticide	Formulation Per Acre	Lb ai/Acre	Application	Remarks/Precautions	Days to Harvest
CARROTS	Flea beetles, celery worm, leafhoppers	beta-cyfluthrin + imidacloprid Leverage 360	2.8 oz	0.066	When insects appear in damaging numbers.	Avoid application when foliage is wet. DO NOT apply during bloom.	7
		carbaryl Sevin 4F Sevin XLR Plus	1 qt 1 qt	1.0			7
		imidacloprid Prey 1.6 F	3.5 oz	0.044			7
		malathion Malathion 57% EC	2 pt	1.25	Use only for leafhoppers.		7
		sulfoxaflor Transform WG	1.5-2.75	0.047-0.086		Leafhopper control only. Check label for crop rotation restrictions.	7
		zeta-cypermethrin (R) Mustang Maxx 0.8 EC	1.8-4.0 oz	0.011-0.025			1
COLE CROPS (Broccoli, Brussels sprouts, cabbage and cauliflower)	Aphids	acetamiprid Assail 30 SG	2.5 oz	0.048			1
		acetamiprid + bifenthrin Savoy	4.9-12.9 oz			Maximum of 19 oz a season.	7
		beta-cyfluthrin + imidacloprid Leverage 360	3 oz	0.07			7
		bifenthrin (R) Brigade 2 EC	2.6-6.4 fl oz	0.04-0.1			7
		flonicamid Beleaf 50SG	2-2.8 oz	0.062-0.089			0
		flupyradifurone Sivanto Prime	7-14 fl oz	0.09-0.18		Except green peach aphid. Do not apply more than 28 fl oz in a season.	1
		imidacloprid Admire Pro 4.6 F Prey 1.6 F	3.75 oz 1.3 fl oz	0.047			7
		lambda-cyhalothrin (R) Warrior II	1.28-1.92 fl oz	0.02-0.03			1
		zeta-cypermethrin (R) Mustang Maxx 0.8 EC	2.24-4.0 oz	0.014-0.025			1
		zeta-cypermethrin + bifenthrin Hero	10.3 oz	0.1			3
	Caterpillars (cabbage looper, diamondback, imported and cross-striped cabbage worm)	acetamiprid + bifenthrin Savoy	9.6-12.9 oz		Check label.	Use on diamond back moth only. Maximum of 19 oz a season.	7
		<i>Bacillus thuringiensis</i> (Dipel, Javelin, Agree, Crymax)				Slow acting but works well.	0
		beta-cyfluthrin + imidacloprid Leverage 360	3 oz	0.07			7
		bifenthrin (R) Brigade 2 EC	2.6-6.4 fl oz	0.04-0.1		Follow label directions.	7

VEGETABLE INSECT CONTROL RECOMMENDATIONS (COMMERCIAL)

Crop	Insect	Insecticide	Formulation Per Acre	Lb ai/Acre	Application	Remarks/Precautions	Days to Harvest
COLE CROPS (Broccoli, Brussels sprouts, cabbage and cauliflower) (cont.)	Caterpillars (cabbage looper, diamondback, imported and cross-striped cabbage worm) (cont.)	chlorantraniliprole		0.045-0.098		Diamondback moth resistance management: Do not apply Coragen® eVo insect control more than twice to any generation of diamondback moth or within any 30 day period. After the second application of Coragen® eVo insect control for diamondback moth, rotate to another effective insecticide with a different mode of action (i.e. a product with a different IRAC group number). See label for more info.	3
		Coragen 1.67 SC	3.5-7.5 fl oz				
		Coragen eVo	1.2 - 2.5 fl oz (foliar)				
			1.2 - 2.5 fl oz (soil)				
		Shenzi 400SC	1.7-3.8 fl oz				
		chlorantraniliprole + lambda-cyhalothrin (R)					
		Besiege	6-9 fl oz	0.06-0.09			3
		Cyantraniliprole		0.45-0.88			1
		Exirel 0.83 EC	7-13.5 fl oz				
		esfenvalerate (R)		0.03-0.05			3
		Asana XL 0.66 EC	5.8-9.6 oz				
		lambda-cyhalothrin (R)		0.02-0.03		1	
		Warrior II	1.28-1.92 fl oz				
		methomyl (R)		0.45-0.9	Apply when cabbage loopers are small.	1 (cabbage)	
		Lannate 2.4 LV	1/2-3 pt			3 (broccoli,	
		Lannate SP	1/2-1 lb			Brussels sprouts & cauliflower)	
		methoxyfenozide		0.06-0.12		1	
		Intrepid 2F	4-8 oz				
		permethrin (R)		0.05-0.1		1	
		Ambush 25 W	3.2-6.4 oz				
		Ambush 2.0 EC	3.2-12.8 oz				
Pounce 25 WP	3.2-6.4 oz						
spinosad		0.023-0.156		1			
SpinTor 2 SC	1.5-10 fl oz						
zeta-cypermethrin (R)		0.014-0.025		1			
Mustang Maxx 0.8 EC	2.24-4.0 oz						
zeta-cypermethrin + bifenthrin		0.1					
Hero	10.3 oz			7			
	Cutworms	beta-cyfluthrin		0.007-0.013			0
		Baythroid XL	0.8-1.6 oz				
		bifenthrin (R)		0.033-0.01		Follow label directions.	7
		Brigade 2 EC	2.1-6.4				
		chlorantraniliprole + lambda-cyhalothrin (R)		0.05-0.08			3
		Besiege	5-8 fl oz				
		cypermethrin		0.05-0.01		Follow label directions.	1
		Holster 2.5 EC	2.5-5 oz				
		diazinon (R)		2.0-4.0	Broadcast just before planting and incorporate.		
		Diazinon AG500	2-4 qt				
		Diazinon AG600 WBC	51-102 fl oz				

VEGETABLE INSECT CONTROL RECOMMENDATIONS (COMMERCIAL)

Crop	Insect	Insecticide	Formulation Per Acre	Lb ai/Acre	Application	Remarks/Precautions	Days to Harvest
COLE CROPS (Broccoli, Brussels sprouts, cabbage and cauliflower) (cont.)	Cutworms (cont.)	esfenvalerate (R) Asana XL 0.66 EC	5.8-9.6 oz	0.03-0.05	Apply at base of plants.	Use as needed.	3
		zeta-cypermethrin (R) Mustang Maxx 0.8 EC	3.2-4.0 oz	0.02-0.025			1
	Harlequin bug, stink bugs	acetamiprid + bifenthrin Savoy	9.6-12.9 oz			Maximum of 19 oz a season.	7
		bifenthrin (R) Brigade 2 EC	2.1-6.4 oz	0.033-0.10			7
		beta-cyfluthrin + imidacloprid Leverage 360	3 oz	0.07			7
		carbaryl Sevin XLR Plus Sevin 4F	1-2 qt 1-2 qt	1.2		Follow label directions. DO NOT apply during bloom.	14
		clothianidin Belay 50 WDG	3 - 4 oz	0.05-0.067			7
		dinotefuran Venom 70 SG Scorpion 35 SL	3-4 oz 2-7 fl oz (foliar) 9-13 fl oz (soil)	0.05-0.18 0.23-0.33		Restriction: Do not combine foliar applications of Scorpion with soil application, or vice versa. Only use one application method.	1
		lambda cyhalothrin (R) Warrior II	1.28-1.92 fl oz	0.02-0.03			1
	Aphids	acetamiprid Assail 30 SG	2.5 oz-4 oz	0.048-0.077			0
		acetamiprid + bifenthrin Savoy	9.6-12.9 oz			Maximum of 38.7 oz a season.	3
		flonicamid Beleaf 50SG	2-2.8 oz	0.062-0.089			0
		flupyradifurone Sivanto Prime	7-14 fl oz	0.09-0.18		DO NOT use foliar applications in muskmelon, cantaloupe, or honeydew melon.	1
		sulfoxaflor Transform WG	0.75	0.023		Check label for crop rotation restrictions.	1
	Cucumber beetles	acetamiprid Assail 30 SG	2.5 oz-5.3 oz	0.05-0.1			1
		acetamiprid + bifenthrin Savoy	6-12.9 oz			Maximum of 38.7 oz a season.	3
		beta-cyfluthrin Baythroid XL	2.4-2.8 oz	0.019-0.022			0
		bifenthrin (R) Brigade 2 EC	2.6-6.4 fl oz	0.04-0.1			3
		carbaryl Sevin XLR Plus Sevin 4F	1 qt 1 qt	1.0	When insects first appear.	Sevin is highly toxic to honeybees. Avoid excessive applications. DO NOT apply when foliage is wet. DO NOT apply during bloom.	3
		clothianidin Belay 50 WDG	3 – 4 oz	0.05-0.067		DO NOT use adjuvant with foliar applications. DO NOT use after 4th true leaf.	-
		dinotefuran Venom 70 SG Scorpion 35 SL	3-4 oz 2-7 fl oz (foliar) 9-13 fl oz (soil)	0.05-0.18 0.23-0.33		Restriction: Do not combine foliar applications of Scorpion with soil application, or vice versa. Only use one application method.	1

VEGETABLE INSECT CONTROL RECOMMENDATIONS (COMMERCIAL)

Crop	Insect	Insecticide	Formulation Per Acre	Lb ai/Acre	Application	Remarks/Precautions	Days to Harvest
CUCURBITS (Cantaloupe, cucumber, melons, pumpkin, squash, summer squash and watermelon) (cont.)	Cucumber beetles (cont.)	imidacloprid Admire Pro 4.6 F	7-10.5 fl oz	0.28-0.38		Admire applied into soil is highly effective against cucumber beetles and can reduce seedling loss. Soil Application Only.	21
		lambda-cyhalothrin (R) Warrior II	1.28-1.92 fl oz	0.02-0.03			1
		malathion Malathion 5 EC	1.5-2.75 pt	0.94-1.7		Use no more than 1.5 pints on winter squash or pumpkins or 2 pints on watermelons.	1
		methomyl (R) Lannate 2.4 LV Lannate SP	1 1/2-3 pt 1/2-1 lb	0.45-0.9		DO NOT use Lannate on pumpkins.	1 (lower rate) 3 (higher rate)
		zeta-cypermethrin (R) Mustang Maxx 0.8 EC	2.8-4.0 oz	0.0175-0.025			1
		zeta-cypermethrin + bifenthrin Hero	10.3 oz	0.1			3
	Flea beetles Tobacco budworm Beet armyworm	methomyl (R) Lannate 2.4 LV Lannate SP	1 1/2-3 pt 1/2-1 lb	0.45-0.9	When insects first appear.	One day up to 2 pt, over 2 pt 3 days. DO NOT apply to pumpkins.	1-3
		methoxyfenozide Intrepid 2F	4-10 oz	0.06-0.16		Not for control of tobacco budworm.	3
		spinosad SpinTor 2 SC	4-8 fl oz	0.0625-0.125		Not labeled for flea beetles.	3
	Mites (Mites are primarily a problem on cucumber and watermelon)	abamectin Agri-Mek 0.7 SC	1.75-3.5 oz	0.01-0.019		Must be mixed with an adjuvant (NIS surfactant).	7
		bifenazate Acromite 50 WS	0.75-1 lb	0.375-0.5		Only one application per season.	3
		extazole Zeal 2.88 SC	4-6 fl oz	0.09-0.135		Does not kill Adults. DO NOT make more than 1 application per season.	7
		Fenpyroximate Portal	2 pt				1
		spiromesifen Oberon 2 SC	7-8.5 oz	0.11-0.13			7
	Pickleworm, Melonworm, Cutworms	acetamiprid + bifenthrin Savoy	6-12.9 oz			Maximum of 38.7 oz a season.	3
		<i>Bacillus thuringiensis</i> Dipel, Javelin, Agree, Crymax, Xentari		Check label.			
		beta-cyfluthrin Baythroid XL	1.6-2.4 oz	0.013-0.019			0
		bifenthrin (R) Brigade 2 EC	2.6-6.4 fl oz	0.04-0.1			3
		carbaryl Sevin XLR Plus Sevin 4F	1 qt 1 qt	1.0	When insects or damage first appears.	Avoid excessive applications. DO NOT apply when foliage is wet. DO NOT apply during bloom.	3
		chlorantraniliprole Coragen 1.67 SC Coragen eVo	2.0-7.5 fl oz 0.7 - 1.2 fl oz (melonworm) 1.2 - 2.5 fl oz (pickleworm) 1.0-3.8 fl oz	0.026-0.098 0.027 - 0.047 (melonworm) 0.047 - 0.098 (pickleworm)		Coragen eVo not labeled for cutworms	3 1 1 3
		Shenzi 400SC chlorantraniliprole + lambda-cyhalothrin (R) Besiege		0.06-0.09		Use higher rate for heavy infestations and for increased residual control	1
			6-9 fl oz				

VEGETABLE INSECT CONTROL RECOMMENDATIONS (COMMERCIAL)

Crop	Insect	Insecticide	Formulation Per Acre	Lb ai/Acre	Application	Remarks/Precautions	Days to Harvest
CUCURBITS (Cantaloupe, cucumber, melons, pumpkin, squash, summer squash and watermelon) (cont.)	Pickleworm, Melonworm, Cutworms (cont.)	Cyantraniliprole Exirel 0.83 EC	7-13.5 fl oz	0.45-0.88			1
		esfenvalerate (R) Asana XL 0.66 EC	5.8-9.6 oz	0.03-0.05		Asana may cause some phytotoxicity to zucchini squash.	3
		lambda-cyhalothrin (R) Warrior II	1.28-1.92 oz	0.02-0.03			1
		methoxyfenozide Intrepid 2F	4-10 fl oz	0.06-0.15			3
		permethrin (R) Ambush 2.0 EC Pounce 3.2 EC	4-8 oz	0.1-0.2	When insects or damage first appear.		0
		spinetoram Radiant 1 SC	5-10 oz	0.038-0.079			3
		spinosad SpinTor 2 SC	4-8 oz	0.062-0.125		Follow label directions. SpinTor does not control squash bug.	3
		zeta-cypermethrin +bifenthrin Hero	10.3 oz	0.1			3
	Squash Bug (Rarely a pest of cucumber or watermelon)	acetamiprid + bifenthrin Savoy	12.9 oz			Maximum of 38.7 oz a season.	3
		beta-cyfluthrin Baythroid XL	1.6-2.4 oz	0.013-0.019			0
		bifenthrin (R) Brigade 2 EC	2.6-6.4 fl oz	0.04-0.1		Bifenthrin is the only registered insecticide that provides moderate but effective control of squash bug nymphs. Almost no control should be expected of adult squash bugs.	3
		carbaryl Sevin XLR Plus Sevin 4F	1 qt 1 qt	1.0	When insects or damage first appear.	Avoid excessive applications. DO NOT apply when foliage is wet. DO NOT apply during bloom.	3
		esfenvalerate (R) Asana XL 0.66 EC	5.8-9.6 oz	0.03-0.05		Asana may cause some phytotoxicity to zucchini squash.	3
		lambda-cyhalothrin (R) Warrior II	1.28-1.92 fl oz	0.02-0.03			1
		permethrin (R) Ambush 2.0 Pounce 3.2	4-8 oz	0.1-0.2	When insects or damage first appear.		0
		zeta-cypermethrin + bifenthrin Hero	10.3 oz	10.3 oz			3
	Squash Vine Borer (Only attacks squash and pumpkin)	acetamiprid Assail 30 SG	5 oz	0.1		Not generally a serious issue in large plantings of squash or pumpkin. Consider a blue hubbard squash trap crop for control.	0
		acetamiprid + bifenthrin Savoy	6-12.9 oz	0.1			3
		bifenthrin (R) Brigade 2 EC	2.6-6.4 fl oz	0.04-0.1			3
		chlorantraniliprole Coragen 1.67 SC	3.5-7.5 fl oz	0.045-0.098			3
		chlorantraniliprole + lambda- cyhalothrin (R) Besiege	6-9 fl oz	0.06-0.09		Use higher rate for heavy infestations and for increased residual control	1
		lambda-cyhalothrin (R) Warrior II	1.28-1.92 fl oz	0.02-0.03			1

VEGETABLE INSECT CONTROL RECOMMENDATIONS (COMMERCIAL)

Crop	Insect	Insecticide	Formulation Per Acre	Lb ai/Acre	Application	Remarks/Precautions	Days to Harvest
CUCURBITS (Cantaloupe, cucumber, melons, pumpkin, squash, summer squash and watermelon) (cont.)	Whiteflies	acetamiprid Assail 30 SG	2.5 oz-4 oz	0.048-0.077		Insecticide use will not effectively reduce high populations of whiteflies. Removal of alternate host plants (Weeds) along with field plowing immediately after harvest aids in population suppression.	0
		acetamiprid + bifenthrin Savoy	6-12.9 oz				3
		chlorantraniliprole Coragen 1.67 SC	5-7.5 fl oz	0.065-0.098	Use on nymphs only. See label for remarks.		1
		Coragen eVo	1.7-2.5 fl oz		Suppression only. Use in conjunction with an effective adult whitefly control program.		
		Shenzi 400SC	2.5-3.5 fl oz				
		Cyantraniliprole Exirel 0.83 EC	13.5-20 fl oz	0.088-0.133			1
		pyriproxyfen Knack 0.86 EC	8-10 oz	0.05-0.067			7
		sulfoxaflor Transform WG	2.0-2.25	0.063-0.071			1
		thiomethoxam Actara 25 WDG	3-5.5 oz	0.047-0.086	Follow label directions.		0
		EGGPLANT	Aphids	acetamiprid Assail 30 SG	2.5 oz-4 oz		0.048-0.077
acetamiprid + bifenthrin Savoy	4.9-9.6 oz					7	
beta-cyfluthrin + imidacloprid Leverage 360	3.8-4.1 oz			0.89-0.096		7	
flonicamid Beleaf 50 SG	2.8-4.28 oz			0.089-0.133		0	
flupyradifurone Sivanto Prime	7-12 fl oz			0.09-0.15		1	
imidacloprid Admire Pro 4.6 F	1.3-2.2 fl oz			0.05-0.08		0	
sulfoxaflor Transform WG	0.75-1.0			0.023-0.031		1	
thiamethoxam Actara 25 WDG	2-3 oz			0.03-0.047		0	
Caterpillars	beta-cyfluthrin Baythroid XL			1.6-2.8 oz	0.013-0.022		Use higher rates for loopers, pinworms and armyworms.
	beta-cyfluthrin + imidacloprid Leverage 360		3.8-4.1 oz	0.89-0.096		7	
	chlorantraniliprole Coragen 1.67 SC		3.5-7.5 fl oz	0.045-0.098		1	
	Shenzi 400SC		1.0-3.8 fl oz				
	Cyantraniliprole Exirel 0.83 EC		7-13.5 fl oz	0.45-0.88		1	
	chlorantraniliprole + lambda-cyhalothrin (R) Besiege		6-9 oz	0.06-0.09		5	
	methoxyfenozide Intrepid 2F		4-16 fl oz	0.06-0.25		1	

VEGETABLE INSECT CONTROL RECOMMENDATIONS (COMMERCIAL)

Crop	Insect	Insecticide	Formulation Per Acre	Lb ai/Acre	Application	Remarks/Precautions	Days to Harvest
EGGPLANT (cont.)	Flea beetles, Colorado potato beetle	beta-cyfluthrin Baythroid XL	2.8 oz	0.022			7
		beta-cyfluthrin + imidacloprid Leverage 360	3.8-4.1 oz	0.89-0.096			7
		bifenthrin (R) Brigade 2 EC	2.1-6.4 fl oz	0.033-0.1			7
		carbaryl Sevin XLR Plus Sevin 4F	1/2-2 qt 1/2-2 qt	0.5-2.0		DO NOT apply during bloom. Use higher rates for Colorado potato beetle.	3
		dinotefuran Venom 70 SG	1-4 oz (foliar) 5 to 7.5 oz (soil)	0.044 -0.175 (foliar) 0.219-0.328 (soil)		Stinkbugs: Coverage is essential for adequate control. Use sufficient water volume to ensure good coverage. Restriction: Do not combine foliar applications of Venom or Scorpion with soil application, or vice versa. Only use one application method.	
		Scorpion 35 SL	2-7 fl oz (foliar) 9-10.5 fl oz (soil)	0.05-0.18 (foliar) 0.23-0.27 (soil)			
		esfenvalerate (R) Asana XL 0.66 EC	5.8-9.6 oz	0.03-0.05			7
		imidacloprid Admire Pro 4.6 F	1.3-2.2 fl oz	0.05-0.08			0
		lambda cyhalothrin (R) Warrior II	1.28-1.92 fl oz	0.02-0.03			5
		zeta-cypermethrin (R) Mustang Maxx 0.8 EC	2.24-4.0 oz	0.014-0.025			1
	Mites	abamectin Agri-Mek 0.7 SC	1.75-3.5 fl oz	0.01-0.019		Must be mixed with an adjuvant.	7
		fenbutatin-oxide (R) Vendex 50 WP	2-3 lb	1.0-1.5			3
		Fenpyroximate Portal	2 pt			Apply in a minimum of 20 gallons per acre	1
		spiromesifen Oberon 2 SC	7-8.5 oz	0.11-0.13			1
	Leafminers	permethrin (R) Ambush 2.0 EC Pounce 25 WP	6-12 oz 6.4-9.6 oz	0.1-0.2			3
		spinosad SpinTor 2 SC	6-8 oz	0.094-0.125		Follow label directions.	1
GREENS (collards)	Caterpillars	<i>Bacillus thuringiensis</i>					
		beta-cyfluthrin Baythroid XL	1.6-3.2 oz	0.013-0.025		Use higher rates for earworms, armyworms and European corn borers.	0
		beta-cyfluthrin + imidacloprid Leverage 360	3 oz	0.07			7
		chlorantraniliprole Coragen 1.67 SC Coragen eVo Shenzi 400SC	3.5-7.5 fl oz 1.2-2.5 fl oz 1.7-3.8 fl oz	0.045-0.098			3
		Cyantraniliprole Exirel 0.83 EC	7-13.5 fl oz	0.45-0.88			1

VEGETABLE INSECT CONTROL RECOMMENDATIONS (COMMERCIAL)

Crop	Insect	Insecticide	Formulation Per Acre	Lb ai/Acre	Application	Remarks/Precautions	Days to Harvest
GREENS (collards) (cont.)	Caterpillars (cont.)	esfenvalerate (R)		0.03-0.05			7
		Asana XL 0.66EC	5.8-9.6 oz				
		indoxacarb		0.045-0.065			3
		Avaunt 30 WDG	2.5-3.5 oz				
		methoxyfenozide		0.06-0.25			1
		Intrepid 2F	4-16 oz				
		permethrin (R)		0.05-0.1			1
GREENS (kale and mustard)	Caterpillars	Ambush 2.0 EC	3.2-6.4 oz				
		Pounce 25 WP	3.2-9.6 oz				
		zeta-cypermethrin (R)		0.014-0.025			1
		Mustang Maxx 0.8 EC	2.24-4.0 oz				
		<i>Bacillus thuringiensis</i>					
		beta-cyfluthrin		0.013-0.025		Use higher rates for earworms and armyworms.	0
		Baythroid XL	16-3.2 oz				
		beta-cyfluthrin + imidacloprid		0.07			
		Leverage 360	3 oz				7
		chlorantraniliprole		0.045-0.098			3
		Coragen 1.67 SC	3.5-7.5 fl oz				
		Coragen eVo	1.2-2.5 fl oz				
		Shenzi 400SC	1.7-3.8 fl oz				
		Cyantraniliprole		0.45-0.88			1
GREENS (turnips)	Caterpillars	Exirel 0.83 EC	7-13.5 fl oz				
		cypermethrin		0.05-0.1			1
		Holster 2.5 EC	2.5-5.0 oz				
		methoxyfenozide		0.06-0.125			1
		Intrepid 2F	4-8 fl oz				
		spinosad		0.047-0.094			1
		SpinTor 2 SC	3-6 oz				
		zeta-cypermethrin (R)		0.014-0.025			1
		Mustang Maxx 0.8 EC	2.24-4.0 oz				
		<i>Bacillus thuringiensis</i>					
GREENS (turnips)	Caterpillars	beta-cyfluthrin		0.013-0.025		Use higher rates for corn earworms and armyworms.	0
		Baythroid XL	1.6-3.2 oz				
		beta-cyfluthrin + imidacloprid		0.07			
		Leverage 360	3 oz				7
		chlorantraniliprole		0.045-0.098			1
		Coragen	3.5-7.5 fl oz				
		Coragen eVo	1.2-2.5 fl oz				
		Shenzi 400SC	1.7-3.8 fl oz				
		methoxyfenozide		0.12-0.25			1
		Intrepid 2F	8-16 oz				
		permethrin (R)		0.05-0.1			1
		Pounce 3.2 EC	2-4 oz				
		spinosad		0.047-0.125			1
		SpinTor 2 SC	3-8 oz				
		zeta-cypermethrin (R)		0.02-0.025			1
		Mustang Maxx 0.8 EC	3.2-4.0 oz				

VEGETABLE INSECT CONTROL RECOMMENDATIONS (COMMERCIAL)

Crop	Insect	Insecticide	Formulation Per Acre	Lb ai/Acre	Application	Remarks/Precautions	Days to Harvest
HOPS	Aphids and Leafhoppers	imidacloprid Admire Pro 4.6 F	2.8 fl oz	0.1			28
		pymetrozine Fulfill 50 WDG	4-6 oz	0.125-0.187		Aphids only, will not control leaf hoppers.	14
		spirotetramat Movento	5-6 fl oz	0.08-0.09		Do not exceed 12.5 fl oz per season.	7
		Malathion Malathion 5 EC Malathion 8 EC	1 pt 0.63 pt	1.25			10
		Pyrethrins Pyganic EC 1.4 II Pyganic EC 5 II	16-64 fl oz 4.5-17 fl oz	0.175-0.7		OMRI approved. Do not expect residual control.	0
	Japanese Beetle	bifenthrin (R) Brigade 2 EC	3.8-6.4 fl oz	0.06-0.1			14
		imidacloprid Admire Pro 4.6 F	2.8 fl oz	0.1			28
	Armyworms, Cutworms, Loopers, Leafrollers, and other caterpillars	Bacillus thuringiensis Bt Containing products					
		bifenthrin (R) Brigade 2 EC	3.8-6.4 fl oz	0.06-0.1			14
		chlorantraniliprole Coragen 1.67 SC	3.5-7.5 fl oz	0.045-0.098			0
		Coragen eVo	1.2-2.5 fl oz	0.047 - 0.098			
		Shenzi 400SC	1.7-3.8 fl oz	0.045-0.098			
		spinosad Entrust 2 SC	4-6 oz	0.063-0.094		OMRI approved.	1
		spinetoram Delegate 25 WG	2.5-4 oz				3
	Spider Mites	abamectin Agri-Mek 0.7 SC	1.75-3.5 fl oz	0.01-0.019		Must be mixed with an adjuvant (NIS surfactant).	7
		acequinocyl Kanemite 15 SC	31 fl oz	0.3			7
		bifenazate Acramite 50 WS	0.75-1 lb	0.375-0.5		Only one application per season.	14
		extazole Zeal 72 WSP	3-4 oz	0.135-0.18		Does not kill Adults. DO NOT make more than 1 application per season.	7
		fenpyroximate Portal 0.4 EC	2 pt	0.1			3
LETTUCE	Aphid	acetamiprid Assail 30 SG	2-4 oz	0.038-0.075	Head and Leaf		7
		dimethoate Dimethoate 4 EC	0.5 pt	0.25	For use on leaf lettuce.		14
		clothianidin Belay	9-12 oz (Soil) 3-4 oz (Foliar)	1.2-1.6 0.4-0.53	Head and Leaf		21 (Soil) 7 (Foliar)

VEGETABLE INSECT CONTROL RECOMMENDATIONS (COMMERCIAL)

Crop	Insect	Insecticide	Formulation Per Acre	Lb ai/Acre	Application	Remarks/Precautions	Days to Harvest
LETTUCE	Aphid	flonicamid Beleaf 50 SG	2-2.8 oz	0.06-0.09	Head and Leaf		0
		flupyradifurone Sivanto Prime	10.5-14.0 fl oz	0.16-0.18	Head and Leaf		1
		imidacloprid Admire Pro 4.6 F	4.4-10.5 fl oz (Soil) 1.3 fl oz (Foliar)	0.16-0.38 0.05	Head and Leaf		21 (Soil) 7 (Foliar)
		pymetrozine Fulfill	2.75 oz	1.4	Head and Leaf		7
		pyrifluquinazon PQZ	2.4-3.2 fl oz	0.035-0.047	Head and Leaf		1
		spirotetramat Movento	4-5 fl oz	0.06 - 0.08	Head and Leaf		3
		thiamethoxam Platinum 75 SG	1.66-3.67oz	0.08-0.17	Head and Leaf		30
		Actara 25 WDG	1.5-3.0 oz	0.08-0.17	Soil application Only Foliar Application Only		7
		tolfenpyrad Torac	17-21 fl oz	0.17-0.21	Head and Leaf		1
	Armyworms, Cabbage Looper, Corn Earworm, and other Lepidopterans	Bacillus thuringiensis Crymax WDG	0.5-1.5 lb	0.2-0.6	Head and Leaf		0
		Dipel DF	0.5-2 lb	0.27-1.08			
		beta-cyfluthrin (R) Baythroid XL	2.4-3.2 fl oz	0.019-0.025	Head and Leaf		0
		beta-cyfluthrin (R) + imidacloprid Leverage 360	3.0		Head and Leaf		7
		bifenthrin Brigade 2 EC	2.1-6.4 fl oz	0.033 - 0.1	Head Lettuce Only		7
		chlorantraniliprole Coragen 1.67 SC	3.5- 7.5 fl oz	0.045 - 0.098	Head and Leaf		1
		Corage eVo 5 SC	1.2-2.5 fl oz	0.047 - 0.098			
		Shenzi SC	1.7 - 3.8	0.044 - 0.098			
		chlorantraniliprole + lambda-cyhalothrin (R) Besiege	6-9 fl oz		Head and Leaf		5
		cyantraniliprole, Verimark 1.67 SC	5- 13.5 fl oz (Soil)	0.065-0.176	Head and Leaf		1
		Exirel 0.83SE	7- 17 fl oz (Foliar)	0.045-0.11			1
		cyclaniliprole Harvanta 50 SL	11- 16.4 fl oz	0.036-0.054	Head and Leaf		1
		emamectin benzoate (R) Proclaim 5 WDG	3.2- 4.8 oz	0.01-0.015	Head and Leaf		7
		indoxacarb Avaunt eVo 30 WDG	3.5- 6 oz	0.065 - 0.11	Head and Leaf		3
		Lambda-cyhalothrin (R) Warrior II	1.28-1.92	0.02-0.03	Head and Leaf		

VEGETABLE INSECT CONTROL RECOMMENDATIONS (COMMERCIAL)

Crop	Insect	Insecticide	Formulation Per Acre	Lb ai/Acre	Application	Remarks/Precautions	Days to Harvest
LETTUCE (cont.)	Armyworms, Cabbage Looper, Corn Earworm, and other Lepidopterans (cont.)	Methomyl (R) Lannate 90 SP Lannate 2.4 LV	0.5-1 lb 1.5- 3 pts	0.45-0.9 0.54-1.08	Head and Leaf		See Label
		methoxyfenozide, MOA 18 Intrepid 2 F	4-10 fl oz	0.06-0.16	Head and Leaf		1
		permethrin Ambush 24 EC	6.4-12.8 oz	0.1-0.2			1
		spinetoram Radiant 1 SC	5-10 fl oz	0.31-0.62	Head and Leaf		1
		zeta-cypermethrin (R) Mustang Maxx 0.8 EC	3.2-4 fl oz	0.02-0.025	Head and Leaf		1
		zeta-cypermethrin (R) + bifenthrin (R) Hero	4-10.3 fl oz		Head Lettuce Only		7
OKRA	Aphids	acetamiprid + bifenthrin Savoy	4.9-9.6 oz			Follow label directions.	7
		flonicamid Beleaf 50 SC	2.8-4.28 oz	0.089-0.133			0
		imidacloprid Admire Pro 4.6 F	1.3-2.2 fl oz	0.05-0.08			0
		sulfoxaflor Transform WG	0.75-1.0	0.023-0.031		Check label for crop rotation restrictions.	1
	Corn earworm	bifenthrin (R) Brigade 2 EC	2.1-6.4 oz	0.033-0.1			7
		chlorantraniliprole Coragen 1.67 SC	3.5-7.5 fl oz	0.045-0.098			1
		Coragen eVo	1.2-2.5 fl oz	0.047 - 0.098			
		Shenzi 400SC	1.7-3.8 fl oz	0.045-0.098			
		Cyantraniliprole Exirel 0.83 EC	7-13.5 fl oz	0.45-0.88			1
		methoxyfenozide Intrepid 2F	4-16 oz	0.06-0.25			1
		spinosad SpinTor 2 SC	3-6 oz	0.047-0.094			1
	Thrips	acetamiprid Assail 30 SG	2.1 oz-3.4 oz	0.040-0.065			7
		lambda-cyhalothrin (R) Warrior II	1.28-1.92 fl oz	0.02-0.03			14
		malathion Malathion 57% EC	1 1/2 pt	0.9		Highly toxic to honeybees.	3
		spinetoram Radiant 1 SC	6-8 oz	0.047-0.063			3
		sulfoxaflor Transform WG	2.75	0.086		Check label for crop rotation restrictions.	7
		zeta-cypermethrin (R) Mustang Maxx 0.8 EC	2.24-4.0 oz	0.014-0.025			7
ONION	Onion Maggot and Seedcorn Maggot	diazinon (R) Diazinon 50W	6-8 lb	3.0-4.0			
		Diazinon AG600	76 1/2-102 oz				
		Diazinon AG500	3-4 qt				

VEGETABLE INSECT CONTROL RECOMMENDATIONS (COMMERCIAL)

Crop	Insect	Insecticide	Formulation Per Acre	Lb ai/Acre	Application	Remarks/Precautions	Days to Harvest
PEAS (Garden or English)	Aphids	acetamiprid + bifenthrin Savoy	4.9-9.6 oz			Follow label directions.	7
		esfenvalerate (R) Asana XL 0.66 EC	2.9-5.8 oz	0.015-0.05			3
		imidacloprid Admire Pro 4.6F	1.2 fl oz	0.05			7
		lambda-cyhalothrin (R) Warrior II	1.28-1.92 fl oz	0.02-0.03			7
		malathion Malathion 57% EC 5 lb/gal	1 1/2 pt	0.9	When insects appear.	Seven days if forage is to be fed to livestock.	3
PEPPERS	Aphids	acetamiprid + bifenthrin Savoy	4.9-9.6 oz			Follow label directions.	7
		beta-cyfluthrin + imidacloprid Leverage 360	3.8-4.1 oz	0.89-0.096			7
		flonicamid Beleaf 50 SG	2.0-2.8 oz	0.026-0.69			0
		imidacloprid Admire Pro 4.6F	1.2 fl oz	0.047			0
		methomyl (R) Lannate 2.4 LV Lannate SP	1 1/2 pt 1/2 lb	0.45			3
		sulfoxaflor Transform WG	0.75-1.0	0.023-0.031		Check label for crop rotation restrictions.	1
		thiamethoxam Actara 25 WDG	2-3 oz	0.033-0.047			0
	Cutworms	bifenthrin (R) Brigade 2 EC	2.1-6.4 oz	0.033-0.1			7
		lambda-cyhalothrin (R) Warrior II	0.96-1.6 fl oz	0.015-0.025			5
		zeta-cypermethrin (R) Mustang Maxx 0.8 EC	1.28-4.0 oz	0.008-0.025			1
		zeta-cypermethrin + bifenthrin Hero	10.3 oz	0.1			7
	Flea beetles, Colorado potato beetle, earworm, European corn borer, hornworms	acetamiprid + bifenthrin Savoy	3.6-6.0 oz			Follow label directions. Colorado potato beetle only.	7
		beta-cyfluthrin Baythroid XL	1.6-2.8 oz	0.013-0.022			7
		beta-cyfluthrin + imidacloprid Leverage 360	3.8-4.1 oz	0.89-0.096			7
		bifenthrin (R) Brigade 2 EC	2.1-6.4 oz	0.033-0.1			7
		carbaryl Sevin 4F Sevin XLR Plus	1-2 qt 1-2 qt	1.0-2.0	When insects appear.	DO NOT apply during bloom.	3
		chlorantraniliprole Coragen 1.67 SC Coragen eVo	2.0-7.5 fl oz 1.2-2.5 fl oz 0.7-1.7 fl oz (hornworms)	0.026-0.098 0.047-0.098 0.027 - 0.066 (hornworms)			1
		Shenzi 400SC	1.0-3.8 fl oz	0.026-0.098			

VEGETABLE INSECT CONTROL RECOMMENDATIONS (COMMERCIAL)

Crop	Insect	Insecticide	Formulation Per Acre	Lb ai/Acre	Application	Remarks/Precautions	Days to Harvest
PEPPERS	Flea beetles, Colorado potato beetle, earworm, European corn borer, hornworms	chlorantraniliprole + lambda-cyhalothrin (R) Besiege	6-9 fl oz	0.06-0.09		Use higher rate for heavy infestations and for increased residual control	5
		Cyantraniliprole Exirel 0.83 EC	7-13.5 fl oz	0.45-0.88			1
		esfenvalerate (R) Asana XL 0.66 EC	5.8-9.6	0.03-0.05			7
		lambda-cyhalothrin (R) Warrior II	1.28-1.92 fl oz	0.02-0.03			5
		methoxyfenozide Intrepid 2F	4-16 oz	0.08-0.25		European corn borer and hornworm control.	1
		permethrin (R) Pounce 25 WP	6.4-12.8 oz	0.1-0.2			3
		spinetoram Radiant 1 SC	5-10 fl oz	0.04-0.078			1
		spinosad SpinTor 2 SC	3-8 fl oz	0.047-0.125			1
		zeta-cypermethrin (R) Mustang Maxx 0.8 EC	2.24-4.0 oz	0.014-0.025			1
		zeta-cypermethrin + bifenthrin Hero	4.0-10.3 oz	0.04-0.1			7
	Mites	abamectin (R) Agri-Mek 0.7 SC	1.75-3.5 fl oz	0.0094-0.01875		Use only two times per season. Must be mixed with an adjuvant (NIS surfactant).	7
		spiromesifen Oberon 2 SC	7-8.5 oz	0.11-0.13			1
	Other caterpillars	bifenthrin (R) Brigade 2 EC	2.1-6.4 oz	0.033-0.1			7
		beta-cyfluthrin Baythroid XL	1.6-2.8 oz	0.013-0.022			7
		beta-cyfluthrin + imidacloprid Leverage 360	3.8-4.1 oz	0.89-0.096			7
		chlorantraniliprole Coragen 1.67 SC	3.5-7.5 fl oz	0.045-0.098			1
		Coragen eVo	1.2-2.5 fl oz	0.047-0.098			
		Shenzi 400SC	1.7-3.8 fl oz	0.045-0.098			
		chlorantraniliprole + lambda-cyhalothrin (R) Besiege	6-9 oz	0.06-0.09			5
		Cyantraniliprole Exirel 0.83 EC	7-13.5 fl oz	0.45-0.88			1
		lambda-cyhalothrin (R) Warrior II	1.28-1.92 fl oz	0.02-0.03			5
		methomyl (R) Lannate 2.4 LV	1 1/2 pt	0.45			3
		Lannate 90 SP	1/2 lb				
		methoxyfenozide Intrepid 2F	4-16 fl oz	0.06-0.25			1

VEGETABLE INSECT CONTROL RECOMMENDATIONS (COMMERCIAL)

Crop	Insect	Insecticide	Formulation Per Acre	Lb ai/Acre	Application	Remarks/Precautions	Days to Harvest
PEPPERS (cont.)	Other caterpillars (cont.)	zeta-cypermethrin (R) Mustang Maxx 0.8 EC	2.24-4.0 oz	0.014-0.025			1
		zeta-cypermethrin + bifenthrin Hero	4.0-10.3 oz	0.4-0.1			7
POTATOES (white or Irish)	Aphids	beta-cyfluthrin + imidacloprid Leverage 360	2.8 oz	0.066			7
		flonicamid Beleaf 50 SG	2.0-2.8 oz	0.026-0.69			7
		sulfoxaflor Transform WG	0.75-1.0	0.023-0.031			
		thiamethoxam Actara 25 WDG	3 oz	0.047			14
	Colorado potato beetle, potato leafhopper, flea beetles	beta-cyfluthrin Baythroid XL	1.6-2.8 oz	0.013-0.022			0
		beta-cyfluthrin + imidacloprid Leverage 360	2.8 oz	0.066			7
		carbaryl Sevin 4F Sevin XLR Plus	1/2-2 qt 1/2-2 qt	0.5-2.0	When insects first appear.	DO NOT apply during bloom. Use higher rates on Colorado potato beetle.	7
		chlorantraniliprole Coragen Coragen eVo Shenzi 400 SC Vantacor	3.5-7.5 fl oz 1.2-2.5 fl oz 1.7-3.8 fl oz 1.2-2.5 fl oz	0.045-0.098 0.047-0.098 0.044-0.098 0.047-0.098		Foliar or chemigation applications.	14
		chlorantraniliprole + lambda-cyhalothrin (R) Besiege	6-9 fl oz	0.06-0.09		For Colorado Potato beetle only.	5
		esfenvalerate (R) Asana XL 0.66 EC	5.8-9.6 oz	0.03-0.05			7
		lambda-cyhalothrin (R) Warrior II	1.28-1.92 fl oz	0.02-0.03			7
		permethrin (R) Ambush 25 WP Ambush 2.0 EC Pounce 25 WP	3.2-12.8 oz 3.2-12.8 oz 6.4-12.8 oz	0.05-0.2 0.05-0.2 0.1-0.2		Apply no more than 12 applications. DO NOT graze or feed foliage.	7
		spinosad SpinTor 2 SC	3-6 fl oz	0.047-0.094			7
		sulfoxaflor Transform WG	1.5-2.25	0.047-0.071		For leaf hopper control. Check label for crop rotation restrictions.	7
		zeta-cypermethrin (R) Mustang Maxx 0.8 EC	3.2-4.0 oz	0.02-0.025			1
	Wireworms	bifenthrin (R) Capture LFR			See label directions.	Check label for crop rotation restrictions.	7
		phorate (R) Thimet 20G	8.5-17.3 lb		Distribute granules evenly in furrow or band on each side of row at planting or sidedress postemer-gence. Sandy soils use low rate.		90

VEGETABLE INSECT CONTROL RECOMMENDATIONS (COMMERCIAL)

Crop	Insect	Insecticide	Formulation Per Acre	Lb ai/Acre	Application	Remarks/Precautions	Days to Harvest
RADISHES	Aphids	beta-cyfluthrin + imidacloprid Leverage 360	2.4-2.8 oz	0.056-0.066			7
		imidacloprid Admire Pro 4.6F	1.3 fl oz	0.044			7
		malathion Malathion 57% EC	1 1/2 pt	1	When insects appear in damaging numbers.		7
		sulfoxaflor Transform WG	0.75-1.0	0.023-0.031		Check label for crop rotation restrictions.	7
	Flea beetles	beta-cyfluthrin Baythroid XL	1.6-2.8 oz	0.013-0.022			0
		beta-cyfluthrin + imidacloprid Leverage 360	2.4-2.8 oz	0.056-0.066			7
		carbaryl Sevin 4F Sevin XLR Plus	1/2-1 qt 1/2-1 qt	0.5-1.0	When insects appear in damaging numbers.	DO NOT apply during bloom.	3
		esfenvalerate (R) Asana XL 0.66 EC	5.8-9.6 oz	0.03-0.05			7
		imidacloprid Admire Pro 4.6F	1.3 fl oz	0.044			7
SOUTHERN PEAS	Bean leaf beetle	beta-cyfluthrin + imidacloprid Leverage 360	2.4-2.8 oz	0.056-0.066			7
		bifenthrin (R) Brigade 2 EC	2.1-6.4 oz	0.033-0.1			3
		carbaryl Sevin 4F Sevin XLR Plus	1/2-1 qt 1/2-1 qt	0.5-1.0	Plant early. Apply treatment to prevent defoliation.	DO NOT apply during bloom. DO NOT use on succulent shelled peas (Group 6B).	3
		lambda-cyhalothrin (R) Warrior II	1.28-1.92 fl oz	0.02-0.03			7
		zeta-cypermethrin (R) Mustang Maxx 0.8 EC	2.24-4.0 oz	0.014-0.025			1
	Corn earworm	beta-cyfluthrin Baythroid XL	1.6-2.1 oz	0.013-0.017			3
		beta-cyfluthrin + imidacloprid Leverage 360	2.4-2.8 oz	0.056-0.066			7
		bifenthrin (R) Brigade 2 EC	2.1-6.4 oz	0.033-0.1			3
		chlorantraniliprole Coragen 1.67 SC Coragen eVo	3.5-7.5 fl oz 1.7-2.5 fl oz (soil) 1.2 -2.5 fl oz (foliar)	0.045-0.098 0.066 - 0.098 (soil) 0.047 - 0.098 (foliar)			1
		Shenzi 400SC	1.7-3.8 fl oz	0.045-0.098			
		chlorantraniliprole + lambda-cyhalothrin (R) Besiege	6-10 fl oz	0.06-0.10			7 (Edible/ Shelled) 21(Dried shelled)
		Cyantraniliprole Exirel 0.83 EC	7-13.5 fl oz	0.45-0.88			1
		esfenvalerate (R) Asana XL 0.66 EC	5.8-9.6 oz	0.03-0.05		DO NOT feed vines.	21
		lambda-cyhalothrin (R) Warrior II	1.28-1.92 fl oz	0.02-0.03			7

VEGETABLE INSECT CONTROL RECOMMENDATIONS (COMMERCIAL)

Crop	Insect	Insecticide	Formulation Per Acre	Lb ai/Acre	Application	Remarks/Precautions	Days to Harvest
SOUTHERN PEAS (cont.)	Corn earworm (Cont.)	methoxyfenozide Intrepid 2F	10-16 oz	0.16-0.25			7
		zeta-cypermethrin (R) Mustang Maxx 0.8 EC	2.24-4.0 oz	0.014-0.025			1
	Cowpea aphid	beta-cyfluthrin + imidacloprid Leverage 360	2.4-2.8 oz	0.056-0.066			7
		bifenthrin (R) Brigade 2 EC	2.1-6.4 oz	0.03-0.1			3
		imidacloprid Admire Pro 4.6 F	7.0-10.5 fl oz	0.25-0.37		Soil application.	21
		imidacloprid Admire Pro 4.6F	1.3 fl oz	0.044		Foliar application.	7
		lambda-cyhalothrin (R) Warrior II	1.28-1.92 fl oz	0.02-0.03			7
		malathion Malathion 57% EC 5 lb/gal	1 1/2 pt	1			3
		methomyl (R) Lannate 1.8 LV Lannate SP	1 1/3-3 pt 1/2-1 pt	0.4-0.9		DO NOT apply more than 4.5 lb ai per acre per crop.	1
		zeta-cypermethrin (R) Mustang Maxx 0.8 EC	3.2-4.0 oz	0.02-0.025		Aphid control may be variable.	1
	Cowpea curculio	beta-cyfluthrin Baythroid XL	1.6-2.1 oz	0.013-0.017			3
		beta-cyfluthrin + imidacloprid Leverage 360	2.4-2.8 oz	0.056-0.066			7
		chlorantraniliprole + lambda-cyhalothrin (R) Besiege	6-10 fl oz	0.06-0.10			7 (Edible/ Shelled) 21(Dried shelled)
		esfenvalerate (R) Asana XL 0.66 EC	5.8-9.6 oz	0.03-0.05			21
		lambda-cyhalothrin (R) Warrior II	1.28-1.92 fl oz	0.02-0.03			7
		zeta-cypermethrin (R) Mustang Maxx 0.8 EC	2.24-4.0 oz	0.014-0.025			1
	European corn borer	beta-cyfluthrin + imidacloprid Leverage 360	2.4-2.8 oz	0.056-0.066			7
		chlorantraniliprole Coragen 1.67 SC Coragen eVo	3.5-7.5 fl oz 1.7-2.5 fl oz (soil) 1.2-2.5 fl oz (foliar)	0.045-0.098 0.066-0.098 (soil) 0.047-0.098 (foliar)			1
		Shenzi 400SC	1.7-3.8 fl oz	0.045-0.098			
		chlorantraniliprole + lambda-cyhalothrin (R) Besiege	6-10 fl oz	0.06-0.10			7 (Succulent) 21(Dried)
		Cyantraniliprole Exirel 0.83 EC	7-13.5 fl oz	0.45-0.88			1
		methoxyfenozide Intrepid 2F	8-16 oz	0.12-0.25			7
		spinosad SpinTor 2 SC	4-6 fl oz	0.062-0.094			3

VEGETABLE INSECT CONTROL RECOMMENDATIONS (COMMERCIAL)

Crop	Insect	Insecticide	Formulation Per Acre	Lb ai/Acre	Application	Remarks/Precautions	Days to Harvest
SPINACH	Aphids, plant bugs, leafhoppers, leafminers	acetamiprid Assail 70WP	0.8-1.2 oz	0.035-0.054			7
		beta-cyfluthrin + imidacloprid Leverage 360	3 oz	0.07			7
		dimethoate Dimethoate 4 EC	1/2 pt	0.25		Effectiveness of dimethoate is reduced when aphid colonies are established.	14
		dinotefuran Venom 70 SG	1-3 oz foliar 5-6 oz soil	0.044-0.131 0.219-0.263			7 21
		flonicamid Beleaf 50 SG	2.0-2.8 oz	0.062-0.089			0
		imidacloprid Admire Pro 4.6 F	4.4-10.5 fl oz	0.158-0.337		Soil application.	21
		imidacloprid Admire Pro 4.6F	1.3 fl oz	0.047		Imidacloprid should only be used with an aphid scouting program. Apply only when aphid numbers exceed the threshold.	7
		zeta-cypermethrin (R) Mustang Maxx 0.8 EC	3.2-4.0 oz	0.02-0.025			1
	Caterpillars	<i>Bacillus thuringiensis</i>	Follow label directions.				
		beta-cyfluthrin Baythroid XL	2.4-3.2 oz	0.019-0.025			0
		beta-cyfluthrin + imidacloprid Leverage 360	3 oz	0.07			7
		bifenthrin (R) Brigade 2 EC	2.1-6.4 oz	0.033-0.1		Pyrethroid use against Leps. can result in increases in aphid populations.	40
		chlorantraniliprole Coragen 1.67 SC Coragen eVo Shenzi 400SC	3.5-7.5 fl oz 1.2 -2.5 fl oz 1.7-3.8 fl oz	0.045-0.098 0.047 - 0.098 0.045-0.098			1
		Cyantraniliprole Exirel 0.83 EC	7-13.5 fl oz	0.45-0.88			1
		methomyl (R) Lannate 2.4 LV Lannate SP	1 1/2-3 pt 1/2-1 lb	0.45-0.9	When insects appear or as needed to keep crop free of insects. Not labeled on corn earworm.	DO NOT apply to seedlings less than 3 inches in diameter.	7
		methoxyfenozide Intrepid 2F	4-8 oz	0.06-0.12			1
		permethrin (R) Ambush 2.0 EC Ambush 25 WP Pounce 3.2 EC	6.4-12.8 oz 6.4-12.8 oz 4-8 oz	0.1-0.2			7
		spinosad SpinTor 2 SC	3-6 fl oz	0.047-0.094			1
		thiodicarb (R) Larvin 3.2	24-30 oz	0.6-0.75			14
		zeta-cypermethrin (R) Mustang Maxx 0.8 EC	3.2-4.0 oz	0.02-0.025			1
SWEET CORN	Corn Earworm	beta-cyfluthrin Baythroid XL	1.6-2.8 oz	0.013-0.022			0
		bifenthrin (R) Brigade 2 EC	2.1-6.4 fl oz	0.033-0.1	When larvae are found.		1

VEGETABLE INSECT CONTROL RECOMMENDATIONS (COMMERCIAL)

Crop	Insect	Insecticide	Formulation Per Acre	Lb ai/Acre	Application	Remarks/Precautions	Days to Harvest
SWEET CORN (cont.)	Corn Earworm (cont.)	carbaryl		1.0-2.0		DO NOT apply during bloom.	2
		Sevin 4F	1-2 qt				
		Sevin XLR	1-2 qt				
		chlorantraniliprole					1
		Coragen 1.67 SC	3.5-7.5 fl oz	0.045-0.098			
		Coragen eVo	1.2-2.5 fl oz	0.047-0.098			
		Vantacor	1.2-2.5 fl oz	0.045-0.098		Cheaper option than Coragen in Sweet Corn	
		Shenzi 400SC	1.7-3.8 fl oz	0.045-0.098			
		chlorantraniliprole + lambda-cyhalothrin (R)		0.06-0.10			1
		Besiege	6-10 fl oz				
		esfenvalerate (R)		0.03-0.05			1
		Asana XL 0.66 EC	5.8-9.6 oz				
		lambda-cyhalothrin (R)		0.02-0.03			1
		Warrior II	1.28-1.92 fl oz				
		methomyl (R)		0.3-0.45			0 (ears) 3 (forage)
		Lannate 2.4 LV	1-1 1/2 pt				
		Lannate SP	1/3-1/2 lb				
		methoxyfenozide + spinetoram				Follow label directions.	21 (dry fodder) 3 (forage) 3 (ears)
		Intrepid Edge	8-12 oz				
		permethrin (R)		0.1-0.2			1
		Ambush 2.0 EC	6.4-12.8 oz				
		Ambush 25 WP	6.4-12.8 oz				
Cutworms, rootworms, seed corn maggot, white grubs, wireworms		beta-cyfluthrin		0.007-0.013		Cutworms only.	0
		Baythroid XL	0.8-1.6 oz				
		bifenthrin (R)		0.08-0.1			3
		Capture LFR	0.39-0.44 oz/ 1,000 ft row		Apply in 5- to 7-inch band or in furrow ahead of press wheel. Compatible with liquid fertilizers.		
		lambda cyhalothrin (R)		0.02-0.03			1
		Warrior II	1.28-1.92 fl oz				
		tefluthrin (R)		0.075-0.165	Banded, T-banded or in furrow.		
Force 3G		zeta-cypermethrin + bifenthrin					
		Hero	4-5 oz/ 1,000 ft row				
			2.6-6.1 oz	0.025-0.05			3
European corn borer, southwestern corn borer		carbaryl		1.5-2.0		When 50% of plants show rows of tiny pinholes in leaves (feeding signs).	0
		Sevin 4F	1 1/2-2 qt				
		Sevin XLR Plus	1 1/2-2 qt				
		chlorantraniliprole					1
		Coragen 1.67 SC	3.5-7.5 fl oz	0.045-0.098			
		Coragen eVo	1.2-2.5 fl oz	0.047-0.098			
		Shenzi 400SC	1.7-3.8 fl oz	0.045-0.098			
Vantacor		chlorantraniliprole + lambda-cyhalothrin (R)		0.06-0.10			1
		Besiege	6-10 fl oz				

VEGETABLE INSECT CONTROL RECOMMENDATIONS (COMMERCIAL)

Crop	Insect	Insecticide	Formulation Per Acre	Lb ai/Acre	Application	Remarks/Precautions	Days to Harvest
SWEET CORN (cont.)	European corn borer, southwestern corn borer (cont.)	esfenvalerate (R) Asana XL 0.66 EC	5.8-9.6 oz	0.03-0.05			1
		lambda cyhalothrin (R) Warrior II	1.28-1.92 fl oz	0.02-0.03			1
		methomyl (R) Lannate 2.4 LV Lannate SP	1 1/2 pt 1/2 lb	0.45		Lannate not labeled on southwestern corn borer.	0 (ears) 3 (forage)
		methoxyfenozide Intrepid 2F	4-16 oz	0.06-0.25			21 (dry fodder) 3 (forage) 3 (ears)
		methoxyfenozide + spinetoram Intrepid Edge	4-12 oz				21 (dry fodder) 3 (forage) 3 (ears)
		spinosad SpinTor 2 SC	1.5-6.0 fl oz	0.023-0.094			1
		thiodicarb (R) Larvin 3.2		0.05-0.75			0
			20-30 oz				
	Flea beetles	acetamiprid + bifenthrin Savoy	9.6-12.9 oz			Maximum of 25.8 oz a season.	7
		beta-cyfluthrin Baythroid XL	0.8-1.6 oz	0.007-0.013			0
		carbaryl Sevin 4F Sevin XLR Plus	1-2 qt 1-2 qt	1.0-2.0	When damage appears.	DO NOT apply during bloom. Hand harvesting is prohibited.	2
		esfenvalerate (R) Asana XL 0.66 EC	5.8-9.6 oz	0.03-0.05			1
		zeta-cypermethrin (R) Mustang Maxx 0.8 EC	2.8-4.0 oz	0.017-0.025			3
	Mites	abamectin Agri-Mek SC	1.75-3.5 fl oz	0.01-0.05	For control of spider mites.	Must be mixed with an adjuvant (NIS surfactant).	7
	Stink Bugs	acetamiprid + bifenthrin Savoy	12.9 oz			Maximum of 25.8 oz a season.	7
		bifenthrin (R) Brigade 2 EC	2.1-6.4 oz	0.033-0.1		Follow label directions.	1
		methomyl (R) Lannate 2.4 LV Lannate SP	1/2 lb 1/2 lb	0.45			0 (ears) 3 (forage)
		lambda cyhalothrin (R) Warrior II	1.28-1.92 fl oz	0.02-0.03			1
	Whorl feeders, fall armyworm, corn earworm	beta-cyfluthrin Baythroid XL	1.6-2.8 oz	0.013-0.022			0
		bifenthrin (R) Brigade 2 EC	2.1-6.4 oz	0.033-0.1		Follow label directions.	1
		carbaryl Sevin 4F Sevin XLR Plus	1-2 qt 1-2 qt	1.0-2.0	Apply when needed. Hand harvesting is prohibited.	Plants will tolerate a great deal of feeding with no yield loss. DO NOT apply during bloom.	2

VEGETABLE INSECT CONTROL RECOMMENDATIONS (COMMERCIAL)

Crop	Insect	Insecticide	Formulation Per Acre	Lb ai/Acre	Application	Remarks/Precautions	Days to Harvest
SWEET CORN (cont.)	Whorl feeders, fall armyworm, corn earworm (cont.)	chlorantraniliprole					1
		Coragen 1.67 SC	3.5-7.5 fl oz	0.045-0.098			
		Coragen eVo	1.2-2.5 fl oz	0.047-0.098			
		Shenzi 400SC	1.7-3.8 fl oz	0.045-0.098			
		esfenvalerate (R)		0.03-0.05			1
		Asana XL 0.66 EC	5.8-9.6 oz				
		lambda-cyhalothrin (R)		0.02-0.03			1
		Warrior II	1.28-1.92 fl oz				
		methomyl (R)		0.03-0.45			3
		Lannate 2.4 LV	1-1 1/2 pt				
Lannate SP	1/3-1/2 pt						
spinosad		0.042-0.094		Follow label directions.	1		
SpinTor 2 SC	3-6 oz						
zeta-cypermethrin (R)		0.02-0.025			3		
Mustang Maxx 0.8 EC	3.2-4.0 oz						
zeta-cypermethrin + bifenthrin		0.04-0.1					
Hero	4.0-10.3 oz				3		
SWEET POTATO	Flea beetles, tortoise beetles	beta-cyfluthrin		0.013-0.022			0
		Baythroid XL	1.6-2.8 oz				
		beta-cyfluthrin + imidacloprid		0.056-0.066			7
		Leverage 360	2.4-2.8 oz				
		bifenthrin (R)		0.033-0.1		Follow label directions.	21
		Brigade 2 EC	2.1-6.4 fl oz				
		carbaryl		1.0-2.0	When damage occurs on leaves as needed.	DO NOT apply during bloom.	7
	Sevin 4F	1-2 qt					
	Sevin XLR Plus	1-2 qt					
	lambda-cyhalothrin (R)		0.02-0.03			7	
	Warrior II	1.28-1.92 fl oz					
	spinosad		0.047-0.094		Not labeled for tortoise beetle.	7	
	SpinTor 2 SC	3-6 fl oz					
	Sweet potato weevil	beta-cyfluthrin		0.013-0.022			0
		Baythroid XL	1.6-2.8 oz				
		beta-cyfluthrin + imidacloprid		0.056-0.066			7
		Leverage 360	2.4-2.8 oz				
		carbaryl			Use as a preplant dip for sweet potato weevil. Just prior to plant- ing, dip sweet potato cuttings in the suspension.	DO NOT apply during bloom.	7
		Sevin 4F	2.6 oz/gal				
	Sevin XLR Plus	2.6 oz/gal					
lambda-cyhalothrin (R)		0.02-0.03			7		
Warrior II	1.28-1.92 fl oz						
phosmet			One application.				
Imidan 5% dust	2-4 oz/50 lb bu stored						
Wireworm, other soil insects	bifenthrin (R)			See label directions.			
	Capture LFR						
TOMATO	Cabbage loopers	Bacillus thuringiensis Dipel, Javelin, Biobit, Agree		Check label.			

VEGETABLE INSECT CONTROL RECOMMENDATIONS (COMMERCIAL)

Crop	Insect	Insecticide	Formulation Per Acre	Lb ai/Acre	Application	Remarks/Precautions	Days to Harvest	
TOMATO (cont.)	Cabbage loopers (cont.)	chlorantraniliprole					1	
		Coragen 1.67 SC	3.5-7.5 fl oz	0.045-0.098				
		Coragen eVo	1.2-2.5 fl oz	0.047-0.098				
		Shenzi 400SC	1.7-3.8 fl oz	0.045-0.098				
		chlorantraniliprole + lambda-cyhalothrin (R) Besiege	5-8 oz	0.05-0.08			5	
		Cyantraniliprole Exirel 0.83 EC	7-13.5 fl oz	0.45-0.88			1	
		esfenvalerate (R) Asana XL 0.66 EC	5.8-9.6 oz	0.03-0.05			1	
		lambda cyhalothrin (R) Warrior II	0.96-1.60 fl oz	0.015-0.025			5	
		methomyl (R) Lannate 2.4 LV Lannate SP	1 1/2-3 pt 1/2-1 lb	0.45-0.9	Apply on foliage as needed when loopers are small.		1	
		methoxyfenozide Intrepid 2F	4-8 oz	0.06-0.12			1	
		methoxyfenozide + spinetoram Intrepid Edge	10-12 oz			Follow label directions.	1	
		Colorado potato beetles, flea beetles, stink bugs	beta-cyfluthrin Baythroid XL	1.6-2.8 oz	0.013-0.022	2.8 oz for flea beetles.		0
			beta-cyfluthrin + imidacloprid Leverage 360	3.8-4.1 oz	0.089-0.096			0
	bifenthrin (R) Brigade 2 EC		2.1-5.2 oz	0.033-0.08			1	
	carbaryl Sevin 4F Sevin XLR Plus		1-2 qt 1-2 qt	1.0-2.0	Apply on foliage as needed.	DO NOT apply during bloom.	3	
	chlorantraniliprole Coragen Coragen eVo Shenzi 400 SC		3.5-7.5 fl oz 1.2-2.5 fl oz 1.7-3.8 fl oz	0.045-0.098 0.047-0.098 0.044-0.098	Foliar or chemigation applications.	For control of Colorado Potato beetle only.	1	
	imidacloprid Admire Pro 4.6F		1.3 fl oz	0.047			0	
	lambda cyhalothrin (R) Warrior II		0.96-1.60 fl oz	0.015-0.025			21	
	spinosad SpinTor 2 SC		3-6 oz	0.047-0.094	Follow label directions.		1	
	zeta-cypermethrin (R) Mustang Maxx 0.8 EC		3.2-4.0 oz	0.02-0.025			1	
	zeta-cypermethrin + bifenthrin Hero		4.0-10.3 oz	0.04-0.1			1	
	Cutworms		beta-cyfluthrin + imidacloprid Leverage 360	3.8-4.1 oz	0.089-0.096			0
			bifenthrin (R) Brigade 2 EC	2.1-5.2 oz	0.033-0.08			1

VEGETABLE INSECT CONTROL RECOMMENDATIONS (COMMERCIAL)

Crop	Insect	Insecticide	Formulation Per Acre	Lb ai/Acre	Application	Remarks/Precautions	Days to Harvest
TOMATO (cont.)	Cutworms (cont.)	bifenthrin (R) Capture LFR	0.29-0.39 oz/ 1,000 ft row OR 3.4-6.8 oz/acre	0.04-0.08	Apply in 5- to 7-inch band or in furrow ahead of press wheel. Compatible with liquid fertilizers.		30
		carbaryl Sevin 4F Sevin XLR Plus	2 qt 2 qt	2.0	Apply to soil surface 2-3 days prior to transplanting or when damage occurs.	DO NOT apply during bloom.	3
		diazinon Diazinon AG500 Diazinon 50 W Diazinon AG600C	2-4 qt 4-8 lb 51-102 oz	2.0-4.0	Broadcast to soil surface just prior to planting. Incorporate into soil 3-6 inches immediately. Mix in a minimum of 5 gallons of water/acre.		
		esfenvalerate (R) Asana XL 0.66 EC	5.8-9.6 oz	0.03-0.05	Broadcast prior to planting and work into soil 4-8 inches.		1
		lambda cyhalothrin (R) Warrior II	0.96-1.60 fl oz	0.015-0.025			5
		zeta-cypermethrin (R) Mustang Maxx 0.8 EC	1.28-4.0 oz	0.008-0.025			1
		zeta-cypermethrin + bifenthrin Hero	10.3 oz	0.1			1
	Leaf miners, aphids	acetamiprid + bifenthrin Savoy	4.9-9.6 oz			Aphids only. Follow label directions.	7
		abamectin (R) Agri-Mek 0.7 SC	1.75-3.5 fl oz	0.009-0.019	20 gallons of water/acre required.	Mites, leafminers, pinworms, potato beetle. Must be mixed with an adjuvant (NIS surfactant).	7
		acetamiprid Assail 30 SG	2-4 oz	0.038-0.075		Follow label directions.	7
		beta-cyfluthrin + imidacloprid Leverage 360	3.8-4.1 oz	0.089-0.096			0
		bifenthrin (R) Brigade 2 EC	2.1-5.2 oz	0.033-0.08			1
		dimethoate Dimethoate 400 Dimethoate 4EC Dimethoate 5 lb	1/2-1 pt 1/2-1 pt 6.4-12.8 oz	0.25-0.5			7
		esfenvalerate (R) Asana XL 0.66 EC	9.6 oz	0.05		Use 5.8-9.6 oz of Asana per acre for aphids.	1
		imidacloprid Admire Pro 4.6F	1.3 fl oz	0.047			0
		methomyl (R) Lannate 2.4 LV Lannate SP	1 1/2-3 pt 1/2-1 lb	0.45-0.9		Aphids only.	1
		sulfoxaflor Transform WG	0.75-1.0	0.023-0.031		Not for leaf miners. Check label for crop rotation restrictions.	1
		zeta-cypermethrin (R) Mustang Maxx 0.8 EC	3.2-4.0 oz	0.02-0.025		Aphid control may be variable.	1
		zeta-cypermethrin + bifenthrin Hero	4.0-10.3 oz	0.04-0.1			1

VEGETABLE INSECT CONTROL RECOMMENDATIONS (COMMERCIAL)

Crop	Insect	Insecticide	Formulation Per Acre	Lb ai/Acre	Application	Remarks/Precautions	Days to Harvest
TOMATO (cont.)	Pinworms	abamectin (R) Agri-Mek 0.7 SC	3.5 oz	0.019		Must be mixed with an adjuvant (NIS surfactant).	7
		beta-cyfluthrin Baythroid XL	2.1-2.8 oz	0.017-0.022			0
		beta-cyfluthrin + imidacloprid Leverage 360	3.8-4.1 oz	0.089-0.096			0
		chlorantraniliprole Coragen	3.5-7.5 fl oz	0.045-0.098			1
		esfenvalerate (R) Asana XL 0.66 EC	5.8-9.6 oz	0.03-0.05		DO NOT exceed 0.5 lb ai/acre per season.	1
		gamma-cyhalothrin Proaxis 0.5 EC	2.56-3.84 oz	0.01-0.015		Follow label directions.	5
		indoxacarb Avaunt 30 DG	3.5 oz	0.065		Follow label directions.	3
		lambda cyhalothrin (R) Warrior II	1.28-1.92 fl oz	0.02-0.03			5
		methomyl (R) Lannate LV Lannate SP	1 1/2-3 pt 1/2-1 lb	0.45-0.9		All are alternatives. Check dosage on label.	1
		methoxyfenozide Intrepid 2F	10-16 oz	0.16-0.25			1
		No-Mate Spiral Bioinsecticide			Read product label.	Comes in a plastic coil that is wrapped around tomato vines or support stakes.	
	Spider mites	abamectin (R) Agri-Mek 0.7 SC	1.75-3.5 oz	0.0094-0.019	DO NOT apply Agri-Mek in less than 20 gallons of water per acre.	Must be mixed with an adjuvant (NIS surfactant).	7
		bifenthrin (R) Brigade 2 EC	5.2-6.4 oz	0.08-0.1		Follow label directions.	1
		fenpyroximate Portal	2 pt		Apply in a minimum of 20 gallons of water per acre		1
		spiromesifen Oberon 2 SC	7-8.5 oz	0.11-0.13			1
	Thrips	acetamiprid + bifenthrin Savoy	9.6 oz			Follow label directions.	7
		beta-cyfluthrin + imidacloprid Leverage 360	3.8-4.1 oz	0.089-0.096			0
		bifenthrin (R) Brigade 2 EC	2.1-5.2 oz	0.033-0.08			1
		flonicamid Beleaf	2.4-4.8 oz	0.089-0.133			0
		spinetoram Radiant 1 SC	6-10 oz	0.047-0.078		Will control thrips on foliage, but not in flowers.	1

VEGETABLE INSECT CONTROL RECOMMENDATIONS (COMMERCIAL)

Crop	Insect	Insecticide	Formulation Per Acre	Lb ai/Acre	Application	Remarks/Precautions	Days to Harvest
TOMATO (cont.)	Tomato fruitworm, Hornworms	carbaryl		1.0-2.0		DO NOT apply during bloom.	3
		Sevin 4F	1-2 qt				
		Sevin XLR Plus	1-2 qt				
		chlorantraniliprole					1
		Coragen 1.67 SC	3.5-7.5 fl oz	0.045-0.098		Coragen: 2.0-5.0 fl oz/ac for hornworms	
		Shenzi 400SC	1.7-3.8 fl oz	0.044-0.098		Shenzi: 1.0-2.5 fl oz and (0.026 - 0.065) lbs ai/acre for hornworms	
		Coragen eVo	1.2-2.5 fl oz	0.047-0.098			
		Cyantraniliprole		0.45-0.88			1
		Exirel 0.83 EC	7-13.5 fl oz				
		chlorantraniliprole + lambda-cyhalothrin (R)					
		Besiege	6-9 oz	0.06-0.09			5
		esfenvalerate (R)		0.03-0.05			1
		Asana XL 0.66 EC	5.8-9.6 oz				
		lambda-cyhalothrin (R)		0.02-0.03	Five-day intervals.		5
		Warrior II	1.28-1.92 fl oz				
		methomyl (R)		0.45-0.9		Bacillus thuringiensis 1/2 lb/acre may be used in combination with methomyl. Other areas have had good results.	
		Lannate 2.4 LV	1 1/2-3 pt				
		Lannate SP	1/2-1 lb				
		methoxyfenozide		0.06-0.25			1
		Intrepid 2F	4-16 oz				
	methoxyfenozide + spinetoram		0.06-0.25		Follow label directions.	1	
	Intrepid Edge	10-12 oz					
	rynaxypyr		0.045-0.065			1	
	Coragen	3.5-5 fl oz					
	spinosad		0.047-0.125			1	
	SpinTor 2 SC	3-8 fl oz					
zeta-cypermethrin (R)		0.014-0.025			1		
Mustang Maxx 0.8 EC	2.24-4.0 oz						
zeta-cypermethrin + bifenthrin		0.04-0.1			1		
Hero	4.0-10.3 oz						
	Wireworms	bifenthrin (R) Capture LFR	0.29-0.39 oz/ 1,000 ft row or 3.4-6.8 oz/A	0.04-0.08	Apply in 5- to 7-inch band or in furrow ahead of press wheel. Compatible with liquid fertilizers.		30
		diazinon (R) Diazinon 50W Diazinon AG600 Diazinon AG500	6-8 lb 76 1/2-102 oz 3-4 qt	3.0-4.0	Broadcast prior to planting and immediately work into soil 4-8 inches.		
VEGETABLES (See labels for specific crops)	Red Imported Fire Ants	ALL FIRE ANT BAITS – Apply when ants are active and soil temperature is above 60 degrees F. DO NOT treat if rain is anticipated within 6 hours.					
		S-Methoprene Extinguish	3-5 Tbsp/mound 1.0-1.5 lb/acre		Mound-to-mound treatment rate. Broadcast rate.	This product is an insect growth regulator (IGR). Apply 3 to 4 weeks prior to harvest date.	
		pyriproxyfen Esteem	2-4 Tbsp/mound 1.5-2.0 lb/acre		Mound-to-mound treatment rate. Broadcast rate.	This product is an insect growth regulator (IGR).	
		spinosad Eliminator Fire Ant Bait Green Light Fire Ant Control Ortho Fire Ant Bait Safer Fire Ant Bait	4-6 Tbsp/mound 2.5-5.0 lb/acre		Mound-to-mound treatment rate. Broadcast rate.	See label for specific rate and application instructions. Acceptable for organic production.	

