



# Ornamental and Lawn Pest Control

## (For Homeowners)

**Eric Rebek**  
Extension Entomologist and Associate Professor

**Mike Schnelle**  
Extension Ornamentals - Floriculture Specialist

Oklahoma Cooperative Extension Fact Sheets are also available on our website at: <http://osufacts.okstate.edu>

This fact sheet describes some common arthropod pest problems encountered on various ornamentals and turfgrass lawns in Oklahoma. If arthropod pest problems arise that are not covered here, consult your OSU County Extension Office for assistance.

Many arthropod pest problems are solved through natural control factors such as weather, disease, parasites, and predators. When nature either does not solve the pest problem or is slow to act, other controls may be warranted. Chemical pesticides often provide the quickest and most dependable control, and in many instances, there may be no other alternatives.

Pesticides are chemicals of plant, animal, or synthetic origin manufactured to kill pests – insects, weeds, plant disease organisms, and rodents. Materials poisonous to one organism are usually poisonous to other organisms if the dosage is large enough. Pesticides can be applied safely when a few basic rules are followed and common sense is used. Refer to OSU Extension Fact Sheets EPP-7450, EPP-7453, and EPP-7457 for more information on pesticide safety. For information on insect control in the vegetable garden, refer to OSU Extension Fact Sheet EPP-7313.

Note: Whenever possible, buy and grow pest resistant plants such as Oklahoma Proven selections (<http://oklahomaproven.okstate.edu>) or other recommended varieties. By doing so, the need for pest control measures can be greatly reduced.

### PESTS OF TREES, SHRUBS, AND FLOWERS

<i>Pest, Time Most Prevalent, &amp; Other Information</i>	<i>Pesticide Common Name</i>	<i>Pesticide Trade Name</i>	<i>Application Instructions</i>	<i>Comments</i>
<b>APHIDS</b>  Measure 1/8 to 1/5 inch long.  Pear-shaped, soft-bodied, sucking insects. Active all growing season.  Aphids secrete honeydew (sticky, sugar-like material), which may attract ants and flies, and provide growing media for sooty mold.  Aphids generally attack the tender terminals and leaves. Leaves may twist and curl and become distorted.  Small infestations can often be washed off plants with strong water pressure (stream of water).	acephate + fenbutatin-oxide	Ortho Systemic Insect Killer Concentrate	2 tbs per gal water	Do not use acephate products on American elm, crabapple, red or sugar maple, cottonwood, redbud, or weigela.  Applied as a granular treatment around base of trunk. Determine rate based on trunk diameter or height of shrub.  Carefully read label of insecticidal soap products for phytotoxicity statements.  Carefully read label of malathion products for phytotoxicity statements.
	acetamiprid	Ortho Max Flower, Fruit and Vegetable Insect Killer RTU	Apply per label	
	dinotefuran	Green Light Tree and Shrub Insect Control w/ Safari 2G	Apply per label	
	insecticidal soap	Safer Insect Killing Soap Concentrate II	5 tbs per gal water	
	malathion	Green Light 50% Malathion Insect Spray	Apply per label	
	neem oil	Safer Bioneem or Bonide Bon-Neem	Apply per label	
<b>BAGWORMS</b>  Measure 1-2 inches long (bagworm case).  Active May through September.  Common caterpillar pests on cedars, arborvitae, and sometimes feed on bald cypress, elms, pines, willows, maples, sycamores, and other trees.  Small infestations can be removed by hand in winter before larvae emerge in May, but be sure to destroy all bags.	acephate + fenbutatin-oxide	Ortho Systemic Insect Killer Concentrate	3 tbs per gal water	Apply B.t. early while worms/bags are still small (e.g., late May or early June). Less effective for large larvae.  See note at end of section on Sevin.  Carefully read label of malathion products for phytotoxicity statements.  Apply spinosad early while worms/bags are still small (e.g., late May or early June). Less effective for large larvae.
	<i>Bacillus thuringiensis</i> (B.t.) var. <i>kurstaki</i>	Thuricide or Dipel	Apply per label	
	carbaryl	GardenTech Sevin Concentrate Bug Killer	3 tbs per gal water	
	malathion	Green Light 50% Malathion Insect Spray	Apply per label	
	spinosad	Ferti-Lome Borer, Bagworm, Leafminer and Tent Caterpillar Spray	4 tbs per gal water	