HOME GARDEN VEGETABLE INSECT CONTROL – Products for Use by the General Public

The following table provides home garden vegetable insect control recommendations with pesticides for use by the homeowner. All chemical information provided below is given with the understanding that no endorsement of named products is intended nor is criticism implied of similar products that are not mentioned. Individuals who use pesticides are responsible for ensuring that the intended use complies with current regulations and conforms to the product label. Before purchasing or using any pesticide, always read and carefully follow the label directions.

Insecticides listed below are identified by common chemical name. A trade name in parentheses may also be listed as a convenience for the reader. Pesticide labels for commercial and homeowner products that are currently registered for use in Arkansas may be found through the Arkansas Department of Agriculture/State Plant Board website by clicking on the following link: <https://www.agriculture.arkansas.gov/plant-industries/pesticide-section/registration/>.

The complete Organic Materials Review Institute (OMRI) products list can be viewed by visiting this link: http://www.omri.org/OMRI_products_list.php.

Commodity	Insect	Insecticide and Formulation	Amount of Formulation Per Gallon of Spray	Minimum Interval (Days) Between Last Application and Harvest	Precautions and Remarks
ASPARAGUS	Asparagus beetle, Japanese beetle, grasshopper, aphids	carbaryl (various brands)	See label.	1	Repeat applications as necessary up to a total of 3 times prior to harvest or a total of 5 times per crop but not more often than once every 7 days. Sevin is not effective against aphids.
		malathion 50% (Bonide)	See label.	1	Aphids and asparagus beetles ONLY. Refer to label.
		permethrin 2.5% EC (various brands)	1.5 fl oz	3	
		spinosad 0.5% (Bonide, Monterey, Natural Guard)	2.0 fl oz	60	Post-harvest to protect ferns.
BEAN	Aphids	acetamiprid 0.5% (Ortho Flower, Fruit & Vegetable Insect Killer)	1.5 fl oz	7	Maximum applications per season (3). Days to wait to reapply (7).
		bifenthrin 0.3% + zeta-cypermethrin 0.075% (Ortho Bug-G-Gon Insect Killer for Lawns and Gardens)	1.5 fl oz	3	Apply when insects first appear. Reapply as necessary to maintain control waiting at least 7 days between applications.
		esfenvalerate 0.425% (Monterey)	1 fl oz	21 dry beans 3 snap beans	Spray plants to wet upper and lower leaf surfaces until dripping. Apply as necessary to maintain control waiting at least 7 days between each application.
		gamma-cyhalothrin 0.08% (Spectracide)	1.5 fl oz	7	Apply when insects first appear or when damage occurs. DO NOT apply more than 9 times per growing season.
		imidacloprid 0.235% (Bayer Advanced Fruit, Citrus and Vegetable Insect Control Concentrate)	0.5 fl oz/1 qt of water/10 sq ft of row as a drench	21	This systemic insecticide dissolved in water moves down through the soil, where it is absorbed by the roots. Once absorbed, it moves up through the plant providing insect protection.
		malathion 50% (Ortho, Bonide)	See label.	1	Refer to label.
		soap (insecticidal, M-Pede 49 EC)	2 Tbsp	0	
	Corn earworm	bifenthrin 0.3% + zeta-cypermethrin 0.075% (Ortho Bug-G-Gon Insect Killer for Lawns and Gardens)	1.5 fl oz	3	Apply when insects first appear. Reapply as necessary to maintain control waiting at least 7 days between applications.
		carbaryl (various brands)	See label.	3/14/21	DO NOT apply within 14 days of grazing or harvest for forage or within 3 days of harvest of fresh beans or peas or within 21 days of harvest of dried beans or peas, seed or hay.
		esfenvalerate 0.425% (Monterey)	1 fl oz	21 dry beans 3 snap beans	Spray plants to wet upper and lower leaf surfaces until dripping. Apply as necessary to maintain control waiting at least 7 days between each application.
		gamma-cyhalothrin 0.08% (Spectracide)	1.5 fl oz	7	Apply when insects first appear or when damage occurs. DO NOT apply more than 9 times per growing season.
		spinosad 0.5% (Bonide, Monterey, Natural Guard)	2.0 fl oz	3	Post-harvest to protect ferns.

HOME GARDEN VEGETABLE INSECT CONTROL – Products for Use by the General Public

Commodity	Insect	Insecticide and Formulation	Amount of Formulation Per Gallon of Spray	Minimum Interval (Days) Between Last Application and Harvest	Precautions and Remarks
BEAN (cont.)	Mexican bean beetle, bean leaf beetle, flea beetle, Japanese beetle, cucumber beetle	acetamiprid 0.5% (Ortho Flower, Fruit & Vegetable Insect Killer)	1.5 fl oz	7	Maximum applications per season (3). Days to wait to reapply (7).
		bifenthrin 0.3% + zeta-cypermethrin 0.075% (Ortho Bug-G-Gon Insect Killer for Lawns and Gardens)	1.5 fl oz	3	Apply when insects first appear. Reapply as necessary to maintain control waiting at least 7 days between applications.
		carbaryl (various)	See label.	3/14/21	DO NOT apply within 14 days of grazing or harvest for forage or within 3 days of harvest of fresh beans or peas or within 21 days of harvest of dried beans or peas, seed or hay.
		esfenvalerate 0.425% (Monterey)	1 fl oz	21 dry beans 3 snap beans	Spray plants to wet upper and lower leaf surfaces until dripping. Apply as necessary to maintain control waiting at least 7 days between each application.
		gamma-cyhalothrin 0.08% (Spectracide)	1.5 fl oz	7	Apply when insects first appear or when damage occurs. DO NOT apply more than 9 times per growing season.
		imidacloprid 0.235% (Bayer Advanced Fruit, Citrus and Vegetable Insect Control Concentrate)	0.5 fl oz/1 qt of water/10 sq ft of row as a drench	21	This systemic insecticide dissolved in water moves down through the soil, where it is absorbed by the roots. Once absorbed, it moves up through the plant providing insect protection.
		malathion 50% (Ortho, Bonide)	See label.	1	Refer to label.
	Potato leafhopper, flea hopper, lygus, stink bug	acetamiprid 0.5% (Ortho Flower, Fruit & Vegetable Insect Killer)	1.5 fl oz	7	Maximum applications per season (3). Days to wait to reapply (7).
		bifenthrin 0.3% + zeta-cypermethrin 0.075% (Ortho Bug-G-Gon Insect Killer for Lawns and Gardens)	1.5 fl oz	3	Apply when insects first appear. Reapply as necessary to maintain control waiting at least 7 days between applications.
		esfenvalerate 0.425% (Monterey)	1 fl oz	21 dry beans 3 snap beans	Spray plants to wet upper and lower leaf surfaces until dripping. Apply as necessary to maintain control waiting at least 7 days between each application.
		gamma-cyhalothrin 0.08% (Spectracide)	1.5 fl oz	7	Lygus and stinkbugs ONLY. Apply when insects first appear or when damage occurs. DO NOT apply more than 9 times per growing season.
		imidacloprid 0.235% (Bayer Advanced Fruit, Citrus and Vegetable Insect Control Concentrate)	0.5 fl oz/1 qt of water/10 sq ft of row as a drench	21	Leafhoppers ONLY. This systemic insecticide dissolved in water moves down through the soil, where it is absorbed by the roots. Once absorbed, it moves up through the plant providing insect protection.
		malathion 50% (Ortho)	See label.	1	NOT for stink bugs. Refer to label.
	Spider mite	gamma-cyhalothrin 0.08% (Spectracide)	1.5 fl oz	7	Apply when mites appear or when damage occurs. DO NOT apply more than 9 times per growing season.
		malathion 50% (Ortho, Bonide)	See label.	1	Refer to label.
		soap (insecticidal, M-Pede 49 EC)	2 Tbsp	0	Apply treatment at first sign of mites and speckled plants.
		sulfur 90%	2 Tbsp	0	DO NOT use if temperature is above 95°F. DO NOT use within 3 weeks of oil spray.

HOME GARDEN VEGETABLE INSECT CONTROL – Products for Use by the General Public

Commodity	Insect	Insecticide and Formulation	Amount of Formulation Per Gallon of Spray	Minimum Interval (Days) Between Last Application and Harvest	Precautions and Remarks
BEAN (cont.)	Thrips, leafminer	acetamiprid 0.5% (Ortho Flower, Fruit & Vegetable Insect Killer)	1.5 fl oz	7	Maximum applications per season (3). Days to wait to reapply (7).
		bifenthrin 0.3% + zeta-cypermethrin 0.075% (Ortho Bug-G-Gon Insect Killer for Lawns and Gardens)	1.5 fl oz	3	Leafminer ONLY. Apply when insects first appear. Reapply as necessary to maintain control waiting at least 7 days between applications.
		carbaryl (various brands)	See label.	3/14/21	DO NOT apply within 14 days of grazing or harvest for forage or within 3 days of harvest of fresh beans or peas or within 21 days of harvest of dried beans or peas, seed or hay.
		esfenvalerate 0.425% (Monterey)	1 fl oz	21 dry beans 3 snap beans	Leafminer ONLY. Spray plants to wet upper and lower leaf surfaces until dripping. Apply as necessary to maintain control waiting at least 7 days between each application.
		gamma-cyhalothrin 0.08% (Spectracide)	1.5 fl oz	7	Thrips ONLY. Apply when insects first appear or when damage occurs. DO NOT apply more than 9 times per growing season.
		imidacloprid 0.235% (Bayer Advanced Fruit, Citrus and Vegetable Insect Control Concentrate)	0.5 fl oz/1 qt of water/10 sq ft of row as a drench	21	Thrips ONLY. This systemic insecticide dissolved in water moves down through the soil, where it is absorbed by the roots. Once absorbed, it moves up through the plant providing insect protection.
		malathion 50% (Ortho)	See label.	1	Refer to label.
		spinosad 0.5% (Bonide, Monterey, Natural Guard)	2.0 fl oz	3	Refer to label.
	Whitefly	acetamiprid 0.5% (Ortho Flower, Fruit & Vegetable Insect Killer)	1.5 fl oz	7	Maximum applications per season (3). Days to wait to reapply (7).
		<i>Beauveria bassiana</i> (Mycotrol WP)	1/4 lb/20 gal water	0	
		bifenthrin 0.3% + zeta-cypermethrin 0.075% (Ortho Bug-G-Gon Insect Killer for Lawns and Gardens)	1.5 fl oz	3	Apply when insects first appear. Reapply as necessary to maintain control waiting at least 7 days between applications.
		esfenvalerate 0.425% (Monterey)	1 fl oz	21 dry beans 3 snap beans	Spray plants to wet upper and lower leaf surfaces until dripping. Apply as necessary to maintain control waiting at least 7 days between each application.
		imidacloprid 0.235% (Bayer Advanced Fruit, Citrus and Vegetable Insect Control Concentrate)	0.5 fl oz/1 qt of water/10 sq ft of row as a drench	21	This systemic insecticide dissolved in water moves down through the soil, where it is absorbed by the roots. Once absorbed, it moves up through the plant providing insect protection.
		malathion 50% (Ortho)	See label.	1	Refer to label.
		soap (insecticidal, M-Pede 49 EC)	2 Tbsp	0	
BEET	Aphids	imidacloprid 0.235% (Bayer Advanced Fruit, Citrus and Vegetable Insect Control Concentrate)	0.5 fl oz/1 qt of water/10 sq ft of row as a drench	21	This systemic insecticide dissolved in water moves down through the soil, where it is absorbed by the roots. Once absorbed, it moves up through the plant providing insect protection.
		malathion 50% (Ortho, Bonide)	See label.	7	Refer to label. DO NOT apply to sugar beets.
	Flea beetle, beet webworm, blister beetle	carbaryl (various brands)	See label.	7	Repeat applications as necessary up to a total of 6 times but not more often than once every 7 days.
		cyfluthrin 0.75% (Bayer Advanced)	0.5 fl oz	0	Flea beetles ONLY. DO NOT spray more than 5 times per season.

HOME GARDEN VEGETABLE INSECT CONTROL – Products for Use by the General Public

Commodity	Insect	Insecticide and Formulation	Amount of Formulation Per Gallon of Spray	Minimum Interval (Days) Between Last Application and Harvest	Precautions and Remarks
BEET (cont.)	Flea beetle, beet webworm, blister beetle (cont.)	imidacloprid 0.235% (Bayer Advanced Fruit, Citrus and Vegetable Insect Control Concentrate)	0.5 fl oz/1 qt of water/10 sq ft of row as a drench	21	Flea beetles ONLY. This systemic insecticide dissolved in water moves down through the soil, where it is absorbed by the roots. Once absorbed, it moves up through the plant providing insect protection.
	Leafhopper	cyfluthrin 0.75% (Bayer Advanced)	0.5 fl oz	0	DO NOT spray more than 5 times per season.
		imidacloprid 0.235% (Bayer Advanced Fruit, Citrus and Vegetable Insect Control Concentrate)	0.5 fl oz/1 qt of water/10 sq ft of row as a drench	21	This systemic insecticide dissolved in water moves down through the soil, where it is absorbed by the roots. Once absorbed, it moves up through the plant providing insect protection.
		malathion 50% (Ortho, Bonide)	See label.	7	Refer to label.
	Thrips	imidacloprid 0.235% (Bayer Advanced Fruit, Citrus and Vegetable Insect Control Concentrate)	0.5 fl oz/1 qt of water/10 sq ft of row as a drench	21	This systemic insecticide dissolved in water moves down through the soil, where it is absorbed by the roots. Once absorbed, it moves up through the plant providing insect protection.
		malathion 50% (Ortho)	See label.	7	Refer to label.
	Whitefly	imidacloprid 0.235% (Bayer Advanced Fruit, Citrus and Vegetable Insect Control Concentrate)	0.5 fl oz/1 qt of water/10 sq ft of row as a drench	21	This systemic insecticide dissolved in water moves down through the soil, where it is absorbed by the roots. Once absorbed, it moves up through the plant providing insect protection.
		malathion 50% (Ortho)	See label.	7	Refer to label.
BROCCOLI, CAULIFLOWER, BRUSSELS SPROUTS, RUTABAGA	Aphids, flea beetle	acetamiprid 0.5% (Ortho Flower, Fruit & Vegetable Insect Killer)	1.5 fl oz	7	Maximum applications per season (4). Days to wait to reapply (7). NOT labeled on rutabaga.
		bifenthrin 0.3% + zeta-cypermethrin 0.075% (Ortho Bug-G-Gon Insect Killer for Lawns and Gardens)	1.5 fl oz	7	NOT for use on Brussels sprouts or rutabaga. Apply when insects first appear. Reapply as necessary to maintain control waiting at least 7 days between applications.
		cyfluthrin 0.75% (Bayer Advanced)	0.5 fl oz	0	DO NOT spray more than 4 times per season, 5 times for rutabaga.
		esfenvalerate 0.425% (Monterey)	1 fl oz	3	NOT for use on Brussels sprouts or rutabaga. Spray plants to wet upper and lower leaf surfaces until dripping. Apply as necessary to maintain control waiting at least 7 days between each application.
		gamma-cyhalothrin 0.08% (Spectracide)	1.5 fl oz	1	NOT for use on rutabaga. Apply when insects first appear or when damage occurs. DO NOT apply more than 9 times per growing season.
		imidacloprid 0.235% (Bayer Advanced Fruit, Citrus and Vegetable Insect Control Concentrate)	0.5 fl oz/1 qt of water/10 sq ft of row as a drench	21	This systemic insecticide dissolved in water moves down through the soil, where it is absorbed by the roots. Once absorbed, it moves up through the plant providing insect protection.
		lambda-cyhalothrin 0.5% (Bonide)	ready-to-use premix	1	NOT for use on rutabaga. Apply thoroughly as a foliar cover spray to both sides of plant leaves and all plant surfaces where insects are present. DO NOT spray more than 9 times per season.
		malathion 50% (Ortho, Bonide)	See label.	2, 7 for rutabaga 7, 3 for broccoli	Refer to label.
		soap (insecticidal, M-Pede 49 EC)	2 Tbsp	0	On foliage as needed.

HOME GARDEN VEGETABLE INSECT CONTROL – Products for Use by the General Public

Commodity	Insect	Insecticide and Formulation	Amount of Formulation Per Gallon of Spray	Minimum Interval (Days) Between Last Application and Harvest	Precautions and Remarks
BROCCOLI, CAULIFLOWER, BRUSSELS SPROUTS, RUTABAGA (cont.)	Cabbage looper, diamondback moth, imported cabbageworm	acetamiprid 0.5% (Ortho Flower, Fruit & Vegetable Insect Killer)	1.5 fl oz	7	Maximum applications per season (4). Days to wait to reapply (7). NOT labeled on rutabaga.
		<i>Bacillus thuringiensis</i> (DiPel) 2 X 4 L (Javelin) WG	1 Tbsp 2 tsp 2 tsp	0	On foliage as needed.
		bifenthrin 0.3% + zeta-cypermethrin 0.075% (Ortho Bug-Gon Insect Killer for Lawns and Gardens)	1.5 fl oz	7	NOT for use on Brussels sprouts or rutabaga. Apply when insects first appear. Reapply as necessary to maintain control waiting at least 7 days between applications.
		cyfluthrin 0.75% (Bayer Advanced)	0.5 fl oz	0	DO NOT spray more than 4 times per season, 5 times for rutabaga.
		esfenvalerate 0.425% (Monterey)	1 fl oz	3	NOT for use on Brussels sprouts or rutabaga. Spray plants to wet upper and lower leaf surfaces until dripping. Apply as necessary to maintain control waiting at least 7 days between each application.
		gamma-cyhalothrin 0.08% (Spectracide)	1.5 fl oz	1	NOT for use on rutabaga. Apply when insects first appear or when damage occurs. DO NOT apply more than 9 times per growing season.
		lambda-cyhalothrin 0.5% (Bonide)	ready-to-use premix	1	NOT for use on rutabaga. Apply thoroughly as a foliar cover spray to both sides of plant leaves and all plant surfaces where insects are present. DO NOT spray more than 9 times per season.
		malathion 50% (Ortho, Bonide)	See label.	2, 7 for rutabaga 7, 3 for broccoli	NOT for diamondback moth. Refer to label.
		spinosad 0.5% (Bonide, Monterey, Natural Guard)	2.0 fl oz	1	NOT for use on rutabaga.
	Harlequin bug	acetamiprid 0.5% (Ortho Flower, Fruit and Vegetable Insect Killer)	1.5 fl oz	7	Maximum applications per season (4). Days to wait to reapply (7). NOT labeled on rutabaga.
		bifenthrin 0.3% + zeta-cypermethrin 0.075% (Ortho Bug-Gon Insect Killer for Lawns and Gardens)	1.5 fl oz	7	NOT for use on Brussels sprouts or rutabaga. Apply when insects first appear. Reapply as necessary to maintain control waiting at least 7 days between applications.
		cyfluthrin 0.75% (Bayer Advanced)	0.5 fl oz	0	DO NOT spray more than 4 times per season, 5 times for rutabaga.
		esfenvalerate 0.425% (Monterey)	1 fl oz	3	NOT for use on Brussels sprouts or rutabaga. Spray plants to wet upper and lower leaf surfaces until dripping. Apply as necessary to maintain control waiting at least 7 days between each application.
		gamma-cyhalothrin 0.08% (Spectracide)	1.5 fl oz	1	NOT for use on rutabaga. Apply when insects first appear or when damage occurs. DO NOT apply more than 9 times per growing season.
		lambda-cyhalothrin 0.5% (Bonide)	ready-to-use premix	1	NOT for use on rutabaga. Apply thoroughly as a foliar cover spray to both sides of plant leaves and all plant surfaces where insects are present. DO NOT spray more than 9 times per season.
		malathion 50% (Ortho)	See label.	7, 3 for broccoli	Refer to label.

HOME GARDEN VEGETABLE INSECT CONTROL – Products for Use by the General Public

Commodity	Insect	Insecticide and Formulation	Amount of Formulation Per Gallon of Spray	Minimum Interval (Days) Between Last Application and Harvest	Precautions and Remarks
BROCCOLI, CAULIFLOWER, BRUSSELS SPROUTS, RUTABAGA (cont.)	Leafhopper	acetamiprid 0.5% (Ortho Flower, Fruit & Vegetable Insect Killer)	1.5 fl oz	7	Maximum applications per season (4). Days to wait to reapply (7). NOT labeled on rutabaga.
		bifenthrin 0.3% + zeta-cypermethrin 0.075% (Ortho Bug-G-Gon Insect Killer for Lawns and Gardens)	1.5 fl oz	7	NOT for use on Brussels sprouts or rutabaga. Apply when insects first appear. Reapply as necessary to maintain control waiting at least 7 days between applications.
		cyfluthrin 0.75% (Bayer Advanced)	0.5 fl oz	0	DO NOT spray more than 4 times per season, 5 times for rutabaga.
		esfenvalerate 0.425% (Monterey)	1 fl oz	3	NOT for use on Brussels sprouts or rutabaga. Spray plants to wet upper and lower leaf surfaces until dripping. Apply as necessary to maintain control waiting at least 7 days between each application.
		gamma-cyhalothrin 0.08% (Spectracide)	1.5 fl oz	1	NOT for use on rutabaga. Apply when insects first appear or when damage occurs. DO NOT apply more than 9 times per growing season.
		imidacloprid 0.235% (Bayer Advanced Fruit, Citrus and Vegetable Insect Control Concentrate)	0.5 fl oz/1 qt of water/10 sq ft of row as a drench	21	This systemic insecticide dissolved in water moves down through the soil, where it is absorbed by the roots. Once absorbed, it moves up through the plant providing insect protection.
		lambda-cyhalothrin 0.5% (Bonide)	ready-to-use premix	1	NOT for use on rutabaga. Apply thoroughly as a foliar cover spray to both sides of plant leaves and all plant surfaces where insects are present. DO NOT spray more than 9 times per season.
	Thrips	malathion 50% (Ortho)	See label.	7, 3 for broccoli	Refer to label.
		acetamiprid 0.5% (Ortho Flower, Fruit & Vegetable Insect Killer)	1.5 fl oz	7	Maximum applications per season (4). Days to wait to reapply (7). NOT labeled on rutabaga.
		cyfluthrin 0.75% (Bayer Advanced)	0.5 fl oz	0	DO NOT spray more than 4 times per season, 5 times for rutabaga.
		gamma-cyhalothrin 0.08% (Spectracide)	1.5 fl oz	1	NOT for use on rutabaga. Apply when insects first appear or when damage occurs. DO NOT apply more than 9 times per growing season.
		imidacloprid 0.235% (Bayer Advanced Fruit, Citrus and Vegetable Insect Control Concentrate)	0.5 fl oz/1 qt of water/10 sq ft of row as a drench	21	This systemic insecticide dissolved in water moves down through the soil, where it is absorbed by the roots. Once absorbed, it moves up through the plant providing insect protection.
		lambda-cyhalothrin 0.5% (Bonide)	ready-to-use premix	1	NOT for use on rutabaga. Apply thoroughly as a foliar cover spray to both sides of plant leaves and all plant surfaces where insects are present. DO NOT spray more than 9 times per season.
		malathion 50% (Ortho)	See label.	7, 3 for broccoli	Refer to label.
	Whitefly	spinosad 0.5% (Bonide, Monterey, Natural Guard)	2.0 fl oz	1	NOT for use on rutabaga.
		acetamiprid 0.5% (Ortho Flower, Fruit & Vegetable Insect Killer)	1.5 fl oz	7	Maximum applications per season (4). Days to wait to reapply (7). NOT labeled on rutabaga.
		bifenthrin 0.3% + zeta-cypermethrin 0.075% (Ortho Bug-G-Gon Insect Killer for Lawns and Gardens)	1.5 fl oz	7	NOT for use on Brussels sprouts or rutabaga. Apply when insects first appear. Reapply as necessary to maintain control waiting at least 7 days between applications.

HOME GARDEN VEGETABLE INSECT CONTROL – Products for Use by the General Public

Commodity	Insect	Insecticide and Formulation	Amount of Formulation Per Gallon of Spray	Minimum Interval (Days) Between Last Application and Harvest	Precautions and Remarks
BROCCOLI, CAULIFLOWER, BRUSSELS SPROUTS, RUTABAGA (cont.)	Whitefly (cont.)	cyfluthrin 0.75% (Bayer Advanced)	0.5 fl oz	0	Adults ONLY. DO NOT spray more than 4 times per season, 5 times for rutabaga.
		esfenvalerate 0.425% (Monterey)	1 fl oz	3	NOT for use on Brussels sprouts or rutabaga. Spray plants to wet upper and lower leaf surfaces until dripping. Apply as necessary to maintain control waiting at least 7 days between each application.
		gamma-cyhalothrin 0.08% (Spectracide)	1.5 fl oz	1	NOT for use on rutabaga. Apply when insects first appear or when damage occurs. DO NOT apply more than 9 times per growing season.
		imidacloprid 0.235% (Bayer Advanced Fruit, Citrus and Vegetable Insect Control Concentrate)	0.5 fl oz/1 qt of water/10 sq ft of row as a drench	21	This systemic insecticide dissolved in water moves down through the soil, where it is absorbed by the roots. Once absorbed, it moves up through the plant providing insect protection.
		lambda-cyhalothrin 0.5% (Bonide)	ready-to-use premix	1	NOT for use on rutabaga. Apply thoroughly as a foliar cover spray to both sides of plant leaves and all plant surfaces where insects are present. DO NOT spray more than 9 times per season.
		malathion 50% (Ortho)	See label.	7, 3 for broccoli	Refer to label.
CABBAGE	Aphids	acetamiprid 0.5% (Ortho Flower, Fruit & Vegetable Insect Killer)	1.5 fl oz	7	Maximum applications per season (4). Days to wait to reapply (7).
		bifenthrin 0.3% + zeta-cypermethrin 0.075% (Ortho Bug-G-Gon Insect Killer for Lawns and Gardens)	1.5 fl oz	7	Apply when insects first appear. Reapply as necessary to maintain control waiting at least 7 days between applications.
		cyfluthrin 0.75% (Bayer Advanced)	0.5 fl oz	0	DO NOT spray more than 4 times per season.
		esfenvalerate 0.425% (Monterey)	1 fl oz	3	Spray plants to wet upper and lower leaf surfaces until dripping. Apply as necessary to maintain control waiting at least 7 days between each application.
		gamma-cyhalothrin 0.08% (Spectracide)	1.5 fl oz	1	Apply when insects first appear or when damage occurs. DO NOT apply more than 9 times per growing season.
		imidacloprid 0.235% (Bayer Advanced Fruit, Citrus and Vegetable Insect Control Concentrate)	0.5 fl oz/1 qt of water/10 sq ft of row as a drench	21	This systemic insecticide dissolved in water moves down through the soil, where it is absorbed by the roots. Once absorbed, it moves up through the plant providing insect protection.
		lambda-cyhalothrin 0.5% (Bonide)	ready-to-use premix	1	Apply thoroughly as a foliar cover spray to both sides of plant leaves and all plant surfaces where insects are present. DO NOT spray more than 9 times per season.
		malathion 55% (Hi-Yield) 50% (Ortho, Bonide)	1.5 tsp See label.	7	Refer to label.
		soap (insecticidal, M-Pede 49 EC)	2 Tbsp	0	

HOME GARDEN VEGETABLE INSECT CONTROL – Products for Use by the General Public

Commodity	Insect	Insecticide and Formulation	Amount of Formulation Per Gallon of Spray	Minimum Interval (Days) Between Last Application and Harvest	Precautions and Remarks
CABBAGE (cont.)	Cabbage looper, imported cabbageworm, diamondback moth, cutworm	acetamiprid 0.5% (Ortho Flower, Fruit & Vegetable Insect Killer)	1.5 fl oz	7	Maximum applications per season (4). Days to wait to reapply (7). NOT labeled for cutworm.
		<i>Bacillus thuringiensis</i> (DiPel) 2X 4L (Javelin) WG	1 Tbsp 2 tsp 2 tsp	0	Start control program when worms are small, and treat foliage every 5 to 7 days.
		bifenthrin 0.3% + zeta-cypermethrin 0.075% (Ortho Bug-G-Gon Insect Killer for Lawns and Gardens)	1.5 fl oz	7	Apply when insects first appear. Reapply as necessary to maintain control waiting at least 7 days between applications.
		carbaryl (various brands)	See label.	3	Repeat applications as needed up to a total of 4 times but not more than once every 7 days.
		cyfluthrin 0.75% (Bayer Advanced)	0.5 fl oz	0	DO NOT spray more than 4 times per season.
		esfenvalerate 0.425% (Monterey)	1 fl oz	3	Spray plants to wet upper and lower leaf surfaces until dripping. Apply as necessary to maintain control waiting at least 7 days between each application.
		gamma-cyhalothrin 0.08% (Spectracide)	1.5 fl oz	1	Apply when insects first appear or when damage occurs. DO NOT apply more than 9 times per growing season.
		lambda-cyhalothrin 0.5% (Bonide)	ready-to-use premix	1	Apply thoroughly as a foliar cover spray to both sides of plant leaves and all plant surfaces where insects are present. DO NOT spray more than 9 times per season.
		malathion 50% (Ortho)	1 Tbsp	7	NOT for diamondback moth. Refer to label.
		spinosad 0.5% (Bonide, Monterey, Natural Guard)	2.0 fl oz	1	
	Flea beetle, thrips	acetamiprid 0.5% (Ortho Flower, Fruit & Vegetable Insect Killer)	1.5 fl oz	7	Maximum applications per season (4). Days to wait to reapply (7).
		bifenthrin 0.3% + zeta-cypermethrin 0.075% (Ortho Bug-G-Gon Insect Killer for Lawns and Gardens)	1.5 fl oz	7	Flea beetles ONLY. Apply when insects first appear. Reapply as necessary to maintain control waiting at least 7 days between applications.
		carbaryl (various brands)	See label.	3	Repeat applications as needed up to a total of 4 times but not more than once every 7 days.
		cyfluthrin 0.75% (Bayer Advanced)	0.5 fl oz	0	DO NOT spray more than 4 times per season.
		esfenvalerate 0.425% (Monterey)	1 fl oz	3	Flea beetle ONLY. Spray plants to wet upper and lower leaf surfaces until dripping. Apply as necessary to maintain control waiting at least 7 days between each application.
		gamma-cyhalothrin 0.08% (Spectracide)	1.5 fl oz	1	Apply when insects first appear or when damage occurs. DO NOT apply more than 9 times per growing season.

HOME GARDEN VEGETABLE INSECT CONTROL – Products for Use by the General Public

Commodity	Insect	Insecticide and Formulation	Amount of Formulation Per Gallon of Spray	Minimum Interval (Days) Between Last Application and Harvest	Precautions and Remarks
CABBAGE (cont.)	Flea beetle, thrips (cont.)	imidacloprid 0.235% (Bayer Advanced Fruit, Citrus and Vegetable Insect Control Concentrate)	0.5 fl oz/1 qt of water/10 sq ft of row as a drench	21	This systemic insecticide dissolved in water moves down through the soil, where it is absorbed by the roots. Once absorbed, it moves up through the plant providing insect protection.
		lambda-cyhalothrin 0.5% (Bonide)	ready-to-use premix	1	Apply thoroughly as a foliar cover spray to both sides of plant leaves and all plant surfaces where insects are present. DO NOT spray more than 9 times per season.
		malathion 50% (Ortho)	1 Tbsp	7	Refer to label.
	Harlequin bug	acetamiprid 0.5% (Ortho Flower, Fruit & Vegetable Insect Killer)	1.5 fl oz	7	Maximum applications per season (4). Days to wait to reapply (7).
		bifenthrin 0.3% + zeta-cypermethrin 0.075% (Ortho Bug-G-Gon Insect Killer for Lawns and Gardens)	1.5 fl oz	7	Apply when insects first appear. Reapply as necessary to maintain control waiting at least 7 days between applications.
		cyfluthrin 0.75% (Bayer Advanced)	0.5 fl oz	0	DO NOT spray more than 4 times per season.
		esfenvalerate 0.425% (Monterey)	1 fl oz	3	Spray plants to wet upper and lower leaf surfaces until dripping. Apply as necessary to maintain control waiting at least 7 days between each application.
		gamma-cyhalothrin 0.08% (Spectracide)	1.5 fl oz	1	Apply when insects first appear or when damage occurs. DO NOT apply more than 9 times per growing season.
		lambda-cyhalothrin 0.5% (Bonide)	ready-to-use premix	1	Apply thoroughly as a foliar cover spray to both sides of plant leaves and all plant surfaces where insects are present. DO NOT spray more than 9 times per season.
		malathion 50% (Ortho)	1 Tbsp	7	Refer to label.
	Leafhopper	acetamiprid 0.5% (Ortho Flower, Fruit & Vegetable Insect Killer)	1.5 fl oz	7	Maximum applications per season (4). Days to wait to reapply (7).
		bifenthrin 0.3% + zeta-cypermethrin 0.075% (Ortho Bug-G-Gon Insect Killer for Lawns and Gardens)	1.5 fl oz	7	Apply when insects first appear. Reapply as necessary to maintain control waiting at least 7 days between applications.
		cyfluthrin 0.75% (Bayer Advanced)	0.5 fl oz	0	DO NOT spray more than 4 times per season.
		esfenvalerate 0.425% (Monterey)	1 fl oz	3	Spray plants to wet upper and lower leaf surfaces until dripping. Apply as necessary to maintain control waiting at least 7 days between each application.
		gamma-cyhalothrin 0.08% (Spectracide)	1.5 fl oz	1	Apply when insects first appear or when damage occurs. DO NOT apply more than 9 times per growing season.
		imidacloprid 0.235% (Bayer Advanced Fruit, Citrus and Vegetable Insect Control Concentrate)	0.5 fl oz/1 qt of water/10 sq ft of row as a drench	21	This systemic insecticide dissolved in water moves down through the soil, where it is absorbed by the roots. Once absorbed, it moves up through the plant providing insect protection.

HOME GARDEN VEGETABLE INSECT CONTROL – Products for Use by the General Public

Commodity	Insect	Insecticide and Formulation	Amount of Formulation Per Gallon of Spray	Minimum Interval (Days) Between Last Application and Harvest	Precautions and Remarks
CABBAGE (cont.)	Leafhopper (cont.)	lambda-cyhalothrin 0.5% (Bonide)	ready-to-use premix	1	Apply thoroughly as a foliar cover spray to both sides of plant leaves and all plant surfaces where insects are present. DO NOT spray more than 9 times per season.
		malathion 50% (Ortho)	1 Tbsp	7	Refer to label.
	Whitefly	acetamiprid 0.5% (Ortho Flower, Fruit & Vegetable Insect Killer)	1.5 fl oz	7	Maximum applications per season (4). Days to wait to reapply (7).
		bifenthrin 0.3% + zeta-cypermethrin 0.075% (Ortho Bug-G-Gon Insect Killer for Lawns and Gardens)	1.5 fl oz	7	Apply when insects first appear. Reapply as necessary to maintain control waiting at least 7 days between applications.
		cyfluthrin 0.75% (Bayer Advanced)	0.5 fl oz	0	Adults ONLY. DO NOT spray more than 4 times per season.
		esfenvalerate 0.425% (Monterey)	1 fl oz	3	Spray plants to wet upper and lower leaf surfaces until dripping. Apply as necessary to maintain control waiting at least 7 days between each application.
		gamma-cyhalothrin 0.08% (Spectracide)	1.5 fl oz	1	Apply when insects first appear or when damage occurs. DO NOT apply more than 9 times per growing season.
		imidacloprid 0.235% (Bayer Advanced Fruit, Citrus and Vegetable Insect Control Concentrate)	0.5 fl oz/1 qt of water/10 sq ft of row as a drench	21	This systemic insecticide dissolved in water moves down through the soil, where it is absorbed by the roots. Once absorbed, it moves up through the plant providing insect protection.
		lambda-cyhalothrin 0.5% (Bonide)	ready-to-use premix	1	Apply thoroughly as a foliar cover spray to both sides of plant leaves and all plant surfaces where insects are present. DO NOT spray more than 9 times per season.
		malathion 50% (Ortho)	1 Tbsp	7	Refer to label.
CANTALOUPE	Aphids, thrips	acetamiprid 0.5% (Ortho Flower, Fruit & Vegetable Insect Killer)	1.5 fl oz	0	Maximum applications per season (5). Days to wait to reapply (5).
		bifenthrin 0.3% + zeta-cypermethrin 0.075% (Ortho Bug-G-Gon Insect Killer for Lawns and Gardens)	1.5 fl oz	3	Aphids ONLY. Apply when insects first appear. Reapply as necessary to maintain control waiting at least 7 days between applications.
		esfenvalerate 0.425% (Monterey)	1 fl oz	3	Aphids ONLY. Spray plants to wet upper and lower leaf surfaces until dripping. Apply as necessary to maintain control waiting at least 7 days between each application.
		imidacloprid 0.235% (Bayer Advanced Fruit, Citrus and Vegetable Insect Control Concentrate)	0.5 fl oz/1 qt of water/10 sq ft of row as a drench	21	This systemic insecticide dissolved in water moves down through the soil, where it is absorbed by the roots. Once absorbed, it moves up through the plant providing insect protection.
		malathion 50% (Ortho, Bonide)	See label.	1	Refer to label.
		soap (insecticidal, M-Pede 49 EC)	2 Tbsp	0	On foliage as needed.
		spinosad 0.5% (Bonide, Monterey, Natural Guard)	2.0 fl oz	3	Thrips ONLY. Refer to label.

HOME GARDEN VEGETABLE INSECT CONTROL – Products for Use by the General Public

Commodity	Insect	Insecticide and Formulation	Amount of Formulation Per Gallon of Spray	Minimum Interval (Days) Between Last Application and Harvest	Precautions and Remarks
CANTALOUPE (cont.)	Cucumber beetle (spotted and striped), pickleworm, squash bug, squash vine borer	acetamiprid 0.5% (Ortho Flower, Fruit & Vegetable Insect Killer)	1.5 fl oz	0	Maximum applications per season (5). Days to wait to reapply (5).
		bifenthrin 0.3% + zeta-cypermethrin 0.075% (Ortho Bug-G-Gon Insect Killer for Lawns and Gardens)	1.5 fl oz	3	APHIDS only. Apply when insects first appear. Reapply as necessary to maintain control waiting at least 7 days between applications.
		carbaryl (various brands)	See label.	3	Repeat applications as needed up to a total of 6 times but not more than once every 7 days. For optimum control of squash bugs, apply sufficient spray volume for thorough coverage and time sprays for early morning or late afternoon.
		cyfluthrin 0.75% (Bayer Advanced)	0.5 fl oz	0	NOT for squash vine borer. DO NOT spray more than 4 times per season.
		esfenvalerate 0.425% (Monterey)	1 fl oz	3	Spray plants to wet upper and lower leaf surfaces until dripping. Apply as necessary to maintain control waiting at least 7 days between each application.
		imidacloprid 0.235% (Bayer Advanced Fruit, Citrus and Vegetable Insect Control Concentrate)	0.5 fl oz/1 qt of water/10 sq ft of row as a drench	21	Cucumber beetles ONLY. This systemic insecticide dissolved in water moves down through the soil, where it is absorbed by the roots. Once absorbed, it moves up through the plant providing insect protection.
		malathion 50% (Ortho, Bonide)	See label.	1	Refer to label. NOT for squash bug.
	Leafhopper	acetamiprid 0.5% (Ortho Flower, Fruit & Vegetable Insect Killer)	1.5 fl oz	0	Maximum applications per season (5). Days to wait to reapply (5).
		bifenthrin 0.3% + zeta-cypermethrin 0.075% (Ortho Bug-G-Gon Insect Killer for Lawns and Gardens)	1.5 fl oz	3	Apply when insects first appear. Reapply as necessary to maintain control waiting at least 7 days between applications.
		cyfluthrin 0.75% (Bayer Advanced)	0.5 fl oz	0	DO NOT spray more than 4 times per season.
		esfenvalerate 0.425% (Monterey)	1 fl oz	3	Spray plants to wet upper and lower leaf surfaces until dripping. Apply as necessary to maintain control waiting at least 7 days between each application.
		imidacloprid 0.235% (Bayer Advanced Fruit, Citrus and Vegetable Insect Control Concentrate)	0.5 fl oz/1 qt of water/10 sq ft of row as a drench	21	This systemic insecticide dissolved in water moves down through the soil, where it is absorbed by the roots. Once absorbed, it moves up through the plant providing insect protection.
	Spider mite	malathion 50% (Ortho, Bonide)	See label.	1	Refer to label.
		soap (insecticidal, M-Pede 49 EC)	2 Tbsp	0	On foliage as needed.

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Commodity	Insect	Insecticide and Formulation	Amount of Formulation Per Gallon of Spray	Minimum Interval (Days) Between Last Application and Harvest	Precautions and Remarks
CANTALOUPE (cont.)	Whitefly	acetamiprid 0.5% (Ortho Flower, Fruit & Vegetable Insect Killer)	1.5 fl oz	0	Maximum applications per season (5). Days to wait to reapply (5).
		bifenthrin 0.3% + zeta-cypermethrin 0.075% (Ortho Bug-Gon Insect Killer for Lawns and Gardens)	1.5 fl oz	3	Apply when insects first appear. Reapply as necessary to maintain control waiting at least 7 days between applications.
		cyfluthrin 0.75% (Bayer Advanced)	0.5 fl oz	0	Adults ONLY. DO NOT spray more than 4 times per season.
		esfenvalerate 0.425% (Monterey)	1 fl oz	3	Spray plants to wet upper and lower leaf surfaces until dripping. Apply as necessary to maintain control waiting at least 7 days between each application.
		imidacloprid 0.235% (Bayer Advanced Fruit, Citrus and Vegetable Insect Control Concentrate)	0.5 fl oz/1 qt of water/10 sq ft of row as a drench	21	This systemic insecticide dissolved in water moves down through the soil, where it is absorbed by the roots. Once absorbed, it moves up through the plant providing insect protection.
		malathion 50% (Ortho)	1 Tbsp	1	Refer to label.
CARROT	Aphids	esfenvalerate 0.425% (Monterey)	1 fl oz	7	Spray plants to wet upper and lower leaf surfaces until dripping. Apply as necessary to maintain control waiting at least 7 days between each application.
		imidacloprid 0.235% (Bayer Advanced Fruit, Citrus and Vegetable Insect Control Concentrate)	0.5 fl oz/1 qt of water/10 sq ft of row as a drench	21	This systemic insecticide dissolved in water moves down through the soil, where it is absorbed by the roots. Once absorbed, it moves up through the plant providing insect protection.
		malathion 50% (Bonide)	See Label	7	Refer to label.
	Armyworm, leafminer, leafhopper	<i>Bacillus thuringiensis</i> (DiPel) 2X DiPel) 4L (Javelin) WG	1 Tbsp 2 tsp 2 tsp	0	<i>B.t.</i> will not control leafhoppers.
		carbaryl (various brands)	See label.	7	Repeat applications as necessary up to a total of 6 times but not more often than once every 7 days. For cutworm control, this product is most effective against species which feed on the upper portions of the plant.
		cyfluthrin 0.75% (Bayer Advanced)	0.5 fl oz	0	DO NOT spray more than 5 times per season.
		esfenvalerate 0.425% (Monterey)	1 fl oz	7	Spray plants to wet upper and lower leaf surfaces until dripping. Apply as necessary to maintain control waiting at least 7 days between each application.
		imidacloprid 0.235% (Bayer Advanced Fruit, Citrus and Vegetable Insect Control Concentrate)	0.5 fl oz/1 qt of water/10 sq ft of row as a drench	21	Leafhoppers ONLY. This systemic insecticide dissolved in water moves down through the soil, where it is absorbed by the roots. Once absorbed, it moves up through the plant providing insect protection.
		malathion 50% (Bonide)	See label.	7	Refer to label. NOT for armyworms. Bonide product labeled for leafhoppers ONLY.

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Commodity	Insect	Insecticide and Formulation	Amount of Formulation Per Gallon of Spray	Minimum Interval (Days) Between Last Application and Harvest	Precautions and Remarks
CARROT (cont.)	Flea beetle	cyfluthrin 0.75% (Bayer Advanced)	0.5 fl oz	0	DO NOT spray more than 5 times per season.
		esfenvalerate 0.425% (Monterey)	1 fl oz	7	Spray plants to wet upper and lower leaf surfaces until dripping. Apply as necessary to maintain control waiting at least 7 days between each application.
		imidacloprid 0.235% (Bayer Advanced Fruit, Citrus and Vegetable Insect Control Concentrate)	0.5 fl oz/1 qt of water/10 sq ft of row as a drench	21	This systemic insecticide dissolved in water moves down through the soil, where it is absorbed by the roots. Once absorbed, it moves up through the plant providing insect protection.
	Thrips	imidacloprid 0.235% (Bayer Advanced Fruit, Citrus and Vegetable Insect Control Concentrate)	0.5 fl oz/1 qt of water/10 sq ft of row as a drench	21	This systemic insecticide dissolved in water moves down through the soil, where it is absorbed by the roots. Once absorbed, it moves up through the plant providing insect protection.
	Whitefly	esfenvalerate 0.425% (Monterey)	1 fl oz	7	Spray plants to wet upper and lower leaf surfaces until dripping. Apply as necessary to maintain control waiting at least 7 days between each application.
		imidacloprid 0.235% (Bayer Advanced Fruit, Citrus and Vegetable Insect Control Concentrate)	0.5 fl oz/1 qt of water/10 sq ft of row as a drench	21	This systemic insecticide dissolved in water moves down through the soil, where it is absorbed by the roots. Once absorbed, it moves up through the plant providing insect protection.
CELERY	Aphids, flea beetle, leafminer, fleahopper, looper	acetamiprid 0.5% (Ortho Flower, Fruit & Vegetable Insect Killer)	1.5 fl oz	7	Maximum applications per season (4). Days to wait to reapply (7).
		cyfluthrin 0.75% (Bayer Advanced)	0.5 fl oz	0	DO NOT spray more than 4 times per season.
		imidacloprid 0.235% (Bayer Advanced Fruit, Citrus and Vegetable Insect Control Concentrate)	0.5 fl oz/1 qt of water/10 sq ft of row as a drench	45	Aphids and flea beetles ONLY. This systemic insecticide dissolved in water moves down through the soil, where it is absorbed by the roots. Once absorbed, it moves up through the plant providing insect protection.
		malathion 50% (Ortho, Bonide)	See label.	7	Refer to label.
		permethrin 2.5% EC (various brands)	1.5 fl oz	3	On foliage as needed.
		spinosad 0.5% (Bonide, Monterey, Natural Guard)	2.0 fl oz	1	Leafminers and loopers ONLY. Refer to label.
	Leafhopper	acetamiprid 0.5% (Ortho Flower, Fruit & Vegetable Insect Killer)	1.5 fl oz	7	Maximum applications per season (4). Days to wait to reapply (7).
		cyfluthrin 0.75% (Bayer Advanced)	0.5 fl oz	0	DO NOT spray more than 4 times per season.
		imidacloprid 0.235% (Bayer Advanced Fruit, Citrus and Vegetable Insect Control Concentrate)	0.5 fl oz/1 qt of water/10 sq ft of row as a drench	45	This systemic insecticide dissolved in water moves down through the soil, where it is absorbed by the roots. Once absorbed, it moves up through the plant providing insect protection.
		malathion 50% (Ortho)	See label.	7	Refer to label.
	Spider mite	malathion 50% (Bonide)	See label.	7	Refer to label.

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Commodity	Insect	Insecticide and Formulation	Amount of Formulation Per Gallon of Spray	Minimum Interval (Days) Between Last Application and Harvest	Precautions and Remarks
CELERY (cont.)	Thrips	acetamiprid 0.5% (Ortho Flower, Fruit & Vegetable Insect Killer)	1.5 fl oz	7	Maximum applications per season (4). Days to wait to reapply (7).
		cyfluthrin 0.75% (Bayer Advanced)	0.5 fl oz	0	DO NOT spray more than 4 times per season.
		imidacloprid 0.235% (Bayer Advanced Fruit, Citrus and Vegetable Insect Control Concentrate)	0.5 fl oz/1 qt of water/10 sq ft of row as a drench	45	This systemic insecticide dissolved in water moves down through the soil, where it is absorbed by the roots. Once absorbed, it moves up through the plant providing insect protection.
		malathion 50% (Ortho)	See label.	7	Refer to label.
	Whitefly	acetamiprid 0.5% (Ortho Flower, Fruit & Vegetable Insect Killer)	1.5 fl oz	7	Maximum applications per season (4). Days to wait to reapply (7).
		cyfluthrin 0.75% (Bayer Advanced)	0.5 fl oz	0	Adults ONLY. DO NOT spray more than 4 times per season.
		imidacloprid 0.235% (Bayer Advanced Fruit, Citrus and Vegetable Insect Control Concentrate)	0.5 fl oz/1 qt of water/10 sq ft of row as a drench	45	This systemic insecticide dissolved in water moves down through the soil, where it is absorbed by the roots. Once absorbed, it moves up through the plant providing insect protection.
		malathion 50% (Ortho)	See label.	7	Refer to label.
COLLARD	Aphids, flea beetle	acetamiprid 0.5% (Ortho Flower, Fruit & Vegetable Insect Killer)	1.5 fl oz	7	Maximum applications per season (4). Days to wait to reapply (7).
		cyfluthrin 0.75% (Bayer Advanced)	0.5 fl oz	0	DO NOT spray more than 4 times per season.
		esfenvalerate 0.425% (Monterey)	1 fl oz	7	Spray plants to wet upper and lower leaf surfaces until dripping. Apply as necessary to maintain control waiting at least 7 days between each application.
		imidacloprid 0.235% (Bayer Advanced Fruit, Citrus and Vegetable Insect Control Concentrate)	0.5 fl oz/1 qt of water/10 sq ft of row as a drench	21	This systemic insecticide dissolved in water moves down through the soil, where it is absorbed by the roots. Once absorbed, it moves up through the plant providing insect protection.
		malathion 50% (Ortho, Bonide)	See label.	7	Refer to label.
		soap (insecticidal, M-Pede 49 EC)	2 Tbsp	0	On foliage as needed.
	Cabbage looper, diamondback moth, imported cabbageworm	acetamiprid 0.5% (Ortho Flower, Fruit & Vegetable Insect Killer)	1.5 fl oz	7	Maximum applications per season (4). Days to wait to reapply (7).
		<i>Bacillus thuringiensis</i> (DiPel) 2X (DiPel) 4L (Javelin) WG	1 Tbsp 2 tsp 2 tsp	0	Begin foliage treatments early and repeat as necessary. Include a spreader/sticker.
		cyfluthrin 0.75% (Bayer Advanced)	0.5 fl oz	0	DO NOT spray more than 4 times per season.

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Commodity	Insect	Insecticide and Formulation	Amount of Formulation Per Gallon of Spray	Minimum Interval (Days) Between Last Application and Harvest	Precautions and Remarks
COLLARD (cont.)	Cabbage looper, diamondback moth, imported cabbageworm (cont.)	esfenvalerate 0.425% (Monterey)	1 fl oz	7	Spray plants to wet upper and lower leaf surfaces until dripping. Apply as necessary to maintain control waiting at least 7 days between each application.
		malathion 50% (Ortho, Bonide)	See label.	7	NOT for diamondback moth. Refer to label.
		spinosad 0.5% (Bonide, Monterey, Natural Guard)	2.0 fl oz	1	
	Harlequin bug	acetamiprid 0.5% (Ortho Flower, Fruit & Vegetable Insect Killer)	1.5 fl oz	7	Maximum applications per season (4). Days to wait to reapply (7).
		cyfluthrin 0.75% (Bayer Advanced)	0.5 fl oz	0	DO NOT spray more than 4 times per season.
		esfenvalerate 0.425% (Monterey)	1 fl oz	7	Spray plants to wet upper and lower leaf surfaces until dripping. Apply as necessary to maintain control waiting at least 7 days between each application.
		malathion 50% (Ortho, Bonide)	See label.	7	Refer to label.
	Leafhopper	acetamiprid 0.5% (Ortho Flower, Fruit & Vegetable Insect Killer)	1.5 fl oz	7	Maximum applications per season (4). Days to wait to reapply (7).
		esfenvalerate 0.425% (Monterey)	1 fl oz	7	Spray plants to wet upper and lower leaf surfaces until dripping. Apply as necessary to maintain control waiting at least 7 days between each application.
		imidacloprid 0.235% (Bayer Advanced Fruit, Citrus and Vegetable Insect Control Concentrate)	0.5 fl oz/1 qt of water/10 sq ft of row as a drench	21	This systemic insecticide dissolved in water moves down through the soil, where it is absorbed by the roots. Once absorbed, it moves up through the plant providing insect protection.
		malathion 50% (Ortho)	See label.	7	Refer to label.
	Thrips	acetamiprid 0.5% (Ortho Flower, Fruit & Vegetable Insect Killer)	1.5 fl oz	7	Maximum applications per season (4). Days to wait to reapply (7).
		cyfluthrin 0.75% (Bayer Advanced)	0.5 fl oz	0	DO NOT spray more than 4 times per season.
		imidacloprid 0.235% (Bayer Advanced Fruit, Citrus and Vegetable Insect Control Concentrate)	0.5 fl oz/1 qt of water/10 sq ft of row as a drench	21	This systemic insecticide dissolved in water moves down through the soil, where it is absorbed by the roots. Once absorbed, it moves up through the plant providing insect protection.
		malathion 50% (Ortho)	See label.	7	Refer to label.
	Whitefly	acetamiprid 0.5% (Ortho Flower, Fruit & Vegetable Insect Killer)	1.5 fl oz	7	Maximum applications per season (4). Days to wait to reapply (7).
		cyfluthrin 0.75% (Bayer Advanced)	0.5 fl oz	0	Adults ONLY. DO NOT spray more than 4 times per season.
		esfenvalerate 0.425% (Monterey)	1 fl oz	7	Spray plants to wet upper and lower leaf surfaces until dripping. Apply as necessary to maintain control waiting at least 7 days between each application.

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Commodity	Insect	Insecticide and Formulation	Amount of Formulation Per Gallon of Spray	Minimum Interval (Days) Between Last Application and Harvest	Precautions and Remarks
COLLARD (cont.)	Whitefly (cont.)	imidacloprid 0.235% (Bayer Advanced Fruit, Citrus and Vegetable Insect Control Concentrate)	0.5 fl oz/1 qt of water/10 sq ft of row as a drench	21	This systemic insecticide dissolved in water moves down through the soil, where it is absorbed by the roots. Once absorbed, it moves up through the plant providing insect protection.
		malathion 50% (Ortho)	See label.	7	Refer to label.
CORN (SWEET)	Aphids	bifenthrin 0.3% + zeta-cypermethrin 0.075% (Ortho Bug-G-Gon Insect Killer for Lawns and Gardens)	1.5 fl oz	3	Apply when insects first appear. Reapply as necessary to maintain control waiting at least 7 days between applications.
		cyfluthrin 0.75% (Bayer Advanced)	0.5 fl oz	0	DO NOT spray more than 10 times per season.
		esfenvalerate 0.425% (Monterey)	1 fl oz	1	Spray plants to wet upper and lower leaf surfaces until dripping. Apply as necessary to maintain control waiting at least 7 days between each application.
		gamma-cyhalothrin 0.08% (Spectracide)	1.5 fl oz	21	Apply when insects first appear or when damage occurs. DO NOT apply more than 5 times per growing season.
		lambda-cyhalothrin 0.5% (Bonide)	ready-to-use premix	21	Apply thoroughly as a foliar cover spray to both sides of plant leaves and all plant surfaces where insects are present. DO NOT spray more than 5 times per season.
		malathion 50% (Bonide)	See label.	5	Refer to label.
	Corn earworm, sap beetle, flea beetle, Japanese beetle	bifenthrin 0.3% + zeta-cypermethrin 0.075% (Ortho Bug-G-Gon Insect Killer for Lawns and Gardens)	1.5 fl oz	3	Apply when insects first appear. Reapply as necessary to maintain control waiting at least 7 days between applications.
		carbaryl (various brands)	See label.	2/14/48	DO NOT apply within 2 days of harvest of ears or within 14 days of harvest or grazing of forage or within 48 days of harvest of fodder.
		cyfluthrin 0.75% (Bayer Advanced)	0.5 fl oz	0	DO NOT spray more than 10 times per season.
		esfenvalerate 0.425% (Monterey)	1 fl oz	1	Spray plants to wet upper and lower leaf surfaces until dripping. Apply as necessary to maintain control waiting at least 7 days between each application.
		gamma-cyhalothrin 0.08% (Spectracide)	1.5 fl oz	21	Apply when insects first appear or when damage occurs. DO NOT apply more than 5 times per growing season.
		lambda-cyhalothrin 0.5% (Bonide)	ready-to-use premix	21	Apply thoroughly as a foliar cover spray to both sides of plant leaves and all plant surfaces where insects are present. DO NOT spray more than 5 times per season.
		malathion 50% (Bonide)	See label.	5	Refer to label. Bonide product labeled for sap beetles ONLY.
		spinosad 0.5% (Bonide, Monterey, Natural Guard)	2.0 fl oz	1	For corn earworms ONLY, treat silk frequently as it grows.

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Commodity	Insect	Insecticide and Formulation	Amount of Formulation Per Gallon of Spray	Minimum Interval (Days) Between Last Application and Harvest	Precautions and Remarks
CORN (SWEET) (cont.)	Corn earworm, European corn borer, fall armyworm	<i>Bacillus thuringiensis</i> (various brands)	2 tsp	0	Consult specific label. <i>B.t.</i> is effective while worms are feeding on the foliage.
		bifenthrin 0.3% + zeta-cypermethrin 0.075% (Ortho Bug-G-Gon Insect Killer for Lawns and Gardens)	1.5 fl oz	3	Corn earworm and European corn borer ONLY. Apply when insects first appear. Reapply as necessary to maintain control waiting at least 7 days between applications.
		carbaryl (various brands)	See label.	2/14/48	DO NOT apply within 2 days of harvest of ears or within 14 days of harvest or grazing of forage or within 48 days of harvest of fodder.
		cyfluthrin 0.75% (Bayer Advanced)	0.5 fl oz	0	DO NOT spray more than 10 times per season.
		esfenvalerate 0.425% (Monterey)	1 fl oz	1	Corn earworm and European corn borer ONLY. Spray plants to wet upper and lower leaf surfaces until dripping. Apply as necessary to maintain control waiting at least 7 days between each application.
		gamma-cyhalothrin 0.08% (Spectracide)	1.5 fl oz	21	Apply when insects first appear or when damage occurs. DO NOT apply more than 5 times per growing season.
		lambda-cyhalothrin 0.5% (Bonide)	ready-to-use premix	21	Apply thoroughly as a foliar cover spray to both sides of plant leaves and all plant surfaces where insects are present. DO NOT spray more than 5 times per season.
		permethrin 2.5% EC (various brands)	1.5 fl oz	3	
		spinosad 0.5% (Bonide, Monterey, Natural Guard)	2.0 fl oz	1	Corn borers, Worms (caterpillars, including ear-worm).
CUCUMBER	Aphids	acetamiprid 0.5% (Ortho Flower, Fruit & Vegetable Insect Killer)	1.5 fl oz	0	Maximum applications per season (5). Days to wait to reapply (5).
		bifenthrin 0.3% + zeta-cypermethrin 0.075% (Ortho Bug-G-Gon Insect Killer for Lawns and Gardens)	1.5 fl oz	3	Apply when insects first appear. Reapply as necessary to maintain control waiting at least 7 days between applications.
		esfenvalerate 0.425% (Monterey)	1 fl oz	3	Spray plants to wet upper and lower leaf surfaces until dripping. Apply as necessary to maintain control waiting at least 7 days between each application.
		imidacloprid 0.235% (Bayer Advanced Fruit, Citrus and Vegetable Insect Control Concentrate)	0.5 fl oz/1 qt of water/10 sq ft of row as a drench	21	This systemic insecticide dissolved in water moves down through the soil, where it is absorbed by the roots. Once absorbed, it moves up through the plant providing insect protection.
		malathion 50% (Ortho, Bonide)	See label.	1	Refer to label.
	Cucumber beetle (spotted and striped), pickleworm, squash bug	acetamiprid 0.5% (Ortho Flower, Fruit & Vegetable Insect Killer)	1.5 fl oz	0	Maximum applications per season (5). Days to wait to reapply (5).
		bifenthrin 0.3% + zeta-cypermethrin 0.075% (Ortho Bug-G-Gon Insect Killer for Lawns and Gardens)	1.5 fl oz	3	Apply when insects first appear. Reapply as necessary to maintain control waiting at least 7 days between applications.

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Commodity	Insect	Insecticide and Formulation	Amount of Formulation Per Gallon of Spray	Minimum Interval (Days) Between Last Application and Harvest	Precautions and Remarks
CUCUMBER (cont.)	Cucumber beetle (spotted and striped), pickleworm, squash bug (cont.)	carbaryl (various brands)	See label.	3	Repeat applications as needed up to a total of 6 times but not more than once every 7 days. For optimum control of squash bugs, apply sufficient spray volume for thorough coverage and time sprays for early morning or late afternoon.
		cyfluthrin 0.75% (Bayer Advanced)	0.5 fl oz	0	DO NOT spray more than 4 times per season.
		esfenvalerate 0.425% (Monterey)	1 fl oz	3	Spray plants to wet upper and lower leaf surfaces until dripping. Apply as necessary to maintain control waiting at least 7 days between each application.
		imidacloprid 0.235% (Bayer Advanced Fruit, Citrus and Vegetable Insect Control Concentrate)	0.5 fl oz/1 qt of water/10 sq ft of row as a drench	21	Cucumber beetles ONLY. This systemic insecticide dissolved in water moves down through the soil, where it is absorbed by the roots. Once absorbed, it moves up through the plant providing insect protection.
		malathion 50% (Ortho, Bonide)	See label.	1	NOT for squash bug. Refer to label.
	Leafhopper	acetamiprid 0.5% (Ortho Flower, Fruit & Vegetable Insect Killer)	1.5 fl oz	0	Maximum applications per season (5). Days to wait to reapply (5).
		bifenthrin 0.3% + zeta-cypermethrin 0.075% (Ortho Bug-G-Gon Insect Killer for Lawns and Gardens)	1.5 fl oz	3	Apply when insects first appear. Reapply as necessary to maintain control waiting at least 7 days between applications.
		cyfluthrin 0.75% (Bayer Advanced)	0.5 fl oz	0	DO NOT spray more than 4 times per season.
		esfenvalerate 0.425% (Monterey)	1 fl oz	3	Spray plants to wet upper and lower leaf surfaces until dripping. Apply as necessary to maintain control waiting at least 7 days between each application.
		imidacloprid 0.235% (Bayer Advanced Fruit, Citrus and Vegetable Insect Control Concentrate)	0.5 fl oz/1 qt of water/10 sq ft of row as a drench	21	This systemic insecticide dissolved in water moves down through the soil, where it is absorbed by the roots. Once absorbed, it moves up through the plant providing insect protection.
		malathion 50% (Ortho)	See label.	1	Refer to label.
	Spider mite	malathion 50% (Ortho, Bonide)	See label.	1	Refer to label.
		soap (insecticidal, M-Pede 49 EC)	2 Tbsp	0	On foliage as needed.
	Thrips	acetamiprid 0.5% (Ortho Flower, Fruit & Vegetable Insect Killer)	1.5 fl oz	0	Maximum applications per season (5). Days to wait to reapply (5).
		imidacloprid 0.235% (Bayer Advanced Fruit, Citrus and Vegetable Insect Control Concentrate)	0.5 fl oz/1 qt of water/10 sq ft of row as a drench	21	This systemic insecticide dissolved in water moves down through the soil, where it is absorbed by the roots. Once absorbed, it moves up through the plant providing insect protection.

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Commodity	Insect	Insecticide and Formulation	Amount of Formulation Per Gallon of Spray	Minimum Interval (Days) Between Last Application and Harvest	Precautions and Remarks
CUCUMBER (cont.)	Thrips (cont.)	malathion 50% (Ortho)	See label	1	Refer to label.
		spinosad 0.5% (Bonide, Monterey, Natural Guard)	2.0 fl oz	1	Refer to label.
	Whitefly	acetamiprid 0.5% (Ortho Flower, Fruit & Vegetable Insect Killer)	1.5 fl oz	0	Maximum applications per season (5). Days to wait to reapply (5).
		bifenthrin 0.3% + zeta-cypermethrin 0.075% (Ortho Bug-G-Gon Insect Killer for Lawns and Gardens)	1.5 fl oz	3	Apply when insects first appear. Reapply as necessary to maintain control waiting at least 7 days between applications.
		cyfluthrin 0.75% (Bayer Advanced)	0.5 fl oz	0	Adults ONLY. DO NOT spray more than 4 times per season.
		esfenvalerate 0.425% (Monterey)	1 fl oz	3	Spray plants to wet upper and lower leaf surfaces until dripping. Apply as necessary to maintain control waiting at least 7 days between each application.
		imidacloprid 0.235% (Bayer Advanced Fruit, Citrus and Vegetable Insect Control Concentrate)	0.5 fl oz/1 qt of water/10 sq ft of row as a drench	21	This systemic insecticide dissolved in water moves down through the soil, where it is absorbed by the roots. Once absorbed, it moves up through the plant providing insect protection.
		malathion 50% (Ortho)	See label.	1	Refer to label.
		soap (insecticidal, M-Pede 49 EC)	2 Tbsp	0	On foliage as needed.
EGGPLANT	Aphids, thrips	acetamiprid 0.5% (Ortho Flower, Fruit & Vegetable Insect Killer)	1.5 fl oz	7	Maximum applications per season (4). Days to wait to reapply (7).
		bifenthrin 0.3% + zeta-cypermethrin 0.075% (Ortho Bug-G-Gon Insect Killer for Lawns and Gardens)	1.5 fl oz	7	Aphids ONLY. Apply when insects first appear. Reapply as necessary to maintain control waiting at least 7 days between applications.
		esfenvalerate 0.425% (Monterey)	1 fl oz	7	Aphids ONLY. Spray plants to wet upper and lower leaf surfaces until dripping. Apply as necessary to maintain control waiting at least 7 days between each application.
		gamma-cyhalothrin 0.08% (Spectracide)	1.5 fl oz	5	Apply when insects first appear or when damage occurs. DO NOT apply more than 9 times per growing season.
		imidacloprid 0.235% (Bayer Advanced Fruit, Citrus and Vegetable Insect Control Concentrate)	0.5 fl oz/1 qt of water/10 sq ft of row as a drench	21	This systemic insecticide dissolved in water moves down through the soil, where it is absorbed by the roots. Once absorbed, it moves up through the plant providing insect protection.
		malathion 50% (Ortho, Bonide)	See label.	3	Refer to label.
		spinosad 0.5% (Bonide, Monterey, Natural Guard)	2.0 fl oz	1	Thrips ONLY.
		soap (insecticidal, M-Pede 49 EC)	2 Tbsp	0	On foliage as needed.
	Colorado potato beetle, hornworm, corn earworm	acetamiprid 0.5% (Ortho Flower, Fruit & Vegetable Insect Killer)	1.5 fl oz	7	Maximum applications per season (4). Days to wait to reapply (7).
		<i>Bacillus thuringiensis</i> var. <i>tennebrionus</i> (Trident II)	2-4 Tbsp	0	Colorado potato beetles ONLY. Treat when small larvae are present. NOT effective against adults or large larvae.

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Commodity	Insect	Insecticide and Formulation	Amount of Formulation Per Gallon of Spray	Minimum Interval (Days) Between Last Application and Harvest	Precautions and Remarks
EGGPLANT (cont.)	Colorado potato beetle, hornworm, corn earworm (cont.)	bifenthrin 0.3% + zeta-cypermethrin 0.075% (Ortho Bug-G-Gon Insect Killer for Lawns and Gardens)	1.5 fl oz	7	Apply when insects first appear. Reapply as necessary to maintain control waiting at least 7 days between applications.
		carbaryl (various brands)	See label.	3	Repeat applications as needed up to a total of 7 times but not more than once every 7 days.
		esfenvalerate 0.425% (Monterey)	1 fl oz	7	Spray plants to wet upper and lower leaf surfaces until dripping. Apply as necessary to maintain control waiting at least 7 days between each application.
		gamma-cyhalothrin 0.08% (Spectracide)	1.5 fl oz	5	Apply when insects first appear or when damage occurs. DO NOT apply more than 9 times per growing season.
		imidacloprid 0.235% (Bayer Advanced Fruit, Citrus and Vegetable Insect Control Concentrate)	0.5 fl oz/1 qt of water/10 sq ft of row as a drench	21	Colorado potato beetles ONLY. This systemic insecticide dissolved in water moves down through the soil, where it is absorbed by the roots. Once absorbed, it moves up through the plant providing insect protection.
		spinosad 0.5% (Bonide, Monterey, Natural Guard)	2.0 fl oz	1	
	Flea beetle	acetamiprid 0.5% (Ortho Flower, Fruit & Vegetable Insect Killer)	1.5 fl oz	7	Maximum applications per season (4). Days to wait to reapply (7).
		bifenthrin 0.3% + zeta-cypermethrin 0.075% (Ortho Bug-G-Gon Insect Killer for Lawns and Gardens)	1.5 fl oz	7	Apply when insects first appear. Reapply as necessary to maintain control waiting at least 7 days between applications.
		carbaryl (various brands)	See label.	3	Repeat applications as needed up to a total of 7 times but not more than once every 7 days.
		esfenvalerate 0.425% (Monterey)	1 fl oz	7	Spray plants to wet upper and lower leaf surfaces until dripping. Apply as necessary to maintain control waiting at least 7 days between each application.
		gamma-cyhalothrin 0.08% (Spectracide)	1.5 fl oz	5	Apply when insects first appear or when damage occurs. DO NOT apply more than 9 times per growing season.
		imidacloprid 0.235% (Bayer Advanced Fruit, Citrus and Vegetable Insect Control Concentrate)	0.5 fl oz/1 qt of water/10 sq ft of row as a drench	21	This systemic insecticide dissolved in water moves down through the soil, where it is absorbed by the roots. Once absorbed, it moves up through the plant providing insect protection.
	Lace bug, spider mite, whitefly	malathion 50% (Ortho, Bonide)	See label.	3	Refer to label.
		acetamiprid 0.5% (Ortho Flower, Fruit & Vegetable Insect Killer)	1.5 fl oz	7	Whiteflies ONLY. Maximum applications per season (4). Days to wait to reapply (7).
		bifenthrin 0.3% + zeta-cypermethrin 0.075% (Ortho Bug-G-Gon Insect Killer for Lawns and Gardens)	1.5 fl oz	7	Lace bugs and whiteflies ONLY. Apply when insects first appear. Reapply as necessary to maintain control waiting at least 7 days between applications.

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Commodity	Insect	Insecticide and Formulation	Amount of Formulation Per Gallon of Spray	Minimum Interval (Days) Between Last Application and Harvest	Precautions and Remarks
EGGPLANT (cont.)	Lace bug, spider mite, whitefly (cont.)	esfenvalerate 0.425% (Monterey)	1 fl oz	7	Whiteflies ONLY. Spray plants to wet upper and lower leaf surfaces until dripping. Apply as necessary to maintain control waiting at least 7 days between each application.
		gamma-cyhalothrin 0.08% (Spectracide)	1.5 fl oz	5	Apply when insects first appear or when damage occurs. DO NOT apply more than 9 times per growing season.
		imidacloprid 0.235% (Bayer Advanced Fruit, Citrus and Vegetable Insect Control Concentrate)	0.5 fl oz/1 qt of water/10 sq ft of row as a drench	21	Whiteflies ONLY. This systemic insecticide dissolved in water moves down through the soil, where it is absorbed by the roots. Once absorbed, it moves up through the plant providing insect protection.
		malathion 50% (Ortho, Bonide)	See label.	3	Refer to label.
		soap (insecticidal, M-Pede 49 EC)	2 Tbsp	0	On foliage as needed.
	Leafhopper	acetamiprid 0.5% (Ortho Flower, Fruit & Vegetable Insect Killer)	1.5 fl oz	7	Maximum applications per season (4). Days to wait to reapply (7).
		bifenthrin 0.3% + zeta-cypermethrin 0.075% (Ortho Bug-Gon Insect Killer for Lawns and Gardens)	1.5 fl oz	7	Apply when insects first appear. Reapply as necessary to maintain control waiting at least 7 days between applications.
		esfenvalerate 0.425% (Monterey)	1 fl oz	7	Spray plants to wet upper and lower leaf surfaces until dripping. Apply as necessary to maintain control waiting at least 7 days between each application.
		gamma-cyhalothrin 0.08% (Spectracide)	1.5 fl oz	5	Apply when insects first appear or when damage occurs. DO NOT apply more than 9 times per growing season.
		imidacloprid 0.235% (Bayer Advanced Fruit, Citrus and Vegetable Insect Control Concentrate)	0.5 fl oz/1 qt of water/10 sq ft of row as a drench	21	This systemic insecticide dissolved in water moves down through the soil, where it is absorbed by the roots. Once absorbed, it moves up through the plant providing insect protection.
		malathion 50% (Ortho)	See label.	3	Refer to label.
KALE	Aphids	acetamiprid 0.5% (Ortho Flower, Fruit & Vegetable Insect Killer)	1.5 fl oz	7	Maximum applications per season (4). Days to wait to reapply (7).
		cyfluthrin 0.75% (Bayer Advanced)	0.5 fl oz	0	DO NOT spray more than 4 times per season.
		imidacloprid 0.235% (Bayer Advanced Fruit, Citrus and Vegetable Insect Control Concentrate)	0.5 fl oz/1 qt of water/10 sq ft of row as a drench	21	This systemic insecticide dissolved in water moves down through the soil, where it is absorbed by the roots. Once absorbed, it moves up through the plant providing insect protection.
		malathion 50% (Ortho, Bonide)	See label.	7	Refer to label.
		soap (insecticidal, M-Pede 49 EC)	2 Tbsp	0	On foliage as needed.

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Commodity	Insect	Insecticide and Formulation	Amount of Formulation Per Gallon of Spray	Minimum Interval (Days) Between Last Application and Harvest	Precautions and Remarks
KALE (cont.)	Cabbage looper, diamondback moth, imported cabbageworm	acetamiprid 0.5% (Ortho Flower, Fruit & Vegetable Insect Killer)	1.5 fl oz	7	Maximum applications per season (4). Days to wait to reapply (7).
		<i>Bacillus thuringiensis</i> (DiPel) 2X (Javelin) WG	1 Tbsp 2 tsp	0	On foliage as needed.
		cyfluthrin 0.75% (Bayer Advanced)	0.5 fl oz	0	DO NOT spray more than 4 times per season.
		malathion 50% (Ortho, Bonide)	See label.	7	NOT for diamondback moth. Refer to label.
		spinosad 0.5% (Bonide, Monterey, Natural Guard)	2.0 fl oz	1	
	Harlequin bug	acetamiprid 0.5% (Ortho Flower, Fruit & Vegetable Insect Killer)	1.5 fl oz	7	Maximum applications per season (4). Days to wait to reapply (7).
		cyfluthrin 0.75% (Bayer Advanced)	0.5 fl oz	0	DO NOT spray more than 4 times per season.
		malathion 50% (Ortho)	See label.	7	Refer to label.
	Leafhopper	acetamiprid 0.5% (Ortho Flower, Fruit & Vegetable Insect Killer)	1.5 fl oz	7	Maximum applications per season (4). Days to wait to reapply (7).
		cyfluthrin 0.75% (Bayer Advanced)	0.5 fl oz	0	DO NOT spray more than 4 times per season.
		imidacloprid 0.235% (Bayer Advanced Fruit, Citrus and Vegetable Insect Control Concentrate)	0.5 fl oz/1 qt of water/10 sq ft of row as a drench	21	This systemic insecticide dissolved in water moves down through the soil, where it is absorbed by the roots. Once absorbed, it moves up through the plant providing insect protection.
		malathion 50% (Ortho)	See label.	7	Refer to label.
	Thrips	acetamiprid 0.5% (Ortho Flower, Fruit & Vegetable Insect Killer)	1.5 fl oz	7	Maximum applications per season (4). Days to wait to reapply (7).
		cyfluthrin 0.75% (Bayer Advanced)	0.5 fl oz	0	DO NOT spray more than 4 times per season.
		imidacloprid 0.235% (Bayer Advanced Fruit, Citrus and Vegetable Insect Control Concentrate)	0.5 fl oz/1 qt of water/10 sq ft of row as a drench	21	This systemic insecticide dissolved in water moves down through the soil, where it is absorbed by the roots. Once absorbed, it moves up through the plant providing insect protection.
		malathion 50% (Ortho)	See label.	7	Refer to label.
Vegetable weevil		acetamiprid 0.5% (Ortho Flower, Fruit & Vegetable Insect Killer)	1.5 fl oz	7	Maximum applications per season (4). Days to wait to reapply (7).
		cyfluthrin 0.75% (Bayer Advanced)	0.5 fl oz	0	DO NOT spray more than 4 times per season.
Whitefly		acetamiprid 0.5% (Ortho Flower, Fruit & Vegetable Insect Killer)	1.5 fl oz	7	Maximum applications per season (4). Days to wait to reapply (7).
		cyfluthrin 0.75% (Bayer Advanced)	0.5 fl oz	0	Adults ONLY. DO NOT spray more than 4 times per season.
		imidacloprid 0.235% (Bayer Advanced Fruit, Citrus and Vegetable Insect Control Concentrate)	0.5 fl oz/1 qt of water/10 sq ft of row as a drench	21	This systemic insecticide dissolved in water moves down through the soil, where it is absorbed by the roots. Once absorbed, it moves up through the plant providing insect protection.
		malathion 50% (Ortho)	See label.	7	Refer to label.

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Commodity	Insect	Insecticide and Formulation	Amount of Formulation Per Gallon of Spray	Minimum Interval (Days) Between Last Application and Harvest	Precautions and Remarks
LETTUCE	Aphids	acetamiprid 0.5% (Ortho Flower, Fruit & Vegetable Insect Killer)	1.5 fl oz	7	Maximum applications per season (4). Days to wait to reapply (7).
		bifenthrin 0.3% + zeta-cypermethrin 0.075% (Ortho Bug-G-Gon Insect Killer for Lawns and Gardens)	1.5 fl oz	7	HEAD LETTUCE ONLY. Apply when insects first appear. Reapply as necessary to maintain control waiting at least 7 days between applications.
		cyfluthrin 0.75% (Bayer Advanced)	0.5 fl oz	0	DO NOT spray more than 4 times per season.
		gamma-cyhalothrin 0.08% (Spectracide)	1.5 fl oz	1	Apply when insects first appear or when damage occurs. DO NOT apply more than 9 times per growing season.
		imidacloprid 0.235% (Bayer Advanced Fruit, Citrus and Vegetable Insect Control Concentrate)	0.5 fl oz/1 qt of water/10 sq ft of row as a drench	21	This systemic insecticide dissolved in water moves down through the soil, where it is absorbed by the roots. Once absorbed, it moves up through the plant providing insect protection.
		malathion 50% (Ortho, Bonide)	See label.	14	Refer to label. Preharvest interval (PHI) for Bonide product is 7 head and 14 leaf.
		soap (insecticidal, M-Pede 49 EC)	2 Tbsp	0	On foliage as needed.
	Cabbage looper, corn earworm	acetamiprid 0.5% (Ortho Flower, Fruit & Vegetable Insect Killer)	1.5 fl oz	7	Maximum applications per season (4). Days to wait to reapply (7).
		<i>Bacillus thuringiensis</i> (DiPel) 2X (Javelin) WG	1 Tbsp 1 tsp	0	On foliage as needed.
		bifenthrin 0.3% + zeta-cypermethrin 0.075% (Ortho Bug-G-Gon Insect Killer for Lawns and Gardens)	1.5 fl oz	7	HEAD LETTUCE ONLY. Apply when insects first appear. Reapply as necessary to maintain control waiting at least 7 days between applications.
		carbaryl (various brands)	See label.	14	Repeat applications as needed up to a total of 5 times but not more than once every 7 days. Will not control cabbage looper.
		cyfluthrin 0.75% (Bayer Advanced)	0.5 fl oz	0	DO NOT spray more than 4 times per season.
		gamma-cyhalothrin 0.08% (Spectracide)	1.5 fl oz	1	Apply when insects first appear or when damage occurs. DO NOT apply more than 9 times per growing season.
		malathion 50% (Ortho, Bonide)	See label.	14	Cabbage loopers ONLY. Refer to label.
		spinosad 0.5% (Bonide, Monterey, Natural Guard)	2.0 fl oz	1	Refer to label.
	Leafhopper	acetamiprid 0.5% (Ortho Flower, Fruit & Vegetable Insect Killer)	1.5 fl oz	7	Maximum applications per season (4). Days to wait to reapply (7).
		bifenthrin 0.3% + zeta-cypermethrin 0.075% (Ortho Bug-G-Gon Insect Killer for Lawns and Gardens)	1.5 fl oz	7	HEAD LETTUCE ONLY. Apply when insects first appear. Reapply as necessary to maintain control waiting at least 7 days between applications.
		cyfluthrin 0.75% (Bayer Advanced)	0.5 fl oz	0	DO NOT spray more than 4 times per season.

HOME GARDEN VEGETABLE INSECT CONTROL – Products for Use by the General Public

Commodity	Insect	Insecticide and Formulation	Amount of Formulation Per Gallon of Spray	Minimum Interval (Days) Between Last Application and Harvest	Precautions and Remarks
LETTUCE (cont.)	Leafhopper (cont.)	gamma-cyhalothrin 0.08% (Spectracide)	1.5 fl oz	1	Apply when insects first appear or when damage occurs. DO NOT apply more than 9 times per growing season.
		imidacloprid 0.235% (Bayer Advanced Fruit, Citrus and Vegetable Insect Control Concentrate)	0.5 fl oz/1 qt of water/10 sq ft of row as a drench	21	This systemic insecticide dissolved in water moves down through the soil, where it is absorbed by the roots. Once absorbed, it moves up through the plant providing insect protection.
		malathion 50% (Ortho, Bonide)	See label.	14	Refer to label.
	Thrips	acetamiprid 0.5% (Ortho Flower, Fruit & Vegetable Insect Killer)	1.5 fl oz	7	Maximum applications per season (4). Days to wait to reapply (7).
		cyfluthrin 0.75% (Bayer Advanced)	0.5 fl oz	0	DO NOT spray more than 4 times per season.
		gamma-cyhalothrin 0.08% (Spectracide)	1.5 fl oz	1	Apply when insects first appear or when damage occurs. DO NOT apply more than 9 times per growing season.
		imidacloprid 0.235% (Bayer Advanced Fruit, Citrus and Vegetable Insect Control Concentrate)	0.5 fl oz/1 qt of water/10 sq ft of row as a drench	21	This systemic insecticide dissolved in water moves down through the soil, where it is absorbed by the roots. Once absorbed, it moves up through the plant providing insect protection.
		malathion 50% (Ortho)	See label.	14	Refer to label.
	Whitefly	acetamiprid 0.5% (Ortho Flower, Fruit & Vegetable Insect Killer)	1.5 fl oz	7	Maximum applications per season (4). Days to wait to reapply (7).
		bifenthrin 0.3% + zeta-cypermethrin 0.075% (Ortho Bug-G-Gon Insect Killer for Lawns and Gardens)	1.5 fl oz	7	HEAD LETTUCE ONLY. Apply when insects first appear. Reapply as necessary to maintain control waiting at least 7 days between applications.
		cyfluthrin 0.75% (Bayer Advanced)	0.5 fl oz	0	Adults ONLY. DO NOT spray more than 4 times per season.
		imidacloprid 0.235% (Bayer Advanced Fruit, Citrus and Vegetable Insect Control Concentrate)	0.5 fl oz/1 qt of water/10 sq ft of row as a drench	21	This systemic insecticide dissolved in water moves down through the soil, where it is absorbed by the roots. Once absorbed, it moves up through the plant providing insect protection.
		malathion 50% (Ortho)	See label.	14	Refer to label.
LIMA BEANS	Aphids	acetamiprid 0.5% (Ortho Flower, Fruit & Vegetable Insect Killer)	1.5 fl oz	7	Maximum applications per season (3). Days to wait to reapply (7).
		bifenthrin 0.3% + zeta-cypermethrin 0.075% (Ortho Bug-G-Gon Insect Killer for Lawns and Gardens)	1.5 fl oz	3	Apply when insects first appear. Reapply as necessary to maintain control waiting at least 7 days between applications.
		imidacloprid 0.235% (Bayer Advanced Fruit, Citrus and Vegetable Insect Control Concentrate)	0.5 fl oz/1 qt of water/10 sq ft of row as a drench	21	This systemic insecticide dissolved in water moves down through the soil, where it is absorbed by the roots. Once absorbed, it moves up through the plant providing insect protection.
		malathion 50% (Bonide)	See label.	1	Refer to label.

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Commodity	Insect	Insecticide and Formulation	Amount of Formulation Per Gallon of Spray	Minimum Interval (Days) Between Last Application and Harvest	Precautions and Remarks
LIMA BEANS (cont.)	Leafhopper	acetamiprid 0.5% (Ortho Flower, Fruit & Vegetable Insect Killer)	1.5 fl oz	7	Maximum applications per season (3). Days to wait to reapply (7).
		bifenthrin 0.3% + zeta-cypermethrin 0.075% (Ortho Bug-G-Gon Insect Killer for Lawns and Gardens)	1.5 fl oz	3	Apply when insects first appear. Reapply as necessary to maintain control waiting at least 7 days between applications.
		imidacloprid 0.235% (Bayer Advanced Fruit, Citrus and Vegetable Insect Control Concentrate)	0.5 fl oz/1 qt of water/10 sq ft of row as a drench	21	This systemic insecticide dissolved in water moves down through the soil, where it is absorbed by the roots. Once absorbed, it moves up through the plant providing insect protection.
	Lima bean vine borer, plant bug, Mexican bean beetle, corn earworm	acetamiprid 0.5% (Ortho Flower, Fruit & Vegetable Insect Killer)	1.5 fl oz	7	Plant bug and Mexican bean beetle ONLY. Maximum applications per season (3). Days to wait to reapply (7).
		bifenthrin 0.3% + zeta-cypermethrin 0.075% (Ortho Bug-G-Gon Insect Killer for Lawns and Gardens)	1.5 fl oz	3	Apply when insects first appear. Reapply as necessary to maintain control waiting at least 7 days between applications.
		carbaryl (various brands)	See label.	3/14/21	DO NOT apply within 14 days of grazing or harvest for forage or within 3 days of harvest of fresh beans or peas or within 21 days of harvest of dried beans or peas, seed or hay.
		spinosad 0.5% (Bonide, Monterey, Natural Guard)	2.0 fl oz	3	Lima bean vine borer and corn earworm ONLY.
	Thrips	acetamiprid 0.5% (Ortho Flower, Fruit & Vegetable Insect Killer)	1.5 fl oz	7	Maximum applications per season (3). Days to wait to reapply (7).
		imidacloprid 0.235% (Bayer Advanced Fruit, Citrus and Vegetable Insect Control Concentrate)	0.5 fl oz/1 qt of water/10 sq ft of row as a drench	21	This systemic insecticide dissolved in water moves down through the soil, where it is absorbed by the roots. Once absorbed, it moves up through the plant providing insect protection.
		spinosad 0.5% (Bonide, Monterey, Natural Guard)	2.0 fl oz	3	
	Whitefly	acetamiprid 0.5% (Ortho Flower, Fruit & Vegetable Insect Killer)	1.5 fl oz	7	Maximum applications per season (3). Days to wait to reapply (7).
		bifenthrin 0.3% + zeta-cypermethrin 0.075% (Ortho Bug-G-Gon Insect Killer for Lawns and Gardens)	1.5 fl oz	3	Apply when insects first appear. Reapply as necessary to maintain control waiting at least 7 days between applications.
		imidacloprid 0.235% (Bayer Advanced Fruit, Citrus and Vegetable Insect Control Concentrate)	0.5 fl oz/1 qt of water/10 sq ft of row as a drench	21	This systemic insecticide dissolved in water moves down through the soil, where it is absorbed by the roots. Once absorbed, it moves up through the plant providing insect protection.
MUSTARD GREENS	Aphids, flea beetle	acetamiprid 0.5% (Ortho Flower, Fruit & Vegetable Insect Killer)	1.5 fl oz	7	Maximum applications per season (4). Days to wait to reapply (7).
		bifenthrin 0.3% + zeta-cypermethrin 0.075% (Ortho Bug-G-Gon Insect Killer for Lawns and Gardens)	1.5 fl oz	7	Apply when insects first appear. Reapply as necessary to maintain control waiting at least 7 days between applications.
		cyfluthrin 0.75% (Bayer Advanced)	0.5 fl oz	0	DO NOT spray more than 4 times per season.
		imidacloprid 0.235% (Bayer Advanced Fruit, Citrus and Vegetable Insect Control Concentrate)	0.5 fl oz/1 qt of water/10 sq ft of row as a drench	21	This systemic insecticide dissolved in water moves down through the soil, where it is absorbed by the roots. Once absorbed, it moves up through the plant providing insect protection.

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Commodity	Insect	Insecticide and Formulation	Amount of Formulation Per Gallon of Spray	Minimum Interval (Days) Between Last Application and Harvest	Precautions and Remarks
MUSTARD GREENS (cont.)	Aphids, flea beetle (cont.)	malathion 50% (Ortho, Bonide)	See label.	7	Refer to label.
		soap (insecticidal, M-Pede 49 EC)	2 Tbsp	0	On foliage as needed.
	Cabbage looper, diamondback moth, imported cabbageworm	acetamiprid 0.5% (Ortho Flower, Fruit & Vegetable Insect Killer)	1.5 fl oz	7	Maximum applications per season (4). Days to wait to reapply (7).
		<i>Bacillus thuringiensis</i> (DiPel) 2X (Javelin) WG	1 Tbsp 2 tsp	0	Begin foliage treatments early and repeat as necessary.
		bifenthrin 0.3% + zeta-cypermethrin 0.075% (Ortho Bug-G-Gon Insect Killer for Lawns and Gardens)	1.5 fl oz	7	Apply when insects first appear. Reapply as necessary to maintain control waiting at least 7 days between applications.
		cyfluthrin 0.75% (Bayer Advanced)	0.5 fl oz	0	DO NOT spray more than 4 times per season.
		malathion 50% (Ortho, Bonide)	See label.	7	NOT for diamondback moth. Refer to label.
		spinosad 0.5% (Bonide, Monterey, Natural Guard)	2.0 fl oz	1	
	Leafhopper	acetamiprid 0.5% (Ortho Flower, Fruit & Vegetable Insect Killer)	1.5 fl oz	7	Maximum applications per season (4). Days to wait to reapply (7).
		bifenthrin 0.3% + zeta-cypermethrin 0.075% (Ortho Bug-G-Gon Insect Killer for Lawns and Gardens)	1.5 fl oz	7	Apply when insects first appear. Reapply as necessary to maintain control waiting at least 7 days between applications.
		cyfluthrin 0.75% (Bayer Advanced)	0.5 fl oz	0	DO NOT spray more than 4 times per season.
		imidacloprid 0.235% (Bayer Advanced Fruit, Citrus and Vegetable Insect Control Concentrate)	0.5 fl oz/1 qt of water/10 sq ft of row as a drench	21	This systemic insecticide dissolved in water moves down through the soil, where it is absorbed by the roots. Once absorbed, it moves up through the plant providing insect protection.
		malathion 50% (Ortho)	See label.	7	Refer to label.
	Thrips	acetamiprid 0.5% (Ortho Flower, Fruit & Vegetable Insect Killer)	1.5 fl oz	7	Maximum applications per season (4). Days to wait to reapply (7).
		cyfluthrin 0.75% (Bayer Advanced)	0.5 fl oz	0	DO NOT spray more than 4 times per season.
		imidacloprid 0.235% (Bayer Advanced Fruit, Citrus and Vegetable Insect Control Concentrate)	0.5 fl oz/1 qt of water/10 sq ft of row as a drench	21	This systemic insecticide dissolved in water moves down through the soil, where it is absorbed by the roots. Once absorbed, it moves up through the plant providing insect protection.
		malathion 50% (Ortho)	See label.	7	Refer to label.
	Vegetable weevil	acetamiprid 0.5% (Ortho Flower, Fruit & Vegetable Insect Killer)	1.5 fl oz	7	Maximum applications per season (4). Days to wait to reapply (7).
		bifenthrin 0.3% + zeta-cypermethrin 0.075% (Ortho Bug-G-Gon Insect Killer for Lawns and Gardens)	1.5 fl oz	7	Apply when insects first appear. Reapply as necessary to maintain control waiting at least 7 days between applications.
		cyfluthrin 0.75% (Bayer Advanced)	0.5 fl oz	0	Adults ONLY. DO NOT spray more than 4 times per season.

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Commodity	Insect	Insecticide and Formulation	Amount of Formulation Per Gallon of Spray	Minimum Interval (Days) Between Last Application and Harvest	Precautions and Remarks
MUSTARD GREENS (cont.)	Whitefly	acetamiprid 0.5% (Ortho Flower, Fruit & Vegetable Insect Killer)	1.5 fl oz	7	Maximum applications per season (4). Days to wait to reapply (7).
		bifenthrin 0.3% + zeta-cypermethrin 0.075% (Ortho Bug-G-Gon Insect Killer for Lawns and Gardens)	1.5 fl oz	7	Apply when insects first appear. Reapply as necessary to maintain control waiting at least 7 days between applications.
		cyfluthrin 0.75% (Bayer Advanced)	0.5 fl oz	0	Adults ONLY. DO NOT spray more than 4 times per season.
		imidacloprid 0.235% (Bayer Advanced Fruit, Citrus and Vegetable Insect Control Concentrate)	0.5 fl oz/1 qt of water/10 sq ft of row as a drench	21	This systemic insecticide dissolved in water moves down through the soil, where it is absorbed by the roots. Once absorbed, it moves up through the plant providing insect protection.
		malathion 50% (Ortho)	See label.	7	Refer to label.
OKRA	Aphids, leafminer	imidacloprid 0.235% (Bayer Advanced Fruit, Citrus and Vegetable Insect Control Concentrate)	0.5 fl oz/1 qt of water/10 sq ft of row as a drench	21	Aphids ONLY. This systemic insecticide dissolved in water moves down through the soil, where it is absorbed by the roots. Once absorbed, it moves up through the plant providing insect protection.
		malathion 50% (Ortho)	See label.	1	Refer to label.
		spinosad 0.5% (Bonide, Monterey, Natural Guard)	2.0 fl oz	1	Leafminer ONLY.
	Corn earworm, European corn borer, flea beetle, stink bug	carbaryl (various brands)	See label.	3	
		imidacloprid 0.235% (Bayer Advanced Fruit, Citrus and Vegetable Insect Control Concentrate)	0.5 fl oz/1 qt of water/10 sq ft of row as a drench	21	Flea beetles ONLY. This systemic insecticide dissolved in water moves down through the soil, where it is absorbed by the roots. Once absorbed, it moves up through the plant providing insect protection.
		spinosad 0.5% (Bonide, Monterey, Natural Guard)	2.0 fl oz	1	Corn earworm and European corn borer ONLY.
	Leafhopper	imidacloprid 0.235% (Bayer Advanced Fruit, Citrus and Vegetable Insect Control Concentrate)	0.5 fl oz/1 qt of water/10 sq ft of row as a drench	21	This systemic insecticide dissolved in water moves down through the soil, where it is absorbed by the roots. Once absorbed, it moves up through the plant providing insect protection.
		malathion 50% (Ortho)	See label.	1	Refer to label.
	Stink bug	carbaryl 5% dust (Hi-Yield)		3	Dust lightly to cover upper leaf surface with a thin, even film of dust. Apply when air is calm. DO NOT repeat applications more often than every 7 days. DO NOT exceed more than 4 applications per year.
	Thrips	imidacloprid 0.235% (Bayer Advanced Fruit, Citrus and Vegetable Insect Control Concentrate)	0.5 fl oz/1 qt of water/10 sq ft of row as a drench	21	This systemic insecticide dissolved in water moves down through the soil, where it is absorbed by the roots. Once absorbed, it moves up through the plant providing insect protection.
		malathion 50% (Ortho)	See label.	1	Refer to label.
		spinosad 0.5% (Bonide, Monterey, Natural Guard)	2.0 fl oz	1	
	Whitefly	imidacloprid 0.235% (Bayer Advanced Fruit, Citrus and Vegetable Insect Control Concentrate)	0.5 fl oz/1 qt of water/10 sq ft of row as a drench	21	This systemic insecticide dissolved in water moves down through the soil, where it is absorbed by the roots. Once absorbed, it moves up through the plant providing insect protection.
		malathion 50% (Ortho)	See label.	1	Refer to label.

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Commodity	Insect	Insecticide and Formulation	Amount of Formulation Per Gallon of Spray	Minimum Interval (Days) Between Last Application and Harvest	Precautions and Remarks
ONION	Onion thrips	acetamiprid 0.5% (Ortho Flower, Fruit & Vegetable Insect Killer)	1.5 fl oz	7	Maximum applications per season (4). Days to wait to reapply (7).
		gamma-cyhalothrin 0.08% (Spectracide)	1.5 fl oz	14	Apply when insects first appear or when damage occurs. DO NOT apply more than 9 times per growing season.
		lambda-cyhalothrin 0.5% (Bonide)	ready-to-use premix	14	Apply thoroughly as a foliar cover spray to both sides of plant leaves and all plant surfaces where insects are present. DO NOT spray more than 9 times per season.
		malathion 50% (Ortho, Bonide)	See label.	3	Refer to label.
		soap (insecticidal, M-Pede 49 EC)	2 Tbsp	0	
PEAS	Aphids, leafminer	acetamiprid 0.5% (Ortho Flower, Fruit & Vegetable Insect Killer)	1.5 fl oz	7	Maximum applications per season (3). Days to wait to reapply (7).
		bifenthrin 0.3% + zeta-cypermethrin 0.075% (Ortho Bug-G-Gon Insect Killer for Lawns and Gardens)	1.5 fl oz	3	Apply when insects first appear. Reapply as necessary to maintain control waiting at least 7 days between applications.
		esfenvalerate 0.425% (Monterey)	1 fl oz	21 dry peas 3 green peas	Spray plants to wet upper and lower leaf surfaces until dripping. Apply as necessary to maintain control waiting at least 7 days between each application.
		gamma-cyhalothrin 0.08% (Spectracide)	1.5 fl oz	7	Apply when insects first appear or when damage occurs. DO NOT apply more than 9 times per growing season.
		imidacloprid 0.235% (Bayer Advanced Fruit, Citrus and Vegetable Insect Control Concentrate)	0.5 fl oz/1 qt of water/10 sq ft of row as a drench	21	Aphids ONLY. This systemic insecticide dissolved in water moves down through the soil, where it is absorbed by the roots. Once absorbed, it moves up through the plant providing insect protection.
		malathion 50% (Ortho)	See label.	3	Refer to label.
		spinosad 0.5% (Bonide, Monterey, Natural Guard)	2.0 fl oz	3	Leafminer ONLY.
		soap (insecticidal, M-Pede 49 EC)	2 Tbsp	0	
	Cowpea curculio	bifenthrin 0.3% + zeta-cypermethrin 0.075% (Ortho Bug-G-Gon Insect Killer for Lawns and Gardens)	1.5 fl oz	3	Apply when insects first appear. Reapply as necessary to maintain control waiting at least 7 days between applications.
		carbaryl (various brands)	See label.	3/14/21	Suppression ONLY. DO NOT apply within 14 days of grazing or harvest for forage or within 3 days of harvest of fresh beans or peas or within 21 days of harvest of dried beans or peas, seed or hay.
		esfenvalerate 0.425% (Monterey)	1 fl oz	21 dry peas 3 green peas	Spray plants to wet upper and lower leaf surfaces until dripping. Apply as necessary to maintain control waiting at least 7 days between each application.

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Commodity	Insect	Insecticide and Formulation	Amount of Formulation Per Gallon of Spray	Minimum Interval (Days) Between Last Application and Harvest	Precautions and Remarks
PEAS (cont.)	Leafhopper	acetamiprid 0.5% (Ortho Flower, Fruit & Vegetable Insect Killer)	1.5 fl oz	7	Maximum applications per season (3). Days to wait to reapply (7).
		bifenthrin 0.3% + zeta-cypermethrin 0.075% (Ortho Bug-G-Gon Insect Killer for Lawns and Gardens)	1.5 fl oz	3	Apply when insects first appear. Reapply as necessary to maintain control waiting at least 7 days between applications.
		esfenvalerate 0.425% (Monterey)	1 fl oz	21 dry peas 3 green peas	Spray plants to wet upper and lower leaf surfaces until dripping. Apply as necessary to maintain control waiting at least 7 days between each application.
		gamma-cyhalothrin 0.08% (Spectracide)	1.5 fl oz	7	Apply when insects first appear or when damage occurs. DO NOT apply more than 9 times per growing season.
		imidacloprid 0.235% (Bayer Advanced Fruit, Citrus and Vegetable Insect Control Concentrate)	0.5 fl oz/1 qt of water/10 sq ft of row as a drench	21	This systemic insecticide dissolved in water moves down through the soil, where it is absorbed by the roots. Once absorbed, it moves up through the plant providing insect protection.
		malathion 50% (Ortho)	See label.	3	Refer to label.
	Spider Mite	sulfur 90%	2 Tbsp	0	DO NOT use if temperature is above 95°F. DO NOT use within 3 weeks of oil spray.
	Thrips	acetamiprid 0.5% (Ortho Flower, Fruit & Vegetable Insect Killer)	1.5 fl oz	7	Maximum applications per season (3). Days to wait to reapply (7).
		gamma-cyhalothrin 0.08% (Spectracide)	1.5 fl oz	7	Apply when insects first appear or when damage occurs. DO NOT apply more than 9 times per growing season.
		imidacloprid 0.235% (Bayer Advanced Fruit, Citrus and Vegetable Insect Control Concentrate)	0.5 fl oz/1 qt of water/10 sq ft of row as a drench	21	This systemic insecticide dissolved in water moves down through the soil, where it is absorbed by the roots. Once absorbed, it moves up through the plant providing insect protection.
		malathion 50% (Ortho)	See label.	3	Refer to label.
		spinosad 0.5% (Bonide, Monterey, Natural Guard)	2.0 fl oz	3	
	Whitefly	acetamiprid 0.5% (Ortho Flower, Fruit & Vegetable Insect Killer)	1.5 fl oz	7	Maximum applications per season (3). Days to wait to reapply (7).
		bifenthrin 0.3% + zeta-cypermethrin 0.075% (Ortho Bug-G-Gon Insect Killer for Lawns and Gardens)	1.5 fl oz	3	Apply when insects first appear. Reapply as necessary to maintain control waiting at least 7 days between applications.
		esfenvalerate 0.425% (Monterey)	1 fl oz	21 dry peas 3 green peas	Spray plants to wet upper and lower leaf surfaces until dripping. Apply as necessary to maintain control waiting at least 7 days between each application.
		imidacloprid 0.235% (Bayer Advanced Fruit, Citrus and Vegetable Insect Control Concentrate)	0.5 fl oz/1 qt of water/10 sq ft of row as a drench	21	This systemic insecticide dissolved in water moves down through the soil, where it is absorbed by the roots. Once absorbed, it moves up through the plant providing insect protection.
		malathion 50% (Ortho)	See label.	3	Refer to label.
PEPPER	Aphids, leafminer, thrips	acetamiprid 0.5% (Ortho Flower, Fruit & Vegetable Insect Killer)	1.5 fl oz	7	Maximum applications per season (4). Days to wait to reapply (7).
		bifenthrin 0.3% + zeta-cypermethrin 0.075% (Ortho Bug-G-Gon Insect Killer for Lawns and Gardens)	1.5 fl oz	7	Aphid and leafminer ONLY. Apply when insects first appear. Reapply as necessary to maintain control waiting at least 7 days between applications.

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Commodity	Insect	Insecticide and Formulation	Amount of Formulation Per Gallon of Spray	Minimum Interval (Days) Between Last Application and Harvest	Precautions and Remarks
PEPPER (cont.)	Aphids, leafminer, thrips (cont.)	cyfluthrin 0.75% (Bayer Advanced)	0.5 fl oz	7	DO NOT spray more than 6 times per season.
		esfenvalerate 0.425% (Monterey)	1 fl oz	7	Aphid and leafminer ONLY. Spray plants to wet upper and lower leaf surfaces until dripping. Apply as necessary to maintain control waiting at least 7 days between each application.
		gamma-cyhalothrin 0.08% (Spectracide)	1.5 fl oz	5	Apply when insects first appear or when damage occurs. DO NOT apply more than 9 times per growing season.
		imidacloprid 0.235% (Bayer Advanced Fruit, Citrus and Vegetable Insect Control Concentrate)	0.5 fl oz/1 qt of water/10 sq ft of row as a drench	21	Aphids and thrips ONLY. This systemic insecticide dissolved in water moves down through the soil, where it is absorbed by the roots. Once absorbed, it moves up through the plant providing insect protection.
		malathion 50% (Ortho, Bonide)	See label.	3	Refer to label.
		soap (insecticidal, M-Pede 49 EC)	2 Tbsp	0	
		spinosad 0.5% (Bonide, Monterey, Natural Guard)	2.0 fl oz	1	Leafminer and thrips ONLY.
	European corn borer, flea beetle, tomato fruitworm, hornworm, stink bug	acetamiprid 0.5% (Ortho Flower, Fruit & Vegetable Insect Killer)	1.5 fl oz	7	Maximum applications per season (4). Days to wait to reapply (7).
		bifenthrin 0.3% + zeta-cypermethrin 0.075% (Ortho Bug-G-Gon Insect Killer for Lawns and Gardens)	1.5 fl oz	7	Apply when insects first appear. Reapply as necessary to maintain control waiting at least 7 days between applications.
		carbaryl (various brands)	See label.	3	Repeat applications as needed up to a total of 7 times but not more than once every 7 days.
		cyfluthrin 0.75% (Bayer Advanced)	0.5 fl oz	7	DO NOT spray more than 6 times per season.
		esfenvalerate 0.425% (Monterey)	1 fl oz	7	Spray plants to wet upper and lower leaf surfaces until dripping. Apply as necessary to maintain control waiting at least 7 days between each application.
		gamma-cyhalothrin 0.08% (Spectracide)	1.5 fl oz	5	Apply when insects first appear or when damage occurs. DO NOT apply more than 9 times per growing season.
		imidacloprid 0.235% (Bayer Advanced Fruit, Citrus and Vegetable Insect Control Concentrate)	0.5 fl oz/1 qt of water/10 sq ft of row as a drench	21	Flea beetles ONLY. This systemic insecticide dissolved in water moves down through the soil, where it is absorbed by the roots. Once absorbed, it moves up through the plant providing insect protection.
		permethrin 2.5% EC (various brands)	2 fl oz	3	
		spinosad 0.5% (Bonide, Monterey, Natural Guard)	2.0 fl oz	1	European corn borer, tomato fruitworm, and hornworm ONLY.
	Leafhopper	acetamiprid 0.5% (Ortho Flower, Fruit & Vegetable Insect Killer)	1.5 fl oz	7	Maximum applications per season (4). Days to wait to reapply (7).
		bifenthrin 0.3% + zeta-cypermethrin 0.075% (Ortho Bug-G-Gon Insect Killer for Lawns and Gardens)	1.5 fl oz	7	Apply when insects first appear. Reapply as necessary to maintain control waiting at least 7 days between applications.

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Commodity	Insect	Insecticide and Formulation	Amount of Formulation Per Gallon of Spray	Minimum Interval (Days) Between Last Application and Harvest	Precautions and Remarks
PEPPER (cont.)	Leafhopper (cont.)	cyfluthrin 0.75% (Bayer Advanced)	0.5 fl oz	7	DO NOT spray more than 6 times per season.
		esfenvalerate 0.425% (Monterey)	1 fl oz	7	Spray plants to wet upper and lower leaf surfaces until dripping. Apply as necessary to maintain control waiting at least 7 days between each application.
		gamma-cyhalothrin 0.08% (Spectracide)	1.5 fl oz	5	Apply when insects first appear or when damage occurs. DO NOT apply more than 9 times per growing season.
		imidacloprid 0.235% (Bayer Advanced Fruit, Citrus and Vegetable Insect Control Concentrate)	0.5 fl oz/1 qt of water/10 sq ft of row as a drench	21	This systemic insecticide dissolved in water moves down through the soil, where it is absorbed by the roots. Once absorbed, it moves up through the plant providing insect protection.
		malathion 50% (Ortho)	See label.	3	Refer to label.
	Whitefly	acetamiprid 0.5% (Ortho Flower, Fruit & Vegetable Insect Killer)	1.5 fl oz	7	Maximum applications per season (4). Days to wait to reapply (7).
		bifenthrin 0.3% + zeta-cypermethrin 0.075% (Ortho Bug-G-Gon Insect Killer for Lawns and Gardens)	1.5 fl oz	7	Apply when insects first appear. Reapply as necessary to maintain control waiting at least 7 days between applications.
		cyfluthrin 0.75% (Bayer Advanced)	0.5 fl oz	7	Adults ONLY. DO NOT spray more than 6 times per season.
		esfenvalerate 0.425% (Monterey)	1 fl oz	7	Spray plants to wet upper and lower leaf surfaces until dripping. Apply as necessary to maintain control waiting at least 7 days between each application.
		imidacloprid 0.235% (Bayer Advanced Fruit, Citrus and Vegetable Insect Control Concentrate)	0.5 fl oz/1 qt of water/10 sq ft of row as a drench	21	This systemic insecticide dissolved in water moves down through the soil, where it is absorbed by the roots. Once absorbed, it moves up through the plant providing insect protection.
		malathion 50% (Ortho)	See label.	3	Refer to label.
POTATO, IRISH	Aphids	acetamiprid 0.5% (Ortho Flower, Fruit & Vegetable Insect Killer)	1.5 fl oz	7	Maximum applications per season (4). Days to wait to reapply (7).
		cyfluthrin 0.75% (Bayer Advanced)	0.5 fl oz	0	DO NOT spray more than 6 times per season.
		esfenvalerate 0.425% (Monterey)	1 fl oz	7	Spray plants to wet upper and lower leaf surfaces until dripping. Apply as necessary to maintain control waiting at least 7 days between each application.
	European corn borer	malathion 50% (Ortho, Bonide)	2 tsp	0	Refer to label.
		acetamiprid 0.5% (Ortho Flower, Fruit & Vegetable Insect Killer)	1.5 fl oz	7	Maximum applications per season (4). Days to wait to reapply (7).
		carbaryl (various brands)	See label.	7	Repeat applications as necessary up to a total of 6 times but not more often than once every 7 days.

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Commodity	Insect	Insecticide and Formulation	Amount of Formulation Per Gallon of Spray	Minimum Interval (Days) Between Last Application and Harvest	Precautions and Remarks
POTATO, IRISH (cont.)	European corn borer (cont.)	cyfluthrin 0.75% (Bayer Advanced)	0.5 fl oz	0	DO NOT spray more than 6 times per season.
		esfenvalerate 0.425% (Monterey)	1 fl oz	7	Spray plants to wet upper and lower leaf surfaces until dripping. Apply as necessary to maintain control waiting at least 7 days between each application.
		spinosad 0.5% (Bonide, Monterey, Natural Guard)	2.0 fl oz	7	
	Potato leafhopper, potato flea beetle, Colorado potato beetle, blister beetle, stink bug	acetamiprid 0.5% (Ortho Flower, Fruit & Vegetable Insect Killer)	1.5 fl oz	7	Maximum applications per season (4). Days to wait to reapply (7). NOT labeled for blister beetles.
		<i>Bacillus thuringiensis</i> var. <i>san diego</i> (M-Trak)	1.5-3 Tbsp	0	Colorado potato beetles ONLY. Treat when small larvae are present. NOT effective against adults or large larvae.
		var. <i>tennebrionus</i> (Trident II)	2-4 Tbsp		
		carbaryl (various brands)	See label.	7	Repeat applications as necessary up to a total of 6 times but not more often than once every 7 days.
		cyfluthrin 0.75% (Bayer Advanced)	0.5 fl oz	0	DO NOT spray more than 6 times per season.
		esfenvalerate 0.425% (Monterey)	1 fl oz	7	Spray plants to wet upper and lower leaf surfaces until dripping. Apply as necessary to maintain control waiting at least 7 days between each application.
		malathion 50% (Ortho, Bonide)	See label.	0	Leafhoppers and blister beetles ONLY. Refer to label.
		phosmet 70W (Imidan)	Follow label	7	
		spinosad 0.5% (Bonide, Monterey, Natural Guard)	2.0 fl oz	7	Colorado potato beetle ONLY
	Potato tuberworm	<i>Bacillus thuringiensis</i> (DiPel) 2X	1 Tbsp	0	
		(DiPel) 4L	2 tsp		
		cyfluthrin 0.75% (Bayer Advanced)	0.5 fl oz	0	DO NOT spray more than 6 times per season.
		esfenvalerate 0.425% (Monterey)	1 fl oz	7	Spray plants to wet upper and lower leaf surfaces until dripping. Apply as necessary to maintain control waiting at least 7 days between each application.
PUMPKIN	See SQUASH and PUMPKIN.				
RADISH	Aphids	cyfluthrin 0.75% (Bayer Advanced)	0.5 fl oz	0	DO NOT spray more than 5 times per season.
		esfenvalerate 0.425% (Monterey)	1 fl oz	7	Spray plants to wet upper and lower leaf surfaces until dripping. Apply as necessary to maintain control waiting at least 7 days between each application.
		imidacloprid 0.235% (Bayer Advanced Fruit, Citrus and Vegetable Insect Control Concentrate)	0.5 fl oz/1 qt of water/10 sq ft of row as a drench	21	This systemic insecticide dissolved in water moves down through the soil, where it is absorbed by the roots. Once absorbed, it moves up through the plant providing insect protection.
		malathion 50% (Ortho)	See label.	7	Refer to label.

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Commodity	Insect	Insecticide and Formulation	Amount of Formulation Per Gallon of Spray	Minimum Interval (Days) Between Last Application and Harvest	Precautions and Remarks
RADISH (cont.)	Flea beetle, imported cabbageworm	carbaryl (various brands)	See label.	7	Repeat applications as necessary up to a total of 6 times but not more often than once every 7 days.
		cyfluthrin 0.75% (Bayer Advanced)	0.5 fl oz	0	DO NOT spray more than 5 times per season.
		esfenvalerate 0.425% (Monterey)	1 fl oz	7	Spray plants to wet upper and lower leaf surfaces until dripping. Apply as necessary to maintain control waiting at least 7 days between each application.
		imidacloprid 0.235% (Bayer Advanced Fruit, Citrus and Vegetable Insect Control Concentrate)	0.5 fl oz/1 qt of water/10 sq ft of row as a drench	21	Flea beetles ONLY. This systemic insecticide dissolved in water moves down through the soil, where it is absorbed by the roots. Once absorbed, it moves up through the plant providing insect protection.
		malathion 50% (Ortho)	See label.	7	Refer to label.
	Leafhopper	cyfluthrin 0.75% (Bayer Advanced)	0.5 fl oz	0	DO NOT spray more than 5 times per season.
		esfenvalerate 0.425% (Monterey)	1 fl oz	7	Spray plants to wet upper and lower leaf surfaces until dripping. Apply as necessary to maintain control waiting at least 7 days between each application.
		imidacloprid 0.235% (Bayer Advanced Fruit, Citrus and Vegetable Insect Control Concentrate)	0.5 fl oz/1 qt of water/10 sq ft of row as a drench	21	This systemic insecticide dissolved in water moves down through the soil, where it is absorbed by the roots. Once absorbed, it moves up through the plant providing insect protection.
		malathion 50% (Ortho)	See label.	7	Refer to label.
	Thrips	imidacloprid 0.235% (Bayer Advanced Fruit, Citrus and Vegetable Insect Control Concentrate)	0.5 fl oz/1 qt of water/10 sq ft of row as a drench	21	This systemic insecticide dissolved in water moves down through the soil, where it is absorbed by the roots. Once absorbed, it moves up through the plant providing insect protection.
		malathion 50% (Ortho)	See label.	7	Refer to label.
	Whitefly	esfenvalerate 0.425% (Monterey)	1 fl oz	7	Spray plants to wet upper and lower leaf surfaces until dripping. Apply as necessary to maintain control waiting at least 7 days between each application.
		imidacloprid 0.235% (Bayer Advanced Fruit, Citrus and Vegetable Insect Control Concentrate)	0.5 fl oz/1 qt of water/10 sq ft of row as a drench	21	This systemic insecticide dissolved in water moves down through the soil, where it is absorbed by the roots. Once absorbed, it moves up through the plant providing insect protection.
		malathion 50% (Ortho)	See label.	7	Refer to label.
SPINACH	Aphids, thrips, leafminer	acetamiprid 0.5% (Ortho Flower, Fruit & Vegetable Insect Killer)	1.5 fl oz	7	Maximum applications per season (4). Days to wait to reapply (7).
		cyfluthrin 0.75% (Bayer Advanced)	0.5 fl oz	0	DO NOT spray more than 4 times per season.
		imidacloprid 0.235% (Bayer Advanced Fruit, Citrus and Vegetable Insect Control Concentrate)	0.5 fl oz/1 qt of water/10 sq ft of row as a drench	21	Aphids and thrips ONLY. This systemic insecticide dissolved in water moves down through the soil, where it is absorbed by the roots. Once absorbed, it moves up through the plant providing insect protection.

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Commodity	Insect	Insecticide and Formulation	Amount of Formulation Per Gallon of Spray	Minimum Interval (Days) Between Last Application and Harvest	Precautions and Remarks
SPINACH (cont.)	Aphids, thrips, leafminer (cont.)	malathion 50% (Ortho, Bonide)	See label.	7	Refer to label.
		soap (insecticidal, M-Pede 49 EC)	2 tsp	0	On foliage as needed.
		spinosad 0.5% (Bonide, Monterey, Natural Guard)	2.0 fl oz	1	Thrips and leafminer ONLY.
	Corn earworm, loopers	acetamiprid 0.5% (Ortho Flower, Fruit & Vegetable Insect Killer)	1.5 fl oz	7	Maximum applications per season (4). Days to wait to reapply (7).
		<i>Bacillus thuringiensis</i> (DiPel) 2X (DiPel) 4L	1 Tbsp 2 tsp	0	
		cyfluthrin 0.75% (Bayer Advanced)	0.5 fl oz	0	DO NOT spray more than 4 times per season.
		malathion 50% (Ortho)	See label.	7	Cabbage loopers ONLY. Refer to label.
		spinosad 0.5% (Bonide, Monterey, Natural Guard)	2.0 fl oz	1	
	Leafhopper	acetamiprid 0.5% (Ortho Flower, Fruit & Vegetable Insect Killer)	1.5 fl oz	7	Maximum applications per season (4). Days to wait to reapply (7).
		cyfluthrin 0.75% (Bayer Advanced)	0.5 fl oz	0	DO NOT spray more than 4 times per season.
		imidacloprid 0.235% (Bayer Advanced Fruit, Citrus and Vegetable Insect Control Concentrate)	0.5 fl oz/1 qt of water/10 sq ft of row as a drench	21	This systemic insecticide dissolved in water moves down through the soil, where it is absorbed by the roots. Once absorbed, it moves up through the plant providing insect protection.
		malathion 50% (Ortho)	See label.	7	Refer to label.
	Whitefly	acetamiprid 0.5% (Ortho Flower, Fruit & Vegetable Insect Killer)	1.5 fl oz	7	Maximum applications per season (4). Days to wait to reapply (7).
		cyfluthrin 0.75% (Bayer Advanced)	0.5 fl oz	0	Adults ONLY. DO NOT spray more than 4 times per season.
		imidacloprid 0.235% (Bayer Advanced Fruit, Citrus and Vegetable Insect Control Concentrate)	0.5 fl oz/1 qt of water/10 sq ft of row as a drench	21	This systemic insecticide dissolved in water moves down through the soil, where it is absorbed by the roots. Once absorbed, it moves up through the plant providing insect protection.
		malathion 50% (Ortho)	See label.	7	Refer to label.
SQUASH, PUMPKIN	Aphids	acetamiprid 0.5% (Ortho Flower, Fruit & Vegetable Insect Killer)	1.5 fl oz	7	Maximum applications per season (5). Days to wait to reapply (5).
		bifenthrin 0.3% + zeta-cypermethrin 0.075% (Ortho Bug-G-Gon Insect Killer for Lawns and Gardens)	1.5 fl oz	3	Apply when insects first appear. Reapply as necessary to maintain control waiting at least 7 days between applications.
		cyfluthrin 0.75% (Bayer Advanced)	0.5 fl oz	0	DO NOT spray more than 4 times per season.
		esfenvalerate 0.425% (Monterey)	1 fl oz	3	Spray plants to wet upper and lower leaf surfaces until dripping. Apply as necessary to maintain control waiting at least 7 days between each application.
		imidacloprid 0.235% (Bayer Advanced Fruit, Citrus and Vegetable Insect Control Concentrate)	0.5 fl oz/1 qt of water/10 sq ft of row as a drench	21	This systemic insecticide dissolved in water moves down through the soil, where it is absorbed by the roots. Once absorbed, it moves up through the plant providing insect protection.

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Commodity	Insect	Insecticide and Formulation	Amount of Formulation Per Gallon of Spray	Minimum Interval (Days) Between Last Application and Harvest	Precautions and Remarks
SQUASH, PUMPKIN (cont.)	Aphids (cont.)	malathion 50% (Ortho, Bonide)	See label.	1 (squash) 3 (pumpkin)	Refer to label.
		soap (insecticidal, M-Pede 49 EC)	2 Tbsp	0	
	Cucumber beetle (spotted and striped), flea beetle, leafhopper	acetamiprid 0.5% (Ortho Flower, Fruit & Vegetable Insect Killer)	1.5 fl oz	0	Maximum applications per season (5). Days to wait to reapply (5).
		bifenthrin 0.3% + zeta-cypermethrin 0.075% (Ortho Bug-G-Gon Insect Killer for Lawns and Gardens)	1.5 fl oz	3	Apply when insects first appear. Reapply as necessary to maintain control waiting at least 7 days between applications.
		carbaryl (various brands)	See label.	3	Repeat applications as needed up to a total of 6 times but not more than once every 7 days.
		cyfluthrin 0.75% (Bayer Advanced)	0.5 fl oz	0	DO NOT spray more than 4 times per season.
		esfenvalerate 0.425% (Monterey)	1 fl oz	3	Spray plants to wet upper and lower leaf surfaces until dripping. Apply as necessary to maintain control waiting at least 7 days between each application.
		imidacloprid 0.235% (Bayer Advanced Fruit, Citrus and Vegetable Insect Control Concentrate)	0.5 fl oz/1 qt of water/10 sq ft of row as a drench	21	This systemic insecticide dissolved in water moves down through the soil, where it is absorbed by the roots. Once absorbed, it moves up through the plant providing insect protection.
		malathion 50% (Ortho, Bonide)	See label.	1 (squash) 3 (pumpkin)	Refer to label.
	Pickleworm	acetamiprid 0.5% (Ortho Flower, Fruit & Vegetable Insect Killer)	1.5 fl oz	0	Maximum applications per season (5). Days to wait to reapply (5).
		bifenthrin 0.3% + zeta-cypermethrin 0.075% (Ortho Bug-G-Gon Insect Killer for Lawns and Gardens)	1.5 fl oz	3	Apply when insects first appear. Reapply as necessary to maintain control waiting at least 7 days between applications.
		carbaryl (various brands)	See label.	3	Repeat applications as needed up to a total of 6 times but not more than once every 7 days.
		cyfluthrin 0.75% (Bayer Advanced)	0.5 fl oz	0	DO NOT spray more than 4 times per season.
		esfenvalerate 0.425% (Monterey)	1 fl oz	3	Spray plants to wet upper and lower leaf surfaces until dripping. Apply as necessary to maintain control waiting at least 7 days between each application.
		malathion 50% (Ortho, Bonide)	See label.	1 (squash) 3 (pumpkin)	Refer to label.

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Commodity	Insect	Insecticide and Formulation	Amount of Formulation Per Gallon of Spray	Minimum Interval (Days) Between Last Application and Harvest	Precautions and Remarks
SQUASH, PUMPKIN (cont.)	Spider mite	malathion 50% (Ortho, Bonide)	See label.	1 (squash) 3 (pumpkin)	Refer to label.
	Squash bug	acetamiprid 0.5% (Ortho Flower, Fruit & Vegetable Insect Killer)	1.5 fl oz	0	Maximum applications per season (5). Days to wait to reapply (5).
		bifenthrin 0.3% + zeta-cypermethrin 0.075% (Ortho Bug-G-Gon Insect Killer for Lawns and Gardens)	1.5 fl oz	3	Apply when insects first appear. Reapply as necessary to maintain control waiting at least 7 days between applications.
		carbaryl (various brands)	See label.	3	Repeat applications as needed up to a total of 6 times but not more than once every 7 days. For optimum control of squash bugs, apply sufficient spray volume for thorough coverage and time sprays for early morning or late afternoon.
		cyfluthrin 0.75% (Bayer Advanced)	0.5 fl oz	0	DO NOT spray more than 4 times per season.
		esfenvalerate 0.425% (Monterey)	1 fl oz	3	Spray plants to wet upper and lower leaf surfaces until dripping. Apply as necessary to maintain control waiting at least 7 days between each application.
	Squash vine borer	acetamiprid 0.5% (Ortho Flower, Fruit & Vegetable Insect Killer)	1.5 fl oz	0	Maximum applications per season (5). Days to wait to reapply (5).
		bifenthrin 0.3% + zeta-cypermethrin 0.075% (Ortho Bug-G-Gon Insect Killer for Lawns and Gardens)	1.5 fl oz	3	Apply when insects first appear. Reapply as necessary to maintain control waiting at least 7 days between applications.
		esfenvalerate 0.425% (Monterey)	1 fl oz	3	Spray plants to wet upper and lower leaf surfaces until dripping. Apply as necessary to maintain control waiting at least 7 days between each application.
		malathion 50% (Ortho, Bonide)	See label.	1 (squash) 3 (pumpkin)	Refer to label.
	Thrips	acetamiprid 0.5% (Ortho Flower, Fruit & Vegetable Insect Killer)	1.5 fl oz	0	Maximum applications per season (5). Days to wait to reapply (5).
		imidacloprid 0.235% (Bayer Advanced Fruit, Citrus and Vegetable Insect Control Concentrate)	0.5 fl oz/1 qt of water/10 sq ft of row as a drench	21	This systemic insecticide dissolved in water moves down through the soil, where it is absorbed by the roots. Once absorbed, it moves up through the plant providing insect protection.
		malathion 50% (Ortho)	See label.	1 (squash) 3 (pumpkin)	Refer to label.
		spinosad 0.5% (Bonide, Monterey, Natural Guard)	2.0 fl oz	3	Refer to label.
	Whitefly	acetamiprid 0.5% (Ortho Flower, Fruit & Vegetable Insect Killer)	1.5 fl oz	0	Maximum applications per season (5). Days to wait to reapply (5).
		bifenthrin 0.3% + zeta-cypermethrin 0.075% (Ortho Bug-G-Gon Insect Killer for Lawns and Gardens)	1.5 fl oz	3	Apply when insects first appear. Reapply as necessary to maintain control waiting at least 7 days between applications.

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Commodity	Insect	Insecticide and Formulation	Amount of Formulation Per Gallon of Spray	Minimum Interval (Days) Between Last Application and Harvest	Precautions and Remarks
SQUASH, PUMPKIN (cont.)	Whitefly (cont.)	cyfluthrin 0.75% (Bayer Advanced)	0.5 fl oz	0	Adults ONLY. DO NOT spray more than 4 times per season.
		esfenvalerate 0.425% (Monterey)	1 fl oz	3	Spray plants to wet upper and lower leaf surfaces until dripping. Apply as necessary to maintain control waiting at least 7 days between each application.
		imidacloprid 0.235% (Bayer Advanced Fruit, Citrus and Vegetable Insect Control Concentrate)	0.5 fl oz/1 qt of water/10 sq ft of row as a drench	21	This systemic insecticide dissolved in water moves down through the soil, where it is absorbed by the roots. Once absorbed, it moves up through the plant providing insect protection.
		malathion 50% (Ortho)	See label.	1 (squash) 3 (pumpkin)	Refer to label.
SWEET POTATO	Wireworm				No effective registered control measures.
TOMATO	Aphids	acetamiprid 0.5% (Ortho Flower, Fruit & Vegetable Insect Killer)	1.5 fl oz	7	Maximum applications per season (4). Days to wait to reapply (7).
		bifenthrin 0.3% + zeta-cypermethrin 0.075% (Ortho Bug-G-Gon Insect Killer for Lawns and Gardens)	1.5 fl oz	1	Apply when insects first appear. Reapply as necessary to maintain control waiting at least 7 days between applications.
		cyfluthrin 0.75% (Bayer Advanced)	0.5 fl oz	0	DO NOT spray more than 6 times per season.
		esfenvalerate 0.425% (Monterey)	1 fl oz	1	Spray plants to wet upper and lower leaf surfaces until dripping. Apply as necessary to maintain control waiting at least 7 days between each application.
		gamma-cyhalothrin 0.08% (Spectracide)	1.5 fl oz	5	Apply when insects first appear or when damage occurs. DO NOT apply more than 9 times per growing season.
		imidacloprid 0.235% (Bayer Advanced Fruit, Citrus and Vegetable Insect Control Concentrate)	0.5 fl oz/1 qt of water/10 sq ft of row as a drench	21	This systemic insecticide dissolved in water moves down through the soil, where it is absorbed by the roots. Once absorbed, it moves up through the plant providing insect protection.
		lambda-cyhalothrin 0.5% (Bonide)	ready-to-use premix	5	Apply thoroughly as a foliar cover spray to both sides of plant leaves and all plant surfaces where insects are present. DO NOT spray more than 9 times per season.
		malathion 50% (Ortho, Bonide)	See label.	1	Refer to label.
		soap (insecticidal, M-Pede 49 EC)	2 Tbsp	0	
	Cutworm (surface type)	bifenthrin 0.3% + zeta-cypermethrin 0.075% (Ortho Bug-G-Gon Insect Killer for Lawns and Gardens)	1.5 fl oz	1	Apply when insects first appear. Reapply as necessary to maintain control waiting at least 7 days between applications.
		carbaryl (various brands)	See label.	3	Repeat applications as needed up to a total of 7 times but not more than once every 7 days.
		cyfluthrin 0.75% (Bayer Advanced)	0.5 fl oz	0	DO NOT spray more than 6 times per season.