<i>Pest, Time Most Prevalent, &amp; Other Information</i>	<i>Pesticide Common Name</i>	<i>Pesticide Trade Name</i>	<i>Application Instructions</i>	<i>Comments</i>
<b>BORERS</b> FLATHEADED BORERS ROUNDHEADED BORERS SHOTHOLE BORERS  Measure 1/2 to 1 3/4 inches long.  Active spring through fall.  See OSU Fact Sheet EPP-7326 for additional information about woodborers.	dinotefuran	Green Light Tree and Shrub Insect Control w/ Safari 2G	Apply per label	Applied as a granular treatment around base of trunk. Determine rate based on trunk diameter or height of shrub.
	imidacloprid	Bayer Advanced Tree and Shrub Insect Control	Apply per label	Use imidacloprid as a drench around base of trunk. Determine rate based on the trunk diameter or height of shrub.
<b>ASH/LILAC BORER</b>  Measure up to 1 inch long. Adult moths are wasp mimics.  Active spring through fall.  As a preventative measure, it is helpful to insure health of trees with proper watering and fertilizer.	permethrin	Hi-Yield Indoor/Outdoor Broad Use Insecticide	2 tbs per gal water	Spray trunk when adult moths are active to target egg-laying adults and newly emerging larvae. Monitor adult activity with pheromone traps.
<b>IRIS BORER</b>  Larvae are pink caterpillars measuring up to 2 inches long.  Active late April through August.  Larvae tunnel within leaves, stems, and rhizomes (roots).	beneficial nematodes		Apply per label	Entomophagous nematodes ( <i>Steinernema</i> and <i>Heterorhabditis</i> species) are tiny roundworms available in garden supply catalogues, garden centers, and online. Levels of control vary, but nematodes function best at soil temperatures between 60° and 93°F. See OSU Fact Sheet HLA 6434 for more information about beneficial nematodes.
	piperonyl butoxide + pyrethrins	GardenTech Worry Free Brand Concentrate	Apply per label	
	spinosad	Ferti-Lome Borer, Bagworm, Leafminer and Tent Caterpillar Spray	4 tbs per gal water	Apply spray to upper and lower leaf surfaces when eggs hatch, corresponding to new growth measuring 4 to 6 inches. A second application may be needed 10 to 14 days later.
<b>BARK BEETLES</b> (in pines)  Adults measure 1/20 to 1/5 inch long.  Small, cylindrical, brown to black beetles that tunnel and create feeding galleries below bark surface.  Active spring through fall.	imidacloprid	Bayer Advanced Tree and Shrub Insect Control	Apply per label	Use imidacloprid as a drench around base of trunk. Determine rate based on the trunk diameter or height of shrub.
	piperonyl butoxide + pyrethrins	GardenTech Worry Free Brand Concentrate	Apply per label	
<b>ELM BARK BEETLES</b>  There are 2 or 3 generations with overlapping broods. Adults emerge in spring from under bark of dead or dying elms and feed on tender bark in twig crotches. Beetles emerging from late April to the end of June are most likely to transmit Dutch Elm Disease.	Only restricted use pesticides are currently available for control of elm bark beetle and the disease it transmits, Dutch Elm Disease. Consult a certified arborist or other tree care professional for control options.			