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Commodity	Insect	Insecticide and Formulation	Amount of Formulation Per Gallon of Spray	Minimum Interval (Days) Between Last Application and Harvest	Precautions and Remarks
TOMATO (cont.)	Cutworm (surface type) (cont.)	esfenvalerate 0.425% (Monterey)	1 fl oz	1	Spray plants to wet upper and lower leaf surfaces until dripping. Apply as necessary to maintain control waiting at least 7 days between each application.
		gamma-cyhalothrin 0.08% (Spectracide)	1.5 fl oz	5	Apply when insects first appear or when damage occurs. DO NOT apply more than 9 times per growing season.
		lambda-cyhalothrin 0.5% (Bonide)	ready-to-use premix	5	Apply thoroughly as a foliar cover spray to both sides of plant leaves and all plant surfaces where insects are present. DO NOT spray more than 9 times per season.
	Flea beetle, Colorado potato beetle	acetamiprid 0.5% (Ortho Flower, Fruit & Vegetable Insect Killer)	1.5 fl oz	7	Maximum applications per season (4). Days to wait to reapply (7).
		<i>Bacillus thuringiensis</i> var. <i>san diego</i> (M-Trak) var. <i>tennebrionus</i> (Trident II)	1.5-3 Tbsp 2-4 Tbsp	0	Colorado potato beetles ONLY. Treat when small larvae are present. NOT effective against adults or large larvae.
		bifenthrin 0.3% + zeta-cypermethrin 0.075% (Ortho Bug-G-Gon Insect Killer for Lawns and Gardens)	1.5 fl oz	1	Apply when insects first appear. Reapply as necessary to maintain control waiting at least 7 days between applications.
		carbaryl (various brands)	See label.	3	Repeat applications as needed up to a total of 7 times but not more than once every 7 days.
		cyfluthrin 0.75% (Bayer Advanced)	0.5 fl oz	0	DO NOT spray more than 6 times per season.
		esfenvalerate 0.425% (Monterey)	1 fl oz	1	Spray plants to wet upper and lower leaf surfaces until dripping. Apply as necessary to maintain control waiting at least 7 days between each application.
		gamma-cyhalothrin 0.08% (Spectracide)	1.5 fl oz	5	Apply when insects first appear or when damage occurs. DO NOT apply more than 9 times per growing season.
		imidacloprid 0.235% (Bayer Advanced Fruit, Citrus and Vegetable Insect Control Concentrate)	0.5 fl oz/1 qt of water/10 sq ft of row as a drench	21	This systemic insecticide dissolved in water moves down through the soil, where it is absorbed by the roots. Once absorbed, it moves up through the plant providing insect protection.
		lambda-cyhalothrin 0.5% (Bonide)	ready-to-use premix	5	Apply thoroughly as a foliar cover spray to both sides of plant leaves and all plant surfaces where insects are present. DO NOT spray more than 9 times per season.
		spinosad 0.5% (Bonide, Monterey, Natural Guard)	2.0 fl oz	1	Colorado potato beetle ONLY
	Grasshopper	bifenthrin 0.3% + zeta-cypermethrin 0.075% (Ortho Bug-G-Gon Insect Killer for Lawns and Gardens)	1.5 fl oz	1	Apply when insects first appear. Reapply as necessary to maintain control waiting at least 7 days between applications.
		carbaryl (various brands)	See label.	3	Repeat applications as needed up to a total of 7 times but not more than once every 7 days.
		esfenvalerate 0.425% (Monterey)	1 fl oz	1	Spray plants to wet upper and lower leaf surfaces until dripping. Apply as necessary to maintain control waiting at least 7 days between each application.
		gamma-cyhalothrin 0.08% (Spectracide)	1.5 fl oz	5	Apply when insects first appear or when damage occurs. DO NOT apply more than 9 times per growing season.

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Commodity	Insect	Insecticide and Formulation	Amount of Formulation Per Gallon of Spray	Minimum Interval (Days) Between Last Application and Harvest	Precautions and Remarks
TOMATO (cont.)	Leafhopper	acetamiprid 0.5% (Ortho Flower, Fruit & Vegetable Insect Killer)	1.5 fl oz	7	Maximum applications per season (4). Days to wait to reapply (7).
		bifenthrin 0.3% + zeta-cypermethrin 0.075% (Ortho Bug-G-Gon Insect Killer for Lawns and Gardens)	1.5 fl oz	1	Apply when insects first appear. Reapply as necessary to maintain control waiting at least 7 days between applications.
		cyfluthrin 0.75% (Bayer Advanced)	0.5 fl oz	0	DO NOT spray more than 6 times per season.
		esfenvalerate 0.425% (Monterey)	1 fl oz	1	Spray plants to wet upper and lower leaf surfaces until dripping. Apply as necessary to maintain control waiting at least 7 days between each application.
		gamma-cyhalothrin 0.08% (Spectracide)	1.5 fl oz	5	Apply when insects first appear or when damage occurs. DO NOT apply more than 9 times per growing season.
		imidacloprid 0.235% (Bayer Advanced Fruit, Citrus and Vegetable Insect Control Concentrate)	0.5 fl oz/1 qt of water/10 sq ft of row as a drench	21	This systemic insecticide dissolved in water moves down through the soil, where it is absorbed by the roots. Once absorbed, it moves up through the plant providing insect protection.
		lambda-cyhalothrin 0.5% (Bonide)	ready-to-use premix	5	Apply thoroughly as a foliar cover spray to both sides of plant leaves and all plant surfaces where insects are present. DO NOT spray more than 9 times per season.
		malathion 50% (Ortho)	See label.	1	Refer to label.
	Leafminer	acetamiprid 0.5% (Ortho Flower, Fruit & Vegetable Insect Killer)	1.5 fl oz	7	Maximum applications per season (4). Days to wait to reapply (7).
		bifenthrin 0.3% + zeta-cypermethrin 0.075% (Ortho Bug-G-Gon Insect Killer for Lawns and Gardens)	1.5 fl oz	1	Apply when insects first appear. Reapply as necessary to maintain control waiting at least 7 days between applications.
		cyfluthrin 0.75% (Bayer Advanced)	0.5 fl oz	0	DO NOT spray more than 6 times per season.
		esfenvalerate 0.425% (Monterey)	1 fl oz	1	Spray plants to wet upper and lower leaf surfaces until dripping. Apply as necessary to maintain control waiting at least 7 days between each application.
		gamma-cyhalothrin 0.08% (Spectracide)	1.5 fl oz	5	Apply when insects first appear or when damage occurs. DO NOT apply more than 9 times per growing season.
		lambda-cyhalothrin 0.5% (Bonide)	ready-to-use premix	5	Apply thoroughly as a foliar cover spray to both sides of plant leaves and all plant surfaces where insects are present. DO NOT spray more than 9 times per season.
		malathion 50% (Ortho)	See label.	1	Refer to label.
		spinosad 0.5% (Bonide, Monterey, Natural Guard)	2.0 fl oz	1	
	Spider mite	malathion 50% (Ortho, Bonide)	See label.	1	Refer to label.
		soap (insecticidal, M-Pede 49 EC)	2 Tbsp	0	On foliage as needed.
		sulfur 90%	2 Tbsp	0	DO NOT use if temperature is above 95°F. DO NOT use within 3 weeks of oil spray.

HOME GARDEN VEGETABLE INSECT CONTROL – Products for Use by the General Public

Commodity	Insect	Insecticide and Formulation	Amount of Formulation Per Gallon of Spray	Minimum Interval (Days) Between Last Application and Harvest	Precautions and Remarks
TOMATO (cont.)	Stink bug	acetamiprid (Ortho Flower, Fruit & Vegetable Insect Killer)	1.5 fl oz	7	Maximum applications per season (4). Days to wait to reapply (7).
		bifenthrin 0.3% + zeta-cypermethrin 0.075% (Ortho Bug-G-Gon Insect Killer for Lawns and Gardens)	1.5 fl oz	1	Apply when insects first appear. Reapply as necessary to maintain control waiting at least 7 days between applications.
		cyfluthrin 0.75% (Bayer Advanced)	0.5 fl oz	0	DO NOT spray more than 6 times per season.
		esfenvalerate 0.425% (Monterey)	1 fl oz	1	Spray plants to wet upper and lower leaf surfaces until dripping. Apply as necessary to maintain control waiting at least 7 days between each application.
		gamma-cyhalothrin 0.08% (Spectracide)	1.5 fl oz	5	Apply when insects first appear or when damage occurs. DO NOT apply more than 9 times per growing season.
		lambda-cyhalothrin 0.5% (Bonide)	ready-to-use premix	5	Apply thoroughly as a foliar cover spray to both sides of plant leaves and all plant surfaces where insects are present. DO NOT spray more than 9 times per season.
		permethrin 2.5% EC (various brands)	1.5 fl oz	7	DO NOT apply on cherry tomatoes or varieties less than 1 inch in diameter.
	Thrips	acetamiprid (Ortho Flower, Fruit & Vegetable Insect Killer)	1.5 fl oz	7	Maximum applications per season (4). Days to wait to reapply (7).
		cyfluthrin 0.75% (Bayer Advanced)	0.5 fl oz	0	DO NOT spray more than 6 times per season.
		imidacloprid 0.235% (Bayer Advanced Fruit, Citrus and Vegetable Insect Control Concentrate)	0.5 fl oz/1 qt of water/10 sq ft of row as a drench	21	This systemic insecticide dissolved in water moves down through the soil, where it is absorbed by the roots. Once absorbed, it moves up through the plant providing insect protection.
		malathion 50% (Ortho)	See label.	1	Refer to label.
		soap (insecticidal, M-Pede 49 EC)	2 Tbsp	0	
		spinosad 0.5% (Bonide, Monterey, Natural Guard)	2.0 fl oz	1	
	Tomato fruitworm, cabbage looper, tomato hornworm	acetamiprid (Ortho Flower, Fruit & Vegetable Insect Killer)	1.5 fl oz	7	Maximum applications per season (4). Days to wait to reapply (7).
		<i>Bacillus thuringiensis</i> (DiPel) 2X	1 Tbsp	0	Treat weekly, if necessary. Begin when fruits are 0.5 inch in diameter. Fruitworms are most serious after August 1. DO NOT tank mix <i>B.t.</i> formulations with Dyrene.
		(DiPel) 4L	2 tsp		
		(Javelin) WG	2 tsp		
		(Biobit) FC	1-3 tsp		
		bifenthrin 0.3% + zeta-cypermethrin 0.075% (Ortho Bug-G-Gon Insect Killer for Lawns and Gardens)	1.5 fl oz	1	Apply when insects first appear. Reapply as necessary to maintain control waiting at least 7 days between applications.
		carbaryl (various brands)	See label.	3	Repeat applications as needed up to a total of 7 times but not more than once every 7 days.
		cyfluthrin 0.75% (Bayer Advanced)	0.5 fl oz	0	DO NOT spray more than 6 times per season.

HOME GARDEN VEGETABLE INSECT CONTROL – Products for Use by the General Public

Commodity	Insect	Insecticide and Formulation	Amount of Formulation Per Gallon of Spray	Minimum Interval (Days) Between Last Application and Harvest	Precautions and Remarks
TOMATO (cont.)	Tomato fruitworm, cabbage looper, tomato hornworm (cont.)	esfenvalerate 0.425% (Monterey)	1 fl oz	1	Spray plants to wet upper and lower leaf surfaces until dripping. Apply as necessary to maintain control waiting at least 7 days between each application.
		gamma-cyhalothrin 0.08% (Spectracide)	1.5 fl oz	5	Apply when insects first appear or when damage occurs. DO NOT apply more than 9 times per growing season.
		lambda-cyhalothrin 0.5% (Bonide)	ready-to-use premix	5	Apply thoroughly as a foliar cover spray to both sides of plant leaves and all plant surfaces where insects are present. DO NOT spray more than 9 times per season.
		permethrin 2.5% EC (various brands)	1.5 fl oz	7	DO NOT apply on cherry tomatoes or varieties less than 1 inch in diameter.
		spinosad 0.5% (Bonide, Monterey, Natural Guard)	2.0 fl oz	1	
	Whitefly	acetamiprid (Ortho Flower, Fruit & Vegetable Insect Killer)	1.5 fl oz	7	Maximum applications per season (4). Days to wait to reapply (7).
		<i>Beauveria bassiana</i> (Mycotrol WP)	1/4 lb/20 gal water	0	Apply when whiteflies are observed. Repeat in 4- to 5-day intervals.
		bifenthrin 0.3% + zeta-cypermethrin 0.075% (Ortho Bug-G-Gon Insect Killer for Lawns and Gardens)	1.5 fl oz	1	Apply when insects first appear. Reapply as necessary to maintain control waiting at least 7 days between applications.
		cyfluthrin 0.75% (Bayer Advanced)	0.5 fl oz	0	Adults ONLY. DO NOT spray more than 6 times per season.
		esfenvalerate 0.425% (Monterey)	1 fl oz	1	Spray plants to wet upper and lower leaf surfaces until dripping. Apply as necessary to maintain control waiting at least 7 days between each application.
		gamma-cyhalothrin 0.08% (Spectracide)	1.5 fl oz	5	Apply when insects first appear or when damage occurs. DO NOT apply more than 9 times per growing season.
		imidacloprid 0.235% (Bayer Advanced Fruit, Citrus and Vegetable Insect Control Concentrate)	0.5 fl oz/1 qt of water/10 sq ft of row as a drench	21	This systemic insecticide dissolved in water moves down through the soil, where it is absorbed by the roots. Once absorbed, it moves up through the plant providing insect protection.
		lambda-cyhalothrin 0.5% (Bonide)	ready-to-use premix	5	Apply thoroughly as a foliar cover spray to both sides of plant leaves and all plant surfaces where insects are present. DO NOT spray more than 9 times per season.
		malathion 50% (Ortho)	See label.	1	Refer to label.
		pyrethrum products	Follow label	0	
		soap (insecticidal, M-Pede 49 EC)	2 Tbsp	0	
TURNIP, TURNIP GREENS	Aphids, flea beetle	cyfluthrin 0.75% (Bayer Advanced)	0.5 fl oz	0	DO NOT spray more than 4 times per season.
		imidacloprid 0.235% (Bayer Advanced Fruit, Citrus and Vegetable Insect Control Concentrate)	0.5 fl oz/1 qt of water/10 sq ft of row as a drench	21	This systemic insecticide dissolved in water moves down through the soil, where it is absorbed by the roots. Once absorbed, it moves up through the plant providing insect protection.
		malathion 50% (Ortho, Bonide)	See label.	7	Refer to label.
		soap (insecticidal, M-Pede 49 EC)	2 Tbsp	0	

HOME GARDEN VEGETABLE INSECT CONTROL – Products for Use by the General Public

Commodity	Insect	Insecticide and Formulation	Amount of Formulation Per Gallon of Spray	Minimum Interval (Days) Between Last Application and Harvest	Precautions and Remarks
TURNIP, TURNIP GREENS (cont.)	Cabbage looper, diamondback moth, imported cabbageworm	<i>Bacillus thuringiensis</i> (DiPel) 2X (Javelin) WG	1 Tbsp 2 tsp	0	On foliage as needed.
		cyfluthrin 0.75% (Bayer Advanced)	0.5 fl oz	0	DO NOT spray more than 4 times per season.
		malathion 50% (Ortho)	See label.	7	NOT for diamondback moth. Refer to label.
		spinosad 0.5% F (Naturalyte)	4 Tbsp	1	On foliage as needed.
	Harlequin bug	carbaryl (various brands)	0.5-1.0 qt/acre	14	Repeat applications as needed up to a total of 4 times but not more than once every 7 days.
		cyfluthrin 0.75% (Bayer Advanced)	0.5 fl oz	0	DO NOT spray more than 4 times per season.
		malathion 50% (Ortho)	See label.	7	Refer to label.
	Leafhopper	cyfluthrin 0.75% (Bayer Advanced)	0.5 fl oz	0	DO NOT spray more than 4 times per season.
		imidacloprid 0.235% (Bayer Advanced Fruit, Citrus and Vegetable Insect Control Concentrate)	0.5 fl oz/1 qt of water/10 sq ft of row as a drench	21	This systemic insecticide dissolved in water moves down through the soil, where it is absorbed by the roots. Once absorbed, it moves up through the plant providing insect protection.
		malathion 50% (Ortho)	See label.	7	Refer to label.
	Thrips	cyfluthrin 0.75% (Bayer Advanced)	0.5 fl oz	0	DO NOT spray more than 4 times per season.
		imidacloprid 0.235% (Bayer Advanced Fruit, Citrus and Vegetable Insect Control Concentrate)	0.5 fl oz/1 qt of water/10 sq ft of row as a drench	21	This systemic insecticide dissolved in water moves down through the soil, where it is absorbed by the roots. Once absorbed, it moves up through the plant providing insect protection.
		malathion 50% (Ortho)	See label.	7	Refer to label.
	Vegetable weevil	cyfluthrin 0.75% (Bayer Advanced)	0.5 fl oz	0	Adults ONLY. DO NOT spray more than 4 times per season.
	Whitefly	cyfluthrin 0.75% (Bayer Advanced)	0.5 fl oz	0	Adults ONLY. DO NOT spray more than 4 times per season.
		imidacloprid 0.235% (Bayer Advanced Fruit, Citrus and Vegetable Insect Control Concentrate)	0.5 fl oz/1 qt of water/10 sq ft of row as a drench	21	This systemic insecticide dissolved in water moves down through the soil, where it is absorbed by the roots. Once absorbed, it moves up through the plant providing insect protection.
		malathion 50% (Ortho)	See label.	7	Refer to label.
WATERMELON	Aphids	acetamiprid (Ortho Flower, Fruit & Vegetable Insect Killer)	1.5 fl oz	0	Maximum applications per season (5). Days to wait to reapply (5).
		bifenthrin 0.3% + zeta-cypermethrin 0.075% (Ortho Bug-G-Gon Insect Killer for Lawns and Gardens)	1.5 fl oz	3	Apply when insects first appear. Reapply as necessary to maintain control waiting at least 7 days between applications.
		cyfluthrin 0.75% (Bayer Advanced)	0.5 fl oz	0	DO NOT spray more than 4 times per season.
		esfenvalerate 0.425% (Monterey)	1 fl oz	3	Spray plants to wet upper and lower leaf surfaces until dripping. Apply as necessary to maintain control waiting at least 7 days between each application.

HOME GARDEN VEGETABLE INSECT CONTROL – Products for Use by the General Public

Commodity	Insect	Insecticide and Formulation	Amount of Formulation Per Gallon of Spray	Minimum Interval (Days) Between Last Application and Harvest	Precautions and Remarks
WATERMELON (cont.)	Aphids (cont.)	imidacloprid 0.235% (Bayer Advanced Fruit, Citrus and Vegetable Insect Control Concentrate)	0.5 fl oz/1 qt of water/10 sq ft of row as a drench	21	This systemic insecticide dissolved in water moves down through the soil, where it is absorbed by the roots. Once absorbed, it moves up through the plant providing insect protection.
		malathion 50% (Ortho, Bonide)	See label.		Refer to label.
		soap (insecticidal, M-Pede 49 EC)	2 Tbsp	0	On foliage as needed.
	Cucumber beetle (spotted and striped)	acetamiprid (Ortho Flower, Fruit & Vegetable Insect Killer)	1.5 fl oz	7	Maximum applications per season (5). Days to wait to reapply (5).
		bifenthrin 0.3% + zeta-cypermethrin 0.075% (Ortho Bug-G-Gon Insect Killer for Lawns and Gardens)	1.5 fl oz	3	Apply when insects first appear. Reapply as necessary to maintain control waiting at least 7 days between applications.
		carbaryl (various brands)	See label.	3	Repeat applications as needed up to a total of 6 times but not more than once every 7 days.
		cyfluthrin 0.75% (Bayer Advanced)	0.5 fl oz	0	DO NOT spray more than 4 times per season.
		esfenvalerate 0.425% (Monterey)	1 fl oz	3	Spray plants to wet upper and lower leaf surfaces until dripping. Apply as necessary to maintain control waiting at least 7 days between each application.
		imidacloprid 0.235% (Bayer Advanced Fruit, Citrus and Vegetable Insect Control Concentrate)	0.5 fl oz/1 qt of water/10 sq ft of row as a drench	21	This systemic insecticide dissolved in water moves down through the soil, where it is absorbed by the roots. Once absorbed, it moves up through the plant providing insect protection.
		malathion 50% (Ortho, Bonide)	See label.	1	Refer to label.
	Leafhopper	acetamiprid (Ortho Flower, Fruit & Vegetable Insect Killer)	1.5 fl oz	0	Maximum applications per season (5). Days to wait to reapply (5).
		bifenthrin 0.3% + zeta-cypermethrin 0.075% (Ortho Bug-G-Gon Insect Killer for Lawns and Gardens)	1.5 fl oz	3	Apply when insects first appear. Reapply as necessary to maintain control waiting at least 7 days between applications.
		cyfluthrin 0.75% (Bayer Advanced)	0.5 fl oz	0	DO NOT spray more than 4 times per season.
		esfenvalerate 0.425% (Monterey)	1 fl oz	3	Spray plants to wet upper and lower leaf surfaces until dripping. Apply as necessary to maintain control waiting at least 7 days between each application.
		imidacloprid 0.235% (Bayer Advanced Fruit, Citrus and Vegetable Insect Control Concentrate)	0.5 fl oz/1 qt of water/10 sq ft of row as a drench	21	This systemic insecticide dissolved in water moves down through the soil, where it is absorbed by the roots. Once absorbed, it moves up through the plant providing insect protection.
		malathion 50% (Ortho)	See label.	1	Refer to label.
	Pickleworm	acetamiprid 0.5% (Ortho Flower, Fruit & Vegetable Insect Killer)	1.5 fl oz	0	Maximum applications per season (5). Days to wait to reapply (5).
		bifenthrin 0.3% + zeta-cypermethrin 0.075% (Ortho Bug-G-Gon Insect Killer for Lawns & Gardens)	1.5 fl oz	3	Apply when insects first appear. Re-apply as necessary to maintain control waiting at least 7 days between applications.
		cyfluthrin 0.75% (Bayer Advanced Vegetable & Garden Insect Spray Concentrate)	0.5 fl oz	0	Adults only. Do not spray more than 4 times per season.
		esfenvalerate 0.425% (Monterey Bug Buster II)	1 fl oz	3	Spray plants to wet upper and lower leaf surfaces until dripping. Apply as necessary to maintain control waiting at least 7 days between each application.
		malathion 50% (Ortho, Bonide)	See label.	1	

HOME GARDEN VEGETABLE INSECT CONTROL – Products for Use by the General Public

Commodity	Insect	Insecticide and Formulation	Amount of Formulation Per Gallon of Spray	Minimum Interval (Days) Between Last Application and Harvest	Precautions and Remarks
WATERMELON (cont.)	Spider mite	malathion 50% (Ortho, Bonide)	See label.	1	Refer to label.
		soap (insecticidal, M-Pede 49 EC)	2 Tbsp	0	
	Thrips	acetamiprid 0.5% (Ortho Flower, Fruit & Vegetable Insect Killer)	1.5 fl oz	0	Maximum applications per season (5). Days to wait to reapply (5).
		carbaryl (various brands)	See label.	3	Repeat applications as needed up to a total of 6 times but not more than once every 7 days.
		imidacloprid 0.235% (Bayer Advanced Fruit, Citrus and Vegetable Insect Control Concentrate)	0.5 fl oz/1 qt of water/10 sq ft of row as a drench	21	This systemic insecticide dissolved in water moves down through the soil, where it is absorbed by the roots. Once absorbed, it moves up through the plant providing insect protection.
		malathion 50% (Ortho)	See label.	1	Refer to label.
		soap (insecticidal, M-Pede 49 EC)	2 Tbsp	0	
		spinosad 0.5% (Bonide, Monterey, Natural Guard)	2.0 fl oz	3	Refer to label.
	Whitefly	acetamiprid 0.5% (Ortho Flower, Fruit & Vegetable Insect Killer)	1.5 fl oz	0	Maximum applications per season (5). Days to wait to reapply (5).
		bifenthrin 0.3% + zeta-cypermethrin 0.075% (Ortho Bug-Gon Insect Killer for Lawns and Gardens)	1.5 fl oz	3	Apply when insects first appear. Reapply as necessary to maintain control waiting at least 7 days between applications.
		cyfluthrin 0.75% (Bayer Advanced)	0.5 fl oz	0	Adults ONLY. DO NOT spray more than 4 times per season.
		esfenvalerate 0.425% (Monterey)	1 fl oz	3	Spray plants to wet upper and lower leaf surfaces until dripping. Apply as necessary to maintain control waiting at least 7 days between each application.
		imidacloprid 0.235% (Bayer Advanced Fruit, Citrus and Vegetable Insect Control Concentrate)	0.5 fl oz/1 qt of water/10 sq ft of row as a drench	21	This systemic insecticide dissolved in water moves down through the soil, where it is absorbed by the roots. Once absorbed, it moves up through the plant providing insect protection.
		malathion 50% (Ortho)	See label.	1	Refer to label.
		WITHIN GARDEN TREATMENT (See labels for specific crops)	Red imported fire ant	S-methoprene (Extinguish)	3-5 Tbsp/mound 1.0-1.5 lb/acre
pyriproxyfen (Esteem)	2-4 Tbsp/mound 1.5-2.0 lb/acre			Mound-to-mound treatment rate Broadcast rate	This product is an insect growth regulator (IGR).
spinosad (Conserve Fire Ant Bait, Ferti-lome Come and Get It Fire Ant Killer)	4-6 Tbsp/mound 2.5-5.0 lb/acre			Mound-to-mound treatment rate Broadcast rate	See label for specific rate and application instructions. Conserve Fire Ant Bait is OMRI listed for organic production.

INSECT CONTROL IN RECREATION AREAS

Pesticide labels for commercial and homeowner products that are currently registered for use in Arkansas may be found through the Arkansas Department of Agriculture/State Plant Board website by clicking on the following link: <https://www.agriculture.arkansas.gov/plant-industries/pesticide-section/registration/>

Insect	Repellent	Rate	Application	Comments/Precautions
Repellents for: Mosquitoes, Biting Flies, Gnats, Chiggers and Ticks	DEET or N, N-Diethyl-meta-toluamide (many brands and formulations)	---	Hand Application: Protect skin by applying a few drops on the palm and rubbing onto exposed skin.	Wash hands after applying. Keep out of eyes and mouth. Higher concentrations provide longer protection, but complete coverage is required.
	DEET or N, N-Diethyl-meta-toluamide (many brands and formulations)	---	Aerosol Application: Hold 6-8 inches from skin or clothing and apply with a slow sweeping motion. Rub gently to spread over skin evenly. Also spray on clothing.	DEET may damage watch crystals or other plastic materials. Children should use 30% concentrations or less. Product should be applied by parents. Apply to parent's hand and then spread onto child's skin. Approved for use on children over 2 months of age.
	IR3535 (Amino acid based)			Classified as a bio-pesticide by the EPA.
	oil of lemon eucalyptus	---		Not approved for children under 3 years of age. Skin reactions have been documented.
	picaridin	---		Effective alternative to DEET for children over 3 years old.
	permethrin (many brands and formulations)	---	To be used on clothing only.	Also good choice when exposed to ticks and chiggers.
Insect	Insecticide	Rate	Application	Comments/Precautions
Ants	alpha cypermethrin (Fendona CS)		Apply as directed on label.	
	carbaryl (various brands)	See label.		Treat mounds and surrounding area or apply broadcast.
	pyrethroids (Advanced Garden, DeltaGard, Scimitar, Talstar, Tempo)	See label.		
Ants (Imported Fire Ants)	Apply all bait products when ants are active and soil temperature is above 60 degrees F. DO NOT treat if rain is anticipated within 6 hours.			
	abamectin B1 0.011% (Award II)	5-7 Tbsp/mound 1 lb/acre	Mound-to-mound treatment rate. Broadcast rate.	
	hydramethylnon (Amdro, Amdro Pro, Combat Fire Ant Bait, MaxForce)	2-5 Tbsp/mound 1 -1.5 lb/acre	Mound-to-mound treatment rate. Broadcast rate.	
	indoxacarb (Advion) 0.045%	4 Tbsp/mound 1.5 lb/acre	Distribute uniformly around mound. Broadcast rate.	
	metaflumizone (Siesta Fire Ant Bait) 0.063%	1.0 to 1.5 lb/acre 2 to 4 Tbsp/mound	Broadcast rate. Mound-to-mound treatment rate.	Do Not exceed 6.0 lbs/A total or 4 applications in a 1 year period.
	pyriproxyfen (Distance, Esteem)	1-4 T/mound 1-1.5 lb/acre	Mound-to-mound treatment rate. Broadcast rate.	This is an IGR.
	S-methoprene (Extinguish)	3-5 T/mound 1-1.5 lb/acre	Mound-to-mound treatment rate. Broadcast rate	This is an IGR.
	S-methoprene + hydramethylnon (Extinguish Plus)	3-5 T/mound 1-1.5 lb/acre	Mound-to-mound treatment rate. Broadcast rate	This is an IGR plus a toxicant.
	spinosad 0.015% (Antixx Fire Ant Bait, Conserve Fire Ant Bait / OMRI Listed, Ferti-lome Come and Get It Fire Ant Killer)	4-6 T/mound 2.5-5 lb/acre	Mound-to-mound treatment rate. Broadcast rate	

INSECT CONTROL IN RECREATION AREAS

Insect	Insecticide	Rate	Application	Comments/Precautions
Ants (Imported Fire Ants) (cont.)	Apply all bait products when ants are active and soil temperature is above 60 degrees F. DO NOT treat if rain is anticipated within 6 hours.			
	acephate (Orthene T, T&O WSP) 75%	0.33 lb in 26.6 gals water	Mound drench only.	Apply 1 gal of mix to each mound area by sprinkling the mound until wet and treat 4 ft diameter circle around mound. Do not treat mound more than once per season.
	acetamiprid + bifenthrin (Transport Mikron) 5% + 6%	1.25 fl oz in 1 gal water	Apply 0.11% concentration of active ingredient to cover 1,000 sq. ft.	Do not apply more than 1 gallon 0.11% finished dilution per 1,000 square feet.
	alpha cypermethrin (Fendona CS)		Apply as directed on label.	
	fipronil 0.0143% granular insecticide (Quali-Pro Fipronil, Top Choice)	2 lbs/1000 sqft or 87lbs/acre	Broadcast only.	For use on home lawns, golf courses, commercial and recreational turf, and sod farms. One application per year. Restricted-Use Pesticide.
	pyrethroids (various) bifenthrin (Talstar) cyfluthrin (Tempo) deltamethrin (Deltagard) lambda cyhalothrin (Scimitar CS, GC) permethrin (various)	See label		
Eye Gnats	prallethrin 0.04% and cyfluthrin 0.03% (OFF! Outdoor Fogger Backyard Pretreat)	--	See label.	Air movement from electric fans will give protection in a limited area. Commercial repellents are not very satisfactory. However, devices like the Thermocell Mosquito Repellent or the Off Power Pad Lamp may provide localized relief.
	tetramethrin 0.15%, deltamethrin 0.15%, piperonyl butoxide 0.75% (Bonide Mosquito Beater Yard Fog)	--	See label.	Not suitable control for indoor use.
	tetramethrin 0.2% and phenothrin 0.2% (Cutter Backyard Bug Control Outdoor Fogger)	--	See label.	Fogging and space sprays give temporary relief to limited areas (patio, porch, etc.). Mosquito adulticides will provide temporary relief.
Midge	temephos (5% Skeeter Abate)		2-10 lb/acre	For control of mosquito and midge larvae, apply uniformly by conventional air or ground equipment. Application of this product by Belly-Grinder is prohibited.
	methoprene 20% EC (Strike)	4-5 oz/1 million gal wastewater	---	For use in wastewater treatment facilities. Uniformly apply at the influent side over a 24-hour period. Apply to natural and manmade aquatic habitats. High rate recommended for wastewater.
	4.25% pellet (Strike)	---	5-10 lb/acre	
	spinosad 2.5% G (Natular XRG)	ready to use	5-20 lb	

INSECT CONTROL IN RECREATION AREAS

Insect	Insecticide	Rate	Application	Comments/Precautions
Ticks and Chiggers	acetamiprid + bifenthrin 22.73% + 27.27% (Transport)		Apply 0.11% concentration of active ingredient to cover 1,000 sq ft.	DO NOT apply more than 0.11% finished dilution per 1,000 square feet. Apply outdoors as an exterior perimeter treatment around structures.
	alpha cypermethrin (Fendona CS)		Apply as directed on label.	
	beta-cyfluthrin (Tempo) SC Ultra 11.8% Ultra WP	6-12 fl oz/acre 7.7-15.4 oz/acre		Use high rate for chiggers. Apply when pests first appear. Reapply as needed based on pest reinfestation. DO NOT treat more than 6 times per year. Keep children and pets off treated areas until lawn has dried.
	bifenthrin (Talstar) EZ Granular Insecticide 0.2%	100-200 lb/acre	Ready to use.	DO NOT make spot applications. Treat the entire area where exposure to ticks may occur. DO NOT allow public use of treated areas during application.
	P Professional Insecticide 7.9%	0.5-1.0 fl oz/ 1,000 sq ft	Broadcast treatment rate.	DO NOT make spot applications. Treat the entire area where exposure to ticks may occur. Use application volumes of up to 10 gal/1,000 sq ft to get uniform coverage when treating dense grass foliage. Limit repeat application to no more than once every 7 days.
	carbaryl (Sevin) 80 WSP SL	2.5 to 5 lb/acre 2 to 4 qts/A		Repeat applications as necessary up to a total of 4 times per year but not more often than once every 7 days.
	deltamethrin (Suspend 0.42 SC)	17.5-26.0 fl oz/acre		Apply when pests become evident. Apply as a broadcast spray in a minimum of 2 gal of water/1,000 sq ft.
	imidacloprid 21.0% - beta-cyfluthrin 10.5% (Temprid SC)	0.27-0.54 fl oz/gal water		Apply at rate not to cause drip/run-off from site. NOT labeled for chiggers.
	rosemary oil, Geraniol, Winter-green (Essentria IC3)	1 to 8 ounces of Essentria IC3 per gallon of water	43 gal/Acre	2 gallons per 1,000 square feet.
	tetrachlorvinphos (Rabon 50% WP)	0.5 lb/6 gal water		Apply as a spot treatment using a low pressure handwand sprayer only. Apply along woody borders of kennels, yards, campgrounds, recreational parks, footpaths, and roadways leading to such areas.

Insect	Insecticide	Mixing Instructions and Application Equipment	Application Rate @ 10 mph	Droplet Size Requirements on Label (µm)	Comments/Precautions
Mosquitoes, Adults (Ground application)	alpha cypermethrin (Fendona CS)				Apply as directed on label.
	bifenthrin 7.9L (Bifen I/T)	0.33 to 1.0 fl oz/gal water in backpack or hydraulic sprayer			Apply at a rate of 1 gallons per 1000 square feet for thorough coverage of lawns and/or ornamentals.
	deltamethrin (Suspend Polyzone)	0.33 to 1.0 fl oz/gal water in backpack or hydraulic sprayer			Treat with mist or spray around landscape plants, turf, ground cover, under decks, around building foundations where mosquitoes may rest.
	etofenprox (Zenivex E20)	Apply undiluted or up to 1:4.5 dilution	Varies with dilution	VMD-7-30 µm Dv 0.9 < 50 µm	Do not apply more than 0.18 lbs per acre per site per year. Do not make more than 25 applications per site per year.
	garlic oil 0.04% (Terminix ALLCLEAR ATSB Mosquito Bait Concentrate)	Thoroughly mix 1 part concentrate in 3 parts water and apply with ground based spray equipment such as motorized portable, pump-up, backpack, handheld, vehicle mounted and other ground based spray equipment capable of medium to heavy spray droplets.			Apply at a rate of 10-20 ounces per 100 linear feet to vegetation 1 to 5 feet above the ground wetting both surfaces of foliage to the point of runoff. Do not apply with handheld or truck-mounted cold ULV or thermal foggers or by aircraft.
	lambda-cyhalothrin (Cyonara 9.7, Demand CS, Cysmic CS)	0.8 fl. Oz/gal. water in backpack or hydraulic sprayer			Treat resting areas on structures as well as surrounding shrubs.
	malathion 96.5% concentrate (Fyfanon ULV)	Use undiluted with aerosol ULV sprayer. Dilute 3.9 to 5.2 gal to 100 gal with No. 2 fuel or diesel oil; use in thermal fog sprayer.	2 to 4.3 fl oz/min	VMD < 30 µm Dv 0.9 < 50 µm	Apply only when weather conditions are favorable. Do not spray when wind speed is more than 3 mph. Wind and rising air currents may cause undesirable spray drift and reduce insect control. Avoid direct application to vehicles; as paint damage may result. Toxic to fish, aquatic invertebrates, and aquatic life stages of amphibians.
	naled 62% concentrate (Dibrom 8 Emulsive)	0.8 to 1.6 fl oz diluted with water 3-5 qts per 100 gal water using mist or cold fogger	2-8 qts diluted spray/acre 0.1 lb a.i./acre	VMD < 60 µm Dv 0.9 < 115 µm VMD < 40 µm Dv 0.9 < 75 µm	Restricted Use Pesticide. Toxic to fish, aquatic invertebrates, and wildlife. Do not directly apply to water or to areas where runoff into water is likely to occur.
	permethrin 10% to 57% concentrate	Apply undiluted or mix with refined mineral or soybean oil.	0.31 to 15 oz/ min depending on dilution	VMD = 150 to 300 µm	Permethrin 57% is not for use in residential misting systems. Do not allow drift onto cropland, poultry ranges or potable water supplies. Do not use on crops used for food or forage.
	(Permanone) 10% EC	Dilute 1:20 with water (6.5 fl oz/ 1 gal of water).			Treat surfaces using coarse wet spray. Do not allow runoff to enter storm drains or waterways.
	permethrin (20%) and piperonyl butoxide (20%) (Aqua-Reslin)	Dilute 1 gal with 2 to 12 gal water.	2.1 to 9 oz/min depending on dilution	VMD < 30 µm Dv 0.9 < 50 µm	Dilute with water only. Toxic to fish and aquatic invertebrates. Can be used as barrier spray on building foundations (up to 3' height) and vegetation around structure, but not within 100 feet of lakes and streams. Structural applications to areas other than foundation limited to crack & crevice.
	permethrin and piperonyl butoxide (Permanone 31-66, Biomist 3 + ULV)	Dilute 1 gal to 2.4 gal with light weight oil; use in ULV sprayer.	0.5 to 3 fl oz/min	VMD < 30 µm Dv 0.9 < 50 µm	Do not exceed 25 applications at maximum rate at any site in one year.

INSECT CONTROL IN RECREATION AREAS

Insect	Insecticide	Mixing Instructions and Application Equipment	Application Rate @ 10 mph	Droplet Size Requirements on Label (µm)	Comments/Precautions
Mosquitoes, Adults (Ground application) (cont.)	prallethrin (1%) and sumithrin (5%) and piperonyl butoxide (5%) (Duet)	Apply undiluted with aerosol ULV sprayer	2.5 to 7.5 oz/min	VMD = 8 to 30 µm Dv 0.9 < 50 µm	DO NOT allow drift onto pastureland, rangeland or potable water supplies.
	pyrethrins (5%) and piperonyl butoxide (25%) (Aquahalt)	Apply undiluted or diluted with water and applied as an ultra low volume (ULV).	0.27 to 0.76 oz/acre	VMD < 30 µm Dv 0.9 < 50µm	Do not apply more than 0.2 pounds of pyrethrins/acre/year or 1.0 pound PBO/acre/year in any treated area.
	sumithrin and piperonyl butoxide (Anvil 10+10 ULV or 2+2 ULV)	Use undiluted or dilute 10+10 formulation with light mineral oil.	0.21 to 0.62 oz/acre	VMD < 30 µm Dv 0.9 < 50 µm	
Mosquitoes, Adults (Fixed-wing aerial application)	deltamethrin (Imperium)	0.00089 to 0.00134 lb. ai/A (undiluted or diluted in water)	Varies with dilution	See label.	During any three day period do not apply more than 0.00134 lb ai/A. Do not make more than 25 applications per site per year at the high rate of 0.00134 lb ai/A. More frequent applications and more than 25 applications per site may be made to prevent or control a threat to public and/or animal health determined by a state, tribal or local health or vector control agency on the basis of documented evidence of disease causing agents in vector mosquitoes or the occurrence of mosquito-borne disease in animal or human populations, or if specifically approved by the state or tribe during a natural disaster recovery effort.
	etofenprox (Zenivex E20)	0.00175 to 0.007 oz (undiluted) per acre	Varies with dilution	VMD < 60 µm Dv 0.9 < 100 µm	DO NOT spray more than 0.18 lbs etofenprox per acre per site per year. Do not make more than 25 applications per site per year. More frequent treatments may be made to prevent or control a threat to public and/or animal health determined by a state, tribal, or local health or vector control agency on the basis of documented evidence of disease-causing agents in vector mosquitoes or the occurrence of mosquito-borne disease in animal or human populations, or if specifically approved by the state or tribe during a natural disaster recovery effort.
	malathion 96.5% concentrate (Fyfanon ULV)	Use undiluted.	2.6-3.0 fl oz/acre	VMD < 60 µm Dv 0.9 < 100 µm	Toxic to fish, aquatic invertebrates and aquatic life stages of amphibians. DO NOT directly apply to water or to areas where runoff into water is likely to occur. DO NOT retreat a site more than three times in any one week except in emergencies.
	naled 87.4% concentrate (Dibrom)	Use undiluted.	0.5-1.0 fl oz/acre	VMD = 60 µm Dv 0.9 < 115 µm	Toxic to fish, aquatic invertebrates, and wildlife. DO NOT directly apply to water, except when necessary to target areas where adult mosquitoes are present or to areas where runoff into water is likely to occur. NOT for use in or around homes.
		Dilute 50-100 fl oz to 100 gal with No. 2 fuel oil or diesel oil.	1 gal/acre	VMD = 60 µm Dv 0.9 < 115 µm	

INSECT CONTROL IN RECREATION AREAS

Insect	Insecticide	Mixing Instructions and Application Equipment	Application Rate @ 10 mph	Droplet Size Requirements on Label (µm)	Comments/Precautions
Mosquitoes, Adults (Fixed-wing aerial application) (cont.)	permethrin (20%) and piperonyl butoxide (20%) (Aqua-Reslin)	Dilute 1 gal with 2-12 gal water.	2.1-9.0 oz/min depending on dilution	VMD < 60 µm Dv 0.9 < 100 µm	Dilute with water only. Toxic to fish and aquatic invertebrates.
	prallethrin (1%) and sumithrin (5%) and piperonyl butoxide (5%) (Duet)	Apply diluted with aerosol ULV sprayer.	0.41-1.24 oz/acre	VMD = < 60 µm	DO NOT allow drift onto pastureland, rangeland or potable water supplies.
	pyrethrins (5%) and piperonyl butoxide (25%) (Aquahalt Water-Based Adulticide)	Apply undiluted or diluted with water and applied as an ultra low volume (ULV).	0.28-0.76 fl oz/acre	VMD < 60 µm Dv 0.9 < 100 µm	DO NOT treat a site with more than 0.0025 lb ai/acre per day. DO NOT apply more than 0.0625 lb ai/acre per year.
	sumithrin (10%) and piperonyl butoxide (10%) (Anvil 10+10 ULV)	Use undiluted or dilute with light mineral oil if dilution is preferred. DO NOT DILUTE WITH WATER.	0.21-0.62 fl oz/acre	VMD < 60 µm Dv 0.9 < 115 µm	Application should be made at 75 to 300 feet for rotary aircraft and 100 to 300 feet for fixed-wing aircraft.

KEY: Dv 0.9 = 90% of the spray volume droplets are smaller than value given
VMD = Volume Median Diameter
µm = micrometer

INSECT CONTROL IN RECREATION AREAS

Insect	Insecticide	Mixing Instructions and Application Equipment	Application Rate Per Acre	Comments/Precautions
Mosquitoes Immatures	<i>Bacillus sphaericus</i> (Vectolex) CG 7.5% WDG 51.2%	ready to use ground (5-100 gal water/acre) aerial (0.5-10 gal water/acre)	5-20 lb 0.5-1.5 lb	Only effective against larvae. Apply uniformly by aerial or conventional ground equipment. Reapply as needed after 1-4 weeks. Use higher rates in areas where extended residual control is necessary or in habitats having deep water or dense surface cover.
	WSP 7.5%		1 pouch/50 sq ft	
	<i>Bacillus thuringiensis</i> , var. <i>israelensis</i> (Bactimos, Teknar, Vectobac) 50 WP 2 WP 14.3% aqueous conc. 15% aqueous conc. 1.2% aqueous conc. 0.8% aqueous conc.	Dilute with sufficient water to obtain uniform coverage.	6-12 oz 4-16 oz 0.5-3.0 pt 0.5-3.0 pt 0.25-2.0 pt 0.5-2.0 pt	Only effective against larvae. Can be applied to all breeding habitats, including potable water supplies.
	<i>Bacillus thuringiensis</i> , var. <i>israelensis</i> (Bactimos) briquettes 10%	ready to use	---	Use one briquette per 100 sq ft of surface area regardless of depth.
	<i>Bacillus thuringiensis</i> , var. <i>israelensis</i> (Bactimos, Teknar, Vectobac) granules 0.2% pellets 0.4%	ready to use	---	Apply 4-10 lb per acre with aircraft or ground equipment.
	methoprene 20% EC (Altosid)	3-4 fl oz/gal water	1 gal	Apply when larvae are in 3rd and 4th instar. Methoprene will not kill pupae or adults.
	methoprene (Altosid) briquette 2.1%, 8.6% (Altosid) pellet 4.2% (Altosid) granule 0.27%, 1.5%	ready to use	---	Water less than 2 ft; 1 briquette per 100 sq ft deeper or flowing water; 1 briquette per 10 cu ft, 2.5- to 10-lb pellet per acre; use high rate in breeding sites with high organic content.
	monomolecular surface film (Agnique MMF)	---	0.2-0.5 gal	Use in conjunction with indicator oil to avoid overtreatment. Can be used for semipermanent or permanent fresh water sources (including potable and irrigation).
	proprietary mosquito control oils (GB-1111, etc.)	undiluted	1-5 gal	Dosage depends on amount of flottage and vegetation in water.
	Spinosad (Natular XRT 6.25% G, Naturlar T30 8.33%)	ready to use	See label for appropriate water volume and depth.	No effect on pupal or adult mosquitos. Toxic to aquatic organisms. Non-target aquatic invertebrates may be killed in waters where this pesticide is used.
	temephos (5% Skeeter Abate)		2-10 lb/acre	For control of mosquito and midge larvae, apply uniformly by conventional air or ground equipment. Application of this product by Belly-Grinder is prohibited.

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MOSQUITO CONTROL BY COMMERCIAL AND GOVERNMENT AGENCIES

Pesticide labels for commercial and homeowner products that are currently registered for use in Arkansas may be found through the Arkansas Department of Agriculture/State Plant Board website by clicking on the following link: <https://www.agriculture.arkansas.gov/plant-industries/pesticide-section/registration/>

Insect	Insecticide Active Ingredient	Trade Name	Application Flow Rate (fl oz/min)	Application Speed (MPH)	Comments/Precautions
Mosquitoes, Adults (ULV and Low Volume Sprays by Ground Application)	chlorpyrifos	Mosquitomist One ULV	3.9-7.8	10	Non-corrosive, quick knockdown, low odor and low mammalian toxicity. 100-foot water set back. Breaks down quickly.
		PyroFos 1.5 ULV	1.4-10.5	5-20	
	chlorpyrifos + permethrin	ULV Mosquito Master 412	2.3-12.9	5-15	A choice where insecticide resistance is a serious concern.
		DeltaGard	1.0-60.9	5-20	NO piperonyl butoxide (pbo) in formulation, Type II pyrethroid.
	etofenprox	Aqua Zenivex E20	0.9-40.4	10-20	Can be diluted with water.
		Zenivex E4 RTU	2.25-8.0	5-15	Can be diluted with water.
		Zenivex E20	0.9-52.8	10-20	Newer product that may be helpful if resistance is a concern.
		Fyfanon ULV	1.0-8.6	5-20	Long time standard and still effective and cost efficient. Odor present, excites mosquitoes prior to mortality.
	malathion				
	naled	Dibrom Concentrate	0.6-1.8	5-15	Best choice for salt-marsh mosquitoes, very safe environmentally, no water set back. However, highly corrosive to all equipment.
		Trumpet EC	0.8-2.2	5-15	
	permethrin/pbo	Aqualuer 20-20	1.6-6.2	10-20	Excellent choice for ground applications. Variety of applications.
		Aqua Perm-X UL 30-30	0.5-21.5	10-20	Widely used and highly effective. Maintain dose in the 0.0035 lb/acre range. Some resistance along Gulf Coast. 100 foot water set back.
		Aqua-Reslin	0.7-35.4	10-20	
		Biomist 3+15	1.5-27	5-15	
		Biomist 4+4	4.5-18	5-15	
		Biomist 30+30	1-6	5-15	
		Biomist 31+66	1-6	5-15	
		Envion	0.5-25.8	10-20	Can be diluted with water or oil.
		Envion RTU	2.4-16.5	10	Pre-mixed, water diluted, ready-to-use formulation.
		Evolver 31-66 ULV	See label.	See label.	Application equipment must be tested at least annually to confirm that pressure at the nozzle and nozzle flow rates(s) are properly calibrated.
		Aqua-Kontrol Concentrate	2.0-15.5	5-20	May be diluted with water.
		Aqua-Kontrol 30-30	0.46-25.8	10-20	May be diluted with water.
		Kontrol 4-4	4-16	5-20	
		Kontrol 30-30	0.27-64.3	5-20	
		Permanone – Ready-to-use	6-18	5-15	
		Permanone 30-30	0.5-2	5-20	
		Permanone 31-66	0.5-15	5-20	
		Perm-X UL 4-4	1.4-105	5-20	
		Perm-X UL 30-30	0.3-38.2	5-20	
		Perm-X UL 31-66	0.2-33.6	5-20	
	sumithrin/pbo	Anvil 2+2 ULV	3.1-37.2	5-20	NO water set back; good for truck applications.
		Anvil 10+10 ULV	0.6-7.6	5-20	
	prallethrin/sumithrin/pbo				
		AquaDUET Water Based Dual-Action Adulticide	2.5-7.5	5-20	Combines two active ingredients + pbo, causes benign agitation, may have uses against Asian tiger mosquito.

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MOSQUITO CONTROL BY COMMERCIAL AND GOVERNMENT AGENCIES

Insect	Insecticide Active Ingredient	Trade Name	Application Flow Rate (fl oz/min)	Application Speed (MPH)	Comments/Precautions
Mosquitos, Adults (Thermal Aerosols by Ground Application)	chlorpyrifos	Mosquitomist One ULV	9.6	5	Non-corrosive, quick knockdown, low odor and low mammalian toxicity. 100 foot water set back. Breaks down quickly.
		PyroFos 1.5 ULV	6.4	5	
	etofenprox	Aqua Zenivex E20	0.9-40.4	10-20	Apply at the rate of 0.00175-0.0070 lb ai/acre.
		Zenivex E4 RTU	3-48	5-15	
		Zenivex E20	0.9-52.8	10-20	
	malathion	Fyfanon ULV	1.6-2.1	5	Long time standard and still effective and cost efficient. Odor present, excites mosquitoes prior to mortality.
	naled	Dibrom Concentrate	1.6-2.1	5-15	Best choice for salt-marsh mosquitoes, very safe environmentally, no water set back; however, highly corrosive to all equipment.
	permethrin/pbo	Aqualuer 20-20	0.7-25.5	10-20	DO NOT exceed 0.007 lb ai/acre.
		Aqua Perm-X UL 30-30	0.5-21.5	10-20	
		Envion	2.2-25.8	10-20	Rate not to exceed 0.007 lb/acre.
		Envion RTU	1.2-32.9	5-20	Droplet size will range from 0.1-1 micron.
		Evolver 31-66 ULV	0.75-36.0	5-20	Application equipment must be tested at least annually to confirm that pressure at the nozzle and nozzle flow rates(s) are properly calibrated.
		Kontrol 4-4	21.0-64	5-20	Flow rate depends on concentration. Rate not to exceed 0.007 lb permethrin/acre.
		Kontrol 30-30	21.0-64	5-20	
		Permanone 30-30	0.41-3	5-20	
		Perm-X UL 4-4	1.4-105	5-20	
		Perm-X UL 30-30	0.3-38.2	5-20	
		Perm-X UL 31-66	0.2-33.6	5-20	
	sumithrin/phenothrin/pbo	Anvil 2+2 ULV	3.1-37.2	5-20	NO water set back; good for truck applications.
		Anvil 10+10 ULV	0.6-7.6	5-20	

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MOSQUITO CONTROL BY COMMERCIAL AND GOVERNMENT AGENCIES

Insect	Insecticide Active Ingredient	Trade Name	Gross Amount Per Acre (oz)	Comments/Precautions
Mosquito Adults (Sprays by Aerial Application)	chlorpyrifos	Mosquitomist One ULV	3	Non-corrosive, quick knockdown, low odor and low mammalian toxicity. 100 foot water set back.
		PyroFos 1.5 ULV	0.87	Breaks down quickly.
	deltamethrin	Imperium	0.00089 to 0.00134 lb. ai/A (undiluted or diluted in water)	During any three day period do not apply more than 0.00134 lb ai/A. Do not make more than 25 applications per site per year at the high rate of 0.00134 lb ai/A. More frequent applications and more than 25 applications per site may be made to prevent or control a threat to public and/or animal health determined by a state, tribal or local health or vector control agency on the basis of documented evidence of disease causing agents in vector mosquitoes or the occurrence of mosquitoborne disease in animal or human populations, or if specifically approved by the state or tribe during a natural disaster recovery effort.
	etofenprox	Aqua Zenivex E20		Apply diluted or undiluted at rates up to 0.007 lb ai/acre. Minimum application height 100 feet.
		Zenivex E4 RTU		
		Zenivex E20		Apply at 100-300 feet altitude.
	malathion	Fyfanon ULV	2.6-3	Long time standard and still effective and cost efficient. Odor present, excites mosquitoes prior to mortality.
	naled	Dibrom Concentrate	0.5-1	Best choice for salt-marsh mosquitoes, very safe environmentally, no water set back, however, highly corrosive to all equipment.
		Trumpet EC	0.6-1.2	
	permethrin/pbo	AquaHalt	0.28-0.76	Water based, labeled for use over crops.
		Aqualuer 20-20		Apply diluted or undiluted at rates up to 0.007 lb ai/acre.
		Aqua-Reslin	0.25-0.5	Widely used and highly effective. Maintain dose in the 0.0035 lb/acre range. Some resistance along Gulf Coast. 100 foot water set-back.
		Biomist 4.0+4.0 ULV	3	
		Biomist 30+30 ULV	0.33-1	
		Biomist 31+66 ULV	0.33-1	
		Envion		Apply diluted or undiluted at rates up to 0.007 lb. Permethrin/PBO/acre.
		Envion RTU	up to 2.72	Apply at altitudes between 100-300 feet.
		Aqua-Kontrol Concentrate	up to 1.5	Apply at sufficient air speed to deliver the appropriate amount of ai/acre (from 0.00175-0.007 lb).
		Kontrol 4+4	up to 3	
		Kontrol 30+30	up to 0.35	
		Permanone 31-66	0.16-0.6	
		Perm-X UL 4-4	up to 3.1	
		Perm-X UL 30-30	up to 0.32	
		Perm-X UL 31-66	up to 0.36	
	sumithrin/pbo	Anvil 2+2 ULV	1-3	No water set back.
		Anvil 10+10 ULV	0.21-0.62	
	prallethrin/sumithrin/pbo	AquaDUET Water-Based Dual-Action Adulticide	0.41-1.24	Combines two active ingredients + pbo, causes benign agitation, option for Asian tiger mosquito.

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MOSQUITO CONTROL BY COMMERCIAL AND GOVERNMENT AGENCIES

Insect	Insecticide Active Ingredient	Trade Name	Gross Amount Per Acre (oz)	Comments/Precautions
Mosquito Larvae (Control by Ground Application)	mineral oil	BVA 2 Mosquito Larvicide Oil	1-5 gal	Surface film material. Effective against both larvae and pupae, low labor input required. Use higher rates for areas with more vegetation or pollution.
		COCObear Mosquito Larvicide Oil	3-5 gal	
		Kontrol Mosquito Larvicide Oil	1-5 gal	
	methoprene	Altosid Liquid Larvicide	3-4 fl oz	Significant residual effect possible, up-front cost more, can save labor costs. Approved for use in stock waters. Newly approved for ULV applications. Used to prepare Altosand granular formulation for areas up to 2 ft in depth. Effective up to 150 days, rate depends on species targeted. Use lower rates when water is shallow or vegetation and/or pollution is minimal. Effective up to 30 days.
		Altosid Liquid Larvicide Concentrate	0.75-1 fl oz	
		Altosid Briquets	1/100 sq ft	
		Altosid XR Briquets	1 briquet/100-200 sq ft	
		Altosid Pellets	2.5-10 lb	
		Altosid Pellets Water Soluble Pouch (WSP)	up to 135 sq ft	
		Altosid SBG II	3-20 lb	
		Altosid XR-G	5-20 lb	
		Aquabac XT 12AS	1-2 pt	
		Aquabac 200G	2.5-10 lb	
		Aquabac 400G	1.25-8 lb	
		FourStar Bti Briquets Sustained Release 150 Day Microbial Briquets	1 briquet/100 sq ft	
		Mosquito Dunks	1 briquet/100 sq ft	
		Teknar CG	2.5-20 lb	
		Vectobac WDG	1.75-14.0 oz	
		Vectobac 12AS	5-100 gal	
		Vectobac G	2-20 lb	
	<i>Bacillus thuringiensis</i> subsp. <i>israelensis</i>	Vectolex FG	5-20 lbs 20-80 lbs for waste tires	Biological control agent with residual effect. Targets specific species, especially <i>Culex</i> . Not recommended for salt-marsh mosquitoes.
		Vectolex WSP	1 pouch/50 sq ft	
		Vectolex WDG	0.5-1.5 lb	
	<i>Bacillus thuringiensis</i> subsp. <i>israelensis</i> and <i>Bacillus sphaericus</i>	Fourstar 45 - Day Briquet	1 briquet/100 sq ft	Effective against all pest species of mosquitoes, will reduce likelihood of resistance. Approved for use in organic crops and sensitive areas.
		Fourstar 90 - Day Briquet	1 briquet/100 sq ft	
		Fourstar 180 - Day Briquet	1 briquet/100 sq ft	
		Fourstar Multi-Brood Granule	5-20 lb	
	spinosad	Fourstar Multi-Brood Controlled Release Granule	7.5-20 lb	New product, registered as a reduced risk pesticide by EPA.
		Natular G	3.5-9 lb	
		Natular G30	5-20 lb	
		Natular 2EC	1.3-2.8 fl oz/acre	
		Natular T30	1 tablet/100 sq ft	
		Natular XRT	1 tablet/100 sq ft	
	temephos	5% Skeeter Abate	2-10 lb	30-day residual. 180-day residual.

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MOSQUITO CONTROL BY COMMERCIAL AND GOVERNMENT AGENCIES

Insect	Insecticide Active Ingredient	Trade Name	Gross Amount Per Acre (oz)	Comments/Precautions
Mosquito Larvae (Control by Aerial Application)	mineral oil	BVA 2 Mosquito Larvicide Oil	3-5 gal	Surface film material. Not for use in environmentally sensitive areas. Surface film product that controls larvae and pupae.
		COCObear Mosquito Larvicide Oil	3-5 gal	
		Kontrol Mosquito Larvicide Oil	2-4 gal	Rate depends on water surface conditions and vegetative density.
	methoprene	Altosid (various formulations)	see labels	See labels.
		Aquabac XT	0.25-2 pt	Biological control agent, very effective, environmentally sound. Store products in cool areas and use by expiration date. Timing of application critical for maximum effectiveness.
	<i>Bacillus thuringiensis</i> subsp. <i>israelensis</i>	Fourstar Single Brood Bti Sand Granule	3-20 lb	
		Fourstar Multi-Brood Controlled Release Granule	7.5-20 lb/acre	
		Sustain MBG	5-20 lbs	
		Teknar CG	0.25-1 pt	
	<i>Bacillus sphaericus</i>	Vectobac 12 AS	0.25-2 pt	Biological control agent with residual effect. Targets specific species, especially <i>Culex</i> .
		Vectobac WDG	1.75-14.0 oz	
		Vectobac G	2.5-5 lb	
		Vectolex CG	5-20 lb	Water soluble pouch, good choice for catch basins.
		Vectolex WDG	0.5-1.5 lb	
	<i>Bacillus thuringiensis</i> subsp. <i>israelensis</i> and <i>Bacillus sphaericus</i>	Vectolex WSP	1 pouch/50 sq ft	New product, registered as a reduced risk pesticide by EPA.
		Fourstar Multi-Brood Granule	5-20 lb	
		Fourstar Multi-Brood Controlled Release Granule	5-20 lb	
	spinosad	Natular G	3.5-9 lb	
		Natular G30	5-20 lb	
		Natular 2EC	1.3-2.8 fl oz/A	
	temephos	5% Skeeter Abate	2-10 lb	

All chemical information provided is given with the understanding that no endorsement of named products is intended, nor is criticism implied of similar products that are not mentioned. Individuals who use pesticides are responsible for ensuring that the intended use complies with current regulations and conforms to the product label. Before purchasing or using any pesticide, always read and carefully follow the label directions.

NOTE: The following list of pesticides is labeled for the uses listed; however, there are different formulations of particular compounds and you must make sure the pesticide used is properly labeled. The plant which is being damaged and the site where the plant is located (nursery or landscape) must be listed on the label. The pests that a compound is registered for are also listed on the label.

Many insects are developing resistance to currently available pesticides. Practice resistance management and rotate the insecticides used to manage a pest. With most pesticides, you should rotate the compounds used at least once during a generation time for that insect. In addition, it is desirable to rotate mode of action of compounds used. A guide to rotating modes of action is the Insecticide Resistance Action Committee (IRAC) classification of the different mode of action sites and a letter for subgroups. In resistance management rotations, these number/letter codes can be used to determine which compounds have different modes of action. These are listed in the table under the column heading "Mode of Action Group" (un = unknown).

Some of the insecticides listed are extremely toxic. Handle with caution and use protective equipment required by the label. A minimum interval between application and reentry has been established. Make sure of the proper reentry period for the insecticide has been observed before allowing people without label prescribed personal protective equipment to enter the treated area. These are listed in the table under the column heading "Minimum Hours Between Application and Reentry."

Phytotoxicity (damage to the plant as the result of the application of a chemical) is an important consideration in controlling pests of ornamentals. Phytotoxicity is generally expressed as damage to the leaves, flowers, or stems and is observed as "burn" (browning of tissue), "chlorosis" (yellowing or bleaching of tissue), or modification of growth by deformation or stunting. There are many species and cultivars of ornamental plants with varying sensitivity to chemicals. Other environmental conditions, such as your particular growing conditions, will also affect phytotoxicity. You are encouraged to evaluate a pesticide for phytotoxicity on a few plants under your particular conditions before treating all plants.

Insecticides listed below are identified by common chemical name. A trade name in parentheses may also be listed as a convenience for the reader. Pesticide labels for commercial and homeowner products that are currently registered for use in Arkansas may be found through the Arkansas Department of Agriculture/State Plant Board website by clicking on the following link: <https://www.agriculture.arkansas.gov/plant-industries/pesticide-section/registration/>.

All chemical information provided below is given with the understanding that no endorsement of named products is intended nor is criticism implied of similar products that are not mentioned. Individuals who use pesticides are responsible for ensuring that the intended use complies with current regulations and conforms to the product label. Before purchasing or using any pesticide, always read and carefully follow the label directions.

Insect or Mite	Pesticide Common Name (Trade Name)	Minimum Hours Between Application and Reentry	IRAC Mode of Action Group	Permitted Application Sites G = greenhouse L = landscape N = nursery
Adelgid	acetamiprid (TriStar)	12 hours	4A	G, L, N
	chlorantraniliprole (Acelepryn)	4 hours	28	L
	azadirachtin (Azatin)	4 hours	18B	G,L,N
	bifenthrin (Talstar)	12 hours	3	Follow label
	bifenthrin + imidacloprid (Alectus)	12 hours	3+ 4A	L
	bifenthrin + clothianidin (Aloft)	12 hours	3 + 4A	L
	dinotefuran (Safari)	12 hours	4A	G, L, N
	cyclaniliprole + flonicamid (Pradia)	12 hours	28 + 29	G, N Not for residential use
	horticultural oil (various brands)	4 hours		G, L, N
	imidacloprid (Merit, Marathon, others)	12 hours	4A	Follow label
	insecticidal soap (various brands)	12 hours	---	G, L, N
	spirotetramat (Kontos)	24 hours foliar (see exception for drench application)	23	G, N
	thiamethoxam (Flagship)	12 hours	4A	G, N
Aphids	abamectin (Avid)	12 hours	6	G, L, N
	acephate (Orthene)	24 hours	1B	G, L, N
	acetamiprid (TriStar)	12 hours	4A	G, L, N
	afidopyropen (Ventigra)	Follow label directions	9D	G, L, N
	azadirachtin (Azatin XL, Ornazin)	4 hours	18B	G, L, N
	<i>Beauveria bassiana</i> (BotaniGard)	4 hours	---	G, L, N
	bifenthrin (Talstar)	12 hours	3	Follow label
	bifenthrin + clothianidin (Aloft)	12 hours	4 + 4A	L
	bifenthrin + imidacloprid (Allectus)	12 hours	3 + 4A	L
	carbaryl (Sevin)	12 hours	1A	L, N
	clothianidin (Arena)	12 hours	4A	Follow label
	cyclaniliprole + flonicamid (Pradia)	12 hours	28 + 29	G, N Not for residential use

INSECT CONTROL FOR ORNAMENTALS GROWN IN NURSERIES OR LANDSCAPES

Insect or Mite	Pesticide Common Name (Trade Name)	Minimum Hours Between Application and Reentry	IRAC Mode of Action Group	Permitted Application Sites: G = greenhouse L = landscape N = nursery
Aphids (cont.)	cyfluthrin (Decathlon)	Follow label directions	3	G, N
	dinotefuran (Safari)	12 hours	4A	G, L, N
	fluvalinate (Mavrik)	Follow label directions	3	G, L
	horticultural oil (various brands)	4 hours	—	G, L, N
	imidacloprid (Merit, Marathon)	12 hours	4A	Follow label
	<i>Isaria fumosorosea</i> (Preferal)	4 hours	UN	G, N
	insecticidal soap (various brands)	12 hours follow label directions	—	G, L, N
	neem oil (Triact) 70	4 hours	18B	G, L, N
	permethrin (Astro, Perm-UP, others)	12 hours	3	Follow label
	pymetrozine (Endeavor)	12 hours	9B	G, L, N
	pyrethrins (various brands)	12 hours	3A	G, L, N
	pyriproxyfen (Distance)	12 hours	7C	G,L,N
	spinetoram + sulfoxaflor (XXpire)	12 hours	4C + 5	G, L, N
	spirotetramat (Kontos)	24 hours foliar (see exception for drench application)	23	G, N
Armored Scale (such as juniper scale, oystershell scale, pine needle scale, tea scale, euonymus scale, white peach scale)	thiamethoxam (Flagship)	12 hours	4A	G, N
	acephate (Orthene)	24 hours	1B	G, L, N
	acetamiprid (TriStar)	12 hours	4A	G, L, N
	afidopyropen (Ventigra)	Follow label directions. (nymphs and crawlers only)	9D	G, L, N
	azadirachtin (Azatin)	4 hours	18B	G,L,N
	bifenthrin (Talstar S Select)	12 hours	3	G, L, N
	buprofezin (Talus)	12 hours	16	G, L, N
	carbaryl (Sevin)	Follow label directions	1A	L, N
	dinotefuran (Safari)	12 hours	4A	G, L, N
	horticultural oil (various brands)	4 hours	---	G, L, N
	insecticidal soap (various brands)	12 hours follow label directions	---	G, L, N
	neem oil (Triact) 70	4 hours	18B	G, L, N
	pyriproxyfen (Distance)	12 hours	7C	G, L, N
	spinetoram + sulfoxaflor (XXpire)	12 hours	4C + 5	G, L, N
Bagworm	acephate (Orthene)	24 hours	1B	G, L, N
	acetamiprid (TriStar)	12 hours	4A	G, L, N
	azadirachtin (Azatin)	4 hours	18B	G, L, N
	<i>Bacillus thuringiensis kurstaki</i> (BiobitHP, DiPel or Foray)	4 hours	11B2	G, L, N
	bifenthrin (Talstar)	12 hours	3	G, L, N
	bifenthrin + clothianidin (Aloft)	12 hours	4 + 4A	L
	bifenthrin + imidacloprid (Allectus)	12 hours	3 + 4A	L
	carbaryl (Sevin)	Follow label directions	1A	L, N
	chlorantraniliprole (Acelepryn)	4 hours	28	L
	cyclaniliprole + flonicamid (Pradia)	12 hours	28 + 29	G, N Not for residential use
	fluvalinate (Mavrik)	Follow label directions	3	G, L
	indoxacarb (Provaunt)	12 hours	22	L

INSECT CONTROL FOR ORNAMENTALS GROWN IN NURSERIES OR LANDSCAPES

Insect or Mite	Pesticide Common Name (Trade Name)	Minimum Hours Between Application and Reentry	IRAC Mode of Action Group	Permitted Application Sites G = greenhouse L = landscape N = nursery
Bagworm (cont.)	<i>Isaria fumosorosea</i> (Preferal)	4 hours	UN	G, N
	novaluron (Pedestal)	12 hours	15	G, N
	spinetoram + sulfoxaflor (XXpire)	12 hours	4C + 5	G, L, N
	spinosad (Conserve SC)	4 hours	5	G, N
Bark Beetle	bifenthrin (Onyx, Talstar)	Follow label directions	3	Follow label
	permethrin (Astro, Perm-UP, others)	12 hours	3	Follow label
Black Vine Weevil	acephate (Orthene)	Follow label directions	1A	G, L, N
	<i>Beauveria bassiana</i> (BotaniGard)	4 hours	---	G, L, N
	bifenthrin (Onyx, Talstar)	Follow label directions	3	Follow label
	cyclaniliprole + flonicamid (Pradia)	12 hours	28 + 29	G, N Not for residential use
	cyfluthrin + imidacloprid (Discus)	12 hours	3 + 4A	N
	dinotefuran (Safari)	12 hours	4A	G, L, N
	fluvalinate (Mavrik)	Follow label directions	3	G, L
	<i>Isaria fumosorosea</i> (Preferal)	4 hours	UN	G, N
	imidacloprid (Merit, Marathon, others)	12 hours	4A	Follow label
	azadirachtin (Azatin)	4 hours	18B	G, L, N
Borers (clearwing, flatheaded, and roundheaded borers are included in this section. Make sure label specifically lists the type of borer you are trying to control.)	bifenthrin (Onyx, Talstar)	Follow local regulations for landscape reentry	3	Follow label
	chlorantraniliprole (Acelepryn)	4 hours	28	L
	cyclaniliprole + flonicamid (Pradia)	12 hours	28 + 29	G, N Not for residential use
	cyfluthrin + imidacloprid (Discus)	12 hours	3 + 4A	N
	dinotefuran (Safari)	12 hours	4A	G, L, N
	imidacloprid (Merit, Marathon II, others)	12 hours	4A	Follow label
	permethrin (Astro, Perm-UP, Permethrin Pro)	12 hours	3	Follow label
Caterpillars (such as armyworm, budworm, eastern tent caterpillar, fall webworm, orangestriped oakworm, leafrollers)	acephate (Orthene)	24 hours	1B	G, L, N
	acetamiprid (TriStar)	12 hours	4A	G, L, N
	azadirachtin (Azatin)	4 hours	18B	G, L, N
	<i>Bacillus thuringiensis kurstaki</i> (DiPel)	4 hours	11B2	G, L, N
	bifenthrin (Onyx, Talstar)	Follow label directions	3	Follow label
	bifenthrin + clothianidin (Aloft)	12 hours	4 + 4A	L
	bifenthrin + imidacloprid (Allectus)	12 hours	3 + 4A	L
	carbaryl (Sevin)	12 hours	1A	L, N
	chlorantraniliprole (Acelepryn)	4 hours	28	L
	chlorfenapyr (Pylon)	12 hours	13	G
	cyclaniliprole + flonicamid (Pradia)	12 hours	28 + 29	G, N Not for residential use
	cyfluthrin (Decathlon)	12 hours	3A	G,L,N
	diflubenzuron (Dimilin)	12 hours	15	L, N
	emamectin benzoate (Arbormectin)	See label.	6	L
	indoxacarb (Provaunt)	12 hours	22	L
	insecticidal soap (various brands)	Follow label directions	---	G, L, N
	<i>Isaria fumosorosea</i> (Preferal)	4 hours	UN	G, N

INSECT CONTROL FOR ORNAMENTALS GROWN IN NURSERIES OR LANDSCAPES

Insect or Mite	Pesticide Common Name (Trade Name)	Minimum Hours Between Application and Reentry	IRAC Mode of Action Group	Permitted Application Sites:
				G = greenhouse L = landscape N = nursery
Caterpillars (cont.)	methoxyfenozide (Intrepid)	4 hours	18	G, L, N
	novaluron (Pedestal)	12 hours	15	G, N
	permethrin (Astro, Perm-UP, Permethrin Pro)	12 hours	3	Follow label
	spinetoram + sulfoxaflor (XXpire)	12 hours	4C + 5	G, L, N
	spinosad (Conserve SC)	4 hours	5	G, N
	tebufenozide (Confirm)	4 hours	18A	G, L, N
Carpenter Ant	permethrin (Astro, Perm-UP, Permethrin Pro)	12 hours	3	Follow label
Cricket	bifenthrin (Onyx, Talstar)	12 hours	3	Follow label
	cyfluthrin (Decathlon)	Follow label directions	3	G, N
	insecticidal soap (various brands)	Follow label directions	3	G, L, N
	pyrethrins (Pyrenone)	Follow label directions		Follow label
Eriophyid Mite	abamectin (Avid)	12 hours	6	G, L, N
	fenpyroximate (Akari)	12 hours	21A	G, N
	horticultural oil (various brands)	4 hours	---	G, L, N
	spiromesifen (Judo, Forbid)	12 hours	23	G, N
False Spider Mite (such as privet mite)	acequinocyl (Shuttle)	12 hours	20B	G, N
	bifenazate (Floramite)	12 hours	un	G, L, N
	etoxazole (TetraSan)	12 hours	10B	G, L, N
	horticultural oil (various brands)	4 hours	---	G, L, N
	insecticidal soaps	12 hours	---	G, L, N
	spiromesifen (Judo, Forbid)	12 hours	23	Follow label
Fire Ant (Imported)	<p>Treatment is required to ship containerized or balled plants from quarantined to non-quarantined areas. Also, maintenance of Fire Ant free status of nurseries in federal imported fire ant quarantine areas requires certain actions. Consult Arkansas Plant Board to determine your nursery's classification and consult USDA APHIS 81-25-001, "Imported Fire Ant: Quarantine Treatments for Nursery Stock, Grass Sod, and Related Materials," updated January 2015, for all rules and regulations pertaining to the Federal Imported Fire Ant quarantine and treatment requirements. The following insecticides are authorized by USDA for the treatment of regulated articles under the Imported Fire Ant (IFA) quarantine:</p> <p>abamectin (Award II) Bait - Field grown bifenthrin (Talstar, Onyx Pro), etc. (many) G, F, EC - Container, B&B, sod chlorpyrifos (Dursban, Chlorpyrifos) E, G - Container, B&B, field grown, sod diazinon Section 24(c) only, contact State plant regulatory official fipronil (Top Choice, Fipronil) G - Container, sod hydramethylnon (Amdro Pro) Bait - Field grown methoprene (Extinguish) Bait - Field grown pyriproxyfen (Distance) Bait - Field grown tefluthrin (no label currently available) G - Container</p>			
Fungus Gnat Adults	bifenthrin (Talstar)	12 hours	3	follow label
	cyfluthrin (Decathlon)	12 hours	3A	G, L, N
	fluvalinate (Mavrik)	12 hours	3A	G, L, N
	insecticidal soaps	12 hours		G, L, N
	permethrin (Astro, Perm-UP, Permethrin Pro)	12 hours	3	Follow label

INSECT CONTROL FOR ORNAMENTALS GROWN IN NURSERIES OR LANDSCAPES

Insect or Mite	Pesticide Common Name (Trade Name)	Minimum Hours Between Application and Reentry	IRAC Mode of Action Group	Permitted Application Sites G = greenhouse L = landscape N = nursery
Fungus Gnat Larvae	acetamiprid (TriStar)	12 hours	4A	G, L, N
	azadirachtin (Azatin XL)	12 hours	18B	G, L, N
	<i>Bacillus thuringiensis</i> var. <i>israelensis</i>	4 hours	11A1	Follow label
	chlorfenapyr (Pylon)	12 hours	13	G
	cyromazine (Citation)	12 hours	17	G, L, N
	diflubenzuron (Adept)	12 hours	15	G
	kinoprene (Enstar II)	4 hours	7A	G
	pyriproxyfen (Distance)	12 hours	7C	G, L, N
	<i>Steinernema feltiae</i> (various; beneficial nematode)	0 hours	biological	G, L, N
Granulate Ambrosia Beetle	permethrin (Astro, Perm-UP, Permethrin Pro)	12 hours	3	Follow label
	cyclaniliprole + flonicamid (Pradia)	12 hours	28 + 29	G, N Not for residential use
Grasshopper	bifenthrin (Onyx, Talstar)	12 hours	3	Follow label
	carbaryl (Sevin 5) bait	Follow label directions	1A	Follow label
	cyfluthrin (Decathlon)	Follow label directions	3	G, N
	insecticidal soap (various brands)	12 hours	---	G, L, N
Gypsy Moth	Contact the Arkansas State Plant Board, 1 Natural Resources Drive, P. O. Box 1069, Little Rock, AR 72203-1069, Phone 501-225-1598, Fax 501-219-1697.			
Japanese Beetle (adult) and other leaf-feeding scarab beetles	acephate (Orthene)	Follow label directions	1A	G, L, N
	acetamiprid (TriStar)	12 hours	4A	G, L, N
	azadirachtin (Azatin XL)	4 hours	18B	G, L, N
	bifenthrin (Onyx, Talstar)	Follow label directions	3	Follow label
	bifenthrin + clothianidin (Aloft)	12 hours	4 + 4A	L
	bifenthrin + imidacloprid (Allectus)	12 hours	3 + 4A	L
	carbaryl (Sevin)	Follow label directions	3	L, N
	chlorantraniliprole (Acelepryn)	4 hours	28	L
	clothianidin (Arena)	12 hours	4A	L
	cyclaniliprole + flonicamid (Pradia)	12 hours	28 + 29	G, N Not for residential use
	cyfluthrin (Decathlon) 20 WP	Follow label directions	3	G, N
	cyfluthrin + imidacloprid (Discus)	12 hours	3 + 4A	N
	dinotefuran (Safari)	12 hours	4A	G, L, N
	imidacloprid (Merit, Marathon II, others)	12 hours	4A	Follow label
	permethrin (Astro, Perm-UP, Permethrin Pro)	12 hours	3	Follow label
	spinetoram + sulfoxaflor (XXpire)	12 hours	4C + 5	G, L, N
	spinosad (Conserve SC)	4 hours	5	G,N
	thiamethoxam (Flagship)	12 hours	4A	G, N
June Beetle	carbaryl (Sevin)	Follow label directions	1A	L, N
	cyclaniliprole + flonicamid (Pradia)	12 hours	28 + 29	G, N Not for residential use
	cyfluthrin (Decathlon)	Follow label directions	3	G, N

INSECT CONTROL FOR ORNAMENTALS GROWN IN NURSERIES OR LANDSCAPES

Insect or Mite	Pesticide Common Name (Trade Name)	Minimum Hours Between Application and Reentry	IRAC Mode of Action Group	Permitted Application Sites G = greenhouse L = landscape N = nursery
Lace Bug	abamectin (Avid)	12 hours	6	G,L,N
	acephate (Orthene)	Follow label directions	1A	G, L, N
	acetamiprid (Tri-Star)	12 hours	4A	G, L, N
	azadirachtin (Azatin XL)	4 hours	18B	G,L,N
	<i>Beauveria bassiana</i> (BotaniGard)	4 hours	---	G, L, N
	bifenthrin (Talstar, Onyx)	12 hours	3	Follow label
	bifenthrin + clothianidin (Aloft)	12 hours	4 + 4A	L
	bifenthrin + imidacloprid (Allectus)	12 hours	3 + 4A	L
	carbaryl (Sevin)	12 hours	1A	L, N
	chlorantraniliprole (Acelepryn)	4 hours	28	L
	<i>Chromobacterium subtsugae</i> (Grandevo WDG)	4 hours	UN	G,L,N
	cyclaniliprole + flonicamid (Pradia)	12 hours	28 + 29	G, N Not for residential use
	cyfluthrin + imidacloprid (Discus)	12 hours	3 + 4A	N
	dinotefuran (Safari)	12 hours	4A	G, L, N
	imidacloprid (Merit, Marathon, others)	12 hours	4A	Follow label
	permethrin (Astro, Perm-UP, Permethrin Pro)	12 hours	3	Follow label
	spinetoram + sulfoxaflor (XXpire)	12 hours	4C + 5	G, L, N
	soap (Olympic Insecticidal)	12 hours; follow label directions	---	Follow label
Leaf Beetles (such as cucumber beetle, elm leaf beetle, willow leaf beetle, and flea beetles including <i>Altica</i> spp.)	thiamethoxam (Flagship)	12 hours	4A	G, N
	acephate (Orthene)	12 hours	1A	G, L, N
	acetamiprid (TriStar)	12 hours	4A	G, L, N
	azadirachtin (Azatin XL)	4 hours	18B	G,L,N
	<i>Beauveria bassiana</i> (BotaniGard)	4 hours		G,L,N
	bifenthrin (Onyx, Talstar)	12 hours	3	Follow label
	bifenthrin + clothianidin (Aloft)	12 hours	4 + 4A	L
	bifenthrin + imidacloprid (Allectus)	12 hours	3 + 4A	L
	carbaryl (Sevin)	12 hours	3	L, N
	chlorantraniliprole (Acelepryn)	4 hours	28	L
	cyclaniliprole + flonicamid (Pradia)	12 hours	28 + 29	G, N Not for residential use
	cyfluthrin + imidacloprid (Discus)	12 hours	3 + 4A	N
	dinotefuran (Safari)	12 hours	4A	G, L, N
	imidacloprid (Merit, Marathon II, others)	12 hours	4A	Follow label
	spinetoram + sulfoxaflor (XXpire)	12 hours	4C + 5	G, L, N
	spinosad (Conserve SC)	4 hours	5	G, N
	thiamethoxam (Flagship)	12 hours	4A	G, N

INSECT CONTROL FOR ORNAMENTALS GROWN IN NURSERIES OR LANDSCAPES

Insect or Mite	Pesticide Common Name (Trade Name)	Minimum Hours Between Application and Reentry	IRAC Mode of Action Group	Permitted Application Sites G = greenhouse L = landscape N = nursery
Leafhoppers (such as potato leafhopper and sharpshooter)	abamectin (Avid)	12 hours	6	G,L,N
	acephate (Orthene)	Follow label directions	1A	G, L, N
	acetamiprid (TriStar) 70 WSP	24 hours	4A	G, L, N
	azadirachtin (Azatin XL)	4 hours	18B	G,L,N
	bifenthrin (Onyx, Talstar)	Follow label directions	3	Follow label
	bifenthrin + clothianidin (Aloft)	12 hours	4 + 4A	L
	bifenthrin + imidacloprid (Allectus)	12 hours	3 + 4A	L
	carbaryl (Sevin)	Follow label directions	1A	L, N
	chlorantraniliprole (Acelepryn)	4 hours	28	L
	<i>Chromobacterium subtsugae</i> (Grandevo WDG)	4 hours	UN	G,L,N
	clothianidin (Arena)	12 hours	4A	L
	cyfluthrin (Decathlon)	Follow label directions	3	G, N
	cyfluthrin + imidacloprid (Discus)	12 hours	3 + 4A	N
	dinotefuran (Safari)	12 hours	4A	G, L, N
	fluvalinate (Mavrik)	Follow label directions	3	G, L
	imidacloprid (Merit, Marathon II, others)	12 hours	4A	Follow label
	insecticidal soap (various brands)	12 hours; follow label directions	---	G, L, N
	neem oil (Triact) 90 EC	4 hours	18B	G, L, N
	permethrin (Astro, Perm-UP, Permethrin Pro)	12 hours	3	Follow label
	spinetoram + sulfoxaflor (XXpire)	12 hours	4C + 5	G,L,N
Leafminers (such as boxwood leafminer, holly leafminer, birch leafminer) Note: This includes dipterous, lepidopterous, and coleopterous leafminers. Make sure leafminer to be treated is listed on label.	spirotetramat (Kontos)	24 hours foliar (see exception for drench application)	23	G, N
	thiamethoxam (Flagship)	12 hours	4A	G, N
	abamectin (Avid)	Follow label directions	6	G, L, N
	acephate (Orthene)	Follow label directions	1A	G, L, N
	acetamiprid (TriStar)	24 hours	4A	G, L, N
	azadirachtin (Azatin XL)	12 hours	18B	G, L, N
	bifenthrin (Onyx, Talstar)	Follow label directions	3	Follow label
	chlorantraniliprole (Acelepryn SC)	4 hours	28	L
	clothianidin (Arena)	12 hours	4A	L
	cyclaniliprole + flonicamid (Pradia)	12 hours	28 + 29	G, N Not for residential use
	cyfluthrin + imidacloprid (Discus)	12 hours	3 + 4A	N
	cvromazine (Citation)	12 hours	17	G,L,N
	dinotefuran (Safari)	12 hours	4A	G, L, N
	imidacloprid (Merit, Marathon, others)	12 hours	4A	Follow label
	<i>Isaria fumosorosea</i> (Preferal)	4 hours	UN	G, N
	permethrin (Astro, Perm-UP, Permethrin Pro)	12 hours	3	Follow label
	pyriproxyfen (Distance)	12 hours	7C	G, L, N
	spinosad (Conserve SC)	4 hours	5	G, N

INSECT CONTROL FOR ORNAMENTALS GROWN IN NURSERIES OR LANDSCAPES

Insect or Mite	Pesticide Common Name (Trade Name)	Minimum Hours Between Application and Reentry	IRAC Mode of Action Group	Permitted Application Sites G = greenhouse L = landscape N = nursery
Mealybugs	acephate (Orthene)	12 hours	1A	G, L, N
	acetamiprid (TriStar)	24 hours	4A	G, L, N
	afidopyropen (Ventigra)	Follow label directions	9D	G, L, N
	<i>Beauveria bassiana</i> (BotaniGard)	4 hours	---	G, L, N
	bifenthrin (Onyx, Talstar)	Follow label directions	3	Follow label
	buprofezin (Talus)	12 hours	16	G, N
	carbaryl (Sevin)	Follow label directions	1A	L, N
	clothianidin (Arena)	12 hours	4A	L
	cyclaniliprole + flonicamid (Pradia)	12 hours	28 + 29	G, N Not for residential use
	cyfluthrin (Decathlon) 20 WP	Follow label directions	3	G, N
	cyfluthrin + imidacloprid (Discus)	12 hours	3 + 4A	N
	dinotefuran (Safari)	12 hours	4A	G, L, N
	fluvalinate (Mavrik) 22.3 F	Follow label directions	3	G, L
	horticultural oil (various brands)	4 hours	---	G, L, N
	imidacloprid (Merit, Marathon, others)	12 hours	4A	Follow label
	insecticidal soap (various brands)	12 hours follow label directions	---	G, L, N
	<i>Isaria fumosorosea</i> (Preferal)	4 hours	UN	G, N
	neem oil (Triact) 70	4 hours	18B	G, L, N
	permethrin (Astro, Perm-UP, Permethrin Pro)	12 hours	3	Follow label
	spinetoram + sulfoxaflor (XXpire)	12 hours	4C + 5	G, L, N
	spirotetramat (Kontos)	24 hours foliar (see exception for drench application)	23	G, N
	thiamethoxam (Flagship)	12 hours	4A	G, N
Pillbug	bifenthrin (Onyx, Talstar)	12 hours	3	Follow label
	cyfluthrin (Decathlon) 20 WP	Follow label directions	3	G, N
Plant Bugs	bifenthrin (Onyx, Talstar)	Follow label directions	3	Follow label
	cyclaniliprole + flonicamid (Pradia)	12 hours	28 + 29	G, N Not for residential use
	cyfluthrin (Decathlon)	Follow label directions	3	G, N
	insecticidal soap (various brands)	Follow label directions	---	G, L, N
	<i>Isaria fumosorosea</i> (Preferal)	4 hours	UN	G, N
	permethrin (Astro, others)	12 hours	3	Follow label
	spinetoram + sulfoxaflor (XXpire)	12 hours	4C + 5	G, L, N
Psyllid	thiamethoxam (Flagship)	12 hours	4A	G, N
	abamectin (Avid)	Follow label directions	6	G, L, N
	acephate (Orthene)	Follow label directions	1A	G, L, N
	acetamiprid (TriStar)	24 hours	4A	G, L, N
	azadirachtin (Azatin XL)	12 hours	18B	G, L, N
	<i>Beauveria bassiana</i> (BotaniGard)	4 hours	---	G, L, N
	bifenthrin (Onyx, Talstar)	Follow label directions	3	Follow label
	buprofezin (Talus)	12 hours	16	G,N

INSECT CONTROL FOR ORNAMENTALS GROWN IN NURSERIES OR LANDSCAPES

Insect or Mite	Pesticide Common Name (Trade Name)	Minimum Hours Between Application and Reentry	IRAC Mode of Action Group	Permitted Application Sites G = greenhouse L = landscape N = nursery
Psyllid (cont.)	clothianidin (Arena, Celero)		4A	L
	cyclaniliprole + flonicamid (Pradia)	12 hours	28 + 29	G, N Not for residential use
	cyfluthrin (Decathlon) 20 WP	Follow label directions	3	G,N
	cyfluthrin + imidacloprid (Discus)	12 hours	3 + 4A	N
	dinotefuran (Safari)	12 hours	4A	G, L, N
	imidacloprid (Merit, Marathon, others)	12 hours	4A	Follow label
	insecticidal soap (various brands)	12 hours	---	G, L, N
	<i>Isaria fumosorosea</i> (Preferal)	4 hours	UN	G, N
	neem oil (Triact) 70	4 hours	18B	G, L, N
	spinosad (Conserve SC)	4 hours	5	G, N
	spirotetramat (Kontos)	24 hours foliar (see exception for drench application)	23	G,N
	thiamethoxam (Flagship)	12 hours	4A	G, N
Sawfly	acephate (Orthene)	Follow label directions	1A	G, L, N
	acetamiprid (TriStar)	24 hours	4A	G, L, N
	azadirachtin (Azatin XL)	12 hours	18B	G, L, N
	bifenthrin (Onyx, Talstar)	Follow label directions	3	Follow label
	carbaryl (Sevin)	Follow label directions	1A	L, N
	chlorantraniliprole (Acelepryn SC)	4 hours	28	L
	cyclaniliprole + flonicamid (Pradia)	12 hours	28 + 29	G, N Not for residential use
	cyfluthrin (Decathlon) 20 WP	Follow label directions	3	G, N
	cyfluthrin + imidacloprid (Discus)	12 hours	3 + 4A	N
	imidacloprid (Merit, Marathon, others)	12 hours	4A	Follow label
	diflubenzuron (Dimilin)	12 hours	15	L, N
	dinotefuran (Safari)	12 hours	4A	G,L,N
	emamectin benzoate (Arbormectin)	See label.	6	L
	indoxacarb (Provaunt)	12 hours	22	L
	insecticidal soap (various brands)	12 hours	---	G, L, N
	spinetoram + sulfoxaflor (XXpire)	12 hours	4C + 5	G, L, N
	spinosad (Conserve SC)	4 hours	5	G, N
	thiamethoxam (Flagship)	12 hours	4A	G,N
Slug, Snail	iron phosphate (bait)	Follow label directions	un	Follow label
	metaldehyde + carbaryl (Sevin) bait	Follow label directions	Follow label	Follow label
	methiocarb (Mesurol)	24 hours	1A	Follow label
Soft Scale (such as Fletcher scale, cottony cushion scale, wax scale, San Jose scale)	acetamiprid (TriStar)	12 hours	4A	G, L, N
	acephate (Orthene)	24 hours	16	G,L,N
	azadirachtin (Azatin)	4 hours	18B	G,L,N
	afidopyropen (Ventigra)	Follow label directions (nymphs and crawlers only)	9D	G, L, N
	bifenthrin (Talstar)	12 hours	3	Follow label
	buprofezin (Talus)	12 hours	16	G, N
	cyclaniliprole + flonicamid (Pradia)	12 hours	28 + 29	G, N Not for residential use
	cyfluthrin + imidacloprid (Discus)	12 hours	3 + 4A	N
	dinotefuran (Safari)	12 hours	4A	G, L, N

INSECT CONTROL FOR ORNAMENTALS GROWN IN NURSERIES OR LANDSCAPES

Insect or Mite	Pesticide Common Name (Trade Name)	Minimum Hours Between Application and Reentry	IRAC Mode of Action Group	Permitted Application Sites G = greenhouse L = landscape N = nursery
Soft Scale (cont.)	fenoxycarb (Preclude)	12 hours	76	G
	flonicamid (Aria)	12 hours	96	G,L,N
	horticultural oil (various brands)	4 hours	---	G, L, N
	imidacloprid (Merit, Marathon, others)	Follow label directions	4A	Follow label
	insecticidal soap (various)	12 hours		G,L,N
	neem oil (Various)	4 hours	UN	G,L,N
	pyriproxyfen (Distance)	12 hours	7C	G, L, N
	spinetoram + sulfoxaflor (XXpire)	12 hours	4C + 5	G, L, N
	spirotetramat (Kontos)	24 hours foliar (see exception for drench application)	23	G,N
	thiamethoxam (Flagship)	12 hours	4A	G, N
Sowbug	cyfluthrin (Decathlon)	Follow label directions	3	G, N
Spider Mite (such as twospotted, southern red, and spruce spider mite)	abamectin (Avid)	12 hours	6	G, L, N
	acephate (Orthene)	24 hours	16	G,L,N
	acequinocyl (Shuttle)	12 hours	20B	G, N
	azadirachtin (Azatin)	4 hours	18B	G,L,N
	Beauveria bassiana (BotaniGard)	4 hours	—	G, L, N
	bifenazate (Floramite)	12 hours	un	G, L, N
	bifenthrin (Talstar)	12 hours	3	Follow label
	<i>Chromobacterium subtsugae</i> (Grandevo WDG)	4 hours	UN	G,L,N
	clofentezine (Ovation)	12 hours	10A	G, N
	cyflumetofen (Sultan)	12 hours	25	G, L, N
	etoxazole (TetraSan)	12 hours	10B	G, L, N
	fenazaquin (Magus)	12 hours	21A	G, L, N
	fenpyroximate (Akari)	12 hours	21A	G, N
	hexythiazox (Hexygon)	12 hours	10B	G, L, N
	horticultural oil (various brands)	4 hours	---	Follow label
	insecticidal soaps	12 hours	---	Follow label
	<i>Isaria fumosorosea</i> (Preferal)	4 hours	UN	G,N
	pyridaben (Sanmite)	12 hours	21A	G, L, N
	spiromesifen (Judo, Forbid)	12 hours	23	Follow label
Spittlebug	acephate (Orthene)	12 hours	1A	G, L, N
	cyfluthrin (Decathlon)	Follow label directions	11B2	G, N
	horticultural oil (various brands)	4 hours	---	Follow label
	insecticidal soaps (various brands)	12 hours	---	Follow label
Stink Bug	pyrethrins (PyGanic, Pyrenone)	Follow label directions	3	Follow label
	cyclaniliprole + flonicamid (Pradia)	12 hours	28 + 29	G, N Not for residential use. Suppression of stink bug NYMPHS ONLY
Thrips	abamectin (Avid)	12 hours	6	G, L, N
	acephate (Orthene)	24 hours	1B	G, L, N
	acetamiprid (TriStar)	12 hours	4A	G, L, N

INSECT CONTROL FOR ORNAMENTALS GROWN IN NURSERIES OR LANDSCAPES

Insect or Mite	Pesticide Common Name (Trade Name)	Minimum Hours Between Application and Reentry	IRAC Mode of Action Group	Permitted Application Sites G = greenhouse L = landscape N = nursery
Thrips (cont.)	azadirachtin (Azatin)	4 hours	18B	G, L, N
	<i>Beauveria bassiana</i> (BotaniGard)	4 hours	---	G, L, N
	bifenthrin (Onyx, Talstar)	Follow label directions	3	Follow label
	chlorfenapyr (Pylon)	12 hours	3A	G,L,N
	<i>Chromobacterium subtsugae</i> (Grandevo WDG)	12 hours	98	G,L,N
	cyclaniliprole + flonicamid (Pradia)	12 hours	28 + 29	G, N Not for residential use
	cyantraniliprole (Mainspring)	12 hours	3A	G,L,N
	cyfluthrin (Decathlon)	12 hours	3A	G, L, N
	dinotefuran (Safari)	12 hours	4A	G,L,N
	flonicamid (Aria)	12 hours	9C	G, L, N
	fluvalinate (Mavrik)	12 hours	3A	G, L, N
	horticultural oil (various brands)	4 hours	---	Follow label
	imidacloprid (Marathon II, others)	12 hours	4A	Follow label
	<i>Isaria fumosorosea</i> (Preferal)	4 hours	UN	G,N
	novaluron (Pedestal)	12 hours	15	G, N
	pyrethrins (various)	12 hours	3A	G,L,N
	spinetoram + sulfoxaflor (XXpire)	12 hours	4C + 5	G, L, N
	spinosad (Conserve SC)	4 hours	4	G, N
	thiamethoxam (Flagship)	12 hours	4A	G,L,N
	tolfenpyrad (Hachi-Hachi)	12 hours	4A	G,N
Twig Borer	bifenthrin (Onyx, Talstar)	12 hours	3	Follow label
	cyclaniliprole + flonicamid (Pradia)	12 hours	28 + 29	G, N Not for residential use
Whitefly	abamectin (Avid)	12 hours	6	G, L, N
	acephate (Orthene)	12 hours	1A	G, L, N
	acetamiprid (TriStar)	12 hours	4A	G, L, N
	afidopyropen (Ventigra)	Follow label directions	9D	G, L, N
	azadirachtin (Azatin)	4 hours	18B	
	<i>Beauveria bassiana</i> (BotaniGard)	4 hours	---	G, L, N
	bifenthrin (Onyx, Talstar)	12 hours	3	Follow label
	buprofezin (Talus)	12 hours	16	G, N
	cyclaniliprole + flonicamid (Pradia)	12 hours	28 + 29	G, N Not for residential use
	cyfluthrin (Decathlon)	Follow label directions	3	G, N
	dinotefuran (Safari)	Follow label directions	4A	G, L, N
	fenazaquin (Magus)	12 hours	21A	G, L, N
	flonicamid (Aria)	12 hours	9C	G, L, N
	fluvalinate (Mavrik)	Follow label directions	3	G, L
	horticultural oil (various brands)	4 hours	---	G, L, N
	imidacloprid (Merit, Marathon, others)	12 hours	4A	Follow label
	insecticidal soap (various brands)	12 hours follow label directions	---	G, L, N
	<i>Isaria fumosorosea</i> (Preferal)	4 hours	UN	G,N
	neem oil (Triact)	4 hours	18B	G, L, N

INSECT CONTROL FOR ORNAMENTALS GROWN IN NURSERIES OR LANDSCAPES

Insect or Mite	Pesticide Common Name (Trade Name)	Minimum Hours Between Application and Reentry	IRAC Mode of Action Group	Permitted Application Sites G = greenhouse L = landscape N = nursery
Whitefly (cont.)	novaluron (Pedestal)	12 hours	15	G, N
	permethrin (Astro, others)	12 hours	3	Follow label
	pyridaben (Sanmite)	12 hours	21A	G, L, N
	pyriproxyfen (Distance) 11.2 EC	12 hours	7C	G, L, N
	spinetoram + sulfoxaflor (XXpire)	12 hours	4C + 5	G, L, N
	spirotetramat (Kontos)	24 hours foliar (see exception for drench application)	23	G, N
	thiamethoxam (Flagship)	12 hours	4A	G, N

INSECT CONTROL FOR ORNAMENTALS GROWN IN COMMERCIAL GREENHOUSES

Note: The following list of pesticides is labeled for the uses listed. However, there are different formulations of particular compounds, and you must make sure the pesticide used is properly labeled. All pesticides must be handled and applied in strict accordance with the label on the pesticide container. The plant being damaged and the site where the plant is located (greenhouse) must be listed on the label. The pests that a compound is registered for are also listed on the label. The pesticides below are listed by common name and by a formulation name, which is used as an example of the formulations available. Many insecticides are now off patent, and there are new trade names available for these active ingredients. There are also mixtures of active ingredients plus synergists available that are not listed. For example, there are several formulations of pyrethrum combined with other active ingredients and synergists available in spray concentrates, aerosols and space-release canisters for the control of several pests. Some chemicals are labeled for use in low-volume spray equipment. Proper rates must be determined by applying the proper amount of active ingredient for the area treated. The rates given below are for high-volume spray equipment. Many insects are developing resistance to pesticides available on the market. Practice resistance management and rotate the insecticides used to manage a pest. With most pesticides, you should rotate the compounds used at least once during a generation time for that insect. In addition, it is desirable to rotate mode of action of compounds used. A guide to rotating modes of action is the Insecticide Resistance Action Committee (IRAC) classification of the different mode of action sites and a letter for subgroups. In resistance management rotations, these number/letter codes can be used to determine which compounds have different modes of action. These are listed in the table under the column heading "Mode of Action Number" (un = unknown).

Some of the insecticides listed are extremely toxic. Handle with caution and use protective equipment required by the label. A minimum interval between application and reentry has been established. Make sure the proper reentry period for the insecticide has been observed before allowing people without label-prescribed personal protective equipment to enter the treated area. These are listed in the table under the column heading "REI."

Phytotoxicity (damage to the plant as a result of the application of a chemical) is an important consideration in controlling pests of ornamentals. Phytotoxicity is generally expressed as damage to the leaves, flowers, or stems and is observed as "burn" (browning of tissue), "chlorosis" (yellowing or bleaching of tissue), or modification of growth by deformation or stunting. There are many species and cultivars of ornamental plants with varying sensitivity to chemicals. Other environmental conditions, such as your particular growing conditions, will also affect phytotoxicity. You are encouraged to evaluate a pesticide for phytotoxicity on a few plants under your particular conditions before treating all plants.

Pesticide labels for commercial and homeowner products that are currently registered for use in Arkansas may be found through the Arkansas Department of Agriculture/State Plant Board website by clicking on the following link: <https://www.agriculture.arkansas.gov/plant-industries/pesticide-section/registration/>.

Insect or Mite	Insecticide and Formulation	Amount Per 100 Gallons of Water	REI	Mode of Action Number	Comments
Aphids	abamectin Avid 0.15EC	8 oz	12 hours	6	Apply as needed and repeat application at 7-day intervals or as necessary. DO NOT apply more than 16 fl oz per acre. Use in sufficient water to obtain uniform plant coverage. Phytotoxicity has been observed in certain species of ferns.
	acephate Orthene TT&O 75 WSP Pro 75 PT 1300 TT&O 97	1/3-2/3 lb aerosol 8 oz	24 hours	1B	Caution: Phytotoxicity has occurred on the following plants: <i>Blechnum gibbum</i> , <i>Cissus antarctica</i> , <i>Ficus triangularis</i> , <i>Fittonia verschaffeltii</i> , <i>Maranta leuconeura kerchoveana</i> , <i>Pachystachya lutea</i> , <i>Placetranthus australis</i> , <i>Polypodium aureus</i> , <i>Polystichum</i> , <i>Pteris ensiformis</i> , <i>Tolmiea menziesii</i> . Before treating large plantings, spray only a few plants and observe 2 weeks for varietal phytotoxicity.
	acetamiprid TriStar 70WSP TriStar 30SG	1 soluble bag 1.3 oz	24 hours 12 hours	4A	Apply as a full-coverage foliar spray. The use of a nonionic spreader-sticker adjuvant may improve control.
	afidopyropen Ventigra	Follow label	12 hours	9D	Follow label directions.
	azadirachtin Azatin 3.0% XL, Align-XL Ornazin 3%	10-16 oz 8 oz	4 hours 12 hours	18B	Must get full coverage for control but avoid excess runoff. Use fine spray; can also be applied as drench. Addition of 0.5%-1.0% nonphytotoxic oil will enhance efficacy.
	<i>Beauveria bassiana</i> Naturalis-L BotaniGard ES	30-100 fl oz 0.5-3.0 qts	4 hours 4 hours		Wait 48 hours before applying fungicides.
	bifenazate + abamectin Sirocco	6 fl oz	12 hours	un + 6	For suppression of pest populations, young immatures must be contacted by the spray.

INSECT CONTROL FOR ORNAMENTALS GROWN IN COMMERCIAL GREENHOUSES

Insect or Mite	Insecticide and Formulation	Amount Per 100 Gallons of Water	REI	Mode of Action Number	Comments
Aphids (cont.)	bifenthrin		12 hours	3A	Apply as a full-coverage foliar spray.
	Talstar T&O, Attain				
	10 WP	6-32 oz			
	7.9%	25-50 fl oz			
	0.67 F	8-40 oz			
	Attain	aerosol			
	chlorpyrifos		24 hours	1B	
	DuraGuard 20% ME	0.25-0.5 fl oz/gal			
	<i>Chromobacterium subtsugae</i> (Grandevo WDG)	Follow label	4 hours	UN	Follow label directions
	cyantraniliprole (Mainspring)	Follow label	4 hours	28	Follow label directions.
	cyfluthrin		12 hours	3A	Good coverage is necessary to provide most effective control. Addition of a spreader-sticker may enhance control of insects on some plants.
	Decathlon 2E	1-2 oz			
	20WP	1.9 oz			
	dinotefuran		12 hours	4A	For drench, apply 4 fl oz finished solution per 6-inch pot. See label for ebb and flood rates.
	Safari 20SG	1/4-1/2 lb for foliar 3/4-1 1/2 lb for drench			
	fenpropathrin		24 hours	3A	
	Tame 2.4EC	10 2/3 oz			
	flonicamid 50 WDG		12 hours	9C	Repeat application every 7-28 days as necessary.
	Aria 0.7 oz package	1-3 packets 0.7-2.1 oz			
	flupyradifurone		4 hours	4D	Don't apply more than 28 fl oz per year. Do not mix with group 3 fungicides.
	Altus	7.0-10.5 oz			
	fluvalinate		12 hours	3A	
	Mavrik 2E	2-5 oz			
	horticultural oils	1-2 gal	4 hours		Care must be taken because some plants are sensitive to oils. Thorough coverage is necessary, but do not overapply and get excessive runoff. Use fine spray.
	Sunspray ultrafine, Saf-T-Side, Triact				
	imidacloprid		12 hours	4A	Use 60WP as drench.
	Marathon 1G, 60WP	9-15 oz/1,000 sq ft			
	Marathon II	1.7 fl oz			
	insecticidal soap 1%-2%		12 hours		Repeat spray in 2 or 3 days. Thoroughly wet both surfaces of infested leaves. Use soft water when possible.
	M-Pede	1-2 gal			
	Olympic	1-2 gal			
	<i>Isaria fumosorosea</i>	14-28 oz		un	
	Preferal				
	lambda-cyhalothrin		24 hours	3A	
	Scimitar GC	1.5-5.0 oz			
	methiocarb		24 hours	1A	
	Mesuroil 75W	0.5-1.0 lb			
	neem oil (various)	Follow label	4 hours	un	Follow label directions.
	permethrin (Astro, others)	Follow label	12 hours	3	Follow label directions.

INSECT CONTROL FOR ORNAMENTALS GROWN IN COMMERCIAL GREENHOUSES

Insect or Mite	Insecticide and Formulation	Amount Per 100 Gallons of Water	REI	Mode of Action Number	Comments
Aphids (cont.)	pymetrozine Endeavor 50WG	2.5-5.0 oz	12 hours	9B	
	pyrethrum X-Clude, Pyrenone, Natural Plus	Follow label directions	12 hours	3A	Follow label directions.
	pyrifluquinazon (Rycar)	Follow label directions	12 hours	un	Follow label directions.
	pyriproxyfen (Distance, Fulcrum)	Follow label	12 hours	7C	Follow label directions.
	s-kinoprene Enstar II 5EC	8-20 oz	4 hours	7A	Complete coverage of foliage is essential for control. Phytotoxicity has been observed under certain conditions.
	spinetoram + sulfoxaflor (XXpire)	Follow label directions	12 hours	4C + 5	Follow label directions.
	spirotetramat Kontos 2F	1.7 fl oz	24 hours	23	See label for drench instructions.
	thiamethoxam Flagship 25WG Flagship 0.22G	2-4 oz Follow label directions	12 hours	4A	Medium treatment may take 1-2 weeks for activity; do not leach for 7 days.
	tolfenpyrad (Hachi-Hachi)	Follow label directions	12 hours	21A	Follow label directions.
Armyworm	abamectin (Avid)	Follow label	12 hours	6	Follow label directions.
	acephate (Orthene)	Follow label	24 hours	1B	Follow label directions.
	acetamiprid TriStar 30SG	2.7-5.3 oz	12 hours	4A	Apply as a full-coverage foliar spray. Use of a nonionic spreader-sticker adjuvant may improve control.
	azadirachtin Azatin 3.0% E Oranzin 3%	10-16 oz 8 oz	4 hours 12 hours	18B	Must get full coverage for control but avoid excess runoff. Use fine spray; can also be applied as drench. Spray when pests first appear.
	<i>Bacillus thuringiensis</i> Dipel, Thuricide, MVP, Sok-Bt, Biobit	1-4 qt	4 hours	11B2	
	<i>Beauveria bassiana</i> Naturalis-L	30-100 fl oz	4 hours		Wait 48 hours before applying a fungicide.
	bifenthrin (Talstar)	Follow label directions	12 hours	3A	Apply as a full-coverage foliar spray.
	carbaryl Sevin SL	1 qt.	12 hours	1A	Follow label directions.
	chlorpyrifos DuraGuard 20% ME	0.25-0.5 fl oz/gal	24 hours	1B	
	<i>Chromobacterium subtsugae</i> (Grandevo WDG)	Follow label	4 hours	UN	Follow label directions.
	chlorfenapyr (Pylon)	2.6-6.4 fl oz	12 hours	13	
	cyantraniliprole (Mainspring)	Follow label directions	4 hours	28	Follow label directions.
	cyfluthrin (Decathlon)	Follow label directions	12 hours	3A	Follow label directions.
	diflubenzuron Adept 25W	1/2-1 lb	12 hours	15	Apply on chrysanthemums when larvae appear and repeat at weekly intervals as required.

INSECT CONTROL FOR ORNAMENTALS GROWN IN COMMERCIAL GREENHOUSES

Insect or Mite	Insecticide and Formulation	Amount Per 100 Gallons of Water	REI	Mode of Action Number	Comments
Armyworm (cont.)	fenoxycarb (Preclude)	Follow label	12 hours	7B	Follow label directions.
	fluvalinate (Mavrik)	Follow label	12 hours	3A	Follow label directions.
	insecticidal Soap 1-2% M-pede Olympic	1-2 gal. 1-2 gal.	12 hours		Repeat spray in 2 or 3 days. Thoroughly wet both surfaces of infested leaves. Use soft water when possible.
	fenpropathrin Tame 2.4EC	10 oz	24 hours	3A	
	lambda-cyhalothrin Scimitar GC	1.5-5 oz	24 hours	3A	
	methoxyfenozide (Intrepid)	Follow label	4 hours	18	Follow label directions.
	novaluron Pedestal 10% SC	6-8 fl oz	12 hours	15	DO NOT apply more than once every 30 days or more than 2 applications per crop. DO NOT apply to poinsettias.
	permethrin (Astro, others)	Follow label	12 hours	3	Follow label directions.
	pyrethrins (various)	Follow label	12 hours	3A	Follow label directions.
	pyrethrum X-Clude, Pyrenone Natural Plus	Follow label directions	12 hours	3A	Follow label directions.
	pyridalyl Overture 35WP	8 oz	12 hours	un	2 oz soluble packets; do not get wet.
	spinetoram + sulfoxaflor (XXpire)	Follow label directions	12 hours	4C + 5	Follow label directions.
	spinosad (Conserve)	Follow label directions	4 hours	5	Follow label directions.
	tebufenozide Confirm T/O	4-8 fl oz	4 hours	18A	For best results, begin applications when larvae are first observed or at first sign of feeding.
	tolfenpyrad (Hachi-Hachi)	Follow label directions	12 hours	21A	Follow label directions.
Broad Mite and Cyclamen Mite	abamectin Avid 0.15EC	4 oz	12 hours	6	Apply as needed and repeat as necessary.
	bifenazate + abamectin Sirocco	3-4 fl oz	12 hours	un + 6	Begin applications as soon as mites appear. One additional application can be made after 7 days or as necessary to maintain control. DO NOT make more than two (2) applications per crop per year.
	bifenthrin (Talstar)	Follow label	12 hours	3A	Follow label directions.
	chlorfenapyr (Pylon)	2.6-5.2 fl oz	12 hours	13	
	fenoxycarb (Preclude)	Follow label	12 hours	7B	Follow label directions.
	fenpyroximate (Akari)	24 fl oz	12 hours	21A	
	pyridaben Sanmite 75WP	2-4 oz	12 hours	21A	
	spiromesifen (Judo)	1-4 fl oz	12 hours	23	
	sulfur (elemental sulfur)	Follow label directions	12 hours		DO NOT tank mix with oils.

INSECT CONTROL FOR ORNAMENTALS GROWN IN COMMERCIAL GREENHOUSES

Insect or Mite	Insecticide and Formulation	Amount Per 100 Gallons of Water	REI	Mode of Action Number	Comments
Cabbage Looper	abamectin (Avid)	Follow label	12 hours	6	Follow label directions.
	acephate (Orthene)	Follow label	24 hours	1B	Follow label directions.
	acetamiprid TriStar 30SG	2.7-5.3 oz	12 hours	4A	Apply as a full-coverage foliar spray. Use of a non-ionic spreader-sticker adjuvant may improve control.
	azadirachtin			18B	Must get full coverage for control but avoid excess runoff. Use fine spray; can also be applied as drench. Spray when pests first appear.
	Azatin	10-16 oz	4 hours		
	Ornazin 3%	8 oz	12 hours		
	<i>Bacillus thuringiensis</i> Dipel, Thuricide, MVP, Sok-Bt, Biobit	1-4 qt	4 hours	11B2	Follow manufacturer's suggestions.
	<i>Beauveria bassiana</i> Naturalis-L	30-100 fl. oz	4 hours		Wait 48 hours before applying a fungicide.
	bifenthrin (Talstar)	Follow label directions	12 hours	3A	Apply as a full-coverage foliar spray.
	carbaryl Sevin SL	1 qt.	12 hours	1A	Follow label directions.
	chlorfenapyr (Pylon)	2.6-6.4 fl oz	12 hours	13	
	chlorpyrifos DuraGuard 20% ME	0.25-0.5 fl. oz/gal.	24 hours	1B	
	<i>Chromobacterium subtsugae</i> (Grandevo WDG)	Follow label	4 hours	UN	Follow label directions.
	cyantraniliprole (Mainspring)	Follow label	4 hours	28	Follow label directions.
	cyfluthrin (Decathlon)	Follow label directions	12 hours	3A	Follow label directions.
	diflubenzuron Adept 25W	½-1 lb.	12 hours	15	Apply on chrysanthemums when larvae appear and repeat as weekly intervals as required.
	fenoxycarb (Preclude)	Follow label	12 hours	7B	Follow label directions.
	fenpropathrin Tame 2.4EC	10 oz	24 hours	3A	
	fluvalinate (Mavrik)	Follow label directions	12 hours	3A	Follow label directions.
	insecticidal soap (1%-2%) M-Pede Olympic	1-2 gal 1-2 gal	12 hours		Repeat spray weekly for 2 or 3 weeks. Thoroughly wet both surfaces of infested leaves. Use soft water when possible.
	lambda-cyhalothrin Scimitar GC	1.5-5 oz	24 hours	3A	
	methoxyfenozide (Intrepid)	Follow label	4 hours	18	Follow label directions.
	novaluron (Pedestal)	Follow label directions	12 hours	15	Follow label directions.
	permethrin (Astro, others)	Follow label	12 hours	3	Follow label directions.
	pyrethrins (various)	Follow label	12 hours	3A	Follow label directions.
	pyrethrum X-Clude Pyrenone	aerosol 2-12 oz/acre	12 hours	3A	Follow label directions.
	pyridalyl Overture 35WP	8 oz	12 hours	un	2 oz soluble packets; do not get wet.
	spinetoram + sulfoxaflor (XXpire)	Follow label directions	12 hours	4C + 5	Follow label directions.

INSECT CONTROL FOR ORNAMENTALS GROWN IN COMMERCIAL GREENHOUSES

Insect or Mite	Insecticide and Formulation	Amount Per 100 Gallons of Water	REI	Mode of Action Number	Comments
Cabbage Looper (cont.)	spinosad Conserve SC	6 fl oz	4 hours	5	
	tebufenozide Confirm T/O	4-8 fl oz	4 hours	18A	For best results, begin applications when larvae are first observed or at first sign of feeding.
	tolfenpyrad (Hachi-Hachi)	Follow label directions	12 hours	21A	Follow label directions.
Cutworm	abamectin (Avid)	Follow label	12 hours	6	Follow label directions.
	acephate (Orthene)	Follow label	24 hours	1B	Follow label directions.
	acetamiprid TriStar 30SG	2.7-5.3 oz	12 hours	4A	Apply as a full coverage foliar spray the use of a non-ionic spreader-sticker adjuvant may improve control.
	azadirachtin Azatin	10-16 oz	4 hours	18B	Must get full coverage for control but avoid excess runoff. Use fine spray; can also be applied as drench. Spray when pests first appear.
	Ornazin 3%	8 oz	12 hours		
	<i>Bacillus thuringiensis</i> Dipel, Thuricide, MVP, Sok-Bt, Biobit	1-4 qt	4 hours	11B2	Follow manufacturer's suggestions.
	<i>Beauveria bassiana</i> Naturalis-L	30-100 fl. oz	4 hours		Wait 48 hours before applying a fungicide.
	bifenthrin (Talstar)	Follow label	12 hours	3	Apply as a full coverage foliar spray.
	carbaryl Sevin SL	1 qt	12 hours	1A	Follow label directions.
	chlorfenapyr Pylon	2.6-6.4 fl. oz	12 hours	13	
	chlorpyrifos DuraGuard 20% ME	0.25-0.5 fl. oz/gal.	24 hours	1B	
	<i>Chromobacterium subtsugae</i> (Grandevo WDG)	Follow label	4 hours	UN	Follow label directions.
	cyantraniliprole (Mainspring)	Follow label directions	4 hours	28	Follow label directions.
	cyfluthrin Decathlon		12 hours	3A	Good coverage is necessary to provide most effective control. Addition of a spreader/sticker may enhance control of insects on some plants.
	2EC	1-2 oz			
	20WP	1.3 oz			
	diflubenzuron Adept 25W	½-1 lb.	12 hours	15	Apply on chrysanthemums when larvae appear and repeat as weekly intervals as required.
	fenoxycarb (Preclude)	Follow label	12 hours	7B	Follow label directions.
	fluvalinate (Mavrik)	Follow label	12 hours	3A	Follow label directions.
	insecticidal Soap 1-2% M-pede Olympic	1-2 gal. 1-2 gal.	12 hours		Repeat spray in 2 or 3 days. Thoroughly wet both surfaces of infested leaves. Use soft water when possible.

INSECT CONTROL FOR ORNAMENTALS GROWN IN COMMERCIAL GREENHOUSES

Insect or Mite	Insecticide and Formulation	Amount Per 100 Gallons of Water	REI	Mode of Action Number	Comments
Cutworm (cont.)	fenpropathrin Tame 2.4EC	10 oz	24 hours	3A	
	lambda-cyhalothrin Scimitar GC	1.5-5.0 oz	24 hours	3A	
	methoxyfenozide (Intrepid)	Follow label	4 hours	18	Follow label directions.
	novaluron (Pedestal)	Follow label	12 hours	15	Follow label directions.
	permethrin (Astro, others)	Follow label	12 hours	3	Follow label directions.
	pyrethrins (various)	Follow label	12 hours	3A	Follow label directions.
	pyrethrum X-Clude Pyrenone	Aerosol 2-12 oz/acre	12 hours	3A	Follow label directions.
	pyridalyl Overture 35WP	8 oz	12 hours	un	2 oz Soluble packets, do not get wet.
	spinosad Conserve SC	6 fl oz	4 hours	5	
	spinetoram + sulfoxaflor (XXpire)	Follow label directions	12 hours	4C + 5	Follow label directions.
	tebufenozide Confirm T/O	4-8 fl oz	4 hours	18A	For best results, begin applications when larvae are first observed or at first sign of feeding.
	tolfenpyrad (Hachi-Hachi)	Follow label directions	12 hours	21A	Follow label directions.
Fungus Gnat	acetamiprid TriStar 30SG	2.7-5.3 oz	12 hours	4A	Apply as a directed spray to thoroughly wet the upper 1/2 to 1 inch of soil medium.
	azadirachtin Azatin 3.0% E	8 oz	4 hours	18B	
	<i>Bacillus thuringiensis</i> var. <i>israelensis</i> Gnatrol	Follow label directions	4 hours	11B2	Apply as a soil drench or spray for larvae. Thoroughly wet the first 3 cm (1 3/16 inches) to 4 cm (1 34/67 inches) of soil. Under benches should also be treated.
	chlorfenapyr (Pylon)	5.2-10 fl oz	12 hours	13	
	chlorpurifos DuraGuard 20% ME	0.25-0.5 oz/gal	24 hours	1B	Shake concentrate well before diluting.
	cyromazine Citation 75WP	Follow label directions	12 hours	17	
	diiflubenzuron Adept 25W	Follow label directions	12 hours	15	DO NOT use on poinsettias, Rieger begonias or hibiscus.
	dinotefuran Safari 20SG	3/4-1 1/2 lb	12 hours	4A	Drench applying 4 fl oz finished solution per 6-inch pot. See label for ebb and flood rates.
	pyriproxyfen (Distance)	2-6 fl oz (see comments)	12 hours	7C	New supplemental label changes rates to a 2 oz drench and 3-6 oz drench.
	s-kinoprene Enstar II	1 oz/5 gal	4 hours	7A	Drench by submersion in solution until no more air bubbles escape.

INSECT CONTROL FOR ORNAMENTALS GROWN IN COMMERCIAL GREENHOUSES

Insect or Mite	Insecticide and Formulation	Amount Per 100 Gallons of Water	REI	Mode of Action Number	Comments
Fungus Gnat (cont.)	<i>Steinernema feltiae</i> Entonem, NemaShield Nemasys, ScanMask	Follow label directions	4 hours		Apply when small larvae first appear. Moisture and temperature are critical.
	thiamethoxam Flagship 25WG	4-8.5 oz	12 hours	4A	Reapply as needed but no sooner than every 7 days. DO NOT exceed 17 oz/acre per crop or year.
Leafminer	abamectin Avid 0.15EC	8 oz	12 hours	6	Apply as needed and repeat application at 7-day intervals or as necessary. DO NOT apply more than 16 fl oz or less than 8 fl oz per acre. Use in sufficient water to obtain uniform plant coverage. Phytotoxicity has been observed on certain species of ferns.
	acephate (Orthene)	Follow label directions	24 hours	1B	May be used in greenhouse, landscape and nursery applications.
	acetamiprid TriStar 30SG	6.7-8.0 oz	12 hours	4A	Rotate with other insecticides. Apply as a full-coverage foliar spray. The use of a nonionic spreader-sticker adjuvant may improve control.
	afidopyropen Ventigra	Follow label	12 hours	9D	Follow label directions.
	azadirachtin Azatin 3.0% E Ornazin 3%	10-16 oz 10 oz	4 hours 12 hours	18B	Must get full coverage for control but avoid excess runoff. Use fine spray; can also be applied as drench. Spray early. Make 2 applications in rotation with adulticides such as pyrethroids.
	bifenazate + abamectin Sirocco	6 fl oz	12 hours	un + 6	For control of mining larvae, apply when adults are beginning to lay eggs on the new foliage.
	chlorpyrifos DuraGuard 20% ME	0.25-0.5 fl oz/gal	24 hours	1B	Shake concentrate well before diluting.
	cyromazine Citation 75WP	2.66 oz/acre	12 hours	17	Labeled only for chrysanthemums. Apply to wet in minimum of 100 gallons of water when stippling first appears. Harvesters must wear long-sleeved shirts, long pants, and rubber gloves when harvesting.
	dinotefuran Safari 20SG	1/4-1/2 lb for foliar 3/4-1 1/2 lb for drench	12 hours	4A	For drench, apply 4 fl oz finished solution per 6-inch pot. See label for ebb and flood rates.
	fenoxycarb (Preclude)	Follow label	12 hours	7B	Follow label directions.
	imidacloprid (Marathon II, others)	Follow label directions	12 hours	4A	Follow label directions.
	lambda-cyhalothrin Scimitar GC	1.5-5.0 oz	24 hours	3A	Use for adults only.
	novaluron Pedestal 10% SC	6-8 fl oz	12 hours	15	DO NOT apply more than once every 30 days or more than 2 applications per crop. DO NOT apply to poinsettias.
	permethrin Pounce 3.2EC	20 fl oz	24 hours	3A	Registered for use on chrysanthemums.
	spinosad Conserve SC	22 fl oz	4 hours	5	
	thiamethoxam Flagship 24WG	4-8.5 oz	12 hours	4A	Reapply as needed but no sooner than every 7 days. DO NOT exceed 17 oz/acre per crop or year.

INSECT CONTROL FOR ORNAMENTALS GROWN IN COMMERCIAL GREENHOUSES

Insect or Mite	Insecticide and Formulation	Amount Per 100 Gallons of Water	REI	Mode of Action Number	Comments
Leafroller	acephate Orthene TT&O 75SP TT&O 97	2/3 lb 8-12 oz	24 hours	1B	
	cyantraniliprole (Mainspring)	Follow label directions	4 hours	28	Follow label directions.
	cyfluthrin Decathlon 2EC 20WP	1-2 oz 1.9 oz	12 hours	3A	Good coverage is necessary to provide most effective control. Addition of a spreader/sticker may enhance control of insects on some plants.
	pyrethrum X-Clude Pyrenone Natural Plus	aerosol 2-12 oz/acre	12 hours	3A	Follow label directions.
	spinetoram + sulfoxaflor (XXpire)	Follow label directions	12 hours	4C + 5	Follow label directions.
Mealybug	acephate Orthene TT&O 75SP TT&O 97	2/3 lb 8-12 oz	24 hours	1B	See Aphid .
	acetamiprid TriStar 70WSP TriStar 30SG	2-4 soluble bags 2.7 oz	24 hours 12 hours	4A	Tank mix with surfactant or pyrethroid may improve control of adults. Apply as a full-coverage foliar spray. Use of a nonionic spreader-sticker adjuvant may improve control.
	afidopyropen Ventigra	Follow label directions	12 hours	9D	Follow label directions.
	azadirachtin Azatin 3% Ornazin 3%	10-16 oz 8 oz	4 hours 12 hours	18B	Must get full coverage for control, but avoid excess runoff. Use fine spray; can also be applied as drench. Addition of 0.5%-1.0% nonphytotoxic oil will enhance efficacy.
	<i>Beauveria bassiana</i> Naturalis-L	30-100 fl oz	4 hours		Wait 48 hours before applying fungicides.
	bifenthrin Talstar T&O, Attain 10 WP 7.9% 0.67 F Attain	8-40 oz 25-50 fl oz 8-40 oz aerosol	12 hours	3A	Apply as a full-coverage foliar spray.
	buprofezin (Talus)	Follow label directions	12 hours	16	Apply no more than 2 applications per growing cycle.
	chlorpyrifos DuraGuard 20% ME	0.25-0.5 fl oz/gal	24 hours	1B	
	cyfluthrin Decathlon 2EC	1-2 oz	12 hours	3A	Good coverage is necessary to provide most effective control. Addition of a spreader/sticker may enhance control of insects on some plants.
	dinotefuran Safari 20SG	1/4-1/2 lb for foliar 3/4-1 1/2 lb for drench	12 hours	4A	For drench, apply 4 fl oz finished solution per 6-inch pot. See label for ebb and flood rates.
	fenoxycarb (Preclude)	Follow label	12 hours	7B	Follow label directions.

INSECT CONTROL FOR ORNAMENTALS GROWN IN COMMERCIAL GREENHOUSES

Insect or Mite	Insecticide and Formulation	Amount Per 100 Gallons of Water	REI	Mode of Action Number	Comments
Mealybug (cont.)	fenpropathrin Tame 2.4EC	10 oz	24 hours	3A	
	flonicamid 50 WDG Aria 0.7 oz package	3-6 packets (2.1-4.3 oz)	12 hours	9C	Repeat application every 7-28 days as necessary.
	fluvalinate Mavrik 2EC	2-5 oz	12 hours	3A	
	flupyradifurone Altus	10.5-14.0 oz	4 hours	4D	Don't apply more than 28 fl oz per year. Do not mix with group 3 fungicides.
	horticultural oils 1%-2% Sunspray ultrafine Saf-T-Side	1-2 gal 1-2 gal	4 hours		Care must be taken because some plants are sensitive to oils. Thorough coverage is necessary, but do not overapply and get excessive runoff. Use fine spray.
	imidacloprid Marathon 1G Marathon II	9-15 oz/1,000 sq ft 1.7 fl oz	12 hours	4A	
	insecticidal soap 1%-2% M-Pede Olympic	1-2 gal 1-2 gal	12 hours		Repeat spray after 2 or 3 days. Thoroughly wet both surfaces of infested leaves. Use soft water whenever possible.
	<i>Isaria fumosorosea</i> Preferal	14-28 oz		un	
	methiocarb Mesurol 75 WP	0.5-1 lb	24 hours	1A	
	neem oil (various)	Follow label directions	4 hours	un	Follow label directions.
	pyrfluquinazon (Rycar)	Follow label directions	12 hours	un	Follow label directions.
	s-kinoprene Enstar II 5EC	6-20 oz	4 hours	7A	See Aphid . Registered for root mealybug.
	spinetoram + sulfoxaflor (XXpire)	Follow label directions	12 hours	4C + 5	Follow label directions.
	spirotetramat Kontos 2F	1.7 fl oz	24 hours	23	See label for drench instructions.
	thiamethoxam Flagship 25WG Flagship 0.22G	4-8.5 oz Follow label directions	12 hours	4A	Medium treatment may take 1-2 weeks for activity; do not leach for 7 days.
Scale (Armored) Check label to be sure it lists scale to be treated.	acephate (Orthene)	Follow label directions	24 hours	1B	Follow label directions.
	acetamiprid (TriStar)	Follow label directions	12 hours	4A	Follow label directions.
	afidopyropen (Ventigra)	Follow label directions	12 hours	9D	Follow label directions. For control of nymphs and crawlers only.
	azadirachtin Azatin 3% Ornazin 3%	10-16 oz 8 oz	4 hours 12 hours	18B	Must get full coverage for control but avoid excess runoff. Use fine spray; can also be applied as drench. Addition of 0.5-1.0% non-phytotoxic oil will enhance efficacy.
	bifenthrin (Talstar)	Follow label directions	12 hours	3	Follow label directions.

INSECT CONTROL FOR ORNAMENTALS GROWN IN COMMERCIAL GREENHOUSES

Insect or Mite	Insecticide and Formulation	Amount Per 100 Gallons of Water	REI	Mode of Action Number	Comments
Scale (Armored) (cont.)	buprofezin (Talus)	Follow label directions	12 hours	16	Follow label directions.
	cyantraniliprole (Mainspring)	Follow label	4 hours	28	For greenhouse application.
	dinotefuran (Safari)	Follow label directions	12 hours	4A	Follow label directions.
	fenoxycarb (Preclude)	Follow label	12 hours	7B	Follow label directions.
	flonicamid 50 WDG Aria 0.7 oz package	3-4 packets (2.1-2.9 oz)	12 hours	9C	Repeat application every 7-28 days as necessary.
	horticultural oil (various)	Follow label directions	4 hours		Follow label directions.
	imidacloprid (Marathon II, others)	Follow label	12 hours	4A	Follow label directions
	kinoprene (Enstar II)	Follow label directions	4 hours	7A	Follow label directions.
	neem oil (Various)	Follow label	4 hours	UN	Follow label directions.
	pyriproxyfen (Distance)	Follow label	12 hours	7C	Follow label directions.
	spirotetramat Kontos 2F		24 hours	23	See label for drench instructions.
	thiamethoxam (Flagship)	Follow label directions	12 hours	4A	Follow label directions.
	tolfenpyrad (Hachi-Hachi)	Follow label	12 hours	21A	Follow label directions.
Scale (Soft) Check label to be sure it lists scale to be treated.	acephate (Orthene)	Follow label directions	24 hours	1B	Follow label directions.
	acetamiprid (TriStar)	Follow label directions	12 hours	4A	Follow label directions.
	afidopyropen (Ventigra)	Follow label directions	12 hours	9D	Follow label directions. For control of nymphs and crawlers only.
	bifenthrin (Talstar)	Follow label directions	12 hours	3	Follow label directions.
	buprofezin (Talus)	Follow label directions	12 hours	16	Follow label directions.
	cyantraniliprole (Mainspring)	Follow label directions	4 hours	28	For greenhouse application.
	dinotefuran (Safari)	Follow label directions	12 hours	4A	Follow label directions.
	horticultural oil (various)	Follow label directions	4 hours		Follow label directions.
	imidacloprid (Marathon II, others)	Follow label directions	12 hours	4A	Follow label directions.
	kinoprene (Enstar II)	Follow label directions	4 hours	7A	Follow label directions.
	neem oil (various)	Follow label directions	4 hours	un	Follow label directions.
	pyriproxyfen (Distance)	Follow label directions	12 hours	7C	Follow label directions.
	thiamethoxam (Flagship)	Follow label directions	12 hours	4A	Follow label directions.

INSECT CONTROL FOR ORNAMENTALS GROWN IN COMMERCIAL GREENHOUSES

Insect or Mite	Insecticide and Formulation	Amount Per 100 Gallons of Water	REI	Mode of Action Number	Comments
Slugs and Snails	iron phosphate bait	Follow label	Follow label	UN	Follow label directions.
	metaldehyde Deadline B 15D	Follow label directions	24 hours		
	methiocarb Mesurol 75 WP	1/2-1 lb	24 hours	1A	Spray plants and foliage until wet. DO NOT use in conjunction with foliar fertilizer.
Spider Mite	abamectin Avid 0.15EC	4 oz	12 hours	6	Apply as needed and repeat as necessary.
	acephate (Orthene)	Follow label	24 hours	1B	Follow label directions.
	acequinocyl Shuttle 15 SC	6.4-12.8 fl oz	12 hours	20B	DO NOT apply through any type irrigation. Wetting agent can be used.
	azadirachtin Azatin 3% Ornazin 3%	10-16 oz 8 oz	4 hours 12 hours	18B	Must get full coverage for control but avoid excess runoff. Use fine spray; can also be applied as drench. Addition of 0.5-1.0% non-phytotoxic oil will enhance efficacy.
	<i>Beauveria bassiana</i> Naturalis-L	30-100 fl. oz	4 hours		Wait 48 hours before applying a fungicide.
	bifenazate (Floramite)	2-4 oz	12 hours	un	DO NOT apply in successive applications. Use at least two alternative products between Floramite treatments.
	bifenazate + abamectin Sirocco	3-4 fl oz	12 hours	un + 6	Begin applications as soon as mites appear. One additional application can be made after 7 days or as necessary to maintain control. DO NOT make more than two (2) applications per crop per year.
	bifenthrin Talstar T&O or Attain 10WP 7.9% Attain	6-32 oz 25-50 fl oz aerosol	12 hours	3A	Apply as a full-coverage foliar spray.
	chlorfenapyr (Pylon)	2.6-5.2 fl oz	12 hours	13	
	chlorpyrifos DuraGuard 20% ME	0.25-0.5 fl oz/gal	24 hours	1B	
	clofentezine (Ovation)	2 oz	12 hours	10A	Limited number of plants (see label).
	cyflumetofen (Sultan)	13.7 fl oz	12 hours	25	DO NOT exceed the maximum seasonal use rate of 27.4 fl oz of Sultan per crop growing cycle. DO NOT make more than 2 applications of Sultan per crop growing cycle.
	<i>Chromobacterium subsugae</i> (Grandevo WDG)	Follow label	4 hours	UN	Follow label directions.
	etoxazole TetraSan 5WDG	8-16 oz	12 hours	10B	Limit to 2 applications per crop cycle.
	fenazaquin (Magus)	12-24 oz	12 hours	21	
	fenbutatin-oxide Vendex 50WP	8-16 oz	48 hours	12B	DO NOT add oil to spray solution.