<i>Pest, Time Most Prevalent, &amp; Other Information</i>	<i>Pesticide Common Name</i>	<i>Pesticide Trade Name</i>	<i>Application Instructions</i>	<i>Comments</i>
<p><b>BOXELDER BUGS and RED-SHOULDERED BUGS</b></p> <p>Measure 1/2 to 1 3/4 inches long.</p> <p>Nuisance household pest in the fall. Feed on seeds of boxelder, golden raintree, and soapberry, but don't injure the tree. Avoid planting host trees in close proximity to house. Plug openings around windows and doors, and caulk small openings that can serve as points of entry.</p> <p>Best control is achieved if applications are made when young nymphs are present in early summer.</p>	cyfluthrin	Bayer Advanced Power Force Multi-Insect Killer	1 tbs per gal water	<p>Carefully read label of malathion products for phytotoxicity statements.</p>
	malathion	Green Light 50% Malathion Insect Spray	Apply per label	
<p><b>CATERPILLARS</b></p> <p>Includes cankerworms, webworms tent caterpillars, and leafrollers/leaftiers.</p> <p>Measure 1/2 to 2 inches long.</p> <p>Active spring through fall.</p> <p>Larvae feed on foliage. Some species roll and tie leaves with silk and some build webs or tents around foliage or in crotches of limbs.</p>	acephate + fenbutatin-oxide	Ortho Systemic Insect Killer Concentrate	3 tbs per gal water	Do not use acephate products on American elm, crabapple, red or sugar maple, cottonwood, redbud, or weigela.
	<i>Bacillus thuringiensis</i> (B.t.) var. <i>kurstaki</i>	Thuricide or Dipel	Apply per label	Apply B.t. early while caterpillars are still small. Less effective for large larvae. B.t. stops larvae from feeding, but has a delayed killing action. <b>B.t. does NOT control sawflies.</b>
	carbaryl	GardenTech Sevin Concentrate Bug Killer	3 tbs per gal water	See note at end of section on Sevin.
	esfenvalerate	Ortho Bug-B-Gon Max Garden and Landscape Insect Killer	Apply per label	
	insecticidal soap	Safer Insect Killing Soap Concentrate II	Apply per label	Carefully read label of insecticidal soap products for phytotoxicity statements.
	malathion	Green Light 50% Malathion Insect Spray	Apply per label	Carefully read label of malathion products for phytotoxicity statements.
	neem oil	Safer Bioneem or Bonide Bon-Neem	Apply per label	
	spinosad	Ferti-Lome Borer, Bagworm, Leafminer and Tent Caterpillar Spray	4 tbs per gal water	Apply spinosad early while caterpillars are still small. Less effective for large larvae.
<p><b>CUTWORMS</b></p> <p>Measure up to 2 inches long.</p> <p>Active early spring.</p> <p>Cutworms feed on plant stems, often cutting young plants down at soil surface.</p>	carbaryl + metaldehyde	Ortho Bug-Geta Plus Snail, Slug and Insect Killer (granules)	1 lb per 2,000 sq ft.	Ortho Bug-Geta Plus is recommended for use with a spreader (see label).
	cyfluthrin	Bayer Advanced Power Force Multi-Insect Killer		1 tbs per gal water

<i>Pest, Time Most Prevalent, &amp; Other Information</i>	<i>Pesticide Common Name</i>	<i>Pesticide Trade Name</i>	<i>Application Instructions</i>	<i>Comments</i>
<p><b>ELM LEAF BEETLE, WILLOW LEAF BEETLE, and ELM CALLIGRAPH BEETLE</b></p> <p>Adults measure 1/8 to 1/4 inch long. Larvae measure 1/4 to 3/8 inch long.</p> <p>These leaf-feeding beetles are active late spring to late summer. Both adults and larvae feed on foliage, but larvae cause the most damage by skeletonizing the leaves.</p>	acephate + fenbutatin-oxide	Ortho Systemic Insect Killer Concentrate	3 tbs per gal water	Do not apply acephate products to American elm. For best results, apply chemical right after eggs hatch (approximately late May to early June).
	carbaryl	GardenTech Sevin Concentrate Bug Killer	3 tbs per gal water	See note at end of section on Sevin.
	cyfluthrin	Bayer Advanced Power Force Multi-Insect Killer	1 tbs per gal water	
	dinotefuran	Green Light Tree and Shrub Insect Control w/ Safari 2G	Apply per label	Applied as a granular treatment around base of trunk. Determine rate based on trunk diameter or height of shrub.
	imidacloprid	Bayer Advanced Tree & Shrub Insect Control	Apply per label	Use imidacloprid as a drench around base of trunk. Determine rate based on the trunk diameter or height of shrub.
<p><b>FLEA BEETLES</b></p> <p>Measure 1/16 to 1/8 inch long.</p> <p>Tiny, black beetles with enlarged hind legs designed for jumping.</p> <p>Active in summer, feeding on foliage of a wide variety of landscape plants.</p>	acetamiprid	Ortho Max Flower, Fruit and Vegetable Insect Killer RTU	3 tbs per gal water	See note at end of section on Sevin.
	carbaryl	GardenTech Sevin Concentrate Bug Killer Bayer	Apply per label	
	cyfluthrin	Advanced Power Force Multi-Insect Killer	1 tbs per gal water	
	lambda-cyhalothrin	Spectracide Triazicide Once and Done Insect Killer	Apply per label	
<p><b>GALLS</b></p> <p>New growth forms during growing season.</p> <p>See OSU Fact Sheet EPP-7168 for detailed information about plant galls.</p> <p>Gall problems can be reduced by applying the chemicals listed in early spring (bud swell), then again at bud break, and again when leaves are half grown.</p>	dormant lime sulfur	Bonide Lime Sulfur Spray	Apply per label	Do not apply lime to actively growing plants.
	malathion	Green Light 50% Malathion Insect Spray	Apply per label	Carefully read label of malathion products for phytotoxicity statements.
	paraffinic oil	Gordon's Dormant Oil Spray (Superior oil grade of 60 or 70 or one specifying unsulfonated residue of 91% or 92%) or Sunspray Ultra Fine Year-Round Pesticidal Oil (growing season oil)	Apply per label  Apply per label	Do not apply dormant oil to actively growing plants nor to broadleaf evergreens, maple, mountain ash, or beech.  Growing season oil can be used during growing season alone or mixed with an insecticide (see above list).
<p><b>GRASSHOPPERS</b></p> <p>Measure 1-2 inches long.</p> <p>Outer wings are leathery, inner wings are clear or colored. Enlarged hind legs designed for jumping.</p> <p>Grasshoppers feed on foliage of numerous plants but prefer grasses.</p> <p>For more information, see OSU Fact Sheet EPP-7322: Grasshopper Control in Gardens and Landscapes.</p>	acephate + fenbutatin-oxide	Ortho Systemic Insect Killer Concentrate	2 tbs per gal water	Read label for specific mixing instructions, specific plants that can be treated, and phytotoxicity statements.
	carbaryl	GardenTech Sevin Concentrate Bug Killer	Apply per label	See note at end of section on Sevin.
	cyfluthrin	Bayer Advanced Power Force Multi-Insect Killer	1 tbs per gal water	
	<i>Nosema locustae</i>	Nolo Bait	Apply per label	Microsporidial pathogen of grasshoppers. Works best on small nymphs. Do not apply Nolo Bait in any manner that results in contact with fruits or vegetables.