INSECT CONTROL FOR ORNAMENTALS GROWN IN COMMERCIAL GREENHOUSES

Insect or Mite	Insecticide and Formulation	Amount Per 100 Gallons of Water	REI	Mode of Action Number	Comments
Spider Mite (cont.)	fenoxycarb (Preclude)	Follow label	12 hours	7B	Follow label directions.
	fenpropathrin Tame 2.4EC	8-16 oz	24 hours	3A	
	fenpyroximate Akari 5 SC	16-24 fl oz	12 hours	21A	
	fluvalinate Mavrik 2E	2-5 oz	12 hours	3A	
	hexythiazox Hexygon DF	1-2 oz	12 hours	10A	
	horticultural oil Sunspray ultrafine	1-2 gal	4 hours		
	Saf-T-Side	1-2 gal			
	Triact	1-2 gal			
	insecticidal soap (1%-2%) M-Pede	1-2 gal	12 hours		Repeat spray weekly for 2 or 3 weeks. Thoroughly wet both surfaces of infested leaves. Use soft water when possible.
	Olympic	1-2 gal			
	lambda-cyhalothrin Scimitar GC	1.5-5 oz	24 hours	3A	
	methiocarb Mesurol 75W	1/2-1 lb	24 hours	1A	
	pyridaben Sanmite 75WP	2-4 oz	12 hours	21A	
	spinosad Conserve SC	22 fl oz	4 hours	5	
	spiromesifen Judo 4 F, Savate	1-4 oz	12 hours	23	Effective on nymphal and egg stages.
	spirotetramat Kontos 2F	1.7 fl oz	24 hours	23	See label for drench instructions.
Thrips	abamectin Avid 0.15 EC	8 oz	12 hours	6	Apply as needed and repeat application at 7-day intervals or as necessary. DO NOT apply more than 16 fl oz or less than 8 fl oz per acre. Use in sufficient water to obtain uniform plant coverage. Phytotoxicity has been observed in certain species of ferns.
	acephate Orthene TT&O 75SP TT&O 97	2/3 lbs. 8 oz	24 hours	1B	Aerosol may also be used as for aphid control.
	acetamiprid TriStar 30SG	4-8 oz	12 hours	4A	Apply as a full coverage foliar spray the use of a non-ionic spreader-sticker adjuvant may improve control.
	azadirachtin Azatin 3% E Ornazin 3%	12-16 oz 8 oz	4 hours 12 hours	18B	Must get full coverage for control, but avoid excess runoff. Use fine spray; can also be applied as drench. Addition of 0.5% to 1.0% nonphytotoxic oil will enhance efficacy.

INSECT CONTROL FOR ORNAMENTALS GROWN IN COMMERCIAL GREENHOUSES

Insect or Mite	Insecticide and Formulation	Amount Per 100 Gallons of Water	REI	Mode of Action Number	Comments
Thrips (cont.)	<i>Beauveria bassiana</i>				
	Naturalis-L	30-100 fl oz	4 hours		
	BotaniGard ES	0.5-3.0 fl oz	4 hours		
	bifenazate + abamectin Sirocco	6 fl oz	12 hours	un + 6	For suppression of pest populations, young immatures must be contacted by the spray.
	bifenthrin (Talstar)	Follow label directions	12 hours		Follow label directions.
	chlorfenapyr (Pylon)	10-20 fl oz	12 hours	13	
	chlorpyrifos DuraGuard 20% ME	0.25-0.5 fl oz/gal	24 hours	1B	
	Chromobacterium subtsugae (Grandevo WDG)	Follow label	4 hours	UN	Follow label directions.
	cyantraniliprole (Mainspring)	Follow label directions	4 hours	28	For greenhouse application.
	cyfluthrin		12 hours	3A	Good coverage is necessary to provide most effective control. Addition of a spreader/sticker may enhance control of insects on some plants.
	Decathlon 2EC	1-2 oz			
	20WP	1.9 oz			
	dinotefuran Safari 20SG	4-8 oz for foliar 12-24 oz for drench	12 hours	4A	Suppression only. For drench, apply 4 fl oz finished solution per 6-inch pot. See label for ebb and flood rates.
	flonicamid 50 WDG		12 hours	9C	Repeat application every 7-28 days as necessary.
	Aria 0.7 oz package	3-4 packets (2.1-2.9 oz)			
	fluvalinate		12 hours	3A	
	Mavrik 2E	2-5 oz			
	horticultural oil (various)	Follow label directions	4 hours		Follow label directions.
	imidacloprid		12 hours	4A	Use 60WP as drench.
	Marathon 1G	9-15 oz/1,000 sq ft			
	60WP				
	insecticidal soap 1%-2%		12 hours		Repeat spray weekly for 2 or 3 weeks. Thoroughly wet both surfaces of infested leaves. Use soft water whenever possible.
	M-Pede	1-2 gal			
	Olympic	1-2 gal			
	Isaria fumorosea Preferal	4-12 oz		UN	
	lambda-cyhalothrin Scimitar GC	1.5-5 oz	24 hours	3A	
	methiocarb MesuroI 75W	0.5-1 lb	24 hours	1A	
	novaluron Pedestal 10% SC	6-8 fl oz	12 hours	15	DO NOT apply more than once every 30 days or more than 2 applications per crop. DO NOT apply to poinsettias.

INSECT CONTROL FOR ORNAMENTALS GROWN IN COMMERCIAL GREENHOUSES

Insect or Mite	Insecticide and Formulation	Amount Per 100 Gallons of Water	REI	Mode of Action Number	Comments
Thrips (cont.)	pyrethrum X-Clude, Natural Plus Pyrenone	aerosol 2-12 oz/acre	12 hours	3A	Follow label directions.
	pyridalyl Overture 35WP	8 oz	12 hours	UN	2 oz soluble packets; DO NOT get wet.
	s-kinoprene (Enstar II)	Follow label directions	4 hours	7A	For greenhouse application.
	spinetoram + sulfoxaflor (XXpire)	Follow label directions	12 hours	4C + 5	Follow label directions.
	spinosad Conserve SC	6 fl oz	4 hours	5	
	thiamethoxam Flagship 25WG	4-8.5 oz	12 hours	4A	For leaf-feeding thrips.
	tolfenpyrad (Hachi-Hachi)	Follow label directions	12 hours	21A	Follow label directions.
Whitefly	abamectin Avid 0.15EC	8 fl oz	12 hours	6	For suppression of pests, young must be contacted by spray.
	acephate Orthene TT&O 75SP PT 1300 TT&O 97	2/3 lb aerosol 8 oz	24 hours	1B	
	acetamiprid TriStar 70WSP TriStar 30SG	2-4 soluble bags 2.7-5.3 oz	24 hours 12 hours	4A	Tank mix with surfactant or pyrethroid may improve control of adults. Apply as a full-coverage foliar spray. Use of a nonionic spreader-sticker adjuvant may improve control.
	afidopyropen Ventigra	Follow label directions	12 hours	9D	Follow label directions.
	azadirachtin Azatin 3.0% E Ornazin 3%	10-16 oz 10 oz	4 hours 12 hours	18B	Must get full coverage for control, but avoid excess runoff. Use fine spray; can also be applied as drench. Ensure good coverage to top and bottom of leaves.
	<i>Beauveria bassiana</i> Naturalis-L BotaniGard ES	30-100 fl oz 0.5-3.0 qts	4 hours 4 hours		
	bifenazate + abamectin Sirocco	6 fl oz	12 hours	un + 6	For suppression of pest populations, young immatures must be contacted by the spray.
	bifenthrin Talstar T&O or Attain 10WP 7.9% Attain	6-32 oz 25-50 fl oz aerosol	12 hours	3A	Apply as a full-coverage foliar spray.
	buprofezin (Talus)	Follow label directions	12 hours	16	Apply no more than 2 applications per growing cycle.
	chlorpyrifos DuraGuard 20% ME	0.25-0.5 fl oz/gal	24 hours	1B	

INSECT CONTROL FOR ORNAMENTALS GROWN IN COMMERCIAL GREENHOUSES

Insect or Mite	Insecticide and Formulation	Amount Per 100 Gallons of Water	REI	Mode of Action Number	Comments
Whitefly (cont.)	cyantraniliprole (Mainspring)	Follow label directions	4 hours	28	For greenhouse application.
	cyfluthrin Decathlon 2E	1-2 oz	12 hours	3A	Good coverage is necessary to provide most effective control. Addition of a spreader/sticker may enhance control of insects on some plants.
	cyfluthrin + imidacloprid Discus	25 fl oz	12 hours	3 + 4A	
	diflubenzuron Adept	4-8 fl oz	12 hours	15	For optimum suppression of whiteflies, spray applications should thoroughly wet the leaf undersides. Begin applications at first sign of insects and repeat applications at 7-day intervals as needed to provide suppression on new foliage growth.
	dinotefuran Safari 20SG	1/4-1/2 lb for foliar 3/4-1 1/2 lb for drench	12 hours	4A	
	fenazaquin (Magus)	Follow label directions	12 hours	21A	
	fenoxycarb (Preclude)	Follow label	12 hours	7B	Follow label directions.
	fenpropathrin Tame 2.4EC	5 1/3-10 2/3 oz	24 hours	3A	
	flonicamid 50 WDG Aria 0.7 oz package	4-6 packets (2.9-4.3 oz)	12 hours	9C	Repeat application every 7-28 days as necessary.
	flupyradifurone Altus	10.5-14.0 oz	4 hours	4D	Don't apply more than 28 fl oz per year. Do not mix with group 3 fungicides.
	fluvalinate Mavrik 2E	2-5 oz	12 hours	3A	
	horticultural oils 1%-2% Sunspray ultrafine Saf-T-Side Triact 70	1-2 gal 1-2 gal 1-2 gal	4 hours		Care must be taken because some plants are sensitive to oils. Thorough coverage is necessary, but do not overapply and get excessive runoff. Use fine spray.
	imidacloprid Marathon 1G 60WP Marathon II	9-15 oz/1,000 sq ft 1.7 fl oz	12 hours	4A	Use 60WP as drench.
	insecticidal soap 1%-2% M-Pede Olympic	1-2 gal 1-2 gal	12 hours		Thoroughly wet both surfaces of infested leaves. Use soft water whenever possible.
	<i>Isaria fumosorosea</i> Preferal	14-28 oz		un	
	lambda-cyhalothrin Scimitar GC	1.5-5 oz	24 hours	3A	

INSECT CONTROL FOR ORNAMENTALS GROWN IN COMMERCIAL GREENHOUSES

Insect or Mite	Insecticide and Formulation	Amount Per 100 Gallons of Water	REI	Mode of Action Number	Comments
Whitefly (cont.)	novaluron Pedestal 10% SC	6-8 fl oz	12 hours	15	DO NOT apply more than once every 30 days or more than 2 applications per crop. DO NOT apply to poinsettias.
	pymetrozine Endeavor 50WG	2.5-5 oz	12 hours	9B	
	pyridaben Sanmite 75WP	2-4 oz	12 hours	21A	
	pyrifluquinazon (Rycar)	Follow label directions	12 hours	un	Follow label directions.
	pyriproxyfen (Distance)	6-8 fl oz	12 hours	7C	Target crawlers. Apply no more than 2 times per crop cycle. DO NOT apply to poinsettias.
	pyrethrum X-Clude, Natural Plus Pyrenone	aerosol 2-12 oz/acre	12 hours	3A	Follow label directions.
	s-kinoprene Enstar 5EC	6-20 oz	4 hours	7A	See Aphid .
	spinetoram + sulfoxaflor (XXpire)	Follow label directions	12 hours	4C + 5	Follow label directions.
	spiromesifen (Judo 4 F)	1-4 oz	12 hours	23	Effective on nymphal and egg stages.
	spirotetramat (Kontos 2F)	1.7 fl oz	24 hours	23	See label for drench instructions.
	thiamethoxam Flagship 25WG Flagship 0.22G	4-8.5 oz Follow label	12 hours	4A	Medium treatment may take 1-2 weeks for activity; do not leach for 7 days.
	tolfenpyrad (Hachi-Hachi)	Follow label directions	12 hours	21A	Follow label directions.

INSECT CONTROL FOR ORNAMENTALS GROWN IN INTERIOR PLANTSCAPES

Note: People without proper application protective clothing must not enter treated area until plants are dry or as stipulated on the label. If possible, remove infested plants from living and eating areas prior to spray application. Place plants outdoors or in an area not likely to come in contact with people, pets, or food while spraying and while plants are wet. In most situations, plants can be returned to original location when they are dry. If plants cannot be removed, follow label precautions.

Phytotoxicity (damage to the plant as a result of the application of a chemical) is an important consideration in controlling pests of ornamentals. Phytotoxicity is generally expressed as damage to the leaves, flowers, or stems and is observed as “burn” (browning of tissue), “chlorosis” (yellowing or bleaching of tissue), or modification of growth by deformation or stunting. There are many species and cultivars of ornamental plants with varying sensitivity to chemicals. Other environmental conditions, such as your particular growing conditions, will also affect phytotoxicity. You are encouraged to evaluate a pesticide for phytotoxicity on a few plants under your particular conditions before treating all plants.

Pesticide labels for commercial and homeowner products that are currently registered for use in Arkansas may be found through the Arkansas Department of Agriculture/State Plant Board website by clicking on the following link: <https://www.agriculture.arkansas.gov/plant-industries/pesticide-section/registration/>

Insect or Mite	Insecticide and Formulation	Amount Per 100 Gallons of Water	Amount Per Gallon	Comments
Aphid	afidopyropen Ventigra	Follow label directions	Follow label directions	Follow label directions. 12 hours. REI.
	<i>Beauveria bassiana</i> BotaniGard ES Naturalis-L	0.5-3.0 qts 30-100 fl oz	0.33-1.0 fl oz 0.30-1.0 fl oz	
	chlorantraniliprole Acelepryn			Soil treatment only. Follow label directions.
	clothianidin Arena 50 WDG	0.63-1.26 oz		Apply as a full-coverage foliar spray or a drench. See label for drench rates. 12 hours restricted entry interval.
	cyfluthrin (Decathlon)	1.3-1.9 oz	1/4 tsp	Follow label directions.
	flonicamid 50 WDG Aria 0.7 oz package	1-6 packets (0.7-4.3 oz)		Repeat application every 7-28 days as necessary. 12 hours restricted entry interval.
	fluvalinate (Mavrik)	4-10 oz	1/2-1 tsp	Follow label directions.
	horticultural oil Sunspray Ultrafine Saf-T-Side Triact 90EC	1%-2%	1%-2%	Thorough coverage is necessary. Spray must contact pest to be effective.
	imidacloprid Merit 75WP Merit 75WPS Marathon II			Per label directions.
	insecticidal soap (M-Pede)	1%-2%	1%-2%	Thorough coverage is necessary. Spray must contact pests to be effective. Repeat spray 3 times at 5- to 7-day interval. Soap could make floor slippery.
	<i>Isaria fumosorosea</i> Preferal	14-28 oz	0.14-0.28 oz	
	pymetrozine (Endeavor)	2-5 oz	1/4-1/2 tsp	Follow label directions.
	pyriproxyfen (Distance)	6-8 fl oz	0.02 oz (0.6 mL)	Follow label directions.
	s-kinoprene Enstar 5E	6-10 oz	1/2 tsp	Follow label directions.
	spirotetramat Kontos 2F	1.7 fl oz		See label for drench instructions. 24-hour restricted entry interval.
	thiamethoxam Flagship 25WG	4-8.5 oz	0.04-0.085 oz	Reapply as needed but no sooner than every 7 days. DO NOT exceed 17 oz/acre per crop or year.
Caterpillars (leaf feeding)	chlorantraniliprole (Acelepryn)	1.0-16.0 fl oz		Foliar application only. Follow label directions.

INSECT CONTROL FOR ORNAMENTALS GROWN IN INTERIOR PLANTSCAPES

Insect or Mite	Insecticide and Formulation	Amount Per 100 Gallons of Water	Amount Per Gallon	Comments
Clearwing Borers	chlorantraniliprole (Acelepryn)	4.0-32 fl oz		Bark treatment application only. Follow label directions.
Fungus Gnats	<i>Bacillus thuringiensis</i> subsp. israelensis	3.2-6.4 oz		For light infestation.
	Gnatrol WDG	13-26 oz		For heavy infestation. Follow label directions.
	<i>Beauveria bassiana</i>			
	Naturalis-L	30-100 fl. oz	0.30-1.0 fl. oz	
	cyromazine			Follow label directions.
	Citation 75% WP	2.66 oz	1/2 tsp	
	diflubenzuron		0.04-0.08 (1-2 grams)	Follow label directions.
	Adept 25WSB	16-24 oz		
	pyriproxyfen (Distance)	3-6 fl oz	0.02 (0.6 mL)	Follow label directions.
	s-kinoprene			Follow label directions.
Lace Bug	Enstar II 5E	6-10 oz	1/2 tsp	
	<i>Steinemema feltiae</i>			Follow label directions.
	Entonem, NemaShield, Nemasys, Scan Mask			
	thiamethoxam			Reapply as needed, but no sooner than every 7 days. DO NOT exceed 17 oz/acre per crop or year.
	Flagship 25WG	4-8.5 oz	0.04-0.085 oz	
	<i>Beauveria bassiana</i>			
	BotaniGard ES	0.5-3.0 qts	0.33-1.0 fl oz	
	chlorantraniliprole (Acelepryn)			Soil treatment only. Follow label directions.
	thiamethoxam			Reapply as needed, but no sooner than every 7 days. DO NOT exceed 17 oz/acre per crop or year.
	Flagship 25WG	4-8.5 oz	0.04-0.085 oz	
Leafminer (Birch leafminer)	chlorantraniliprole (Acelepryn)			Soil treatment only. Follow label directions.
	thiamethoxam			Reapply as needed, but no sooner than every 7 days. DO NOT exceed 17 oz/acre per crop or year.
Mealybug	Flagship 25WG	4-8.5 oz	0.04-0.085 oz	
	afidopyropen			Follow label directions. 12 hours. REI.
	Ventiga	Follow label directions	Follow label directions	
	<i>Beauveria bassiana</i>			
	BotaniGard ES	0.5-3.0 qts	0.33-1.0 fl oz	
	Naturalis-L	30-100 fl. oz	0.30-1.0 fl. oz	
	clothianidin			Apply as a full-coverage foliar spray or a drench. See label for drench rates.
	Arena 50 WDG	0.9-1.26 oz		12 hours restricted entry interval.
	cyfluthrin (Decathlon)	1.3-1.9 oz	1/4 tsp	Follow label directions.
	dinotefuran		1/2-1 tsp	Also effective on armored scale.
	Safari 20 SG			
	flonicamid 50 WDG			Repeat application every 7-28 days as necessary. 12 hours restricted entry interval.
	Aria 0.7 oz package	1-6 packets (0.7-4.3 oz)		
	horticultural oils	1%-2%	1%-2%	Care must be taken because some plants are sensitive to oils. Thorough coverage is necessary, but do not overapply. Use fine spray.
	Sunspray ultrafine			
	Saf-T-Side			
	Triact 90EC			
	imidacloprid			Follow label directions.
	Merit 75WP			
	Merit 75 WSP			
	Marathon II			

INSECT CONTROL FOR ORNAMENTALS GROWN IN INTERIOR PLANTSCAPES

Insect or Mite	Insecticide and Formulation	Amount Per 100 Gallons of Water	Amount Per Gallon	Comments
Mealybug (cont.)	insecticidal soap (M-Pede)	1%-2%	1%-2%	Thorough coverage is necessary. Spray must contact pests to be effective. Repeat spray 3 times at 10- to 14-day intervals. Soap could make floor slippery.
	<i>Isaria fumosorosea</i> (Preferal)	14-28 oz	0.14-0.28 oz	
	pyrethrum PT 1600A Pyrenone	aerosol		Follow label directions.
	pyriproxyfen (Distance)	8-12 fl oz	0.02 (0.6 mL)	Follow label directions.
	s-kinoprene Enstar II 5E	6-10 oz	1/2 tsp	Follow label directions.
	spirotetramat Kontos 2F	1.7 fl oz		See label for drench instructions. 24-hour restricted entry interval.
	thiamethoxam Flagship 25WG	4-8.5 oz	0.04-0.085 oz	Reapply as needed, but no sooner than every 7 days. DO NOT exceed 17 oz/acre per crop or year.
Mites	<i>Beauveria bassiana</i>	0.5-3.0 qts	0.33-1.0 fl oz	
	BotaniGard ES	30-100 fl oz	0.30-1.0 fl oz	
	Naturalis-L			
	bifenazate (Floramite)	2-4 oz	1/4-1/2 tsp	Follow label directions.
	cyflumetofen (Sultan)	13.7 fl oz		12 hours restricted entry interval. IRAC Group 25. DO NOT exceed the maximum seasonal use rate of 27.4 fl oz of Sultan per crop growing cycle. DO NOT make more than 2 applications of Sultan per crop growing cycle. Sultan has selective activity on the Tetranychid family of mites but is not active on other species such as broad mite, cyclamen mite, flat mite or rust mite.
	fenazaquin (Magus)	12-24 oz	0.12-0.24 oz	Follow label directions.
	fenproximate Akari 5SC	16-24 oz	0.16-0.24 oz (4.527 mL)	Follow label directions.
	fluvalinate (Mavrik)	4-10 oz	1/2-1 tsp	Follow label directions.
	insecticidal soap (M-Pede)	1%-2%	1%-2%	Thorough coverage is necessary. Spray must contact pest to be effective. Repeat spray 3 times at 5- to 7-day intervals. Soap could make floor slippery.
	pyrethrum PT 1600A Pyrenone	aerosol		Follow label directions.
Scale	afidopyropen Ventigra	Follow label directions	Follow label directions	Follow label directions. 12 hours. REI. Controls nymphs and crawlers only.
	cyfluthrin (Decathlon)	1.3-1.9 oz	1/4 tsp	Follow label directions.
	dinotefuran Safari 20 SG		1/2-1 tsp	Also effective on armored scale.
	horticultural oil Sunspray ultrafine Saf-T-Side Triact 90EC	1%-2%	1%-2%	Care must be taken because some plants are sensitive to oils. Thorough coverage is necessary, but do not overapply. Use fine spray.
	imidacloprid (Marathon, others)			Follow label directions. Many names and formulations are available.

INSECT CONTROL FOR ORNAMENTALS GROWN IN INTERIOR PLANTSCAPES

Insect or Mite	Insecticide and Formulation	Amount Per 100 Gallons of Water	Amount Per Gallon	Comments
Scale (cont.)	insecticidal soap (M-Pede)	1%-2%	1%-2%	Thorough coverage is necessary. Spray must contact pests to be effective. Soap could make floor slippery.
	pyrethrum PT 1600A Pyrenone	aerosol		Follow label directions.
	pyrifluquinazon (Rycar)	6.4 oz	0.064 oz	Follow label directions. IRAC Group: un
	pyriproxyfen (Distance)	8-12 fl oz	0.02 oz (0.6 mL)	Follow label directions.
	spirotetramat Kontos 2F	1.7 fl oz		See label for drench instructions. 24-hour restricted entry interval.
	thiamethoxam Flagship 25WG	4-8.5 oz	0.04-0.085 oz	Soft scale only. Reapply as needed, but no sooner than every 7 days. DO NOT exceed 17 oz/acre per crop or year.
Thrips	azadirachtin (Azatin)			Follow label directions.
	<i>Beauveria bassiana</i> BotaniGard ES	0.5-3.0 qts	0.33-1.0 fl oz	
	Naturalis-L	30-100 fl oz	0.30-1.0 fl oz	
	cyfluthrin (Decathlon)	1.3-1.9 oz	1/4 tsp	Follow label directions.
	flonicamid 50 WDG Aria 0.7 oz package	1-6 packets (0.7-4.3 oz)		Repeat application every 7-28 days as necessary. 12-hour restricted entry interval.
	fluvalinate (Mavrik)	4-10 oz	1/2-1 tsp	
	insecticidal soap (M-Pede)	1%-2%	1%-2%	Thorough coverage is necessary. Spray must contact pest to be effective. Repeat spray 3 times at 5- to 7-day intervals. Soap could make floor slippery.
White Grub	thiamethoxam Flagship 25WG	4-8.5 oz	0.04-0.085 oz	For leaf-feeding thrips. Reapply as needed, but no sooner than every 7 days. DO NOT exceed 17 oz/acre per crop or year.
	chlorantraniliprole (Acelepryn)	0.184-0.367 fl oz per 1,000 sq ft		Soil treatment only. Follow label directions.
	clothianidin Arena 50 WDG	See label.		Apply as a drench. See label for drench rates. 12 hours restricted entry interval.
	thiamethoxam Flagship 25WG	6-8.5 oz	0.06-0.085 oz	Reapply as needed, but no sooner than every 7 days. DO NOT exceed 17 oz/acre per crop or year.
Whitefly	afidopyropen Ventigra	Follow label directions	Follow label directions	Follow label directions. 12 hours. REI.
	azadirachtin (Azatin)			Follow label directions.
	<i>Beauveria bassiana</i> BotaniGard ES	0.5-3.0 qts	0.33-1.0 fl oz	
	Naturalis-L	30-100 fl oz	0.30-1.0 fl oz	
	clothianidin Arena 50 WDG	0.9-1.26 oz		Apply as a full coverage foliar spray or a drench. See label for drench rates. 12 hours restricted entry interval.

INSECT CONTROL FOR ORNAMENTALS GROWN IN INTERIOR PLANTSCAPES

Insect or Mite	Insecticide and Formulation	Amount Per 100 Gallons of Water	Amount Per Gallon	Comments
Whitefly (cont.)	diflubenzuron Adept 25WSB	16-24 oz	0.04-0.08 oz (1-2 grams)	Follow label directions.
	dinotefuran Safari 20 SG		1/2-1 tsp	Also effective on armored scale.
	flonicamid 50 WDG Aria 0.7 oz package	1-6 packets (0.7-4.3 oz)		Repeat application every 7-28 days as necessary. 12-hour restricted entry interval.
	horticultural oils Sunspray ultrafine Saf-T-Side Triact 90EC	1%-2%	1%-2%	Care must be taken because some plants are sensitive to oils. Thorough coverage is necessary, but do not overapply. Use fine spray.
	imidacloprid Merit 75WP Merit 75WPS Marathon II			Follow label directions.
	insecticidal soap (M-Pede)	1%-2%	1%-2%	Thorough coverage is necessary. Spray must contact pest to be effective. Repeat spray 3 times at 5- to 7-day intervals. Soap could make floor slippery.
	<i>Isaria fumosorosea</i> (Preferal)	14-28 oz	0.14-0.28 oz	
	pymetrozine (Endeavor)	2-5 oz	1/4-1/2 tsp	Follow label directions.
	pyrethrum PT 1600A Pyrenone	aerosol		Follow label directions.
	pyriproxyfen (Distance)	6-8 fl oz	0.02 oz (0.6 mL)	Follow label directions.
	s-kinoprene Enstar 5E	6-10 oz	1/2 tsp	Follow label directions.
	spirotetramat Kontos 2F	1.7 fl oz		See label for drench instructions. 24-hour restricted entry interval.
	thiamethoxam Flagship 25WG	4-8.5 oz	0.04-0.085 oz	Reapply as needed, but no sooner than every 7 days. DO NOT exceed 17 oz/acre per crop or year.

ORNAMENTAL INSECT CONTROL FOR HOMEOWNERS

OUTDOOR ORNAMENTAL INSECT CONTROL

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Pest	Insecticide and Formulation*	Amount Formulation Per Gallon Spray	Remarks and Precautions
Aphid	acephate (Orthene, etc.) 75S		Follow label directions.
	acetamiprid (Ortho Flower, Fruit & Vegetable Insect Killer Concentrate)		Follow label directions.
	beta-cyfluthrin 0.0015% + imidacloprid 0.012% (Bayer Advanced Dual Action Rose & Flower Insect Killer Ready-To-Use)	ready to use	Follow label directions.
	bifenthrin		Follow label directions.
	cyfluthrin		Follow label directions.
	dinotefuran (Ortho Tree & Shrub Insect Control Plus Miracle-Gro Plant Food Concentrate 0.43%, Ortho Tree & Shrub Insect Control Granules 2.0%)		Per label directions.
	horticultural oils	1%-2%	Follow label directions.
	imidacloprid (Bayer Advanced)		Follow label directions.
	insecticidal soap	1%-2%	Thorough coverage is necessary. Spray must contact pests to be effective. Repeat spray three times at 5- to 7-day intervals.
	malathion (various)		Follow label directions.
Azalea Leaf Miner	pyrethrin/pyrethrum		Follow label directions.
	pyrethroids (various)	ready to use and concentrate	Follow label directions.
	acephate (Orthene, etc.) 75S	1 tsp	Per label directions.
	beta-cyfluthrin 0.0015% + imidacloprid 0.012% (Bayer Advanced Dual Action Rose & Flower Insect Killer Ready-To-Use)	ready to use	Follow label directions.
	dinotefuran (Ortho Tree & Shrub Insect Control Plus Miracle-Gro Plant Food Concentrate 0.43%, Ortho Tree & Shrub Insect Control Granules 2.0%)		Per label directions.
Bagworm	imidacloprid (Bayer Advanced)		
	<i>Bacillus thuringiensis</i> (Biotrol WP, Thuricide, Sok-Bt)	2 tsp	Per label directions.
	beta-cyfluthrin 0.0015% + imidacloprid 0.012% (Bayer Advanced Dual Action Rose & Flower Insect Killer Ready-To-Use)	ready to use	Follow label directions.
	malathion (various)		Per label directions. In winter, hand-pick and burn if only a few bagworms are present.
	pyrethroids (various)		Per label directions.

ORNAMENTAL INSECT CONTROL FOR HOMEOWNERS
OUTDOOR ORNAMENTAL INSECT CONTROL

Pest	Insecticide and Formulation*	Amount Formulation Per Gallon Spray	Remarks and Precautions
Beetles (foliage feeding such as elm leaf beetle)	acetamiprid (Ortho Flower, Fruit & Vegetable Insect Killer Concentrate)		Follow label directions.
	beta-cyfluthrin 0.0015% + imidacloprid 0.012% (Bayer Advanced Dual Action Rose & Flower Insect Killer Ready-To-Use)	ready to use	Follow label directions.
	carbaryl		Apply to foliage when injury first noted.
	dinotefuran (Ortho Tree & Shrub Insect Control Plus Miracle-Gro Plant Food Concentrate 0.43%, Ortho Tree & Shrub Insect Control Granules 2.0%)		Per label directions.
	imidacloprid (Bayer Advanced)		Follow label directions.
Borers (various kinds)	dinotefuran (Ortho Tree & Shrub Insect Control Plus Miracle-Gro Plant Food Concentrate 0.43%, Ortho Tree & Shrub Insect Control Granules 2.0%)		Dinotefuran is effective against flat-headed borers and some clear-winged moths only.
	imidacloprid (Bayer Advanced)		Dinotefuran is effective against flat-headed borers and some clear-winged moths only.
	permethrin	per label	Apply to trunk and lower limbs in spring as per label directions.
Boxwood Leaf Miner	acephate (Orthene, etc.) 75S	2 tsp	Per label directions.
	beta-cyfluthrin 0.0015% + imidacloprid 0.012% (Bayer Advanced Dual Action Rose & Flower Insect Killer Ready-To-Use)	ready to use	Follow label directions.
	dinotefuran (Ortho Tree & Shrub Insect Control Plus Miracle-Gro Plant Food Concentrate 0.43%, Ortho Tree & Shrub Insect Control Granules 2.0%)		Per label directions.
	imidacloprid (Bayer Advanced)		Per label directions.
	malathion (various)		Per label directions.
Caterpillars (such as armyworm, cutworm and looper)	acephate (Orthene, etc.) 75S		Follow label directions.
	acetamiprid (Ortho Flower, Fruit & Vegetable Insect Killer Concentrate)		Not for cutworm control. Follow label directions.
	<i>Bacillus thuringiensis</i> (Dipel, Thuricide)		Follow manufacturer's suggestions.
	beta-cyfluthrin 0.0015% + imidacloprid 0.012% (Bayer Advanced Dual Action Rose & Flower Insect Killer Ready-To-Use)	ready to use	Follow label directions.
	bifenthrin	ready to use	Follow label directions.
	carbaryl		Follow label directions.
	cyfluthrin		Follow label directions.
	pyrethroids (various)	ready to use and concentrate	Follow label directions.
	spinosad (various)	1 tsp	Some organic certified products are available.

ORNAMENTAL INSECT CONTROL FOR HOMEOWNERS
OUTDOOR ORNAMENTAL INSECT CONTROL

Pest	Insecticide and Formulation*	Amount Formulation Per Gallon Spray	Remarks and Precautions
Fungus gnats	dinotefuran (Ortho Tree & Shrub Insect Control Granules 2.0%)		Per label directions.
Holly Leaf Miner	beta-cyfluthrin 0.0015% + imidacloprid 0.012% (Bayer Advanced Dual Action Rose & Flower Insect Killer Ready-To-Use)	ready to use	Follow label directions.
	dinotefuran (Ortho Tree & Shrub Insect Control Plus Miracle-Gro Plant Food Concentrate 0.43%, Ortho Tree & Shrub Insect Control Granules 2.0%)		Per label directions.
	imidacloprid (Bayer Advanced)		Spray in late spring to kill larvae in mines. Per label directions.
Japanese Beetle (adults)	beta-cyfluthrin 0.0015% + imidacloprid 0.012% (Bayer Advanced Dual Action Rose & Flower Insect Killer Ready-To-Use)	ready to use	Follow label directions.
	dinotefuran (Ortho Tree & Shrub Insect Control Plus Miracle-Gro Plant Food Concentrate 0.43%)		Per label directions.
	carbaryl (Sevin) 50WP	2 Tbsp	Treat as needed. Repeat applications as necessary.
	imidacloprid (Bayer Advanced)		Per label directions.
	malathion (various)		Per label directions.
Lace Bug	acephate (Orthene, etc.) 75S	1 tsp	Apply in early spring when nymphs of first generation are present.
	beta-cyfluthrin 0.0015% + imidacloprid 0.012% (Bayer Advanced Dual Action Rose & Flower Insect Killer Ready-To-Use)	ready to use	Follow label directions.
	dinotefuran (Ortho Tree & Shrub Insect Control Plus Miracle-Gro Plant Food Concentrate 0.43%, Ortho Tree & Shrub Insect Control Granules 2.0%)		Per label directions.
	imidacloprid (Bayer Advanced)		Per label directions.
	malathion (various)		Per label directions.
Mealybug	acephate (Orthene, etc.) 75S		Follow label directions.
	acetamiprid (Ortho Flower, Fruit & Vegetable Insect Killer Concentrate)		Follow label directions.
	beta-cyfluthrin 0.0015% + imidacloprid 0.012% (Bayer Advanced Dual Action Rose & Flower Insect Killer Ready-To-Use)	ready to use	Follow label directions.
	bifenthrin	ready to use	Follow label directions.
	cyfluthrin		Follow label directions.

ORNAMENTAL INSECT CONTROL FOR HOMEOWNERS
OUTDOOR ORNAMENTAL INSECT CONTROL

Pest	Insecticide and Formulation*	Amount Formulation Per Gallon Spray	Remarks and Precautions
Mealybug (cont.)	dinotefuran (Ortho Tree & Shrub Insect Control Plus Miracle-Gro Plant Food Concentrate 0.43%, Ortho Tree & Shrub Insect Control Granules 2.0%)		Per label directions.
	horticultural oil	1%-2%	Coverage is important. Spray must contact pests.
	imidacloprid (Bayer Advanced)		Follow label directions.
	insecticidal soap	1%-2%	Thorough coverage is necessary. Spray must contact pests to be effective. Repeat spray three times at 5- to 7-day intervals.
	malathion (various)		Follow label directions.
	pyrethroids (various)	ready to use and concentrate	Follow label directions.
Plant Bugs Leafhopper (cont.)	acephate (Orthene, etc.) 75S		Follow label directions.
	acetamiprid (Ortho Flower, Fruit & Vegetable Insect Killer Concentrate)		Follow label directions.
	beta-cyfluthrin 0.0015% + imidacloprid 0.012% (Bayer Advanced Dual Action Rose & Flower Insect Killer Ready-To-Use)	ready to use	Follow label directions.
	carbaryl		Apply to foliage as needed.
	cyfluthrin		Follow label directions.
	dinotefuran (Ortho Tree & Shrub Insect Control Plus Miracle-Gro Plant Food Concentrate 0.43%, Ortho Tree & Shrub Insect Control Granules 2.0%)		Follow label directions. Leafhoppers ONLY.
	imidacloprid (Bayer Advanced)		Per label directions.
	insecticidal soap	1%-2%	Thorough coverage is necessary. Spray must contact pests to be effective. Repeat spray three times at 5- to 7-day intervals.
	malathion (various)		Follow label directions.
	pyrethroids (various)	ready to use and concentrate	Follow label directions.
Rose Midges	beta-cyfluthrin 0.0015% + imidacloprid 0.012% (Bayer Advanced Dual Action Rose & Flower Insect Killer Ready-To-Use)	ready to use	Follow label directions.
Rose Slugs	beta-cyfluthrin 0.0015% + imidacloprid 0.012% (Bayer Advanced Dual Action Rose & Flower Insect Killer Ready-To-Use)	ready to use	Follow label directions.
Scale Insects	acephate (Orthene, etc.) 75S		Follow label directions.
	acetamiprid (Ortho Flower, Fruit & Vegetable Insect Killer Concentrate)		Follow label directions.

ORNAMENTAL INSECT CONTROL FOR HOMEOWNERS
OUTDOOR ORNAMENTAL INSECT CONTROL

Pest	Insecticide and Formulation*	Amount Formulation Per Gallon Spray	Remarks and Precautions
Scale Insects (cont)	beta-cyfluthrin 0.0015% + imidacloprid 0.012% (Bayer Advanced Dual Action Rose & Flower Insect Killer Ready-To-Use)	ready to use	Follow label directions. Effective against crawler stages.
	bifenthrin		Follow label directions.
	carbaryl		Follow label directions.
	cyfluthrin		Follow label directions.
	dinotefuran (Ortho Tree & Shrub Insect Control Plus Miracle-Gro Plant Food Concentrate 0.43%, Ortho Tree & Shrub Insect Control Granules 2.0%)		Per label directions.
	horticultural oils	1%-2%	Follow label directions.
	imidacloprid (Bayer Advanced)		Follow label directions.
	insecticidal soap	1%-2%	
	malathion (various)		Follow label directions.
	pyrethroids (various)	ready to use and concentrate	Follow label directions.
Slug and Snail	iron phosphate (Slug-Go)		Follow label directions.
	methaldehyde		Attention should be given to moist areas or water leaks. DO NOT use in home gardens.
	MesuroI 2B	1 lb/100 sq ft	Follow label directions.
Sowbug and Pillbug	beta-cyfluthrin 0.0015% + imidacloprid 0.012% (Bayer Advanced Dual Action Rose & Flower Insect Killer Ready-To-Use)	ready to use	Follow label directions. Effective against crawler stages.
	carbaryl	Follow label directions	Clean up breeding and hiding places; i.e., treat any mulched area of ornamental shrubbery.
	malathion (various)		Follow label directions.
Spider Mite	bifenthrin 0.012%	ready to use	Follow label directions.
	horticultural oil	1%-2%	
	insecticidal soap	1%-2%	Coverage is important. Spray must contact pests to be effective.
	malathion (various)		Follow label directions.
Stalk Borer	carbaryl	Follow label directions	Treat as often as needed beginning when first damage is noted. DO NOT allow ragweed to grow near flower beds.
Thrips	acephate (Orthene, etc.) 75S		Follow label directions.
	acetamiprid (Ortho Flower, Fruit & Vegetable Insect Killer Concentrate)		Follow label directions.

ORNAMENTAL INSECT CONTROL FOR HOMEOWNERS
OUTDOOR ORNAMENTAL INSECT CONTROL

Pest	Insecticide and Formulation*	Amount Formulation Per Gallon Spray	Remarks and Precautions
Thrips (cont.)	beta-cyfluthrin 0.0015% + imidacloprid 0.012% (Bayer Advanced Dual Action Rose & Flower Insect Killer Ready-To-Use)	ready to use	Follow label directions. Effective against crawler stages.
	carbaryl		Follow label directions.
	cyfluthrin		Follow label directions.
	dinotefuran (Ortho Tree & Shrub Insect Control Plus Miracle-Gro Plant Food Concentrate 0.43%, Ortho Tree & Shrub Insect Control Granules 2.0%)		Per label directions.
	imidacloprid (Bayer Advanced)		Follow label directions.
	insecticidal soap	1%-2%	Thorough coverage is necessary. Spray must contact pests to be effective. Repeat spray three times at 5- to 7-day intervals.
	malathion (various)		Follow label directions.
	pyrethroids (various)	ready to use and concentrate	Follow label directions.
	spinosad (various)	1 tsp	Some organic certified products are available.
Whitefly	acephate (Orthene, etc.) 75S		Follow label directions.
	acetamiprid (Ortho Flower, Fruit & Vegetable Insect Killer Concentrate)		Follow label directions.
	beta-cyfluthrin 0.0015% + imidacloprid 0.012% (Bayer Advanced Dual Action Rose & Flower Insect Killer Ready-To-Use)	ready to use	Follow label directions. Effective against crawler stages.
	bifenthrin	ready to use	Follow label directions.
	cyfluthrin		Follow label directions.
	dinotefuran (Ortho Tree & Shrub Insect Control Plus Miracle-Gro Plant Food Concentrate 0.43%, Ortho Tree & Shrub Insect Control Granules 2.0%)		Per label directions.
	horticultural oils	1%-2%	
	imidacloprid (Bayer Advanced)		Follow label directions.
	insecticidal soap	1%-2%	
	malathion (various)		Follow label directions.
	pyrethrins/pyrethrum		Follow label directions.
	pyrethroids (various)	ready to use and concentrate	Follow label directions.
White grubs	dinotefuran (Ortho Tree & Shrub Insect Control Granules 2.0%)		Per label directions.
	imidacloprid (Bayer Advanced Season Long Grub Control)		Per label directions.

*Numerous products containing insecticide are available to homeowners. Products containing the same insecticide may vary in the concentration of the active ingredient. Always consult the product label for information on rate of application.

ORNAMENTAL INSECT CONTROL FOR HOMEOWNERS

INDOOR ORNAMENTAL INSECT CONTROL

Note: Many formulations of insecticides for use in the home are combinations of active ingredients. The following list of insecticides is given as a guide to determine which pests an active ingredient is effective in controlling. Many pyrethroids and other compounds are now off label, and there may be several brand names for different chemicals. Only the active ingredient of insecticides is listed. Other compounds, especially oils, contain a mixture of oils, and these are listed under the general category of oils. The trade names below are only examples of several different formulations available and are not given as recommendations. Check the label on the insecticide container to determine what plants can be treated and the active ingredients present in the product. When possible, place plants outdoors or in an area not likely to come in contact with people, pets or food while making insecticide application. If plants cannot be moved outside for treatment, follow label precautions for indoor treatment.

Insecticide and Formulation*		Rate	Comments
bifenthrin	Ortho Houseplant and Garden Insect Killer, other Ortho products	as directed	mealybugs, mites, whiteflies, aphids, and most chewing pests.
cyfluthrin	Bayer Advanced Home Pest Control	as directed	gnats, centipedes, earwigs, scorpions Follow label directions.
horticultural oil	SunSpray Ultrafine, Saf-T-Side, Superior Oil, Golden Natural Spray Oil, Volck Oil; found in Green Light products and others	1%-2%	scale, whiteflies, mites Coverage is important; spray must contact pests to be effective.
imidacloprid + fertilizer	Bayer Advanced Garden 2-in-1 Plant Spikes	as directed	aphids, mealybugs, whiteflies
insecticidal soap	M-Pede and Safer Soap	1%-2%	aphids, mealybugs, scale, thrips, mites, whiteflies Coverage is important; spray must contact pests to be effective.
pyrethrins, pyrethrum	Pyrethrum (aerosol); found in several Safer products, Garden Safe	as directed	aphids, mealybugs, thrips, whiteflies

*Numerous products containing insecticide are available to homeowners. Products containing the same insecticide may vary in the concentration of the active ingredient. Always consult the product label for information on rate of application.

HOME LAWN INSECT CONTROL

The following table provides home lawn insect control recommendations with pesticides for use by the homeowner and with pesticides for use by licensed professionals only. All chemical information provided below is given with the understanding that no endorsement of named products is intended nor is criticism implied of similar products that are not mentioned. Individuals who use pesticides are responsible for ensuring that the intended use complies with current regulations and conforms to the product label. Before purchasing or using any pesticide, always read and carefully follow the label directions.

Insecticides listed below are identified by common chemical name. Pesticide labels for commercial and homeowner products that are currently registered for use in Arkansas may be found through the Arkansas Department of Agriculture/State Plant Board website by clicking on the following link: <https://www.agriculture.arkansas.gov/plant-industries/pesticide-section/registration/>

Pest	Insecticide and Formulation	Amount Per 1,000 Square Feet	Precautions and Remarks
Ant (also see Red Imported Fire Ant)	bifenthrin 0.3% (Ortho)	See label.	
	bifenthrin 0.058% + carbaryl 2.3% (Duocide)	4-8 lb	Product must be watered in immediately after application to lawns. DO NOT apply more than 4 times per year to lawns. The minimum reapplication interval to lawns is 7 days. Will only kill pests present at the time of application. Pest must be directly contacted to be effective.
	carbaryl (GardenTech Sevin)	See label.	Treat mounds and surrounding area or apply broadcast.
	clothianidin + bifenthrin (Aloft) SC G	0.27-0.54 fl oz 1.8-3.6 lb	Toxic to fish and aquatic invertebrates. DO NOT apply near or allow runoff into surface waters or intertidal areas.
	cyfluthrin 0.75% (Bayer Advanced)	See label.	
	gamma-cyhalothrin 0.08% (Spectracide)	See label.	
	hydramethylnon* (Maxforce G)	See label.	
	lambda-cyhalothrin 0.5% (Bonide)	See label.	
	other pyrethroids* (DeltaGard, Scimitar, Talstar, Tempo)	See label.	
	permethrin 10% (Hi-Yield)	See label.	
	pyrethroids* (Advanced Lawn, Bug-B-Gone, Deltagard, Scimitar, Talstar, Tempo, Wisdom and others)	See label.	Many pyrethroids are toxic to fish and aquatic invertebrates. Apply these products only as specified on the label.
	Some ants are susceptible to fire ant products		
	zeta-cypermethrin + bifenthrin + imidacloprid (Triple Crown T&O, Triple Crown Golf)	0.46-0.80 fl oz	Triple Crown Golf is a Restricted Use Pesticide .
Ant, Red Imported Fire	Apply all bait products when ants are active and soil temperature is above 60 degrees F. DO NOT treat if rain is anticipated within 6 hours.		
	abamectin B1* (Ascend, Award II) 0.011% bait	5-7 Tbsp/mound 1 lb/acre	Mound-to-mound treatment rate. Broadcast rate.
	acephate* (Orthene T, T&O) 75 S (Ortho Orthene Fire Ant Killer1) 50 S	1-2 tsp/mound 1 Tbsp/mound	Distribute uniformly over mound. For best results, apply early in the morning or late afternoon.
	bifenthrin 0.058% + carbaryl 2.3% (Duocide)	4-8 lb	Product must be watered in immediately after application to lawns. DO NOT apply more than 4 times per year to lawns. The minimum reapplication interval to lawns is 7 days. Will only kill pests present at the time of application. Pest must be directly contacted to be effective.
	carbaryl (GardenTech Sevin)	See label.	Use as a mound drench.
	clothianidin + bifenthrin (Aloft LC SC)	2.3-3.6 lb	Toxic to fish and aquatic invertebrates. DO NOT apply near or allow runoff into surface waters or intertidal areas.
	d-limonene (Orange Guard)	See label.	Mound treatment (acceptable to organic growers).

*Several trade names available. Check label for active ingredient. Always follow label instructions.

HOME LAWN INSECT CONTROL

Pest	Insecticide and Formulation	Amount Per 1,000 Square Feet	Precautions and Remarks
Ant, Red Imported Fire (cont.)	Apply all bait products when ants are active and soil temperature is above 60 degrees F. DO NOT treat if rain is anticipated within 6 hours.		
	fipronil 0.0143% granular insecticide (Quali-Pro Fipronil, Taurus G, Top Choice)	2 lb OR 87 lb/acre	Broadcast only.
	fipronil (Maxforce FC) bait	See label.	Apply as a mound treatment or broadcast bait.
	fipronil + bifenthrin + lambda-cyhalothrin (Taurus Trio G)	2 lb	Apply as a broadcast. Irrigate prior to treatment.
	hydramethylnon (Amdro, Amdro Pro, Maxforce Fire Ant Granular Bait)	2-5 Tbsp/mound 1.0-1.5 lb/acre	Mound-to-mound treatment rate. Broadcast rate.
	indoxacarb (Advion, Ortho Fire Ant Killer Mound Bait)	See label.	
	metaflumizone (Siesta Fire Ant Bait) 0.063%	1.0-1.5 lb/acre 2-4 Tbsp/mound	Broadcast rate. Mound-to-mound treatment rate. DO NOT exceed 6.0 lb/acre total or 4 applications in a one-year period.
	pyrethroids (various brands) bifenthrin (Ortho MAX Fire Ant Killer Broadcast) Granules, Over 'n Out, Talstar)	See label.	
	cyfluthrin (Bayer Advanced Lawn Fire Ant Killer, Tempo)		
	deltamethrin (DeltaGard G, D-Fense SC)		
	lambda-cyhalothrin (Spectracide Fire Ant Killer Granules)		
	pyriproxyfen (Distance)	1-4 Tbsp/mound 1.0-1.5 lb/acre	Mound-to-mound treatment rate. Broadcast rate. This is an insect growth regulator (IGR).
	S-methoprene (Extinguish)	3-5 Tbsp/mound 1.0-1.5 lb/acre	Mound-to-mound treatment rate. Broadcast rate. This is an IGR.
	S-methoprene + hydramethylnon (Amdro Firestrike, Extinguish Plus)	See label.	Mound-to-mound and broadcast treatments. This is an IGR plus a toxicant.
	spinosad (Ferti-lome Come and Get It Fire Ant Killer)	See label.	Acceptable to organic growers. Follow label directions precisely. Repeat treatments usually required. Use fresh bait.
Armyworm, Fall Armyworm, Cutworm	thiamethoxam 11.6% + lambda-cyhalothrin 3.5% (Tandem)	See label.	Apply a single application of 28 fl. oz per acre or apply two applications of 14 fl. oz per acre on a 3 to 5-week interval.
	zeta-cypermethrin + bifenthrin + imidacloprid (Triple Crown T&O, Triple Crown Golf)	0.46-0.80 fl oz	Triple Crown Golf is a Restricted Use Pesticide .
	azadirachtin* (Azatrol, Neemix, Turplex, etc.)	See label.	
	<i>Bacillus thuringiensis/B.t.</i> (various brands)	See label.	Small armyworms only.
	bifenthrin 0.3% (Ortho)	See label.	
	bifenthrin 0.058% + carbaryl 2.3% (Duocide)	2 lb	Product must be watered in immediately after application to lawns. DO NOT apply more than 4 times per year to lawns. The minimum reapplication interval to lawns is 7 days. Will only kill pests present at the time of application. Pest must be directly contacted to be effective.

HOME LAWN INSECT CONTROL

Pest	Insecticide and Formulation	Amount Per 1,000 Square Feet	Precautions and Remarks
Armyworm, Fall Armyworm, Cutworm (cont.)	carbaryl (GardenTech Sevin)	See label.	Apply as a coarse spray in sufficient water for good coverage. Treat when first injury noted. Repeat as needed. DO NOT water into soil. DO NOT cut grass for 1 to 3 days after treatment.
	chlorantraniliprole (Acelepryn) SC G	0.046-0.092 fl oz 1.15-2.3 lb	
	chlorantraniliprole (GrubEx1)	See label.	Rate varies with size and species.
	cyfluthrin 0.75% (Bayer Advanced)	See label.	
	gamma-cyhalothrin 0.08% (Spectracide)	See label.	
	indoxacarb (Provaunt) WDG	0.046-0.092 oz	
	lambda-cyhalothrin 0.5% (Bonide)	See label.	
	other pyrethroids* (DeltaGard, Scimitar, Talstar, Tempo)	See label.	
	permethrin 10% (Hi-Yield)	See label.	
	spinosad A and D (Conserve SC)	0.25-1.25 fl oz	
	thiamethoxam 11.6% + lambda-cyhalothrin 3.5% (Tandem)	See label.	
	trichlorfon* (Bayer Advanced)	See label.	
	various entomogenous nematode and <i>B.t.</i> products	See label.	
	zeta-cypermethrin + bifenthrin + imidacloprid (Triple Crown T&O, Triple Crown Golf)	10-15 fl oz/acre	Triple Crown Golf is a Restricted Use Pesticide .
Bee and Wasp	bifenthrin 0.3% (Ortho)	See label.	Most of these are parasitic on soil pests, especially grubs; therefore, they are beneficial. Sometimes there are so many bees and wasps burrowing in the soil that chemical treatments are necessary to prevent damage or reduce danger from stings. Spot spray ground nest openings. Bee, wasp and hornet sprays in pressurized cans are also effective.
	carbaryl (GardenTech Sevin)	See label.	
	cyfluthrin 0.75% (Bayer Advanced)	See label.	
	other pyrethroids* (DeltaGard, Scimitar, Talstar, Tempo)	See label.	
Billbug	chlorotraniliprole (Acelepryn) G SC	1.15 to 2.3 lb 0.184 to 0.46 fl oz	Toxic to aquatic invertebrates.
	zeta-cypermethrin + bifenthrin + imidacloprid (Triple Crown T&O, Triple Crown Golf)	10-20 fl oz/acre	Triple Crown Golf is a Restricted Use Pesticide .
Chinch Bug	<i>Beauveria bassiana</i> * (Naturalis-T)	See label.	
	bifenthrin 0.3% (Ortho)	See label.	

*Several trade names available. Check label for active ingredient. Always follow label instructions.

HOME LAWN INSECT CONTROL

Pest	Insecticide and Formulation	Amount Per 1,000 Square Feet	Precautions and Remarks
Chinch Bug (cont.)	bifenthrin 0.058% + carbaryl 2.3% (Duocide)	2-4 lb	Product must be watered in immediately after application to lawns. DO NOT apply more than 4 times per year to lawns. The minimum reapplication interval to lawns is 7 days. Will only kill pests present at the time of application. Pest must be directly contacted to be effective.
	carbaryl (GardenTech Sevin)	See label.	
	chlorotraniliprole (Acelepryn) G SC	1.15-2.3 lb 0.184-0.46 fl oz	Suppression ONLY. Toxic to aquatic invertebrates.
	clothianidin + bifenthrin (Aloft) SC G	0.27-0.54 fl oz 1.8-3.6 lb	Toxic to fish and aquatic invertebrates. DO NOT apply near or allow runoff into surface waters or intertidal areas.
	cyfluthrin 0.75% (Bayer Advanced)	See label.	
	dinotefuran (Zylam 20 SG)	1.0 fl oz	For suppression, make application prior to hatching of first instar nymphs.
	gamma-cyhalothrin 0.08% (Spectracide)	See label.	
	lambda-cyhalothrin 0.5% (Bonide)	See label.	
	other pyrethroids* (DeltaGard, Scimitar, Talstar, Tempo)	See label.	
	permethrin 10% (Hi-Yield)	See label.	
	thiamethoxam 11.6% + lambda-cyhalothrin 3.5% (Tandem)	See label.	Apply when insects are first observed. Repeat applications may be necessary. Highly toxic to fish and aquatic invertebrates.
	zeta-cypermethrin + bifenthrin + imidacloprid (Triple Crown T&O, Triple Crown Golf)	20-35 fl oz/acre	Triple Crown Golf is a Restricted Use Pesticide .
Earwigs, Pillbugs, Solitary Digger Wasps	bifenthrin 0.3% (Ortho)	See label	
	carbaryl (GardenTech Sevin)	See label	
	cyfluthrin 0.75% (Bayer Advanced)	See label	
	gamma cyhalothrin 0.08% (Spectracide)	See label	
	lambda cyhalothrin 0.5% (Bonide)	See label	
	other pyrethroids* (Deltagard, Scimitar, Talstar, Tempo)	See label	
	permethrin 10% (Hi-Yield)	See label	
Eriophyid Mites (zoysiagrass mite and bermudagrass stunt mite)	azadirachtin (Azatrol)	See label.	Registered for use on eriophyid mites in turfgrass.
	bifenthrin (Allectus GC SC, Bifenthrin 2EC, Quali-Pro Bifenthrin, Talstar F)	See label.	Registered for use on eriophyid mites in turfgrass.
	deltamethrin (D-Fense SC)	See label.	Suppression ONLY.
	lambda-cyhalothrin (Quali-Pro Lambda GC-O, Scimitar)	See label.	Registered for use on eriophyid mites in turfgrass.
	zeta-cypermethrin + bifenthrin + imidacloprid (Triple Crown T&O, Triple Crown Golf)	10-20 fl oz/acre	Triple Crown Golf is a Restricted Use Pesticide .

HOME LAWN INSECT CONTROL

Pest	Insecticide and Formulation	Amount Per 1,000 Square Feet	Precautions and Remarks
European Crane Fly	bifenthrin (Ortho Bug-B-Gon MAX Insect Killer for Lawns)	See label.	Product must be watered in immediately after application to lawns. DO NOT apply more than 4 times per year to lawns. The minimum reapplication interval to lawns is 7 days. Will only kill pests present at the time of application. Pest must be directly contacted to be effective.
	bifenthrin 0.058% + carbaryl 2.3% (Duocide)	4-8 lb	
	carbaryl (GardenTech Sevin)	See label.	
	chlorantraniliprole (GrubEx1)	See label.	
European Crane Fly (cont.)	gamma-cyhalothrin (Spectracide)	See label.	Triple Crown Golf is a Restricted Use Pesticide .
	imidacloprid (Merit) (Advanced Season Long Grub Control)	See label.	
	lambda-cyhalothrin (Bonide)	See label.	
	zeta-cypermethrin + bifenthrin + imidacloprid (Triple Crown T&O, Triple Crown Golf)	20-35 fl oz/acre	
Grasshopper	bifenthrin 0.3% (Ortho)	See label.	Product must be watered in immediately after application to lawns. DO NOT apply more than 4 times per year to lawns. The minimum reapplication interval to lawns is 7 days. Will only kill pests present at the time of application. Pest must be directly contacted to be effective.
	bifenthrin 0.058% + carbaryl 2.3% (Duocide)	2-4 lb	
	carbaryl (GardenTech Sevin)	See label.	
	cyfluthrin 0.75% (Bayer Advanced)	See label.	
	gamma-cyhalothrin 0.08% (Spectracide)	See label.	
	lambda-cyhalothrin 0.5% (Bonide)	See label.	
	other pyrethroids* (DeltaGard, Scimitar, Talstar, Tempo)	See label.	
	permethrin 10% (Hi-Yield)	See label.	
	thiamethoxam 11.6% + lambda-cyhalothrin 3.5% (Tandem)	See label.	
	zeta-cypermethrin + bifenthrin + imidacloprid (Triple Crown T&O, Triple Crown Golf)	10-20 fl oz/acre	
Ground Pearls	Maintain a vigorous lawn through proper fertilization, watering, mowing, etc. Good cultural practices will help the lawn outgrow damage. No practical, effective pesticide treatments are currently available.		
Grub, Green June Beetle (only) (also see Grub, White)	bifenthrin 0.058% + carbaryl 2.3% (Duocide)	4-8 lb	Product must be watered in immediately after application to lawns. DO NOT apply more than 4 times per year to lawns. The minimum reapplication interval to lawns is 7 days. Will only kill pests present at the time of application. Pest must be directly contacted to be effective.
	carbaryl (GardenTech Sevin)	See label.	
	imidacloprid (Merit) (Advanced Lawn Grub Control)	See label	
	thiamethoxam 11.6% + lambda-cyhalothrin 3.5% (Tandem)	See label.	
Begin applications up to 45 days before the historical peak of adult flight to second instar grub of the species being targeted. For optimum control, treat from peak flight to peak egg hatch. Irrigate to move Tandem into the root zone. Full-season control of white grubs will be obtained with either a single 28 fl oz application or two 14 fl oz applications.			

*Several trade names available. Check label for active ingredient. Always follow label instructions.

HOME LAWN INSECT CONTROL

Pest	Insecticide and Formulation	Amount Per 1,000 Square Feet	Precautions and Remarks
Grub, White (Japanese beetle, southern chafer, European chafer, billbug, green June beetle)	bifenthrin 0.058% + carbaryl 2.3% (Duocide)	4-8 lb	Product must be watered in immediately after application to lawns. DO NOT apply more than 4 times per year to lawns. The minimum reapplication interval to lawns is 7 days. Will only kill pests present at the time of application. Pest must be directly contacted to be effective.
	carbaryl (GardenTech Sevin)	See label.	
	chlorantraniliprole (Acelepryn) G	1.15-2.3 lb	
	chlorantraniliprole (GrubEx1)	See label.	
	clothianidin (Arena) G WDG	See label.	Toxic to fish and aquatic invertebrates. DO NOT apply near or allow runoff into surface waters or intertidal areas.
	clothianidin + bifenthrin (Aloft) SC G	0.27-0.54 fl oz 1.8-3.6 lb	Toxic to fish and aquatic invertebrates. DO NOT apply near or allow runoff into surface waters or intertidal areas.
	dinotefuran (Zylam 20 SG)	1.0 fl oz	Make application prior to or during peak egg hatch.
	imidacloprid (Merit) (Advanced Lawn Grub Control)	See label.	
	imidacloprid + bifenthrin (Allectus)	See label	
	thiamethoxam (Meridian)	See label.	Highly toxic to aquatic invertebrates.
	thiamethoxam 11.6% + lambda-cyhalothrin 3.5% (Tandem)	See label.	Begin applications up to 45 days before the historical peak of adult flight to second instar grub of the species being targeted. For optimum control, treat from peak flight to peak egg hatch. Irrigate to move Tandem into the root zone. Full-season control of white grubs will be obtained with either a single 28 fl oz application or two 14 fl oz applications.
	trichlorfon* (Bayer Advanced)	See label.	
Millipede	various entomogenous nematode products	See label.	Must be <i>Heterorhabditid</i> species to be effective.
	bifenthrin 0.3% (Ortho)	See label.	
	bifenthrin 0.058% + carbaryl 2.3% (Duocide)	4-8 lb	Product must be watered in immediately after application to lawns. DO NOT apply more than 4 times per year to lawns. The minimum reapplication interval to lawns is 7 days. Will only kill pests present at the time of application. Pest must be directly contacted to be effective.
	carbaryl (GardenTech Sevin)	See label.	
	gamma-cyhalothrin (Spectracide)	See label.	
	lambda-cyhalothrin (Bonide)	See label.	
	other pyrethroids* (DeltaGard, Scimitar, Talstar, Tempo)	See label.	
	permethrin 10% (Hi-Yield)	See label.	
	zeta-cypermethrin + bifenthrin + imidacloprid (Triple Crown T&O, Triple Crown Golf)	10-20 fl oz/acre	Triple Crown Golf is a Restricted Use Pesticide .

HOME LAWN INSECT CONTROL

Pest	Insecticide and Formulation	Amount Per 1,000 Square Feet	Precautions and Remarks
Mole Cricket	bifenthrin 0.3% (Ortho)	See label.	
	bifenthrin 0.058% + carbaryl 2.3% (Duocide)	4-8 lb	Product must be watered in immediately after application to lawns. DO NOT apply more than 4 times per year to lawns. The minimum reapplication interval to lawns is 7 days. Will only kill pests present at the time of application. Pest must be directly contacted to be effective.
	carbaryl (various commercial bait formulations)	See label.	
	clothianidin + bifenthrin (Aloft) G SC	1.8-3.6 lb 0.27-0.54 fl oz	Toxic to fish and aquatic invertebrates. DO NOT apply near or allow runoff into surface waters or intertidal areas.
	cyfluthrin 0.75% (Bayer Advanced)	See label.	
	dinotefuran (Zylam 20 SG)	1 fl oz	Make application prior to or during peak egg hatch.
	fipronil (several products)	2 lb	Apply as a broadcast.
	gamma-cyhalothrin 0.08% (Spectracide)	See label.	
	imidacloprid (Advanced Lawn Grub Control, Merit)	See label.	
	indoxacarb (Advion Mole Cricket Bait) (Provaunt) SC	See label. 0.275 fl oz	
	lambda-cyhalothrin 0.5% (Bonide)	See label.	
	other pyrethroids* (DeltaGard, Menace, Scimitar, Talstar, Tempo)	See label.	
	permethrin 10% (Hi-Yield)	See label.	
	thiamethoxam 11.6% + lambda-cyhalothrin 3.5% (Tandem)	See label.	Apply from first egg hatch to peak egg hatch. Highly toxic to fish and aquatic invertebrates.
	various entomogenous nematode products	See label.	Requires irrigation.
	zeta-cypermethrin + bifenthrin + imidacloprid (Triple Crown T&O, Triple Crown Golf)	25-35 fl oz/acre	Triple Crown Golf is a Restricted Use Pesticide .
Slug, Snail	iron phosphate (Natria) bait	See label.	Apply in late afternoon.
	Mesurol 2% B	1 lb	Apply in late afternoon.
	metaldehyde	See label.	Apply in late afternoon.
Sod Webworm (also Burrowing Sod Webworm)	<i>Bacillus thuringiensis/B.t.</i> (various brands)	See label.	
	bifenthrin 0.3% (Ortho)	See label.	
	bifenthrin 0.058% + carbaryl 2.3% (Duocide)	2 lb	Product must be watered in immediately after application to lawns. DO NOT apply more than 4 times per year to lawns. The minimum reapplication interval to lawns is 7 days. Will only kill pests present at the time of application. Pest must be directly contacted to be effective.
	carbaryl (GardenTech Sevin)	See label.	DO NOT water sprays into soil. Use 6 gal water plus the insecticide per 1,000 sq ft. Treat in late afternoon. DO NOT cut grass for 1 to 3 days after treatment. Granules must be watered into soil.

*Several trade names available. Check label for active ingredient. Always follow label instructions.

HOME LAWN INSECT CONTROL

Pest	Insecticide and Formulation	Amount Per 1,000 Square Feet	Precautions and Remarks
Sod Webworm (also Burrowing Sod Webworm) (cont.)	chlorantraniliprole (GrubEx1)	See label.	
	cyfluthrin 0.75% (Bayer Advanced)	See label.	
	dinotefuran (Zylam 20 SG)	1 fl oz	
	gamma-cyhalothrin 0.08% (Spectracide)	See label.	
	halofenozide (Natural Guard Grub Control)	1.72 lb	DO NOT apply more than 3.4 lb (2 lb active ingredient) per 1,000 square feet per year regardless of pests controlled.
	lambda-cyhalothrin 0.5% (Bonide)	See label.	
	other pyrethroids* (DeltaGard, Scimitar, Talstar, Tempo)	See label.	
	permethrin 10% (Hi-Yield)	See label.	
	spinosad A and D (Conserve) SC	0.25-1.25 fl oz	Rate varies with size and species.
	thiamethoxam 11.6% + lambda-cyhalothrin 3.5% (Tandem)	See label.	Highly toxic to fish and aquatic invertebrates.
	trichlorfon* (Bayer Advanced)	See label.	Use sufficient water for good coverage.
	various entomogenous nematode and <i>B.t.</i> products	See label.	
Spittlebug and Leafhopper	zeta-cypermethrin + bifenthrin + imidacloprid (Triple Crown T&O, Triple Crown Golf)	10-15 fl oz/acre	Triple Crown Golf is a Restricted Use Pesticide .
	acephate* (Orthene T, T&O) 75 S	See label.	
	bifenthrin 0.3% (Ortho)	See label.	
	bifenthrin 0.058% + carbaryl 2.3% (Duocide)	2-4 lb	Cut grass to its recommended height and remove clippings prior to application. Various pyrethroid materials are available in a variety of homeowner formulations for use as broadspectrum contact insecticides. Common active ingredients include bifenthrin, cyfluthrin, cypermethrin, deltamethrin, lambda-cyhalothrin and permethrin.
	carbaryl (GardenTech Sevin)	See label.	
	deltamethrin (D-Fense SC)	See label.	
	gamma-cyhalothrin (Spectracide)	See label.	
	lambda-cyhalothrin (Bonide)	See label.	
	other pyrethroids* (DeltaGard, Scimitar, Talstar, Tempo)	See label.	For Duocide, the product must be watered in immediately after application to lawns. DO NOT apply more than 4 times per year to lawns. The minimum reapplication interval to lawns is seven days. Will only kill pests present at the time of application. Pest must be directly contacted to be effective.
	permethrin 10% (Hi-Yield)	See label.	
Ticks and Chiggers	zeta-cypermethrin + bifenthrin + imidacloprid (Triple Crown T&O, Triple Crown Golf)	10-20 fl oz/acre	Triple Crown Golf is a Restricted Use Pesticide .
	bifenthrin (Hi-Yield, Ortho)	See label.	
	bifenthrin 0.058% + carbaryl 2.3% (Duocide)	2-4 lb (chiggers ONLY)	The maximum application rate to kill ticks is 1.15 lb product per 1,000 square feet. Duocide must be watered in immediately after application to lawns. DO NOT apply more than 4 times per year to lawns. The minimum reapplication interval to lawns is 7 days. Will only kill pests present at the time of application. Pest must be directly contacted to be effective.
	carbaryl (GardenTech Sevin)	See label.	
	cyfluthrin 0.75% (Bayer Advanced)	See label.	
	deltamethrin (D-Fense SC, DeltaGard G)	See label.	DeltaGard G registered for ticks only.
	imidacloprid 0.72%+ beta-cyfluthrin 0.36% (Bayer Advanced)	See label.	
	gamma-cyhalothrin (Spectracide)	See label.	
	lambda-cyhalothrin (Bonide, Martin's)	See label.	
	zeta-cypermethrin + bifenthrin + imidacloprid (Triple Crown T&O, Triple Crown Golf)	20-35 fl oz/acre	Labeled for ticks ONLY . Triple Crown Golf is a Restricted Use Pesticide .

*Several trade names available. Check label for active ingredient. Always follow label instructions.

COMMERCIAL TURF AND GOLF COURSE INSECT CONTROL

The following table provides commercial turf and golf course insect control recommendations with pesticides for use by professional applicators.

All chemical information provided below is given with the understanding that no endorsement of named products is intended nor is criticism implied of similar products that are not mentioned. Individuals who use pesticides are responsible for ensuring that the intended use complies with current regulations and conforms to the product label. Before purchasing or using any pesticide, always read and carefully follow the label directions.

Insecticides listed below are identified by common chemical name. A trade name in parentheses may also be listed as a convenience for the reader. Pesticide labels for commercial and homeowner products that are currently registered for use in Arkansas may be found through the Arkansas Department of Agriculture/State Plant Board website by clicking on the following link: <https://www.agriculture.arkansas.gov/plant-industries/pesticide-section/registration/>

Pest	Insecticide and Formulation	Amount Per 1,000 Square Feet	Comments/Precautions
Ant	bifenthrin* (Menace, Talstar, others) F, GC and G formulations also available	0.5-1 fl oz	Use GC formulation for golf courses.
	bifenthrin 0.058% + carbaryl 2.3% (Duocide)	4-8 lb	Not for use on golf courses and sod farms. Product must be watered in immediately after application to lawns. DO NOT apply more than 4 times per year to lawns. The minimum reapplication interval to lawns is 7 days. Will only kill pests present at the time of application. Pest must be directly contacted to be effective.
	carbaryl* (Sevin 80 WSP)	See label.	
	chlorpyrifos* (Nufarm Chlorpyrifos)	See label.	See label. For use on golf course turf, turf and ornamentals around industrial buildings and turf and ornamentals in road medians. Restricted Use Pesticide.
	clothianidin + bifenthrin (Aloft)	See label.	
	GC SC	0.27-0.44 fl oz	
	LC SC	0.27-0.54 fl oz	
	GC G	1.8-3.6 lb	
	LC G	1.8-3.6 lb	
	cyfluthrin (Tempo 2)	0.143 fl oz	Home lawns only.
	cypermethrin* (Demon) TC	See label.	
	deltamethrin (DeltaGard) G	2-3 lb	
	fipronil 0.0143 G (Taurus G, Top Choice)	2 lb	
	fipronil 0.0143% + bifenthrin 0.23% + lambda-cyhalothrin 0.059% (Taurus Trio G)	2 lb	
	hydramethylnon* (Maxforce G, Amdro)	See label.	
Ant, Red Imported Fire	lambda-cyhalothrin* (Scimitar, Cyonara)	See label.	DO NOT make applications within 20 ft of any body of water. No reentry until spray has dried.
	zeta-cypermethrin + bifenthrin + imidacloprid (Triple Crown T&O, Triple Crown Golf)	0.46-0.80 fl oz	Triple Crown Golf is a Restricted Use Pesticide.
	Treatment is required to ship grass sod from quarantined to non-quarantined areas. Consult the Arkansas State Plant Board and USDA APHIS 81-25-001, "Imported Fire Ant: Quarantine Treatments for Nursery Stock, Grass Sod, and Related Materials," updated January 2015, for all rules and regulations pertaining to the Federal Imported Fire Ant quarantine and treatment requirements. The following insecticides are authorized by USDA for the treatment of regulated grass sod under the Imported Fire Ant (IFA) quarantine: bifenthrin (liquid), chlorpyrifos (liquid), fipronil (granular).		
	Apply all bait products when ants are active and soil temperature is above 60 degrees F. DO NOT treat if rain is anticipated within 6 hours.		
	abamectin* (Award II)	1 lb/acre broadcast; no more than 4 lb/acre per year or 5-7 Tbsp per mound; no more than 12 mounds/acre	Changes in product labels and new products for insect control include acquisition of DuPont turf insecticides by Syngenta, including Acelepryn, Provaunt, Advion Fire Ant Bait, and Advion Insect Granules. Syngenta has a new fire ant active ingredient with the new product Award II Fire Ant Bait containing abamectin as the active ingredient. It is NOT labeled for use on horse farms as was the older Award product. Advion Insect Granules are still useful for insect control, including mole crickets, but this is a bait and should NOT be watered in after application. BASF released a new fire ant bait called Siesta with a new active ingredient metaflumizone.

*Several trade names available. Check label for active ingredient. Always follow label instructions.

COMMERCIAL TURF AND GOLF COURSE INSECT CONTROL

Pest	Insecticide and Formulation	Amount Per 1,000 Square Feet	Comments/Precautions
Ant, Red Imported Fire (cont.)	Treatment is required to ship grass sod from quarantined to non-quarantined areas. Consult the Arkansas State Plant Board and USDA APHIS 81-25-001, "Imported Fire Ant: Quarantine Treatments for Nursery Stock, Grass Sod, and Related Materials," updated January 2015, for all rules and regulations pertaining to the Federal Imported Fire Ant quarantine and treatment requirements. The following insecticides are authorized by USDA for the treatment of regulated grass sod under the Imported Fire Ant (IFA) quarantine: bifenthrin (liquid), chlorpyrifos (liquid), fipronil (granular).		
	Apply all bait products when ants are active and soil temperature is above 60 degrees F. DO NOT treat if rain is anticipated within 6 hours.		
	acephate* (Lesco-Fate)	See label.	Distribute uniformly over mound. For best results, apply early in morning or late afternoon.
	(Orthene T, T&O) 75 S	1-2 tsp/mound	
	(Ortho Orthene Fire Ant Killer1) 50 S	1 Tbsp/mound	Distribute uniformly 5 to 7 level tablespoons of bait 3 to 4 feet around base of each mound.
	(Precise 4G)	See label.	
	avermectin/B1 (Affirm) 0.011% bait	5-7 Tbsp/mound	Not for use on golf courses and sod farms. Product must be watered in immediately after application to lawns. DO NOT apply more than 4 times per year to lawns. The minimum reapplication interval to lawns is seven days. Will only kill pests present at the time of application. Pest must be directly contacted to be effective.
	bifenthrin 0.058% + carbaryl 2.3% (Duocide)	4-8 lb	
	chlorpyrifos* (Nufarm Chlorpyrifos)	See label.	See label. For use on golf course turf, turf and ornamentals around industrial buildings; turf and ornamentals in road medians. Restricted Use Pesticide.
	chlorpyrifos (Dursban Pro)	See label.	Single mound treatment ONLY.
	clothianidin + bifenthrin (Aloft)	See label.	Apply as a broadcast. May treat up to 4 times per year. Broadcast only.
	GC SC	0.27-0.44 fl oz	
	LC SC	0.27-0.54 fl oz	The fipronil products have the same active ingredient but are different formulations; read and follow the label.
	GC G	1.8-3.6 lb	
	LC G	1.8-3.6 lb	
	fipronil (Maxforce FC) 0.00045%	See label.	The fipronil products have the same active ingredient but are different formulations; read and follow the label.
	(Taurus G, Top Choice) 0.0143G	87 lb/acre	
	(Chipco Choice) 0.1% granular contact insecticide	12.5 lb/acre	Rate varies with pest. Different formulations for different sites.
	fipronil 0.0143% + bifenthrin 0.23% + lambda-cyhalothrin 0.059% (Taurus Trio G)	87lbs/acre	
	imidacloprid + bifenthrin (Allectus)	See label.	Single mound treatment rate. Broadcast rate.
	hydramethylnon (Amdro, Amdro Pro, MaxForce Fire Ant Granular Bait)	2-5 Tbsp/mound 2 lb/acre	
	indoxacarb (Advion) fire ant bait 0.045%	4 Tbsp/mound 1.5 lb/acre	DO NOT apply to top of mound. Distribute uniformly 3 to 4 feet around mound. Broadcast rate.
	metaflumizone (Siesta Fire Ant Bait) 0.063%	1.0-1.5 lb/acre 2-4 Tbsp/mound	Broadcast rate. Single mound treatment rate. DO NOT exceed 6.0 lb/acre total or 4 applications in a one-year period.
	pyrethroids (various brands) bifenthrin (Menace, Talstar, others) F and G formulations also available cyfluthrin (Tempo) deltamethrin (DeltaGard) G lambda-cyhalothrin (Scimitar, Cyonara)	See label.	

COMMERCIAL TURF AND GOLF COURSE INSECT CONTROL

Pest	Insecticide and Formulation	Amount Per 1,000 Square Feet	Comments/Precautions
Ant, Red Imported Fire (cont.)	pyriproxyfen (Distance)	1-4 Tbsp/mound 1.0-1.5 lb/acre	Single mound treatment rate Broadcast rate This is an IGR.
	S-methoprene (Extinguish)	3-5 Tbsp/mound 1.0-1.5 lb/acre	Single mound treatment rate Broadcast rate This is an IGR.
	S-methoprene + hydramethylnon (Extinguish Plus)	3-5 Tbsp/mound 1.0-1.5 lb/acre	Single mound treatment rate. Broadcast rate. This is an IGR plus a toxicant.
	spinosad 0.015% (Conserve Fire Ant Bait)	2.5-5.0 lb/acre	
	spinosad (Conserve SC)	0.1 fl oz/gal/mound	Dilute 0.1 fluid ounce in 1 gallon water. Use 1-2 gallons per mound.
	zeta-cypermethrin + bifenthrin + imidacloprid (Triple Crown T&O, Triple Crown Golf)	0.46-0.80 fl oz	Triple Crown Golf is a Restricted Use Pesticide .
Bee and Wasp (burrowing)	carbaryl* (Sevin 80 WSP)	See label.	
	acephate* (Orthene 75WP, Surrender, & others)	1-2 tsp/hole (do not exceed this amount in 1 sq ft)	Apply in late afternoon or early evening at insect entrance/exit holes.
	chlorpyrifos* (Nufarm Chlorpyrifos)	See label.	See label. For use on golf course turf, turf and ornamentals around industrial buildings and turf and ornamentals in road medians. Restricted Use Pesticide .
	pyrethroids (Advanced Garden, DeltaGard, Menace, Scimitar, Talstar, Tempo)	See label.	
Billbug	bifenthrin* (Menace, Talstar, others) F, GC and G formulations also available	0.25-0.5 fl oz	Use GC formulation for golf courses.
	carbaryl (Sevin SL)	6 oz/1000 sq ft	Bluegrass billbug larvae ONLY.
	chlorantraniliprole (Acelepryn)	0.184 to 0.46 fl oz	
	chlorpyrifos* (Nufarm Chlorpyrifos)	See label.	See label. For use on golf course turf, turf and ornamentals around industrial buildings and turf and ornamentals in road medians. Restricted Use Pesticide .
	clothianidin (Arena) 0.5 G 50 WDG	14-22 oz 0.15-0.22 oz	
	clothianidin + bifenthrin (Aloft) GC SC LC SC GC G LC G	See label. 0.27-0.44 fl oz 0.27-0.54 fl oz 1.8-3.6 lb 1.8-3.6 lb	
	cyantraniliprole (Ference)	0.28 fl oz	Monitor for adults, apply at peak activity. Apply approximately 7 to 14 days after adulticide to target larvae.
	deltamethrin (DeltaGard) G	2-3 lb	
	dinotefuran (Zylam) 20 SG	1 oz	For optimum control of billbugs and annual bluegrass weevil, make application to or during egg hatch of the target pest.
	imidacloprid* (Merit) 75 WSP	3-4 level tsp	Make application prior to egg hatch.

*Several trade names available. Check label for active ingredient. Always follow label instructions.

COMMERCIAL TURF AND GOLF COURSE INSECT CONTROL

Pest	Insecticide and Formulation	Amount Per 1,000 Square Feet	Comments/Precautions
Billbug (cont.)	imidacloprid + bifenthrin (Allectus)	See label.	Rate varies with pest. Different formulations for different sites.
	lambda-cyhalothrin* (Scimitar, Cyonara)	See label.	Observe restrictions near water.
	thiamethoxam (Meridian) 0.33 G 25 WG	60-80 lb/acre 12.7-17 oz/acre	Optimum control when applied from peak flight of adults to peak of egg hatch. Also suppresses mole crickets and chinch bugs.
	trichlorfon Dylox 420 SL	4.6-6.9 fl oz/1000 sq ft (200-300 fl oz/A)	For use on residential and golf course turf only. Post-application irrigation required. Not for sod farm use.
	Dylox 6.2 G	3 lb/1000 sq ft or 130 lb/A	
	zeta-cypermethrin + bifenthrin + imidacloprid (Triple Crown T&O, Triple Crown Golf)	10-20 fl oz/acre	Triple Crown Golf is a Restricted Use Pesticide .
Chinch Bug	acephate* (Orthene T, T&O) 75 S	1.2-2.4 oz	
	<i>Beauveria bassiana</i> (Botanigard, Naturalis-T)	See label.	
	bifenthrin* (Menace, Talstar, others) F, GC and G formulations also available	0.25-0.5 fl oz	Use GC formulation for golf courses.
	bifenthrin 0.058% + carbaryl 2.3% (Duocide)	2-4 lb	Not for use on golf courses and sod farms. Product must be watered in immediately after application to lawns. DO NOT apply more than 4 times per year to lawns. The minimum reapplication interval to lawns is 7 days. Will only kill pests present at the time of application. Pest must be directly contacted to be effective.
	carbaryl* (Sevin SL)	See label.	
	chlorantraniliprole (Acelepryn)	0.184-0.46 fl oz	Suppression.
	chlorpyrifos* (Nufarm Chlorpyrifos)	See label.	See label. For use on golf course turf, turf and ornamentals around industrial buildings and turf and ornamentals in road medians. Restricted Use Pesticide.
	clothianidin (Arena) 0.25 G, 50 WDG	See label.	
	clothianidin + bifenthrin (Aloft) GC SC LC SC GC G LC G	See label. 0.27-0.44 fl oz 0.27-0.54 fl oz 1.8-3.6 lb 1.8-3.6 lb	
	cyfluthrin (Tempo and other formulations)	See label.	
	cypermethrin (Demon) TC	0.33 to 0.65 fl oz	
	deltamethrin (DeltaGard) G	2-3 lb	
	dinotefuran (Zylam) 20 SG	1 oz	For suppression of chinch bugs, make application prior to hatching of the first instar nymphs.
	imidacloprid + bifenthrin (Allectus)	See label.	Rate varies with pest. Different formulations for different sites.
	lambda-cyhalothrin* (Scimitar, Cyonara)	See label.	DO NOT make applications within 20 ft of any body of water. No reentry until spray has dried.
	permethrin* (Astro)	0.4-0.8 fl oz	

COMMERCIAL TURF AND GOLF COURSE INSECT CONTROL

Pest	Insecticide and Formulation	Amount Per 1,000 Square Feet	Comments/Precautions
Chinch Bug (cont.)	trichlorfon (Dylox 420 SL)	4.6-6.9 fl oz/1000 sq ft (200-300 fl oz/A)	Post-application irrigation required.
	zeta-cypermethrin + bifenthrin + imidacloprid (Triple Crown T&O, Triple Crown Golf)	20 to 35 fl oz/Acre	Triple Crown Golf is a Restricted Use Pesticide .
Cutworm, Armyworm	acephate* (Orthene T, T&O)	1.2-2.4 oz	Commercial and residential turf only.
	azadirachtin* (Neemix, Turplex)	See label.	
	bifenthrin* (Menace, Talstar, others) F, GC and G formulations also available	0.18-0.25 fl oz	Use GC formulation for golf courses.
	bifenthrin 0.058% + carbaryl 2.3% (Duocide)	2 lb	Not for use on golf courses and sod farms. Product must be watered in immediately after application to lawns. DO NOT apply more than 4 times per year to lawns. The minimum reapplication interval to lawns is 7 days. Will only kill pests present at the time of application. Pest must be directly contacted to be effective.
	<i>B.t.</i> products (various labels)	See label.	
	carbaryl* baits	0.75-1.5 oz	Treat in late afternoon. Apply in adequate water for good coverage but do not flood or water in. DO NOT cut grass for 1 to 3 days after treatment.
	carbaryl* (Sevin) 80 WSP	See label.	
	chlorantraniliprole (Acelepryn)	0.046-0.092 fl oz	
	chlorpyrifos* (Nufarm Chlorpyrifos)	See label.	See label. For use on golf course turf, turf and ornamentals around industrial buildings and turf and ornamentals in road medians. Restricted Use Pesticide.
	clothianidin (Arena) 0.5 G 50 WDG	1.4-1.8 oz 0.2-0.3 oz	Cutworms only.
	clothianidin + bifenthrin (Aloft)	See label.	
	cyfluthrin (Tempo and other formulations)	See label.	
	deltamethrin (DeltaGard) G	2-3 lb	
	dinotefuran (Zylam) 20 SG	1 oz	Cutworm only.
	entomogenous nematodes*	See label.	Read and follow special application instructions. Effective only against small cutworms.
	imidacloprid + bifenthrin (Allectus)	See label.	Rate varies with pest. Different formulations for different sites.
	indoxacarb (Provaunt) WDG	See label.	Not labeled for use on sod farms.
	lambda-cyhalothrin* (Scimitar, Cyonara)	See label.	DO NOT make applications within 20 ft of any body of water. No reentry until spray has dried.
	spinosad (Conserve SC)	0.25-1.2 fl oz	Rate varies with size and species.
	trichlorfon (Dylox) 420 SL	4.6-6.9 fl oz/1000 sq ft (200-300 fl oz/A)	For use on residential and golf course turf only. Post-application irrigation required. Not for sod farm use.
	zeta-cypermethrin + bifenthrin + imidacloprid (Triple Crown T&O, Triple Crown Golf)	10-15 fl oz/acre	Triple Crown Golf is a Restricted Use Pesticide . To ensure optimal control of eriophyid mites, apply in combination with the labeled application rate of a surfactant. A second application, five to seven days after the first, may be necessary to achieve acceptable control.

*Several trade names available. Check label for active ingredient. Always follow label instructions.

COMMERCIAL TURF AND GOLF COURSE INSECT CONTROL

Pest	Insecticide and Formulation	Amount Per 1,000 Square Feet	Comments/Precautions
Earthworm			Usually not a problem. No effective controls available.
Eriophyid Mites (zoysiagrass mite and bermudagrass stunt mite)	azadirachtin (Azatrol)	See label.	Registered for use on eriophyid mites in turfgrass.
	bifenthrin (Bifenthrin 2EC, Quali-Pro Bifenthrin, Talstar F)	See label.	Registered for use on eriophyid mites in turfgrass.
	chlorpyrifos* (Nufarm Chlorpyrifos)	See label.	See label. For use on golf course turf, turf and ornamentals around industrial buildings and turf and ornamentals in road medians. Restricted Use Pesticide.
	deltamethrin (DeltaGard T&O 5SC)	See label.	Registered for use on eriophyid mites in turfgrass.
	imidacloprid + bifenthrin (Allectus GC SC),	See label.	Registered for use on eriophyid mites in turfgrass.
	lambda-cyhalothrin* (Quali-Pro Lambda GC-O, Scimitar)	See label.	Registered for use on eriophyid mites in turfgrass.
	zeta-cypermethrin + bifenthrin + imidacloprid (Triple Crown T&O, Triple Crown Golf)	10-20 fl oz/acre	Triple Crown Golf is a Restricted Use Pesticide . To ensure optimal control of eriophyid mites, apply in combination with the labeled application rate of a surfactant. A second application, five to seven days after the first, may be necessary to achieve acceptable control.
Fall Armyworm	acephate* (Orthene T, T&O)	0.5-1.2 oz	Water into soil immediately after application.
	bifenthrin 0.058% + carbaryl 2.3% (Duocide)	2 lb	Not for use on golf courses and sod farms. Product must be watered in immediately after application to lawns. DO NOT apply more than 4 times per year to lawns. The minimum reapplication interval to lawns is 7 days. Will only kill pests present at the time of application. Pest must be directly contacted to be effective.
	chlorantraniliprole (Acelepryn)	0.046-0.092 fl oz	
	chlorpyrifos* (Nufarm Chlorpyrifos)	See label.	See label. For use on golf course turf, turf and ornamentals around industrial buildings and turf and ornamentals in road medians. Restricted Use Pesticide.
	indoxacarb (Provaunt WDG)	See label.	Not labeled for use on sod farms.
	pyrethroids* (Advanced Garden, DeltaGard, Menace, Scimitar, Talstar, Tempo, Cyonara)	See label.	
	spinosad (Conserve) SC	0.25 to 1.2 fl oz	Rate varies with size and species.
	zeta-cypermethrin + bifenthrin + imidacloprid (Triple Crown T&O, Triple Crown Golf)	10-15 fl oz/acre	Triple Crown Golf is a Restricted Use Pesticide .
Grasshopper	acephate* (Orthene T, T&O)	0.5 oz	DO NOT mow turfgrass for at least 24 hours after application.
	bifenthrin 0.058% + carbaryl 2.3% (Duocide)	2-4 lb	Not for use on golf courses and sod farms. Product must be watered in immediately after application to lawns. DO NOT apply more than 4 times per year to lawns. The minimum reapplication interval to lawns is 7 days. Will only kill pests present at the time of application. Pest must be directly contacted to be effective.
	chlorpyrifos* (Nufarm Chlorpyrifos)	See label.	See label. For use on golf course turf, turf and ornamentals around industrial buildings and turf and ornamentals in road medians. Restricted Use Pesticide.
	deltamethrin (DeltaGard) G	2-3 lb	
	lambda-cyhalothrin* (Scimitar, Cyonara)	See label.	DO NOT make applications within 20 ft of any body of water. No reentry until spray has dried.
	zeta-cypermethrin + bifenthrin + imidacloprid (Triple Crown T&O, Triple Crown Golf)	10-20 fl oz/acre	Triple Crown Golf is a Restricted Use Pesticide .

COMMERCIAL TURF AND GOLF COURSE INSECT CONTROL

Pest	Insecticide and Formulation	Amount Per 1,000 Square Feet	Comments/Precautions
Ground Pearl			No effective control; practice good management.
Grub (white, May beetle, chafers, green June beetle, others)	bifenthrin 0.058% + carbaryl 2.3% (Duocide)	4-8 lb	Not for use on golf courses and sod farms. Product must be watered in immediately after application to lawns. DO NOT apply more than 4 times per year to lawns. The minimum reapplication interval to lawns is 7 days. Will only kill pests present at the time of application. Pest must be directly contacted to be effective.
	carbaryl* (Sevin 80 WSP)	See label.	
	chlorantraniliprole (Acelepryn)	0.184-0.367 fl oz	Optimal control when applied at egg hatch. Use higher rates later in summer.
	chlorpyrifos* (Nufarm Chlorpyrifos)	See label.	See label. For use on golf course turf, turf and ornamentals around industrial buildings and turf and ornamentals in road medians. Restricted Use Pesticide.
	clothianidin (Arena)		Mole cricket suppression.
	0.5 G	14-22 oz	
	50 WDG	0.15-0.22 oz	
	clothianidin + bifenthrin (Aloft)	See label.	
	dinotefuran (Zylam) 20 SG	1 oz	Apply at egg hatch.
	imidacloprid* (Merit) 75 WP	3-4 level tsp	Make application prior to egg hatch. (Offers some suppression of caterpillars.)
	imidacloprid + bifenthrin (Allectus)	See label.	Rate varies with pest. Different formulations for different sites.
	thiamethoxam (Meridian)		Optimum control when applied from peak flight of adults to peak of egg hatch. Also suppresses mole crickets and chinch bugs.
	0.33 G	60-80 lb/acre	
	25 WG	12.7-17 oz/acre	
	trichlorfon (Dylox) 420 SL	4.6-6.9 fl oz/1000 sq ft (200-300 fl oz/A)	For use on residential and golf course turf only. Post-application irrigation required. Not for sod farm use.
Grub, Green June Beetle (only)	bifenthrin 0.058% + carbaryl 2.3% (Duocide)	4-8 lb	Not for use on golf courses and sod farms. Product must be watered in immediately after application to lawns. DO NOT apply more than 4 times per year to lawns. The minimum reapplication interval to lawns is 7 days. Will only kill pests present at the time of application. Pest must be directly contacted to be effective.
	carbaryl* (Sevin 80 WSP)	See label.	
	chlorantraniliprole (Acelepryn)	0.184-0.367 fl oz	Optimal control when applied at egg hatch. Use higher rates later in summer.
	chlorpyrifos* (Nufarm Chlorpyrifos)	See label.	See label. For use on golf course turf, turf and ornamentals around industrial buildings and turf and ornamentals in road medians. Restricted Use Pesticide.
	clothianidin (Arena)		Mole cricket suppression.
	0.5 G	14-22 oz	
	50 WDG	0.15-0.22 oz	
	clothianidin + bifenthrin (Aloft)	See label.	
	dinotefuran (Zylam) 20 SG	1 oz	Apply at egg hatch.
	imidacloprid* (Merit) 75 WP	3-4 level tsp	Make application prior to egg hatch. DO NOT use on sod farms. (Offers some suppression of caterpillars.)
	imidacloprid + bifenthrin (Allectus)	See label.	Rate varies with pest. Different formulations for different sites.
	thiamethoxam (Meridian)		Optimum control when applied from peak flight of adults to peak of egg hatch. Also suppresses mole crickets and chinch bugs.
	0.33 G	60-80 lb/acre	
	25 WG	12.7-17 oz/acre	

*Several trade names available. Check label for active ingredient. Always follow label instructions.

COMMERCIAL TURF AND GOLF COURSE INSECT CONTROL

Pest	Insecticide and Formulation	Amount Per 1,000 Square Feet	Comments/Precautions
Grub (Japanese beetle)	<i>B.t.</i> (various products)	See label.	
	bifenthrin 0.058% + carbaryl 2.3% (Duocide)	4-8 lb	Not for use on golf courses and sod farms. Product must be watered in immediately after application to lawns. DO NOT apply more than 4 times per year to lawns. The minimum reapplication interval to lawns is 7 days. Will only kill pests present at the time of application. Pest must be directly contacted to be effective.
	carbaryl* (Sevin 80 WSP)	See label.	
	chlorantraniliprole (Acelepryn)	0.184-0.367 fl oz	Optimal control when applied at egg hatch. Use higher rates later in summer.
	chlorpyrifos* (Nufarm Chlorpyrifos)	See label.	See label. For use on golf course turf, turf and ornamentals around industrial buildings and turf and ornamentals in road medians. Restricted Use Pesticide.
	clothianidin (Arena)		Mole cricket suppression.
	0.5 G	14-22 oz	
	50 WDG	0.15-0.22 oz	
	clothianidin + bifenthrin (Aloft)	See label.	
	dinotefuran (Zylam) 20 SG	1 oz	Apply at egg hatch.
	imidacloprid* (Merit) 75 WP	3-4 level tsp	Make application prior to egg hatch. (Offers some suppression of caterpillars.)
	imidacloprid + bifenthrin (Allectus)	See label.	Rate varies with pest. Different formulations for different sites.
Leafhopper, Spittlebug	thiamethoxam (Meridian)		Optimum control when applied from peak flight of adults to peak of egg hatch. Also suppresses mole crickets and chinch bugs.
	0.33 G	60-80 lb/acre	
	25 WG	12.7-17 oz/acre	
	trichlorfon (Dylox) 420 SL	4.6-6.9 fl oz/1000 sq ft (200-300 fl oz/A)	For use on residential and golf course turf only. Post-application irrigation required. Not for sod farm use.
	acephate* (Orthene T, T&O) 75 S	1 oz	
	bifenthrin* (Menace, Talstar, others) F, GC and G forms also available	0.25-0.5 fl oz	Use GC formulation for golf courses.
	bifenthrin 0.058% + carbaryl 2.3% (Duocide)	2-4 lb	Not for use on golf courses and sod farms. Product must be watered in immediately after application to lawns. DO NOT apply more than 4 times per year to lawns. The minimum reapplication interval to lawns is 7 days. Will only kill pests present at the time of application. Pest must be directly contacted to be effective.
	carbaryl* (Sevin 80 WSP)	See label.	
	chlorpyrifos* (Nufarm Chlorpyrifos)	See label.	See label. For use on golf course turf, turf and ornamentals around industrial buildings and turf and ornamentals in road medians. Restricted Use Pesticide.
	deltamethrin (DeltaGard) G	2-3 lb	
	zeta-cypermethrin + bifenthrin + imidacloprid (Triple Crown T&O, Triple Crown Golf)	10-20 fl oz/acre	Triple Crown Golf is a Restricted Use Pesticide.
Millipede	bifenthrin* (Menace, Talstar, others) F, GC and G forms also available	0.25-0.5 fl oz	Use GC formulation for golf courses.
	bifenthrin 0.058% + carbaryl 2.3% (Duocide)	4-8 lb	Not for use on golf courses and sod farms. Product must be watered in immediately after application to lawns. DO NOT apply more than 4 times per year to lawns. The minimum reapplication interval to lawns is 7 days. Will only kill pests present at the time of application. Pest must be directly contacted to be effective.

COMMERCIAL TURF AND GOLF COURSE INSECT CONTROL

Pest	Insecticide and Formulation	Amount Per 1,000 Square Feet	Comments/Precautions
Millipede (cont.)	carbaryl* (Sevin 80 WSP)	See label.	
	chlorpyrifos* (Nufarm Chlorpyrifos)	See label.	See label. For use on golf course turf, turf and ornamentals around industrial buildings and turf and ornamentals in road medians. Restricted Use Pesticide.
	cypermethrin (Demon) TC	See label.	For use on golf courses. See new label.
	lambda-cyhalothrin* (Scimitar, Cyonara)	See label.	DO NOT make applications within 20 ft of any body of water. No reentry until spray has dried.
	zeta-cypermethrin + bifenthrin + imidacloprid (Triple Crown T&O, Triple Crown Golf)	10-20 fl oz/acre	Triple Crown Golf is a Restricted Use Pesticide.
Mole Cricket	acephate* (Orthene T, T&O, Lesco-Fate)	1.0-1.9 oz	Water soil before application. DO NOT water into soil.
	bifenthrin* (Menace, Talstar, others) F, GC and G forms also available	0.5-1.0 fl oz	Use GC formulation for golf course.
	bifenthrin 0.058% + carbaryl 2.3% (Duocide)	4-8 lb	Not for use on golf courses and sod farms. Product must be watered in immediately after application to lawns. DO NOT apply more than 4 times per year to lawns. The minimum reapplication interval to lawns is 7 days. Will only kill pests present at the time of application. Pest must be directly contacted to be effective.
	carbaryl* baits	See label.	
	chlorpyrifos* (Nufarm Chlorpyrifos)	See label.	See label. For use on golf course turf, turf and ornamentals around industrial buildings and turf and ornamentals in road medians. Restricted Use Pesticide.
	cyfluthrin* (Tempo Ultra)	0.2 fl oz	
	deltamethrin (DeltaGard) G	2-3 lb	
	dinotefuran (Zylam) 20 SG	1 oz	Apply at egg hatch.
	entomogenous nematodes*	See label.	Various formulations now available. Adequate soil moisture critical for good control.
	fipronil (Chipco Choice) 0.1 G (Taurus G, Top Choice) 0.0143	12.5-25 lb/acre 2 lb	Use slit placement equipment. Apply as a broadcast.
	imidacloprid (Merit) 75 WP 0.5G	4 level tsp 1.8 lb	Apply while crickets are less than 1/2 inch long (June, early July).
	imidacloprid + bifenthrin (Allectus)	See label.	Rate varies with pest. Different formulations for different sites.
	indoxacarb (Advion) mole cricket bait 0.22%	1.15-4.6 lb 50-200 lb/acre	Not for use on sod farms.
	indoxacarb (Provaunt)	0.275 oz	Must be in possession of a supplemental label for this use at the time of application.
	lambda-cyhalothrin* (Scimitar, Cyonara)	See label.	DO NOT make applications within 20 ft of any body of water. No reentry until spray has dried.
	trichlorfon (Dylox) 420 SL	4.6-6.9 fl oz/1000 sq ft (200-300 fl oz/A) 3 lb/1000 sq ft or 130 lb/A	For use on residential and golf course turf only. Post-application irrigation required. Not for sod farm use.
	6.2 G		
	zeta-cypermethrin + bifenthrin + imidacloprid (Triple Crown T&O, Triple Crown Golf)	20-35 fl oz/acre	Triple Crown Golf is a Restricted Use Pesticide.
Slug, Snail	Mesuroil 2 B	1 lb	Apply late in afternoon.
	metaldehyde	See label.	

*Several trade names available. Check label for active ingredient. Always follow label instructions.

COMMERCIAL TURF AND GOLF COURSE INSECT CONTROL

Pest	Insecticide and Formulation	Amount Per 1,000 Square Feet	Comments/Precautions
Sod Webworm	acephate* (Lesco-Fate, Orthene T, T&O) (Precise 4G)	0.5-1.0 oz 2.8 lb	Home lawns only. Irrigate immediately.
	azadirachtin* (Azatrol, Neemix, Turplex)	0.5 fl oz	
	<i>Bacillus thuringiensis</i> (various brands)	1-2 lb/acre	
	bifenthrin* (Menace, Talstar, others) F, GC and G formulations also available	0.18-0.25 fl oz	Use GC formulation for golf courses.
	bifenthrin 0.058% + carbaryl 2.3% (Duocide)	2 lb	Not for use on golf courses and sod farms. Product must be watered in immediately after application to lawns. DO NOT apply more than 4 times per year to lawns. The minimum reapplication interval to lawns is 7 days. Will only kill pests present at the time of application. Pest must be directly contacted to be effective.
	carbaryl* (Sevin 80 WSP)	See label.	
	chlorantraniliprole (Acelepryn)	0.046-0.092 fl oz	
	chlorpyrifos* (Nufarm Chlorpyrifos)	See label.	See label. For use on golf course turf, turf and ornamentals around industrial buildings and turf and ornamentals in road medians. Restricted Use Pesticide.
	clothianidin (Arena) 0.5 G 50 WDG	14-22 oz 0.15-0.22 oz	
	clothianidin + bifenthrin (Aloft)	See label.	
	cyfluthrin* (Tempo Ultra)	0.143 fl oz	Irrigate immediately after application. DO NOT apply to newly seeded stands of bentgrass.
	deltamethrin (DeltaGard) G	2-3 lb	
	dinotefuran (Zylam) 20 SG	1 oz	
	imidacloprid + bifenthrin (Allectus)	See label.	Rate varies with pest. Different formulations for different sites.
	indoxacarb (Provaunt) SC	0.0625-0.25 fl oz	Not labeled for use on sod farms.
	lambda-cyhalothrin* (Scimitar, Cyonara)	See label.	DO NOT make applications within 20 ft of any body of water. No reentry until spray has dried.
	permethrin* (Astro)	0.4-0.8 fl oz	
	spinosad A and D (Conserve) SC	0.25-1.25 fl oz	Rate varies with size and species.
	trichlorfon (Dylox) 420 SL	4.6-6.9 fl oz/1000 sq ft (200-300 fl oz/A)	For use on residential and golf course turf only. Post-application irrigation required. Not for sod farm use.
	zeta-cypermethrin + bifenthrin + imidacloprid (Triple Crown T&O, Triple Crown Golf)	10-15 fl oz/acre	Triple Crown Golf is a Restricted Use Pesticide.

*Several trade names available. Check label for active ingredient. Always follow label instructions.

COMMERCIAL TURF AND GOLF COURSE INSECT CONTROL

Pest	Insecticide and Formulation	Amount Per 1,000 Square Feet	Comments/Precautions
Sowbug, Pillbug	bifenthrin* (Talstar) F, GC and G forms also available	0.25-0.5 fl oz	Use GC formulation for golf courses.
	bifenthrin 0.058% + carbaryl 2.3% (Duocide)	8 lb	Not for use on golf courses and sod farms. Product must be watered in immediately after application to lawns. DO NOT apply more than 4 times per year to lawns. The minimum reapplication interval to lawns is 7 days. Will only kill pests present at the time of application. Pest must be directly contacted to be effective.
	carbaryl* (Carbaryl 4L, Sevin SL) (Sevin 80 WSP)	1.5-3 fl oz 2.5-5 lb/acre	
	chlorpyrifos* (Nufarm Chlorpyrifos)	See label.	See label. For use on golf course turf, turf and ornamentals around industrial buildings and turf and ornamentals in road medians. Restricted Use Pesticide.
	cypermethrin* (Demon) TC	See label.	
	deltamethrin (DeltaGard) G	2-3 lb/1,000 ft	
	lambda-cyhalothrin* (Scimitar, Cyonara)	See label.	DO NOT make applications within 20 ft of any body of water. No reentry until spray has dried.
	zeta-cypermethrin + bifenthrin + imidacloprid (Triple Crown T&O, Triple Crown Golf)	10-20 fl oz/acre	Triple Crown Golf is a Restricted Use Pesticide.
Spittlebugs	acephate* (Orthene 75WP) (Orthene 97)	1-1.9 oz/1000 sq ft 0.8-1.4 oz/10,000 sq ft	
	carbaryl (Sevin SL)	1.5-3 fl oz/1000 sq ft or 2-4 qt/A	
	bifenthrin (Onyx)	0.07-0.15 fl oz/1000 sq ft	Pyrethroids applied with sufficient volume of water have been effective but not always consistently so.
	deltamethrin (DeltaGard GC 5SC) (DeltaGard T&O 5 SC landscape turf only)	0.2-0.4 fl oz/1000 sq ft or 8.75-17.5 fl oz/A	Cut grass to its recommended height and remove clippings prior to application.

*Several trade names available. Check label for active ingredient. Always follow label instructions.

COMMERCIAL CHRISTMAS TREE PRODUCTION INSECT CONTROL

Pesticide labels for commercial and homeowner products that are currently registered for use in Arkansas may be found through the Arkansas Department of Agriculture/State Plant Board website by clicking on the following link: <https://www.agriculture.arkansas.gov/plant-industries/pesticide-section/registration/>

Insect or Mite	Insecticide and Formulations	Amount of Formulation Per Gallon of Spray	Amount Per 100 Gallons of Water	Minimum Interval (Hours) Between Application and Reentry	Precautions and Remarks
Adelgids (Balsam Woolly Adelgid, Cooley, Eastern Spruce Gall, Hemlock Woolly Adelgid)	bifenthrin 25% (Sniper)		3.9-12.8 oz/acre	12	Will also control twig aphids and spider mites but not rust mites.
	bifenthrin (OnyxPro)		See label.	12	See label.
	chlorpyrifos (Lorsban 4E, Nufos 4E)		1 qt/acre	24	DO NOT treat plants under extreme heat or drought stress. Control is achieved only when eggs and crawlers are not present.
	dimethoate (Dimethoate 400)		1 to 1.5 pt/acre	10 days	
	dinotefuran (Safari)		4-8 oz/100 gal	12	DO NOT apply more than 2.7 lb per acre.
	esfenvalerate (Asana XL)		5.8-9.6 oz/100 gal	12	Use full rate to control balsam woolly adelgid.
	imidacloprid (Pasada 1.6F, Provado 1.6 F)		4-8 oz/acre OR 2 oz/100 gal	12	Adding a spray adjuvant may improve coverage. DO NOT apply more than 40 oz/acre per year.
	lambda-cyhalothrin (Silencer,)		2.58-5.12 oz/acre	24	Maximum use 1.92 pt/acre per year.
	petroleum oil (Damoil)		2-4 gal/100 gal dormant use 1-3 gal/100 gal summer use	4	
	spirotetramat (Movento)		5-10 oz/acre	24	Maximum use 20 oz/acre per year. Use adjuvant to increase penetration.
	thiamethoxam (Flagship 25WG)		4 to 8.5 oz/100 gal or 8 to 17 oz/acre	12	Maximum use 17 oz/acre/year.
Ants	bifenthrin (OnyxPro)		See label.	12	See label.
	carbaryl (Sevin SL)		1 qt/acre	12	
	chlorpyrifos (Lorsban 4E)		1 qt/acre	24	DO NOT treat plants under extreme heat or drought stress.
	insecticidal soap (M-Pede)		1 to 2 gal/100 gal	12	May cause foliage discoloration.
Aphids (including balsam twig aphid and cinara aphid)	abamectin (Avid 0.15 EC)		8 oz/100 gal	12	DO NOT apply more than 16 oz or less than 8 oz per acre. To suppress aphids, spray must contact young immatures.
	acephate (Orthene Tree, Turf, & Ornamental) 97% Spray WSP		1/4 to 1/2 lb. (4 to 8 oz) 1/3 to 2/3 lb (5 1/3 to 10 2/3 oz)	24	Apply the specified amount of ORTHENE Turf, Tree & Ornamental in 100 gals. of water with a hydraulic sprayer. The addition of a suitable sticker improves control.
	azadirachtin (Aza-Direct)		1-2 pt/acre	4	Under extremely heavy pest pressure, up to 3 1/2 pt may be used.
	<i>Beauveria bassiana</i> (Naturalis L)	0.3-1.0 oz/gal	30-100 oz/100 gal	4	Spray immediately after mixing.
	bifenthrin 25% (Sniper)		3.9-12.8 oz/acre	12	Will also control twig aphid and spider mites but not rust mites.
	bifenthrin (OnyxPro)		See label.	12	See label.
	carbaryl (Sevin SL)		1 qt/acre	12	
	chlorpyrifos (Lorsban 4E, Nufos 4E)		1 qt/acre	24	DO NOT treat plants under extreme heat or drought stress.
	cinnamaldehyde (Cinnamite)	0.85 oz/gal	85 oz/100 gal	4	
	cyantraniliprole (Mainspring GNL)		See label.	4	No more than 32 fl oz per acre per year.
	dimethoate (Dimethoate 400)		1.0-1.5 pt/acre	10 days	
	esfenvalerate (Asana XL)		5.8-9.6 oz/100 gal	12	

COMMERCIAL CHRISTMAS TREE PRODUCTION INSECT CONTROL

Insect or Mite	Insecticide and Formulations	Amount of Formulation Per Gallon of Spray	Amount Per 100 Gallons of Water	Minimum Interval (Hours) Between Application and Reentry	Precautions and Remarks
Aphids (cont.) (including balsam twig aphid and cinara aphid)	flupyradifurone (Sivanto Prime)		7 to 14 oz/acre	4	Not for use in bare-ground plantations. May also control balsam woolly adelgid.
	imidacloprid (Pasada 1.6F, Provado 1.6 F)		4-8 oz/acre OR 2 oz/100 gal	12	Adding a spray adjuvant may improve control. DO NOT apply more than 40 oz/acre per year.
	insecticidal soap (M-Pede)		1 to 2 gal/100 gal	12	May cause foliage discoloration.
	lambda-cyhalothrin (Silencer)		2.58-5.12 oz/acre	24	Maximum use 1.92 pt/acre per year.
	(Warrior II)		1.28-2.56 oz/acre	24	
	mineral oil emulsion (TriTek)		1 to 2 gal/100 gal	4	Maintain agitation until solution is used.
	petroleum oil (Damoil)		2-4 gal/100 gal dormant use 1-3 gal/100 gal summer use	4	
	pymetrozine (Endeavor)		up to 10 oz/acre	12	Maximum use 20 oz/acre per year. Use adjuvant to increase penetration.
	spirotetramat (Movento)		5-10 oz/acre	24	
	thiamethoxam (Flagship 25WG)		4 to 8.5 oz/100 gal or 8 to 17 oz/acre	12	Maximum use 17 oz/acre/year.
Bagworm	acephate (Orthene Tree, Turf, & Ornamental) 97% Spray WSP		1/4 to 1/2 lb. (4 to 8 oz) 1/3 to 2/3 lb (5 1/3 to 10 2/3 oz)	24	Apply the specified amount of ORTHENE Turf, Tree & Ornamental in 100 gals. of water with a hydraulic sprayer. The addition of a suitable sticker improves control.
	azadirachtin (Aza-Direct)		1-2 pt/acre	4	Under extremely heavy pest pressure, up to 3 1/2 pt may be used.
	bifenthrin (OnyxPro)		See label.	12	See label.
	carbaryl (Sevin SL)		1 qt/acre	12	
	cyantraniliprole (Mainspring GNL)		See label.	4	No more than 32 fl oz per acre per year.
	diflubenzuron (Dimilin 25W)		2-4 oz/acre	12	Apply to early instars in mid to late June.
	dimethoate (Dimethoate 400)		1.0-1.5 pt/acre	10 days	
	lambda-cyhalothrin (Silencer)		2.58-5.12 oz/acre	24	Maximum use 1.92 pt/acre per year.
	(Warrior II)		1.28-2.56 oz/acre	24	
	spinosad (Conserve SC, SpinTor 2SC)		See label.	4	
	tebufenozide (Confirm 2F)		4-8 oz/acre	4	Apply to early instar larvae; foliage development should be a minimum of 20%. DO NOT apply more than 16 oz/acre per year.
Elongate Hemlock Scale and Cryptomeria Scale	bifenthrin 25% (Sniper)		3.9-12.8 oz/acre	12	Will also control twig aphid and spider mites but not rust mites.
	bifenthrin (OnyxPro)		See label.	12	See label.
	buprofezin (Talus 70 DF)		14 oz/acre	12	
	dimethoate (Dimethoate 400)		1.0-1.5 pt/acre	10 days	
	dinotefuran (Safari)		4-8 oz/100 gal	12	DO NOT apply more than 2.7 lb per acre.
	esfenvalerate (Asana XL)		5.8-9.6 oz/100 gal	12	Best results when mixed with dimethoate.

COMMERCIAL CHRISTMAS TREE PRODUCTION INSECT CONTROL

Insect or Mite	Insecticide and Formulations	Amount of Formulation Per Gallon of Spray	Amount Per 100 Gallons of Water	Minimum Interval (Hours) Between Application and Reentry	Precautions and Remarks
Elongate Hemlock Scale and Cryptomeria Scale (cont.)	mineral oil emulsion (TriTek)		1 to 2 gal/100 gal	4	Maintain agitation until solution is used.
	spirotetramat (Movento)		5 to 10 oz/acre	24	Maximum use 20 oz/acre/year. Use adjuvant to increase penetration.
European Pine Shoot Moth	azadirachtin (Aza-Direct)		1-2 pt/acre	4	Under extremely heavy pest pressure, up to 3 1/2 pt may be used.
	chlorpyrifos (Lorsban 4E)		1 qt/acre	24	DO NOT treat plants under extreme heat or drought stress.
	dimethoate (Dimethoate 400)		1.0-1.5 pt/acre	10 days	
	phosmet (Imidan 70-W)		1.3-1.5 lb/acre	13 days	
Midge (Douglas fir needle midge, pine needle midge)	acephate (Orthene Tree, Turf, & Ornamental) 97% Spray WSP		1/2 lb. (8 oz) 2/3 lb (10 2/3 oz)	24	Apply the specified amount of ORTHENE Turf, Tree & Ornamental in 100 gals. of spray per acre by ground.
	azadirachtin (Aza-Direct)		1 to 2 pts/acre	4	Under extremely heavy pest pressure up to 3.5 pints may be used.
	carbaryl (Sevin SL)		1 qt/acre	12	
	chlorpyrifos (Lorsban 4E)		1 qt/acre	24	Do not treat plants under extreme heat or drought stress.
	diflubenzuron (Dimilin 4L)		1 to 2 oz/acre	12	Apply when second generation instars are present or 70% of first generation pupal cases are empty.
	dimethoate (Dimethoate 400 or Clean Crop)		1 to 1 1/2 pt/acre	10 days	
	esfenvalerate (Asana XL)		5.8 to 9.6 oz/100 gal	12	
	permethrin (Permethrin 3.2 EC)		4 to 8 oz/acre	12	
	phosmet (Imidan 70-WSB)		1.3 to 1.5 lb/acre	13 days	
	tebufenozide (Confirm or Mimic 2LV)		8 oz/acre	4	Apply to early instar larvae after each foliage flush at approximately 25% foliage expansion. Allow at least 6 hours between application and rainfall to assure thorough spray drying.
Nantucket Pine Tip Moth	acephate (Orthene Tree, Turf, & Ornamental) 97% Spray WSP		3/4 lb. (12 oz) 1 lb (16 oz)	24	Apply the specified amount of ORTHENE Turf, Tree & Ornamental in 100 gals. of spray per acre by ground.
	azadirachtin (Aza-Direct)		1-2 pt/acre	4	Under extremely heavy pest pressure, up to 3 1/2 pt may be used.
	bifenthrin (OnyxPro)		See label.	12	See label.
	carbaryl (Sevin SL)		1 qt/acre	12	
	diflubenzuron (Dimilin 25W)		2-4 oz/acre	12	Apply when second generation instars are present or 70% of first generation pupal cases are empty.
	dimethoate (Dimethoate 400)		1.0-1.5 pt/acre	10 days	
	esfenvalerate (Asana XL)		5.8-9.6 oz/100 gal	12	Apply as needed for control. Spray sufficient gallonage to obtain good coverage of entire tree.
	lambda-cyhalothrin (Warrior II)		1.28-2.56 fl oz/A	12	Do not apply more than 15.36 fl oz/year. Thorough coverage is very important.

COMMERCIAL CHRISTMAS TREE PRODUCTION INSECT CONTROL

Insect or Mite	Insecticide and Formulations	Amount of Formulation Per Gallon of Spray	Amount Per 100 Gallons of Water	Minimum Interval (Hours) Between Application and Reentry	Precautions and Remarks
Nantucket Pine Tip Moth (cont.)	permethrin (Permethrin 3.2 EC, Pounce)		4-8 oz/100 gal	12	Begin applications when adults appear. Repeat applications may be made in 5- to 7-day intervals as needed.
	phosmet (Imidan 70-W)		1.3-1.5 lb/acre	13 days	
	spinosad (Conserve SC, SpinTor 2SC)		See label.	4	Apply to early instar larvae after each foliage flush at approximately 25% foliage expansion. Allow at least 6 hours between application and rainfall to ensure thorough spray drying.
	tebufenozide (Confirm)		8 oz/acre	4	
Pine Chafer	esfenvalerate (Asana XL)		5.8-9.6 oz/100 gal	12	Maximum use 1.92 pt/acre per year.
	lambda-cyhalothrin (Silencer)		2.58-5.12 oz/acre	24	
	(Warrior II)		1.28-2.56 oz/acre	24	
Rosette Bud Mite	dimethoate (Dimethoate 400)		1.3 pt/acre	10 days	See label. Maximum use 20 oz/acre per year. Use adjuvant to increase penetration.
	bifenthrin (OnyxPro)		See label.	12	
	spirotetramat (Movento)		5-10 oz/acre	24	
Rust Mite	abamectin (Ardent 0.15 EC)		4 oz/100 gal	12	See label.
	bifenthrin (OnyxPro)		See label.	12	
	carbaryl (Sevin SL)		1 qt/acre	12	
	chlorpyridan (Sanmite)		4 oz/100 gal OR 10.7 oz/acre	12	DO NOT treat plants under extreme heat or drought stress.
	chlorpyrifos (Lorsban 4E)		1 qt/acre	24	
	dimethoate (Dimethoate 400)		1.0-1.5 pt/acre	10 days	
	fenpyroximate (Akari 5SC)		24 oz/100 gal	12	May cause foliage discoloration.
	insecticidal soap (M-Pede)		1 to 2 gal/100 gal	12	
	mineral oil emulsion (TriTek)		1 to 2 gal/100 gal	4	
	petroleum oil (Damoil)		2-4 gal/100 gal dormant use 1-3 gal/100 gal summer use	4	Maintain agitation until solution is used.
	spirotetramat (Movento)		5-10 oz/acre	24	
Sawfly (redheaded pine, red pine, European pine)	acephate (Orthene Tree, Turf, & Ornamental) 97% Spray WSP		3/4 lb. (12 oz) 1 lb (16 oz)	24	Apply the specified amount of ORTHENE Turf, Tree & Ornamental in 100 gals. of spray per acre by ground.
	carbaryl (Sevin SL)		1 qt/acre	12	
	chlorpyrifos (Nufos 4E)		1 qt/acre	24	Apply to early instars.
	diflubenzuron (Dimilin 25W)		4-8 oz/acre	12	
	dinotefuran (Safari)		4 to 8 oz/100 gal	12	Do not apply more than 2.7 pounds per acre.
	esfenvalerate (Asana XL)		5.8-9.6 oz/100 gal	12	
	imidacloprid (Pasada 1.6F, Provado 1.6 F)		4-8 oz/acre OR 2 oz/100 gal	12	Adding a spray adjuvant may improve control. DO NOT apply more than 40 oz/acre per year.

COMMERCIAL CHRISTMAS TREE PRODUCTION INSECT CONTROL

Insect or Mite	Insecticide and Formulations	Amount of Formulation Per Gallon of Spray	Amount Per 100 Gallons of Water	Minimum Interval (Hours) Between Application and Reentry	Precautions and Remarks
Sawfly (cont.) (redheaded pine, red pine, European pine)	insecticidal soap (M-Pede)		1 to 2 gal/100 gal	12	May cause foliage discoloration.
	lambda-cyhalothrin (Silencer) (Warrior II)		2.58-5.12 oz/acre 1.28-2.56 oz/acre	24 24	Maximum use 1.92 pt/acre per year.
	malathion (Malathion 8 or Gowan)	2 Tbsp/gal	1 pt/100 gal	12	
	mineral oil emulsion (TriTek)		1 to 2 gal/100 gal	4	Maintain agitation until solution is used.
	phosmet (Imidan 70-W)		1.3-1.5 lb/acre	13 days	
	spinosad (Conserve SC, SpinTor 2SC)		See label.	4	
	thiamethoxam (Flagship 25WP)		4 to 8.5 oz/100 gal or 8 to 17 oz/acre	12	Maximum use 17 oz/acre/year.
Scale (cont.) (pine needle, pine tortoise, spruce bud, black pine, stripped pine) See also elongate hemlock scale	acephate (Orthene 75SP and others Tree and Ornamental Spray Formulations)		2/3 lb	24	
	azadirachtin (Aza-Direct)		1-2 pt/acre	4	Under extremely heavy pest pressure, up to 3 1/2 pint may be used.
	carbaryl (Sevin SL)		1 qt/acre	12	Controls crawlers only.
	chlorpyrifos (Lorsban 4E)		1 qt/acre	24	DO NOT treat plants under extreme heat and drought stress. Apply when scale crawlers are active.
	dinotefuran (Safari)		4-8 oz/100 gal	12	DO NOT apply more than 2.7 lb per acre.
	lambda-cyhalothrin (Silencer) (Warrior II)		2.58-5.12 oz/acre 1.28-2.56 oz/acre	24 24	Maximum use 1.92 pt/acre/year.
	mineral oil emulsion (TriTek)		1 to 2 gal/100 gal	4	Maintain agitation until solution is used.
	petroleum oil (Damoil)		2-4 gal/100 gal dormant use 1-3 gal/100 gal summer use	4	
	spirotetramat (Movento)		5 to 10 oz/acre	24	Maximum use 20 ounces/acre/year. Use adjuvant to increase penetration.
	spirodiclofen (Envidor 2SC)		18-24.7 oz/ 100 gal		
	Superior oil, 70 sec		2 gal/100 gal		Apply oil as dormant spray.
	thiamethoxam (Flagship 25WP)		4 to 8.5 oz/100 gal or 8 to 17 oz/acre	12	Maximum use 17 oz/acre/year.
Seed Bug	esfenvalerate (Asana XL or Adjourn)		9.6 oz/100 gal	12	
	lambda-cyhalothrin (Silencer, Warrior)		2.58-5.12 oz/acre	24	Maximum use 1.92 pt/acre per year.
	permethrin (Permethrin 3.2 EC)		30 oz/acre	12	
	phosmet (Imidan 70-WSB)		1.3 to 1.5 lb/acre	13 days	

COMMERCIAL CHRISTMAS TREE PRODUCTION INSECT CONTROL

Insect or Mite	Insecticide and Formulations	Amount of Formulation Per Gallon of Spray	Amount Per 100 Gallons of Water	Minimum Interval (Hours) Between Application and Reentry	Precautions and Remarks
Spider Mite (spruce spider mite)	abamectin (Ardent 0.15 EC)	0.3-1.0 oz/gal	4 oz/100 gal	12	
	abamectin (Avid 0.15 EC)		4-8 oz/100 gal	12	DO NOT apply more than 16 oz or less than 8 oz per acre.
	azadirachtin (Aza-Direct)		1 to 2 pts/acre	4	Under extremely heavy pest pressure up to 3½ pints may be used.
	<i>Beauveria bassiana</i> (Naturalis L)		30-100 oz/100 gal	4	Spray immediately after mixing.
	bifenazate (Floramite)		2-8 oz/100 gal	12	Add an adjuvant like Silwet L-77 or Slygard 309 to the Floramite solution.
	bifenthrin 25% (Sniper)	2 Tbsp/gal	3.9-12.8 oz/acre	12	Will also control twig aphids and spider mites but not rust mites.
	bifenthrin (OnyxPro)		See label.	12	See label.
	chloropyridan (Sanmite)		4 oz/100 gal OR 10.7 oz/acre	12	
	chlorpyrifos (Lorsban 4E, Nufos 4E)		1 qt/acre	24	DO NOT treat plants under extreme heat or drought stress. If eggs are present, reapply in 7 to 10 days to control newly hatched nymphs.
	clofentezine (Apollo SC)		4-8 oz/acre	12	Most effective when applied at first sign of mite activity and mite eggs.
	cinnamaldehyde (Cinnamite)		85 oz/100 gal	4	
	cyflumetofen (Sultan Miticide)		13.7 fl oz/100 gal	12	DO NOT exceed the maximum seasonal use rate of 27.4 fl oz of Sultan per crop growing cycle. DO NOT make more than two (2) applications of Sultan per crop per year.
	dimethoate (Dimethoate 400)		1.0-1.5 pt/acre	10 days	
	etoxazole (TetraSan 5 WDG)		8-16 oz/100 gal	12	TetraSan kills mite eggs and nymphs but not adult mites. Treated adults will not produce viable eggs.
	fenazaquin Magus		12 to 24 oz/100 gal	12	Do not exceed 24 oz per acre per year for outdoor applications.
	fenpyroximate (Akari 5 SC)		16-24 oz/100 gal	12	
	hexathiazox (Savey) 50 WP	3-6 oz/acre	2 oz/100 gal	12	DO NOT make more than one application per year.
	insecticidal soap (M-Pede)		1 to 2 gal/100 gal	12	May cause foliage discoloration.
	mineral oil emulsion (TriTek)		1 to 2 gal/100 gal	4	Maintain agitation until solution is used.
	propargite (Ornamite-CR)		3.0-7.5 lb/acre	7 days	No more than 3 applications per year. Compatibility restrictions.
	spirodichlofen (Envidor 2SC)		18-24.7 oz/acre	24	Make only 1 application per season.
	spiromesifen (Judo)		1-4 oz/100 gal	12	DO NOT apply more than 4 times per season.
Spittlebug	bifenthrin (OnyxPro)		See label.	12	See label.
	chlorpyrifos (Lorsban 4E)		1 qt/acre	24	DO NOT treat plants under extreme heat or drought stress.
	esfenvalerate (Asana XL)		5.8-9.6 oz/100 gal	12	
	lambda-cyhalothrin (Silencer)		2.58-5.12 oz/acre	24	Maximum use 1.92 pt/acre per year.
	(Warrior II)		1.28-2.56 oz/acre	24	

COMMERCIAL CHRISTMAS TREE PRODUCTION INSECT CONTROL

Insect or Mite	Insecticide and Formulations	Amount of Formulation Per Gallon of Spray	Amount Per 100 Gallons of Water	Minimum Interval (Hours) Between Application and Reentry	Precautions and Remarks
Spruce Needle Miner	chlorpyrifos (Lorsban 4E)		1 qt/acre	24	DO NOT treat plants under extreme heat or drought stress.
Weevil (pales, northern pine, pitch eating, root collar, white pine)	azadirachtin (Aza-Direct)		1-2 pt/acre	4	Under extremely heavy pest pressure, up to 3 1/2 pint may be used.
	bifenthrin (OnyxPro)		See label.	12	See label.
	chlorpyrifos (Lorsban 4E, Nufos 4E)	2 Tbsp/gal	3 qt/100 gal	24	Apply as a cut stump drench.
	diflubenzuron (Dimilin 25W)		See label.	12	Treat prior to egg deposition.
	esfenvalerate (Asana XL)		5.8-9.6 oz/100 gal	12	
	permethrin (Astro, etc.)		See label.	12	
	phosmet (Imidan 70-W)		1.3-1.5 lb/acre	13 days	
White Grub	chlorpyrifos (Lorsban 4E)		1 qt/acre	24	Incorporate into the soil if possible.
	imidacloprid (Admire Pro)		7-14 oz/acre	12	Maximum per season: 14 oz/acre.
	thiamethoxam (Flagship 25WG)		6 to 8.5 oz/100 gal or 12.7 to 17 oz/acre	12	Apply from adult flight through peak egg hatch. Maximum use 17 oz/acre/year.
Zimmerman Pine Moth	azadirachtin (Aza-Direct)		1-2 pt/acre	4	Under extremely heavy pest pressure, up to 3 1/2 pint may be used.
	bifenthrin (OnyxPro)		See label.	12	See label.
	diflubenzuron (Dimilin 25W)		4-8 oz/acre	12	Apply to early instars.
	dimethoate (Dimethoate 400)		1.0-1.5 pt/acre	10 days	
	tebufenozide (Confirm 2F)		4 to 8 oz/acre	4	Apply to early instar larvae; foliage development should be a minimum of 20%. Do not apply more than 16 oz per acre per year.

HOUSEHOLD AND STRUCTURAL PEST CONTROL – Products for Use by the General Public and Products for Professional Use Only

The following tables provide household and structural pest control recommendations with pesticides for use by the homeowner and with pesticides for use by licensed pest control operators only. Mention of pesticides in this section does not imply that chemicals are or should be the first or only means of control. Nonchemical control methods, including exclusion and sanitation, should always be considered when seeking to obtain a long-term solution to household pest problems.

All chemical information provided below is given with the understanding that no endorsement of named products is intended nor is criticism implied of similar products that are not mentioned. Individuals who use pesticides are responsible for ensuring that the intended use complies with current regulations and conforms to the product label. Before purchasing or using any pesticide, always read and carefully follow the label directions.

Insecticides listed below are identified by common chemical name. A trade name in parentheses may also be listed as a convenience for the reader. Pesticide labels for commercial and homeowner products that are currently registered for use in Arkansas may be found through the Arkansas Department of Agriculture/State Plant Board website by clicking on the following link: <https://www.agriculture.arkansas.gov/plant-industries/pesticide-section/registration/>

Formulation Designations: A = Aerosol (injectable or spray); B = Bait (gel or granular); CRS = Controlled Release Strip; D = Dust; F = Fogger (total release aerosol); FM = Foam; FU = Fumigant; G = Granular; P = Powder (for mixing with water); L = Liquid (for mixing with water or ready-to-use; RC (repellent coil); S = Bait (station). Restricted Use Pesticides designated with “RUP”

Pests	Insecticide	Formulation	Precautions and Remarks
ANT	abamectin	S	Place bait stations in areas where ants are active. Keep out of reach of children and pets. Use dust formulations only in inaccessible areas. Treat ant-traveled areas. Repeat treatment as effectiveness diminishes. Some products are not suitable for use in residential kitchens or commercial food/feed preparation sites. Read the product label carefully. Remove food from storage areas before treating. Apply products as directed on the label.
(a) Indoors (For information on Carpenter Ants , see entry.)	alpha cypermethrin (Fendona CS)	L	
	beta-cyfluthrin (Bayer Advanced)	L	
	bifenthrin (Ortho)	A, L	
	borax/boric acid (Hot Shot, Terro)	B, D, S	
	cypermethrin (Black Flag, Hi-Yield, Hot Shot, Raid, Spectracide)	A, F, L	
	d-allethrin (Raid House & Garden Bug Kill Formula 7)	A	
	d-phenothrin (Raid)	A	
	deltamethrin (Black Flag, Raid, Spectracide, Terro)	A, L	
	diatomaceous earth (Perma-Guard)	D	
	dichlorvos (Nuvan)	A, CRS, F(RUP)	
	dinotefuran (Hot Shot, Spectracide)	B, S	
	eugenol (Bayer Advanced)	L	
	fipronil (Combat)	B	
	hydramethylnon (Amdro, Combat)	B, S	
	imiprothrin (Hot Shot, Raid)	A	
	indoxacarb (Hot Shot, Spectracide)	S	Imiprothrin is usually formulated with other pesticides in these products.
	lambda-cyhalothrin (Hot Shot, Spectracide)	L	
	lemongrass oil (Hot Shot)	A, L	
	permethrin (various)	A, D, G	
	prallethrin (Hot Shot, Raid, Terro)	A	
	propoxur (Amdro)	S	
	pyrethrins, pyrethrum (Black Flag, Hot Shot)	A	
	sodium O-phenylphenate (Bayer Advanced)	A	
	tetramethrin (various)	A	
	thiamethoxam (Optigard, Raid)	B	
	zeta-cypermethrin (Cynoff)	D	
ANT	alpha cypermethrin (Fendona CS)	L	Apply granular bait around nest. Place bait stations in areas where ants are active. Treat nest and surrounding area. May be applied along building perimeter.
(b) Outdoors See “Ant” and “Imported Fire Ant” under Home Lawns .	beta-cyfluthrin (Bayer Advanced)	L	
	bifenthrin (Ortho)	G, L	Apply products as directed on the label.
	borax (Terro)	B	
	cypermethrin (Hi-Yield)	L	
	deltamethrin (Black Flag, Raid, Spectracide, Terro)	A, L	

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Pests	Insecticide	Formulation	Precautions and Remarks
ANT (b) Outdoors (cont.)	diatomaceous earth (Perma-Guard)	D	Apply granular bait around nest. Place bait stations in areas where ants are active. Treat nest and surrounding area. May be applied along building perimeter.
	dinotefuran (Hot Shot, Spectracide)	S	
	fipronil (Combat)	B	Apply products as directed on the label.
	gamma-cyhalothrin (Spectracide)	G, L	
	hydramethylnon (Amdro, Combat)	B	
	indoxacarb (Hot Shot, Spectracide)	S	
	lambda-cyhalothrin (Hot Shot, Spectracide, Terro)	L	
	lemongrass oil (Hot Shot)	A, L	
	permethrin (various)	L	
	tetramethrin (various)	L	
	zeta-cypermethrin (Cynoff)	D	
BED BUG	alpha cypermethrin (Fendona CS)	L	Apply to mattress tufts and folds, crevices in bed frame and cracks and crevices along baseboard. Mattress heat sanitizing is an alternative.
	amorphous silica gel 100% (CimeXa Insecticide Dust)	D	
	Beauveria bassiana Strain GHA (Aprehend RTU)	L	Apply Aprehend RTU as a 2 inch wide continuous band/barrier at a speed of approximately ≥1 foot per second. For indoor use only.
	beta-cyfluthrin (Bayer Advanced)	L	
	bifenthrin (Ortho)	A, L	Apply all listed products as directed on the label.
	clothianidin 4% + metofluthrin 0.10% + piperonyl butoxide 10.00% (Crossfire Bed Bug Concentrate)	L	
	cypermethrin (Hot Shot)	L	Some listed products provide no residual control and are effective only by direct application to the insect.
	deltamethrin (Black Flag)	L	
	diatomaceous earth (Perma-Guard)	D	
	dichlorvos (Hot Shot)	Pest Strip	
	dichlorvos (Nuvan)	A, CRS, F(RUP)	
	d-phenothrin (Raid)	A	
	imiprothrin (Raid)	A	
	lambda-cyhalothrin (Hot Shot)	L	
	N-octyl bicycloheptene dicarboximide (Raid)	A	
	permethrin (various)	L, A	
	phenoxystyrene (Bayer, Black Flag, Hot Shot)	A	
	prallethrin (Hot Shot)	A	
	silicon dioxide (Hot Shot)	D	
	zeta-cypermethrin (Cynoff)	D	
BEE (a) Indoors	alpha cypermethrin (Fendona CS)	L	Apply only for sporadic invaders. If bees are found frequently, locate and remove the nest.
	bifenthrin (Ortho)	L	
	cypermethrin (Black Flag, Hi-Yield, Hot Shot, Spectracide)	A, F, L	Apply products as directed on the label.
	deltamethrin (Raid)	L	
	diatomaceous earth (Perma-Guard)	D	
	d-phenothrin (Raid)	A	
	dichlorvos (Nuvan)	A, CRS, F(RUP)	

HOUSEHOLD AND STRUCTURAL PEST CONTROL – Products for Use by the General Public and Products for Professional Use Only

Pests	Insecticide	Formulation	Precautions and Remarks
BEE (a) Indoors (cont.)	imiprothrin (Raid)	A	Apply only for sporadic invaders. If bees are found frequently, locate and remove the nest.
	permethrin (various)	A	
	pyrethrins, pyrethrum	A, L	Apply products as directed on the label.
	tetramethrin (various)	A	
BEE (b) Outdoors For carpenter bees, see Carpenter Bee entry.	alpha cypermethrin (Fendona CS)	L	
	beta-cyfluthrin (Bayer Advanced)	L	
	bifenthrin (Ortho)	L	
	carbaryl (various)	D, L, P	
	cypermethrin (Hi-Yield)	L	
	deltamethrin (Raid)	L	
	d-phenothrin (Raid)	A	
	gamma-cyhalothrin (Spectracide)	L	
	permethrin (various)	A, L	
	prallethrin (Hot Shot)	A	
	tetramethrin (various)	L	
	zeta-cypermethrin (Cynoff)	D	
BOOKLOUSE (psocid) (Indoors and outdoors)	beta-cyfluthrin (Bayer Advanced)	L	Apply as a barrier spray along foundation and entry points (doors and windows). Read labels to determine which products are suitable for indoor use. Clean up moisture problems that may attract insects indoors. Excess moisture may impede product effectiveness.
	bifenthrin (Ortho)	L	
	cypermethrin (Spectracide)	A	
	d-allethrin (Raid House & Garden Bug Kill Formula 7)	A	
	deltamethrin (Black Flag)	L	Imiprothrin is formulated with other pesticides in these products.
	diatomaceous earth (Perma-Guard)	D	
	imiprothrin (Raid)	A	
	permethrin (various)	L	
BOXELDER BUG (Outdoors)	pyrethrins, pyrethrum	A	Harmless insects become nuisances when searching indoors for hibernation sites in the fall. Treat door thresholds, window ledges and other areas where the insects congregate or may gain entry.
	alpha cypermethrin (Fendona CS)	L	
	beta-cyfluthrin (Bayer Advanced)	L	
	bifenthrin (Ortho)	L	
	cypermethrin (Black Flag)	L	
	deltamethrin (Spectracide)	L	
	d-phenothrin (Raid)	A	
	gamma-cyhalothrin (Spectracide)	L	
BROWN DOG TICK (a) Indoors	permethrin (various)	L	Spot-treat pet beds (not actual bedding) along with cracks, crevices and similar hiding areas. DO NOT apply to animals (see also ANIMAL INSECT CONTROL section). Discard or launder infested bedding in hot, soapy water.
	alpha cypermethrin (Fendona CS)	L	
	beta-cyfluthrin (Bayer Advanced)	A, L	
	bifenthrin (Ortho)	L	
	cypermethrin (Black Flag, Hi-Yield, Hot Shot, Spectracide)	A, F, L	
	d-allethrin (Raid House & Garden Bug Kill Formula 7)	A	

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Pests	Insecticide	Formulation	Precautions and Remarks
BROWN DOG TICK (a) Indoors (cont.)	deltamethrin (Spectracide)	L	Imiprothrin is formulated with other pesticides in these products.
	diatomaceous earth (Perma-Guard)	D	
	dichlorvos (Nuvan)	A, CRS, F(RUP)	
	d-phenothrin (Raid)	A	
	gamma-cyhalothrin (Spectracide)	L	
	imiprothrin (Black Flag)	A	
	lambda-cyhalothrin (Spectracide)	A, L	
	lemongrass oil (Hot Shot)	A, L	
	permethrin (various)	A	
	prallethrin (Black Flag)	A	
	pyrethrins, pyrethrum	A	
	tetramethrin (various)	A	
BROWN DOG TICK (b) Outdoors and under buildings	alpha cypermethrin (Fendona CS)	L	See also ANIMAL INSECT CONTROL section.
	beta-cyfluthrin (Bayer Advanced)	L	
	bifenthrin (Ortho)	G	
	cypermethrin (Hi-Yield)	L	
	deltamethrin (Black Flag, Spectracide)	L	
	diatomaceous earth (Perma-Guard)	D	
	gamma-cyhalothrin (Spectracide)	G, L	
	lambda-cyhalothrin (Spectracide)	A, L	
	lemongrass oil (Hot Shot)	A, L	
	permethrin (various)	L	
	tetramethrin (various)	L	
CARPENTER ANT (a) Indoors	2-Phenethyl Propionate 1% Pyrethrins (EcoPCOAR-X-M)	A	Apply as directed on label.
	abamectin (Advance)	B	Apply as directed on label.
	acetamiprid + bifenthrin (Transport Mikron)	L	Apply as directed on label.
	alpha cypermethrin (Fendona CS)	L	Apply as directed on label.
	beta-cyfluthrin (Bayer Advanced, Tempo)	L	Apply as directed on label.
	bifenthrin (Ortho, Talstar)	A, L	Apply as directed on label.
	boric acid (Niban, Mother Earth G)	B	Apply as directed on label.
	chlorfenapyr (Phantom)	L	Apply as directed on label.
	cyfluthrin (Bayer Advanced, Tempo)	L	Apply as directed on label.
	cypermethrin (Cynoff EC)	D	Apply as directed on label.
	d-allethrin (Raid House & Garden Bug Kill Formula 7)	A	
	deltamethrin (Bayer Advanced, Spectracide, Suspend)	L	Apply as directed on label.
	dinotefuran (Alpine, Hot Shot)	B, FM, L	Apply as directed on label.
	disodium octaborate tetrahydrate (Bora-Care, Tim-bor, Borathor)	D, L	Apply as directed on label.
	esfenvalerate (Onslaught)	L	Apply as directed on label.

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Pests	Insecticide	Formulation	Precautions and Remarks
CARPENTER ANT (a) Indoors (cont.)	fipronil (Combat, Maxforce)	B	Bait where you see ant activity. Apply as directed on label.
	hydramethylnon (Combat)	B	Bait where you see ant activity. Apply as directed on label.
	imidacloprid (Masterline MaxxPro 2F)	L	Apply as directed on label.
	imidacloprid + cyfluthrin (Temprid SC)	L	Apply as directed on label.
	indoxacarb (Advion, Arilon)	B, L	Bait where you see ant activity. Apply as directed on label.
	lambda-cyhalothrin (Demand, Spectracide)	FM, L	Apply as directed on label.
	permethrin (Dragnet, various others)	L	Apply as directed on label.
	sodium borate (Boracare, Borathor Spectracide, Terminate)	D, L	Apply as directed on label.
	thiamethoxam (Optigard)	L, S	Apply as foam to wall voids or infested wood. Place bait stations as directed on label.
	zeta-cypermethrin (Cynoff)	D	Apply dust formulation directly to galleries.
CARPENTER ANT (b) Outdoors	abamectin (Advance)	B	Apply as directed on label.
	acetamiprid + bifenthrin (Transport Mikron)	L	Apply outdoors only as pinstream, spot, crack and crevice, or perimeter spray.
	alpha cypermethrin (Fendona CS)	L	Apply as directed on label.
	beta-cyfluthrin (Bayer Advanced, Tempo)	L	Treat into and around the nest, then seal holes.
	bifenthrin (Ortho, Bifen, Talstar)	L	Spray or inject into wood.
	boric acid (Niban, Mother Earth G)	B	Place bait granules around perimeter.
	chlorfenapyr (Phantom)	L	Exterior use limited to spot (2 square feet) and crack and crevice treatments at points of entry.
	cyfluthrin (Bayer Advanced, Tempo)	L	Treat into and around the nest, then seal holes.
	cypermethrin (Cynoff EC, Hi-Yield, Martin's Viper, Demon TC)	D, L	Apply dust formulation directly to galleries.
	deltamethrin (BioAdvanced, Suspend, D-Fend Dust, D-Foam)	FM, D, L	Apply as directed on label. . D-Foam is applied to voids where nests may be located. Treat into and around the nest.
	dinotefuran (Alpine)	FM, L	Apply as directed on label.
	disodium octaborate tetrahydrate (Bora-Care, Tim-bor, Borathor)	D, L	Apply as directed on label.
	esfenvalerate (Onslaught)	L	Apply as directed on label.
	fipronil (Maxforce, Termidor, Taurus)	B, G, P	Apply bait granules in ant foraging areas. Water area after applying granules.
	gamma-cyhalothrin (Spectracide)	L	Apply as directed on label.
	hydramethylnon (Maxforce)	B	Apply granules along perimeter of building or nest. (Maxforce is for professional use.)
	imidacloprid (Masterline MaxxPro 2F, BioAdvanced)	FM, L	Apply to galleries as directed on label.
	imidacloprid + cyfluthrin (Temprid SC)	B, L	Apply as directed on label.
	indoxacarb (Arilon, Advion)	B, L	Apply as directed on label.
	lambda-cyhalothrin (Demand, Spectracide)	A, L	
	permethrin (Dragnet, various others)	L	Apply as crack and crevice or spot treatment or paint onto surface. Application by drilling and injecting is also permitted.
	sodium borate (Boracare, Borathor) (Spectracide)	L	Spray/brush on or inject into wood. For long-term protection, apply a water repellent stain to exterior wood surfaces 2 to 3weeks after treatment.
	zeta-cypermethrin (Cynoff)	D	
CARPENTER BEE	alpha cypermethrin (Fendona CS)	L	Apply as directed on label.
	beta-cyfluthrin (Bayer Advanced, Tempo)	L	Apply liquid as a surface spray and into entrance hole. Seal entrance hole.

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Pests	Insecticide	Formulation	Precautions and Remarks
CARPENTER BEE (cont.)	bifenthrin (Ortho, Bifen, Talstar)	L	Apply as a coarse surface spray and into entrance hole. Seal entrance hole.
	carbaryl (various)	D, L	Apply liquid as a surface spray and into entrance hole. Puff into and around entrance holes using dust applicator. Seal with wood plugs, putty, or stainless steel or copper wool.
	chlorfenapyr (Phantom)	L	Apply as directed on label.
	cyfluthrin (Bayer Advanced, Tempo)	L	Apply liquid as a surface spray and into entrance hole. Seal entrance hole.
	cypermethrin (Demon TC)	L	Treat into and around the nest.
	deltamethrin (BioAdvanced, Suspend, D-Fend Dust, D-Foam)	FM, D, L	Apply liquid as a coarse surface spray and into gallery entrance. Inject foam or puff into and around entrance holes using dust applicator. Seal with wood plugs, putty, or stainless steel or copper wool.
	disodium octaborate tetrahydrate (Bora-Care, Tim-bor, Borathor)	D, L	Apply as directed on label.
	imidacloprid (Bayer Advanced, Premise)	FM	Apply to galleries as directed on label.
	imidacloprid + cyfluthrin (Temprid SC)	L	Apply as directed on label.
	lambda-cyhalothrin (Demand, Spectracide)	L	Spray or inject into wood. Seal holes in wood before injecting. Avoid runoff.
	permethrin (Dragnet)	L	Spray or inject into wood. Seal holes in wood before injecting. Avoid runoff.
	prallethrin-lambda-cyhalothrin (Spectracide)	FM	Apply to galleries as directed on label.
	zeta-cypermethrin (Cynoff)	D	Apply dust formulation directly into galleries.
CARPET BEETLE (a) Nonfabric areas and infested areas of carpets only	alpha cypermethrin (Fendona CS)	L	Treat cracks, crevices and hidden areas to point of runoff with spray. Moisten but DO NOT saturate fabric. For valuable rugs or cloth items, consider hiring a pest control professional.
	beta-cyfluthrin (Bayer Advanced)	A	
	bifenthrin (Ortho)	A, L	
	cypermethrin (Black Flag)	A	
	d-allethrin (Raid House & Garden Bug Kill Formula 7)	A	Imiprothrin is formulated with other pesticides in these products.
	deltamethrin (Black Flag, Spectracide)	A	
	diatomaceous earth (Perma-Guard)	D	
	dichlorvos (Nuvan)	A, CRS, F(RUP)	
	d-phenothrin (Raid)	A	Use Cynoff insecticide as a crack and crevice treatment in closets and other storage areas where these pests are found. This is an adjunct treatment and will not control moth larvae already on the clothes. DO NOT apply this product directly to clothing.
	gamma-cyhalothrin (Spectracide)	L	
	imiprothrin (Hot Shot)	A	
	prallethrin (Ortho)	A	
	pyrethrins, pyrethrum	A	
	zeta-cypermethrin (Cynoff)	D	
CARPET BEETLE (b) On fabric	d-allethrin (Raid House & Garden Bug Kill Formula 7)	A	Other pyrethroids are also available ready-to-use. While many are specifically recommended for clothes moths, they are also effective on carpet beetles. DO NOT saturate fabric.
	diatomaceous earth (Perma-Guard)	D	
	prallethrin (Black Flag)	A	
	pyrethrins, pyrethrum	A, L	
CENTIPEDE (a) Indoors	beta-cyfluthrin (Bayer Advanced)	A, L	Usually infest damp areas such as basements. Spot-treat cracks, crevices and moldings where pests may crawl. Some products are not suitable for use in residential kitchens or commercial food/feed preparation sites. Read the product label carefully.
	bifenthrin (Ortho)	L	

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Pests	Insecticide	Formulation	Precautions and Remarks
CENTIPEDE (cont.) (a) Indoors	d-allethrin (Raid House & Garden Bug Kill Formula 7)	A	Imiprothrin is formulated with other pesticides in these products.
	deltamethrin (Spectracide)	L	
	diatomaceous earth (Perma-Guard)	D	
	gamma-cyhalothrin (Spectracide)	L	
	imiprothrin (Hot Shot, Raid)	A	
	lemongrass oil (Hot Shot)	A, L	
	permethrin (various)	A	
	prallethrin (Ortho)	A	
	pyrethrins, pyrethrum	A	
	zeta-cypermethrin (Cynoff)	D	
CENTIPEDE (b) Outdoors	beta-cyfluthrin (Bayer Advanced)	L	Treat infested areas around building foundations, vents and similar access points. Barrier sprays of 12 to 18 inches along perimeter may be effective.
	bifenthrin (Ortho)	G	
	cypermethrin (Black Flag, Hi-Yield, Hot Shot, Enforcer)	L	
	deltamethrin (Spectracide)	L	
	diatomaceous earth (Perma-Guard)	D	
	gamma-cyhalothrin (Spectracide)	L	
	lambda-cyhalothrin (Hot Shot, Spectracide)	A, G, L	
	lemongrass oil (Hot Shot)	A, L	
	permethrin (various)	L	
	tetramethrin (various)	A	
	zeta-cypermethrin (Cynoff)	D	
CHIGGER (red bug) (Outdoors)	alpha cypermethrin (Fendona CS)	L	Apply to grass, bushes and weeds in infested areas. Thoroughly saturate soil, but avoid runoff into ponds, lakes or other bodies of water. Repeat as needed. Apply labeled repellent products to shoes, ankles and legs before entering suspected chigger-infested areas.
	beta-cyfluthrin (Bayer Advanced)	L	
	bifenthrin (Ortho)	G, L	
	deltamethrin (Spectracide)	L	
	gamma-cyhalothrin (Spectracide)	L	
	lambda-cyhalothrin (Bonide)	L	
	permethrin (various)	L	
	tetramethrin (various)	L	
CLOTHES MOTH (a) Nonfabric areas and infested areas of carpet only			See Carpet Beetle .
CLOTHES MOTH (b) On fabric			See Carpet Beetle .
CLOTHES MOTH (c) In storage areas	dichlorvos (Hot Shot)	FU strip	Hang strip in clothes closets or storage chests up to 1,000 cubic feet in capacity. Not for use in occupied rooms or in closets in occupied rooms. Follow label instructions carefully.
	paradichlorobenzene (various)	Crystals or similar solid	Effective repellents on clean fabric in airtight enclosures. Avoid contact with plastic buttons and zippers.

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CLOVER MITE (a) Indoors	alpha cypermethrin (Fendona CS)	L	Clover mite is strictly a nuisance pest. Treat around door thresholds. Some products are not suitable for use in residential kitchens or commercial food/feed preparation sites. Read the product label carefully.
	beta-cyfluthrin (Bayer Advanced)	A, L	
	bifenthrin (Ortho)	L	
	cypermethrin (Black Flag)	L	Imiprothrin is formulated with other pesticides in these products.
	d-allethrin (Raid House & Garden Bug Kill Formula 7)	A	
	deltamethrin (Spectracide)	L	
	diatomaceous earth (Perma-Guard)	D	
	imiprothrin (Raid)	A	
	gamma-cyhalothrin (Spectracide)	L	
	permethrin (various)	A	
	prallethrin (Ortho)	A	
	pyrethrins, pyrethrum	A	
CLOVER MITE (b) Outdoors	alpha cypermethrin (Fendona CS)	L	Treat around points of entry, such as foundations, vents, windows and doors. Maintain a 12-inch vegetation-free zone along foundation. Spray 1 to 2 feet high along the foundation wall and a 3- to 5-foot barrier on the grass or landscaped areas around the foundation. Water immediately after applying granules.
	beta-cyfluthrin (Bayer Advanced)	G, L	
	bifenthrin (Ortho)	L	
	cypermethrin (Black Flag)	L	Apply products as directed on the label.
	deltamethrin (Spectracide)	L	
	diatomaceous earth (Perma-Guard)	D	
	gamma-cyhalothrin (Spectracide)	L	
	permethrin (various)	G, L	
	tetramethrin (various)	L	
COCKROACH (a) Indoors	abamectin (Raid Max)	S	Apply sprays along baseboards, under sinks, in cabinets and other infested areas. Remove and cover food, cooking and eating utensils before spraying cabinets. DO NOT restock shelves until surface dries completely. Some products are not suitable for use in residential kitchens or commercial food/feed preparation sites. Read the product label carefully. Place bait stations in infested areas; follow label instructions. Keep out of reach of children and pets. Sanitation is critical; before using baits, eliminate other food sources. Place bait stations in cabinets under sinks and behind stoves and refrigerators. Dusts are slow acting but gives long-lasting control. Force small amounts into all hidden nesting areas with dust applicator. Avoid over-application and inhalation of dust. Some formulations may contain pyrethrins or pyrethrum. DO NOT contaminate food preparation or storage sites. Use diatomaceous earth in the same manner as boric acid powders.
	alpha cypermethrin (Fendona CS)	L	
	beta-cyfluthrin (Bayer Advanced)	L	
	bifenthrin (Ortho)	A, L	
	boric acid (Bonide, Niban)	B, D	
	chlorpyrifos (Hot Shot)	S	
	cypermethrin (Black Flag, Hi-Yield, Hot Shot, Spectracide)	A, F, L	
	d-allethrin (Raid House & Garden Bug Kill Formula 7)	A	
	diatomaceous earth (Perma-Guard)	D	
	deltamethrin (Black Flag)	L	
	dichlorvos (Nuvan)	A, CRS, F(RUP)	Apply products as directed on the label.
	dinotefuran (Hot Shot)	S	
	eugenol (Bayer Advanced)	L	
	fipronil (Combat)	B, S	Hydroprene is an insect growth regulator and should be used with an adulticide.
	hydramethylnon (Amdro, Combat)	B	
	hydroprene (Egg Stopper)	S	
	imidacloprid (Bayer)	B	

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COCKROACH (a) Indoors (cont.)	imiprothrin (Hot Shot, Raid)	A	Imiprothrin is formulated with other pesticides in these products.
	indoxacarb (Hot Shot)	B	
	gamma-cyhalothrin (Spectracide)	A, L	
	lambda-cyhalothrin (Spectracide)	A, L	
	lemongrass oil (Hot Shot)	A, L	
	permethrin (various)	A	
	permethrin + pyriproxyfen (Bengal)	A	
	prallethrin (Ortho)	A	
	pyrethrins, pyrethrum	A	
	tetramethrin (various)	F	
	zeta-cypermethrin (Cynoff)	D	
COCKROACH (b) Outdoors	alpha cypermethrin (Fendona CS)	L	Some species of cockroaches can live indoors and outdoors. Cockroaches that live outdoors tend to hide under mulch, ivy and similar cover. Treat groundcover and along foundation walls, patios and other areas where cockroaches are seen. Certain products cannot be used on or around edible plants. Read product labels for any limitations. Apply products as directed on the label.
	beta-cyfluthrin (Bayer Advanced)	A, L	
	bifenthrin (Ortho)	A, L	
	cypermethrin (Hi-Yield)	L	
	deltamethrin (Spectracide)	L	
	diatomaceous earth (Perma-Guard)	D	
	dinotefuran (Hot Shot)	S	
	gamma-cyhalothrin (Spectracide)	G, L	
	hydramethylnon (Amdro, Combat)	B	
	lambda-cyhalothrin (Spectracide)	A, L	
	lemongrass oil (Hot Shot)	A, L	
	permethrin (various)	A, L	
	tetramethrin (various)	A, L	
	zeta-cypermethrin (Cynoff)	D	
CRICKET (Indoors and in crawlspaces)	alpha cypermethrin (Fendona CS)	L	Crickets enter homes through basements and similar areas. Some formulations may be sprinkled along foundation. Read product label before using outdoors. Treat along foundation walls, patios and other areas where crickets are seen. Apply in a light 2-to 4-inch band around foundation. DO NOT use excessive amounts, and DO NOT apply to foliage of ornamentals or to food crops. Apply products as directed on the label.
	beta-cyfluthrin (Bayer Advanced)	L	
	bifenthrin (Ortho)	A	
	boric acid (Bonide, Niban)	B	
	cypermethrin (Black Flag, Hi-Yield, Hot Shot, Spectracide)	A, F, L	
	d-allethrin (Raid House & Garden Bug Kill Formula 7)	A	
	deltamethrin (Spectracide)	L	
	diatomaceous earth (Perma-Guard)	D	
	dichlorvos (Nuvan)	A, CRS, F(RUP)	
	eugenol (Bayer Advanced)	L	
	gamma-cyhalothrin (Spectracide) OUTDOORS ONLY	G, L	
	imiprothrin (Raid)	A	
	lambda-cyhalothrin (Spectracide)	A, L	

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Pests	Insecticide	Formulation	Precautions and Remarks
CRICKET (cont.) (Indoors and in crawlspaces)	lemongrass oil (Hot Shot)	A, L	
	permethrin (various)	L	
	prallethrin (Ortho)	A	
	pyrethrins, pyrethrum	L	
	tetramethrin (various)	A	
	zeta-cypermethrin (Cynoff)	D	
EARWIG (a) Indoors	alpha cypermethrin (Fendona CS)	L	Repeat treatments may be necessary at two-week intervals. Some products are not suitable for use in residential kitchens or commercial food/feed preparation sites. Read the product label carefully.
	beta-cyfluthrin (Bayer Advanced)	L	
	bifenthrin (Ortho)	A, L	
	cypermethrin (Black Flag, Hi-Yield, Hot Shot, Spectracide)	A, F, L	
	d-allethrin (Raid House & Garden Bug Kill Formula 7)	A	
	diatomaceous earth (Perma-Guard)	D	
	eugenol (Bayer Advanced)	L	
	imiprothrin (Raid)	A	
	gamma-cyhalothrin (Spectracide)	L	
	lambda-cyhalothrin (Spectracide)	A, L	
	lemongrass oil (Hot Shot)	A, L	
	prallethrin (Ortho)	A	
	tetramethrin (various)	A	
	zeta-cypermethrin (Cynoff)	D	
EARWIG (b) Outdoors	alpha cypermethrin (Fendona CS)	L	Repeat treatments at 14-day intervals if necessary. Granular formulations are for outdoor use only and must be watered into soil or applied before rain.
	beta-cyfluthrin (Bayer Advanced)	L	
	bifenthrin (Ortho)	G, L	
	cypermethrin (Hi-Yield)	L	
	diatomaceous earth (Perma-Guard)	D	
	gamma-cyhalothrin (Spectracide)	G, L	
	lambda-cyhalothrin (Spectracide)	L	
	lemongrass oil (Hot Shot)	A, L	
	permethrin (various)	D, G, L	
	prallethrin (Hot Shot, Raid)	A	
	tetramethrin (various)	L	
	zeta-cypermethrin (Cynoff)	D	
FLEA (a) Indoors	alpha cypermethrin (Fendona CS)	L	Only use products specifically labeled for flea control. Apply to carpets and crevices in flooring. DO NOT leave chemical residue on surface. Avoid accidental inhalation during application. Treat sleeping quarters of pets and other localized areas, such as under cushions and furniture, as specified on label. Vacuum carpets and furniture before applying, and dispose of contents properly. Sprays may be used for general area treatment. Also treat cracks, crevices and similar areas only. Foggers are only effective when used in conjunction with other sprays to other critical areas. Treat infested animals with properly labeled product for lasting control. See also ANIMAL INSECT CONTROL section. Apply as directed on the label.
	beta-cyfluthrin (Bayer Advanced)	L	
	bifenthrin (Ortho)	A	
	boric acid (Bonide, Niban)	D	
	cypermethrin (Black Flag, Hi-Yield, Hot Shot, Spectracide)	A, F, L	
	d-allethrin (Raid House & Garden Bug Kill Formula 7)	A	
	deltamethrin (Spectracide)	L	

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FLEA (a) Indoors (cont.)	dichlorvos (Nuvan)	A, CRS, F(RUP)	Methoprene products are insect growth regulators that control immature fleas only. Usually formulated with an adulticide.
	d-phenothrin (Raid)	A	
	eugenol (Bayer Advanced)	L	
	gamma-cyhalothrin + pyriproxyfen (Black Flag)	A	
	imiprothrin (Black Flag)	A	
	lambda-cyhalothrin (Spectracide)	L	
	lambda-cyhalothrin + pyriproxyfen (Black Flag)	L	
	lemongrass oil (Hot Shot)	A, L	
	methoprene (Precor)	A, F, L	
	permethrin (various)	L	
	phenoxybenzI (Hot Shot)	A	
	pyrethrins, pyrethrum	L	
	pyriproxyfen (Archer, Nylar)	A, L	
	sumithrin (Enforcer)	D	
	tetramethrin (Enforcer)	L	
	zeta-cypermethrin (Cynoff)	D	
FLEA (b) Outdoors	alpha cypermethrin (Fendona CS)	L	Concentrate on kennels and shaded areas where animals tend to rest or congregate. Apply liquid formulations with sufficient spray volume to saturate soil. Granular formulations must be watered into soil or applied before rain. Repeat as needed at 4- to 6-week intervals. Apply as directed on the label. See also ANIMAL INSECT CONTROL section.
	beta-cyfluthrin (Bayer Advanced)	L	
	bifenthrin (Ortho)	L	
	cypermethrin (Hi-Yield)	L	
	deltamethrin (Spectracide)	L	
	diatomaceous earth (Perma-Guard)	D	
	gamma-cyhalothrin (Spectracide)	G, L	
	lambda-cyhalothrin (Spectracide)	L	
	lemongrass oil (Hot Shot)	A, L	
	permethrin (various)	L	
	tetramethrin (various)	L	
FLIES (a) Indoors	alpha cypermethrin (Fendona CS)	L	Strips can only be used in unoccupied areas. Apply as labeled to areas or objects (such as garbage cans) infested with flies. Repeat treatments as may be necessary. See label before treating areas of vegetation. Sanitation in the area is essential for satisfactory control of flies.
	beta-cyfluthrin (Bayer Advanced)	L	
	cypermethrin (Black Flag, Hi-Yield, Hot Shot, Spectracide)	A, F, L	
	d-allethrin (Raid House & Garden Bug Kill Formula 7)	A	
	d-phenothrin (Raid)	A	
	deltamethrin (Black Flag, Spectracide)	A	
	dichlorvos (Nuvan)	A, CRS, F(RUP)	
	eugenol (Bayer Advanced)	L	
	lemongrass oil (Hot Shot)	A	
	permethrin (various)	A, F	
	pyrethrins, pyrethrum (various)	A, L	
	tetramethrin (various)	L, F	

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Pests	Insecticide	Formulation	Precautions and Remarks
FLIES (b) Outdoors	alpha cypermethrin (Fendona CS)	L	Apply as a surface spray to areas or objects (such as garbage cans) infested with flies. Repeat treatments may be necessary. See label before treating areas of vegetation. Sanitation in the area is essential for satisfactory control using any of these chemicals but particularly important with baits. Use as directed.
	beta-cyfluthrin (Bayer Advanced)	L	
	bifenthrin (Ortho)	L	
	cypermethrin (Hi-Yield)	L	
	deltamethrin (Black Flag, Spectracide)	A, L	
	d-phenothrin (Raid)	A	
	imidacloprid (Maxforce)	B	
	lambda-cyhalothrin (Spectracide)	L	
	permethrin (various)	L	
	prallethrin (Hot Shot)	A	
	tetramethrin (various)	A	
HORNETS, MUD DAUBERS, WASPS, YELLOW JACKETS (a) Indoors	alpha cypermethrin (Fendona CS)	L	Apply to insects as needed for quick knockdown. Mechanical control (swatting) is usually adequate. Use product with “crack and crevice” nozzle to reach nests in wall voids. Remove nest when wasps are dead.
	beta-cyfluthrin (Bayer Advanced)	L	
	cypermethrin (Black Flag, Hi-Yield, Hot Shot, Spectracide)	A, F, L	
	d-phenothrin (Raid)	A	
	d-allethrin (Raid House & Garden Bug Kill Formula 7)	A	
	deltamethrin (Black Flag, Spectracide)	A, L	
	dichlorvos (Nuvan)	A, CRS, F(RUP)	
	prallethrin (Ultra-Kill, Spectracide)	A	
	prallethrin + lambda-cyhalothrin (Spectracide)	FM	
	pyrethrins, pyrethrum	A, L	
	S-bioallethrin (Spectracide)	A	
	tetramethrin (various)	A	
HORNETS, MUD DAUBERS, WASPS, YELLOW JACKETS (b) Nest and adjacent areas	alpha cypermethrin (Fendona CS)	L	Apply to nest or opening after dark when insects have returned to nest. Repeat treatment may be necessary. Most are packaged in pressurized containers that direct an insecticide stream of 10 feet or more. For yellow jackets and other soil-dwelling wasps, apply chemical to nests in soil. Fendona CS for use on yellow jackets only.
	beta-cyfluthrin (Bayer Advanced)	L	
	bifenthrin (Ortho)	L	
	carbaryl (various)	D, L	
	cypermethrin (Hi-Yield)	L	
	deltamethrin (Spectracide)	A	
	diatomaceous earth (Perma-Guard)	D	
	d-phenothrin (Raid)	A	
	lambda-cyhalothrin (Hot Shot, Spectracide)	L	
	permethrin (various)	L	
	prallethrin (Hot Shot, Spectracide, Ultra-Kill)	A	Apply to nest or opening after dark when insects have returned to nest. Repeat treatment may be necessary. Most are packaged in pressurized containers that direct an insecticide stream of up to 10 feet. For yellow jackets and other soil-dwelling wasps, apply chemical to nests in soil.
	prallethrin + lambda-cyhalothrin (Spectracide)	FM	
	tetramethrin (various)	A	
	zeta-cypermethrin (Cynoff)	D	
			Not for use on paper wasps.

HOUSEHOLD AND STRUCTURAL PEST CONTROL – Products for Use by the General Public and Products for Professional Use Only

Pests	Insecticide	Formulation	Precautions and Remarks
LICE: body, head, crab (on person)	malathion (Ovide)	L	Shampoo formulations. Thoroughly treat infested areas of body with lotion. Wash infested clothing with strong soap and very hot water. Dryclean woolens. Ovide requires a physician's prescription. Insecticidal treatment of furniture, carpets or other areas of the home are not needed.
	permethrin (Nix)	L	
	pyrethrins, pyrethrum (Rid)	L	
MILLIPEDE (a) Indoors	alpha cypermethrin (Fendona CS)	L	Harmless pest is short-lived once indoors; therefore, insecticides may not be necessary. Spot-treat pest entrance areas (door thresholds). Outside treatment is necessary for satisfactory control. Some products are not suitable for use in residential kitchens or commercial food/feed preparation sites. Read the product label carefully.
	beta-cyfluthrin (Bayer Advanced)	L	
	bifenthrin (Ortho)	L	
	cypermethrin (Black Flag, Hi-Yield, Hot Shot, Spectracide)	A, F, L	
	d-allethrin (Raid House & Garden Bug Kill Formula 7)	A	
	deltamethrin (Spectracide)	A	
	diatomaceous earth (Perma-Guard)	D	
	dichlorvos (Nuvan)	A, CRS,F(RUP)	
	imiprothrin (Raid)	A	
	lambda-cyhalothrin (Hot Shot, Spectracide)	L	
	permethrin (various)	D, L	
	prallethrin (Hot Shot)	A	
	pyrethrins, pyrethrum	A	
	zeta-cypermethrin (Cynoff)	D	
MILLIPEDE (b) Outdoors	alpha cypermethrin (Fendona CS)	L	Use as a barrier treatment along foundation wall, door threshold and window ledges. Some sprays may damage vegetation under hot, humid conditions. Read label precautions. For lawn treatment, apply an insecticide band 10 to 15 feet wide. Apply liquid formulations with sufficient spray volume to saturate soil. Use granular formulations outdoors only; water into soil or apply before rain. Repeat as needed at 4- to 6-week intervals.
	beta-cyfluthrin (Bayer Advanced)	L	
	bifenthrin (Ortho)	G, L	
	cypermethrin (Hi-Yield)	L	
	diatomaceous earth (Perma-Guard)	D	
	gamma-cyhalothrin (Spectracide)	G, L	
	lambda-cyhalothrin (Hot Shot, Spectracide)	D, G, L	
	lemongrass oil (Hot Shot)	A, L	
	permethrin (various)	D, G, L	
	tetramethrin (various)	L	
	zeta-cypermethrin (Cynoff)	D	
MOSQUITOES (a) Indoors	alpha cypermethrin (Fendona CS)	L	Aerosol sprays may provide temporary relief. Keep insects out by installing and repairing screens. Other labeled pyrethroids are also effective.
	beta-cyfluthrin (Bayer Advanced)	L	
	cypermethrin (Black Flag, Hi-Yield, Hot Shot, Spectracide)	A, F, L	
	d-allethrin (Raid House & Garden Bug Kill Formula 7)	A	
	deltamethrin (Black Flag, Spectracide)	A	
	d-phenothrin (Raid)	A	
	lemongrass oil (Hot Shot)	A	
	permethrin (various)	A	
	pyrethrins, pyrethrum (Raid)	A	
	tetramethrin (various)	F	

HOUSEHOLD AND STRUCTURAL PEST CONTROL – Products for Use by the General Public and Products for Professional Use Only

Pests	Insecticide	Formulation	Precautions and Remarks
MOSQUITOES (b) Outdoors (See also INSECT CONTROL IN RECREATION AREAS)	alpha cypermethrin (Fendona CS)	L	<i>Bacillus thuringiensis</i> is a “biopesticide” containing bacteria that kill mosquitoes and some biting flies. Place in small ponds, bird baths and ornamental pools (not swimming pools). Follow instructions for specifics of application.
	<i>Bacillus thuringiensis</i> (Bti) (Mosquito Dunks)	Solid	
	beta-cyfluthrin (Bayer Advanced)	L	Long-term control requires eliminating or cleaning mosquito breeding areas, such as discarded containers, ditches and other artificial sources of standing water. Spraying nearby vegetation may eliminate some mosquito resting sites, but some formulations may damage vegetation. Aerosols or foggers may be used for temporary relief when winds are insignificant. Use repellents on exposed body areas.
	bifenthrin (Ortho)	L	
	cypermethrin (Hi-Yield)	L	
	d-allethrin (Coleman)	RC	
	deltamethrin (Black Flag, Spectracide)	A, L	
	gamma-cyhalothrin (Spectracide)	G, L	
	lambda-cyhalothrin (Spectracide)	L	
	permethrin (various)	A, L	
	prallethrin (Ortho)	A	
	tetramethrin (various)	A	
OLD HOUSE BORER	aluminum phosphide (Phostoxin)	FU	Use aluminum phosphide for infested furniture, stacked lumber and other wood products. Apply under gas-tight tarpaulins or in a sealed chamber. Requires an Arkansas Class 3 General Fumigation Commercial Pesticide Applicator's License.
	alpha cypermethrin (Fendona CS)	L	Apply as directed on label.
	beta-cyfluthrin (Bayer Advanced, Tempo)	L	Spray, brush on or inject into wood. Seal holes in wood before injecting. Avoid runoff.
	bifenthrin (Ortho, Bifen, Talstar)	L	Apply as directed on the label.
	cyfluthrin (BioAdvanced, Tempo)	L	Coarse spray, brush on, or inject into wood. Avoid excessive runoff.
	cypermethrin (Demon TC)	L	Apply as directed on label.
	deltamethrin (BioAdvanced, Suspend, D-Fend Dust, D-Foam)	FM, D, L	Apply as directed on label.
	disodium octaborate tetrahydrate (Bora-Care, Tim-bor, Borathor)	D, L	Spray, brush on, or inject into wood. For permanent protection, a water repellent should be applied to exterior surfaces 2 to 3 weeks after treatment.
	imidacloprid + cyfluthrin (Temprid SC)	L	Apply as directed on the label.
	permethrin (Dragnet, various others)	L	Apply as directed on the label.
PANTRY PESTS (Pests in food storage areas)	sulfuryl fluoride (Vikane)	FU	Apply under gas-tight tarpaulins only. Hold for 24 hours at temperature above 60 degrees F. Requires an Arkansas Class 3 General Fumigation Commercial Pesticide Applicator's License.
	alpha cypermethrin (Fendona CS)	L	Discard infested material. Overall treatment of storage shelves and pantry is usually not necessary. Treat cracks, crevices, moldings and similar areas only. Remove and cover food and cooking and eating utensils before spraying storage cabinets. DO NOT restock shelves until surfaces are dry. Cover treated shelves with shelf paper if desired. Some products are not suitable for use in residential kitchens or commercial food/feed preparation sites. Read the product label carefully.
	beta-cyfluthrin (Bayer Advanced)	L	
	bifenthrin (Ortho)	L	
	cypermethrin (various)	L	
	d-allethrin (Raid House & Garden Bug Kill Formula 7)	A	
	deltamethrin (Black Flag, Spectracide)	A	
	diatomaceous earth (Perma-Guard)	D	
	dichlorvos (Nuvan)	A, CRS, F(RUP)	
	eugenol (Bayer Advanced)	L	
	fipronil (Maxforce FC Magnum Roach Killer Bait Gel)	B	

HOUSEHOLD AND STRUCTURAL PEST CONTROL – Products for Use by the General Public and Products for Professional Use Only

Pests	Insecticide	Formulation	Precautions and Remarks
PANTRY PESTS (Pests in food storage areas) (cont.)	gamma-cyhalothrin (Spectracide)	L	Discard infested material. Overall treatment of storage shelves and pantry is usually not necessary. Treat cracks, crevices, moldings and similar areas only. Remove and cover food and cooking and eating utensils before spraying storage cabinets. DO NOT restock shelves until surfaces are dry. Cover treated shelves with shelf paper if desired. Some products are not suitable for use in residential kitchens or commercial food/feed preparation sites. Read the product label carefully.
	imiprothrin (Raid)	A	
	permethrin (various)	L	
	prallethrin (Hot Shot)	A	
	pyrethrins, pyrethrum	A, F	
	zeta-cypermethrin (Cynoff)	D	Imiprothrin is formulated with other pesticides in these products.
POWDERPOST BEETLE	aluminum phosphide (Phostoxin)	FU	Use aluminum phosphide for infested furniture, stacked lumber or other wood products. Apply under gas-tight tarpaulins or in a sealed chamber. Requires an Arkansas Class 3 General Fumigation Commercial Pesticide Applicator's License.
	alpha cypermethrin (Fendona CS)	L	Apply as directed on label.
	beta-cyfluthrin (Bayer Advanced, Tempo)	L	Coarse spray, brush on or inject into wood. Avoid excessive runoff.
	bifenthrin (Ortho, Bifen, Talstar)	L	Coarse spray, brush on or inject into wood. Avoid excessive runoff.
	chlorfenapyr (Phantom)	L	Apply as directed on the label.
	cyfluthrin (BioAdvanced, Tempo)	L	Coarse spray, brush on, or inject into wood. Avoid excessive runoff.
	cypermethrin (Demon TC)	L	Apply as directed on the label.
	deltamethrin (BioAdvanced, Suspend, D-Fend Dust, D-Foam)	FM, D, L	Apply as directed on label. Surface spray or inject foam or dust into galleries.
	disodium octaborate tetrahydrate (Bora-Care, Tim-bor, Borathor, Spectracide)	D, L	For long-term protection, apply a water repellent to exterior surfaces 2 to 3 weeks after treatment.
	imidacloprid (Bayer Advanced)	FM	Apply as directed on label.
	imidacloprid + cyfluthrin (Temprid SC)	L	Apply as directed on the label.
	lambda-cyhalothrin (Demand, Spectracide)	L	Apply as directed on the label.
	permethrin (Dragnet, various others)	L	Apply as directed on the label.
	sulfuryl fluoride (Vikane)	FU	Use sulfuryl fluoride for infested furniture, stacked lumber or other wood products. Apply under gas-tight tarpaulins only. Hold for 24 hours at temperature above 60 degrees F. Requires an Arkansas Class 3 General Fumigation Commercial Pesticide Applicator's License.
	zeta-cypermethrin (Cynoff)	D	Apply as directed on label.
SCORPIONS	acetamiprid + bifenthrin (Transport)	L	Apply as directed on the label.
	alpha cypermethrin (Fendona CS)	L	
	beta-cyfluthrin (Bayer Advanced, Tempo)	L	
	bifenthrin (Bifen, Talstar)	G, L	
	cypermethrin (Cynoff, Demon, Martin's Viper)	L	
	diatomaceous earth (Mother Earth D)	D	
	gamma-cyhalothrin (Spectracide)	G, L	
	lambda-cyhalothrin (Demand, 228L, Spectracide)	G, L	
	lemongrass oil (Hot Shot)	A, L	
	permethrin (Flee, Dragnet, Prelude, various others)	L	
	phenothrin (Bedlam)	L	
	pyrethrins, pyrethrum (Kicker, Pyrenone, various others)	A, L	
	silica gel (Drione, Tri-Die)	D	

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Pests	Insecticide	Formulation	Precautions and Remarks
SILVERFISH	alpha cypermethrin (Fendona CS)	L	Treat cracks, crevices, moldings and similar areas. Attic treatment may be necessary. Apply to cracks and crevices and behind and underneath appliances. Spray along baseboards and other areas where silverfish are found.
	beta-cyfluthrin (Bayer Advanced)	L	
	bifenthrin (Ortho)	L	
	cypermethrin (Black Flag, Hi-Yield, Hot Shot, Spectracide)	A, F, L	Apply as directed on the label.
	d-allethrin (Raid House & Garden Bug Kill Formula 7)	A	
	deltamethrin (Black Flag, Spectracide)	A	Imiprothrin is formulated with other pesticides in these products.
	diatomaceous earth (Perma-Guard)	D	
	dichlorvos (Nuvan)	A, CRS, F(RUP)	
	gamma-cyhalothrin (Spectracide)	L	
	imiprothrin (Raid)	A	
	lambda-cyhalothrin (Spectracide)	A, L	
	lemongrass oil (Hot Shot)	A, L	
	permethrin (various)	L	
	prallethrin (Ortho)	A	
	pyrethrins, pyrethrum	A	
	tetramethrin (various)	A	
	zeta-cypermethrin (Cynoff)	D	
SOWBUGS AND PILLBUGS (a) Indoors	alpha cypermethrin (Fendona CS)	L	Clean up breeding and hiding places; treat thoroughly. Outdoor barrier treatments along foundation and door thresholds are usually sufficient. Some products are not suitable for use in residential kitchens or commercial food/feed preparation sites. Read the product label carefully.
	beta-cyfluthrin (Bayer Advanced)	L	
	bifenthrin (Ortho)	L	
	cypermethrin (Black Flag, Hi-Yield, Hot Shot, Spectracide)	A, F, L	
	d-allethrin (Raid House & Garden Bug Kill Formula 7)	A	Use as a barrier treatment along foundation wall, door threshold and window ledges. Oil (petroleum-distillate) sprays may harm asphalt, rubber and vinyl tiles. Some sprays may damage vegetation under hot, humid conditions. Read label precautions. For lawn treatment, apply an insecticide band 10 to 15 feet wide. Apply liquid formulations with sufficient spray volume to saturate soil. Granular formulations are for outdoor use only and must be watered into soil or applied before rain. Repeat as needed at 4- to 6-week intervals.
	deltamethrin (Black Flag, Spectracide)	A, L	
	diatomaceous earth (Perma-Guard)	D	
	dichlorvos (Nuvan)	A, CRS, F(RUP)	
	gamma-cyhalothrin (Spectracide)	L	
	lambda-cyhalothrin (Spectracide)	A, L	
	permethrin (various)	A	
	prallethrin (Ortho)	A	
	pyrethrins, pyrethrum	A	
	zeta-cypermethrin (Cynoff)	D	
SOWBUGS AND PILLBUGS (b) Outdoors	alpha cypermethrin (Fendona CS)	L	Use as a barrier treatment along foundation wall, door threshold and window ledges. Oil (petroleum-distillate) sprays may harm asphalt, rubber and vinyl tiles. Some sprays may damage vegetation under hot, humid conditions. Read label precautions. For lawn treatment, apply an insecticide band 10 to 15 feet wide. Apply liquid formulations with sufficient spray volume to saturate soil. Granular formulations are for outdoor use only and must be watered into soil or applied before rain. Repeat as needed at 4- to 6-week intervals.
	beta-cyfluthrin (Bayer Advanced)	L	
	bifenthrin (Ortho)	G, L	
	cypermethrin (Hi-Yield)	L	
	deltamethrin (Spectracide)	A	
	diatomaceous earth (Perma-Guard)	D	

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Pests	Insecticide	Formulation	Precautions and Remarks
SOWBUGS AND PILLBUGS (b) Outdoors (cont.)	gamma-cyhalothrin (Spectracide)	G, L	
	lambda-cyhalothrin (Spectracide)	L	
	permethrin (various)	D, G, L	
	tetramethrin (various)	L	
	zeta-cypermethrin (Cynoff)	D	
SPIDERS (a) Indoors	alpha cypermethrin (Fendona CS)	L	Treat infested areas along baseboards. Use foggers if rooms have been undisturbed for some time and spider populations are extensive. Some products are not suitable for use in residential kitchens or commercial food/feed preparation sites. Read the product label carefully.
	beta-cyfluthrin (Bayer Advanced)	L	
	bifenthrin (Ortho)	L	
	cypermethrin (Black Flag, Hi-Yield, Hot Shot, Spectracide)	A, F, L	Apply as directed on the label.
	d-allethrin (Raid House & Garden Bug Kill Formula 7)	A	
	d-phenothrin (Raid)	A	
	deltamethrin (Black Flag, Spectracide)	A	
	diatomaceous earth (Perma-Guard)	D	
	dichlorvos (Nuvan)	A, CRS, F(RUP)	
	eugenol (Bayer Advanced)	L	
	gamma-cyhalothrin (Spectracide)	L	
	imiprothrin (Raid)	A	Imiprothrin is formulated with other pesticides in these products.
	lambda-cyhalothrin (Spectracide)	A, L	
	lemongrass oil (Hot Shot)	A, L	
	permethrin (various)	A	
	prallethrin (Ortho)	A	
	pyrethrins, pyrethrum	A	
	tetramethrin (various)	A	
	zeta-cypermethrin (Cynoff)	D	Not for use on black widow and brown recluse spiders.
SPIDERS (b) Outdoors	alpha cypermethrin (Fendona CS)	L	Apply as a barrier treatment along foundation. Spray corners of decks, eaves, porches and other areas where spiders tend to build webs. Webbing can be knocked down as an alternative. Exercise caution when spraying in crawlspace. Avoid inhaling spray.
	beta-cyfluthrin (Bayer Advanced)	L	
	bifenthrin (Ortho)	L	
	cypermethrin (Hi-Yield)	L	Apply as directed on the label.
	deltamethrin (Black Flag, Spectracide)	A	
	diatomaceous earth (Perma-Guard)	D	
	gamma-cyhalothrin (Spectracide)	G, L	
	lambda-cyhalothrin (Spectracide)	L	
	lemongrass oil (Hot Shot)	A, L	
	permethrin (various)	L	
	pyrethrins, pyrethrum	A	
	tetramethrin (various)	L	
	zeta-cypermethrin (Cynoff)	D	Not for use on black widow and brown recluse spiders.

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Pests	Insecticide	Formulation	Precautions and Remarks
SPRINGTAILS (Indoors and Outdoors)	alpha cypermethrin (Fendona CS)	L	Apply as a barrier spray along foundation and entry points. Some products may be used indoors for temporary relief. Clean up moisture conditions that may attract insects indoors. Excess moisture may impede product effectiveness. Use indoors for temporary relief. Some products are not suitable for use in residential kitchens or commercial food/feed preparation sites. Read the product label carefully.
	beta-cyfluthrin (Bayer Advanced)	L	
	bifenthrin (Ortho)	L	
	cypermethrin (Black Flag, Hi-Yield, Hot Shot, Spectracide)	A, F, L	
	d-allethrin (Raid House & Garden Bug Kill Formula 7)	A	Apply as directed on the label.
	deltamethrin (Spectracide)	A	
	diatomaceous earth (Perma-Guard)	D	Imiprothrin is formulated with other pesticides in these products.
	gamma-cyhalothrin (Spectracide)	G, L	
	imiprothrin (Raid)	A	
	lambda-cyhalothrin (Spectracide)	L	
	permethrin (various)	L	
	prallethrin (Ortho)	A	
	pyrethrins, pyrethrum	A	
	tetramethrin (various)	A	
	zeta-cypermethrin (Cynoff)	D	
STINGING CATERPILLARS			See Caterpillar entry under INSECT CONTROL FOR ORNAMENTALS GROWN IN NURSERIES OR LANDSCAPES section.
STINK BUGS (Indoors and outdoors)	alpha cypermethrin (Fendona CS)	L	Apply as directed on label.
	beta-cyfluthrin (Bayer Advanced)	L	Apply as directed on label.
	bifenthrin (Ortho)	L	Apply as directed on label.
	cypermethrin (Raid)	A	Apply as directed on label.
	d-phenothrin (Raid)	A	Apply as directed on label.
	deltamethrin (Raid)	A	Apply as directed on label.
	gamma-cyhalothrin (Spectracide)	G, L	Apply as directed on label.
	imiprothrin (Raid)	A	Apply as directed on label.
	lambda-cyhalothrin (Spectracide)	L	Apply as directed on label.
STORED FOOD PESTS			See Pantry Pests .
TERMITE DRYWOOD SPECIES (Wood treatment)	acetamiprid + bifenthrin (Transport)	L	Coarse spray or drill and inject into wood.
	alpha cypermethrin (Fendona CS)	L	Apply as directed on label.
	aluminum phosphide (Phostoxin)	FU	Apply under gas-tight tarpaulins or in sealed chamber. Requires an Arkansas Class 3 General Fumigation Commercial Pesticide Applicator's License.
	beta-cyfluthrin (Bayer Advanced, Tempo)	L	Coarse surface spray or inject into wood.
	bifenthrin (Ortho, Bifen, Talstar)	L	Coarse spray or inject into wood.
	cypermethrin (Demon TC, Cyoe TC)	L	Coarse spray or inject into wood for localized infestations.
	deltamethrin (BioAdvanced, Suspend, D-Fend Dust, D-Foam)	D, FM, L	Surface spray or inject foam or dust into galleries.
	dinotefuran (Alpine)	FM, L	Apply as directed on label.
	disodium octaborate tetrahydrate (Bora-Care, Tim-bor, Borathor, Spectracide)	L	Coarse surface spray or inject wood.

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Pests	Insecticide	Formulation	Precautions and Remarks
TERMITE DRYWOOD SPECIES (Wood treatment) (cont.)	fipronil (Termidor, Taurus)	FM, L	Coarse spray or inject into wood.
	imidacloprid (Bayer Advanced, Dominion, Premise)	FM, L	Drill and inject spray or foam into voids.
	imidacloprid + cyfluthrin (Temprid SC)	L	Apply as directed on label.
	lambda-cyhalothrin (Demand, Spectracide)	L	Apply as directed on label. Localized treatments. Spectracide is not recommended as a sole protection against termites.
	permethrin (Dragnet, various others)	L	Coarse spray on wood for localized infestation.
	sulfuryl fluoride (Vikane)	FU	Apply under gas-tight tarpaulins only. Hold for 24 hours at temperature above 60 degrees F. Requires an Arkansas Class 3 General Fumigation Commercial Pesticide Applicator's License.
	thiamethoxam (Optigard)	L	Coarse spray or drill and inject into wood.
	zeta-cypermethrin (Cynoff)	D	This product is intended to kill workers and/or winged reproductive forms of termites present at the time of application only. Application of this product will not provide structural protection nor substitute for mechanical alteration, soil or foundation treatment with termiticide. This product is not to be used as sole protection against termites, as it is not intended for use for elimination of termite infestations nor for protection against future infestations. A professional inspection is recommended.
	acetamiprid + bifenthrin (Transport)	L	
	beta-cyfluthrin (Bayer Advanced, Tempo)	L	Coarse spray, brush on or inject into wood. Avoid excess runoff.
TERMITE SUBTERRANEAN SPECIES (a) Wood treatment	bifenthrin (Ortho, Bifen, Talstar)	L	For use only in voids or channels in damaged wood or to cracks and spaces between wooden members of structures.
	chlorantraniliprole (Altriset)	L	Coarse spray around or inject into infested poles, trees and stumps (outdoors).
	chlorfenapyr (Phantom)	L	Coarse spray or inject into wood.
	cypermethrin (Demon TC, Cyoe TC)	L	Coarse surface spray or inject into wood.
	deltamethrin (BioAdvanced, Suspend, D-Fend Dust, D-Foam)	D, FM, L	Course surface spray or inject foam or dust into galleries.
	diflubenzuron (Advance, Isophor, Labyrinth, Truth)	S	Aboveground stations used in conjunction with in-ground baiting systems.
	dinotefuran (Alpine)	FM, L	Apply as directed on label.
	disodium octaborate tetrahydrate (Bora-Care, Tim-bor, Borathor, Spectracide)	D, L	Spray, brush on, or inject into wood. For long-term protection, apply a water repellent to exterior wood surfaces 2 to 3 weeks after treatment. Not a replacement for soil treatment.
	esfenvalerate (Bengal Termite killing Concentrate, Onslaught)	L	Onslaught labeled for swarming termites only.
	fipronil (Termidor, Taurus)	FM, L	Coarse spray or inject into wood.
	imidacloprid (Premise)	B, FM, L	Gel and foam formulations may be injected into voids or damaged wood.
	imidacloprid + cyfluthrin (Temprid SC)	L	Apply as directed on label.
	lambda-cyhalothrin (Demand, Spectracide)	L	Apply as directed on label. Localized treatments. Spectracide is not recommended as a sole protection against termites.
	noviflumuron (Recruit IV AG)	S	Available only as part of the Sentricon in-ground system.
	permethrin (Dragnet, various others)	L	Coarse spray, brush on or inject into wood. Avoid excessive runoff.
	zeta-cypermethrin (Cynoff)	D	This product is intended to kill workers and/or winged reproductive forms of termites present at the time of application only. Application of this product will not provide structural protection nor substitute for mechanical alteration, soil or foundation treatment with termiticide. This product is not to be used as sole protection against termites, as it is not intended for use for elimination of termite infestations nor for protection against future infestations. A professional inspection is recommended.

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Pests	Insecticide	Formulation	Precautions and Remarks
TERMITE SUBTERRANEAN SPECIES (b) Soil treatment NOTE: Most structural termite infestations require treatment by a pest control professional with a Class 1 Termite and Other Structural Pest Control License issued by the Arkansas State Plant Board.	acetamiprid + bifenthrin (Transport)	L	Apply as directed on label.
	beta-cyfluthrin (Bayer Advanced, Tempo)	L	Apply as directed on label.
	bifenthrin (Bifen, Ortho, Talstar)	L	Apply as directed on label.
	chlorfenapyr (Phantom)	L	Apply as directed on label.
	chlorantraniliprole (Altriset)	L	Apply as directed on label.
	cypermethrin (Demon, TC, Cyoe TC)	L	Apply as directed on label.
	diflubenzuron (Advance, Isophor, Labyrinth, Truth)	S	Apply as directed on label.
	fipronil (Termidor, Taurus)	L	Apply as directed on label.
	hexaflumuron (Shatter)	B	Shatter is for localized treatments.
	imidacloprid (Bayer Advanced, Premise)	G, L	Apply as directed on label.
	imidacloprid + cyfluthrin (Temprid SC)	L	Apply as directed on label.
	indoxacarb (Arilon)	L	Arilon should be used for spot or localized treatment only. (Arilon is not intended as a sole protection against termites.)
	lambda-cyhalothrin (Demand, Spectracide)	L	Apply as directed on label.
	novaluron (Trelona)	B	Apply as directed on label.
	noviflumuron (Recruit HD)	S	Apply as directed on label.
	permethrin (Dragnet FT, MasterLine)	L	Apply as directed on label.
TICKS (Outdoors)	See Brown Dog Tick and control of ticks in ANIMAL INSECT CONTROL section.		
WASPS, YELLOW JACKETS	See Hornets, Mud Daubers, Wasps, Yellow Jackets .		

INDUSTRIAL AND HOUSEHOLD PESTS—For use by licensed pest management professionals only

Pesticide	Boric acid (Niban, Perma-Dust, InTice)		Diatomaceous earth (Mother Earth D)	Silica gel (Drione, Tri-Die, Cimex Dust)	Sodium Tetraborate (Gourmet Liquid Ant Bait, Cymex)		Methomyl (Flytek, Sysco Fly Bait)	Propoxur (Invader)	Acephate (Orthene)	Dichlorvos (Nuvan)	
Chemical Class ¹	Inorganic						Carbamates		Organophosphates		
Formulation ²	Bait	Dust	Dust ³	Dust ³	Bait	Dust	Bait ⁴	Sprayable	Sprayable ⁷ (outdoor use only)	Strip	Sprayable
Pests											
Ants	X	X	X	X	X6	X			X		X
Bed Bugs			X	X		X		X		X	X
Bees				X					X		X
Booklice	X		X	X							
Bugs (True) ⁵	X			X				X	X	X	
Carpet Beetles			X			X				X	X
Centipedes	X		X	X				X	X		
Clothes Moths			X							X	X
Clover Mites	X		X	X				X	X		
Cockroaches	X	X	X	X				X	X	X	X
Crickets	X	X	X	X					X		X
Earwigs	X	X	X	X				X	X	X	
Fleas		X	X	X		X			X		X
Flies	X		X	X			X			X	X
Hornets/Wasps				X					X		X
Lady Beetles			X	X							
Millipedes	X		X	X				X	X		X
Mosquitoes											X
Stored Product Pests	X		X	X							
Scorpions			X	X							
Silverfish	X	X	X	X				X	X	X	X
Spiders			X					X	X	X	X
Sowbugs			X					X	X		X
Springtails			X	X				X	X		X
Ticks				X				X			

¹ Alternating uses of insecticides in different chemical classes can help reduce the likelihood of the pests developing resistance to one group or class of compounds.

² Formulations:

Aerosol includes Crack & Crevice. Bait may be granular, gel, or station.

Sprayable may be concentrate or powder, some RTU formulations.

³ Some formulations of diatomaceous earth and silica gel contain pyrethrins as a flushing agent.

⁴ Not to be used in or around residences or other buildings where children may be present.

⁵ True bugs includes boxelder bugs, stink bugs, kudzu bugs, and similar occasional invaders.

⁶ Baits may be formulated as solids, dusts or liquids.

⁷ Some formulations of Orthene may be applied indoors as crack & crevice treatment only.

INDUSTRIAL AND HOUSEHOLD PESTS—For use by licensed pest management professionals only (cont.)

Pesticide	Bifenthrin (Bifen, Talstar)	Cyfluthrin (Tempo Ultra, Ultrashield CS)	Cypermethrin ² (Demon, Cynoff, Fendona, Talstar Xtra)			Deltamethrin (DeltaDust, DeltaGuard, Suspend)			Esfenvalerate (Onslaught)	Etofenprox (Zenprox)	Lambda-cyhalothrin (Demand, 228L)		Permethrin (Flee, Dragnet, Prelude)		Phenothrin (Bedlam, Nyguard Plus ⁶)	Prallethrin (Altocirrus Fog)	Pyrethrins and pyrethrum (Kicker, Pyrenone)			Tetramethrin (Wasp & Hornet Killer)
Chemical Class	Pyrethroids ¹																			
Formulation ³	S,G	S	D	G	S	D	G	S	S	S	S	G	S	G	S	S	A ⁴	S ⁴	D ⁴	S
Pests																				
Ants	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
Bed Bugs		X				X		X	X	X	X		X		X			X	X	
Bees	X	X	X		X	X		X	X		X		X					X	X	X
Booklice		X				X		X					X		X			X		
Bugs (True) ⁵	X	X	X		X				X		X		X		X	X				
Carpet Beetles		X				X		X	X	X	X		X			X	X	X		
Centipedes	X	X	X	X	X	X	X	X	X	X	X		X		X	X				
Clothes Moths		X				X		X								X				
Clover Mites		X	X		X		X					X		X	X	X	X	X		
Cockroaches	X	X	X		X	X	X	X	X	X	X		X		X	X	X	X	X	
Crickets	X	X	X		X	X		X	X	X	X	X	X	X	X	X	X	X		
Earwigs	X	X	X	X	X				X	X	X	X	X	X	X	X	X	X		
Fleas	X	X	X	X	X	X		X	X	X	X		X		X	X	X	X		
Flies/Gnats	X	X	X		X			X		X	X		X		X	X	X	X		
Hornets/Wasps	X	X	X		X			X	X	X	X				X	X	X	X		X
Lady Beetles															X					
Millipedes	X	X	X	X	X		X	X	X	X	X	X	X	X						
Mosquitoes	X	X	X		X			X	X	X	X					X	X	X		
Stored Product Pests		X						X		X	X		X			X	X	X		
Scorpions	X	X	X	X	X				X			X	X		X		X	X		
Silverfish	X	X	X		X			X	X	X	X	X	X		X	X	X	X		
Spiders	X	X	X	X	X		X	X	X	X	X		X		X	X	X	X		
Sowbugs	X	X	X	X	X	X	X	X	X		X		X	X	X	X	X	X		
Springtails	X	X	X		X	X	X	X	X	X	X		X		X	X	X	X		
Ticks	X	X	X	X	X	X	X	X	X	X	X		X	X	X	X	X	X		

¹ Alternating use of insecticides in different chemical classes can help reduce development of pesticide resistance to one class/group of compounds. Piperonyl butoxide tank-mixed with many pyrethroids will synergize performance.

² Some products use alpha-cypermethrin or zeta-cypermethrin which contain chemical isomers of cypermethrin. Talstar Xtra is a mixture of zeta-cypermethrin and bifenthrin.

³ **KEY TO FORMULATION SYMBOLS:** A = aerosol; B = bait (granular or station) D = dust; G = granular; S = sprayable (concentrate or powder, some RTU formulations);

⁴ Some formulations of pyrethrins contain piperonyl butoxide as a synergist.

⁵ True bugs includes boxelder bugs, stink bugs, kudzu bugs, and similar occasional invaders.

⁶ Nyguard Plus contains the IGR pyriproxyfen

INDUSTRIAL AND HOUSEHOLD PESTS—For use by licensed pest management professionals only (cont.)

Pesticide	Hydroprene (Gencor ³)	Methoprene (Altosid Kabat, Pharorid, Precor, Vigren) ³		Pyriproxyfen (Archer, Ultracide)	Acetamiprid + Bifenthrin (Transport)	Dinotefuran (Advance, Alpine)	Imidacloprid (FlyBait Maxforce, Premise, Temprid) ⁸	Thiamethoxam (Optigard) ⁹	Clothianidin (Maxfore Impact, Crossfire Bed Bug)	Abamectin (Ascend, Avert, Advance)	Aluminum phosphide (Phostoxin) ⁵	Chlorfenapyr (Phantom) ⁶	Cytraniliprole (Zyrox)	d-Limonene (ProCitra DL)	Fipronil (Maxforce F, TopChoice, Termidor) ⁷	2-Phenyl Proprionate (EcoPCO EC)	Hydramethylnon (Amdro, Siege, MaxForce)	Indoxacarb (Advion, Arillion)	Rosemary Oil (Essentria IC3)	Sulfuryl floride (Vikane, Profume, Zythor) ⁹
Chemical Class ¹	Insect Growth Regulators				Neonicotinoids					Other Classes										
Formulation ²	A,S	B	A,S	A,S	B,S	B,D,S	B	B,S		B	F	S	B	S	B,G,S	A,S	B	B,S	A	F
Pests																				
Ants	X	X		X	X	X	X	X ⁹		X		X		X	X	X	X	X	X	
Bed Bugs			X	X	X	X			X ¹¹			X		X		X			X	X
Bees					X	X										X			X	
Booklice					X	X													X	
Bugs (True) ⁴					X	X		X						X		X			X	
Carpet Beetles					X	X										X			X	X
Centipedes					X			X						X		X			X	
Clothes Moths					X	X								X						X
Clover Mites					X									X					X	
Cockroaches	X			X	X	X	X	X	X	X		X		X	X	X	X	X	X	X
Crickets				X	X	X		X				X		X	X	X		X	X	
Earwigs	X				X	X		X				X		X	X	X			X	
Fleas			X	X	X	X								X		X				
Flies/Gnats	X			X	X	X	X					X	X	X	X	X			X	
Hornets/Wasps					X	X						X ¹⁰		X	X	X			X	
Lady Beetles					X	X		X				X		X	X	X			X	
Millipedes					X	X		X				X		X	X	X		X	X	
Mosquitoes	X	X		X	X									X		X			X	
Stored Product Pests	X		X	X	X	X		X			X	X				X			X	X
Scorpions					X	X						X								
Silverfish					X	X		X				X			X	X			X	
Spiders					X	X						X		X	X	X			X	
Sowbugs					X	X								X					X	
Springtails					X	X								X					X	
Ticks				X	X									X	X				X	

¹ Alternating uses of insecticides in different chemical classes can help reduce the likelihood of the pest developing resistance to one class or group of compounds.

KEY TO FORMULATION SYMBOLS:

A = Aerosol (includes Crack & Crevice), B = Bait (granular, gel or station), D = Dust, F = Fumigant, G = Granular, S = sprayable (concentrate or powder, some RTU formulations)

³ IGR products are not typically effective against adult stage of pests; use with an adulticide to provide quicker control of pest population.

⁴ True bugs includes boxelder bugs, stink bugs, kudzu bugs, and similar occasional invaders

⁵ Requires an F-Phase Structural Pest Control License.

⁶ Chlorfenapyr labeled for indoor use only for these pests or limited spot treatment outdoors.

⁷ Termidor liquid formulations are labeled for outdoor use only; use other insecticide products indoors.

⁸ Temprid contains both imidacloprid and cyfluthrin.

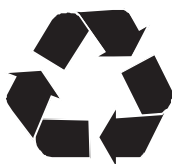
⁹ Optigard not for use against pharaoh ants or carpenter ants.

¹⁰ Phantom is not a knockdown insecticide for pests such as wasps

¹¹ Use spray formulation only for bed bugs. Also contains Metofluthrin and Piperonyl Butoxide

NOTES

This image shows a full page of white paper with horizontal blue or grey ruling lines. The lines are evenly spaced and run across the width of the page, typical of notebook paper. There are no margins, text, or other markings on the page.



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