<i>Pest, Time Most Prevalent, &amp; Other Information</i>	<i>Pesticide Common Name</i>	<i>Pesticide Trade Name</i>	<i>Application Instructions</i>	<i>Comments</i>
<p><b>JUNE (MAY) BEETLES and JAPANESE BEETLES</b></p> <p>Measure 1/2 to 3/4 inches long.</p> <p>June beetles active at night April through September. Japanese beetles active during the day late June through July.</p> <p>June beetles occasionally feed on foliage of American elm and other trees. Japanese beetles are serious pests, feeding on foliage, fruits, and flowers of many landscape plants.</p>	acephate + fenbutatin-oxide	Ortho Systemic Insect Killer Concentrate	4 tbs per gal water	Do not use acephate products on American elm, crabapple, red or sugar maple, cottonwood, redbud, or weigela. Labeled for Japanese beetle only.
	carbaryl	GardenTech Sevin Concentrate Bug Killer	3 tbs per gal water	See note at end of section on Sevin.
	cyfluthrin	Bayer Advanced Power Force Multi-Insect Killer	1 tbs per gal water	
	imidacloprid	Bayer Advanced Tree and Shrub Insect Control	Apply per label	Recommended as a preventative treatment for Japanese beetle.
	lambda-cyhalothrin	Spectracide Triazicide Once and Done Insect Killer	Apply per label	
<p><b>LACE BUGS</b></p> <p>Measure 1/8 inch long.</p> <p>Tiny, mottled, brown to black and gray insects with long, lace-like wings. Suck sap from undersides of leaves causing them to become mottled with gray or brown spots.</p> <p>Active spring through summer.</p> <p>Common on sycamores, elms and some oaks, pyracantha, and occasionally azaleas.</p> <p>Small infestations can be washed off plants/foliage with strong water pressure (stream of water).</p>	acephate + fenbutatin-oxide	Ortho Systemic Insect Killer Concentrate	3 tbs per gal of water	Do not use acephate on American elm.
	bifenthrin	Ortho Bug B Gone Max Lawn and Garden Insect Killer Concentrate	3 tbs per gal water	
	carbaryl	GardenTech Sevin Concentrate Bug Killer	3 tbs per gal water	See note at end of section on Sevin.
	cyfluthrin	Bayer Advanced Power Force Multi-Insect Killer	1 tbs per gal water	
	dinotefuran	Green Light Tree and Shrub Insect Control w/ Safari 2G	Apply per label	Applied as a granular treatment around base of trunk. Determine rate based on trunk diameter or height of shrub.
	imidacloprid	Bayer Advanced Tree and Shrub Insect Control	Apply per label	Use imidacloprid as a drench around base of trunk. Determine rate based on the trunk diameter or height of shrub.
	insecticidal soap	Safer Insect Killing Soap Concentrate II	5 tbs per gal water	Carefully read label of insecticidal soap products for phytotoxicity statements.
neem oil	Safer Bioneem or Bonide Bon-Neem	Apply per label		
<p><b>LEAFHOPPERS and TREEHOPPERS</b></p> <p>Measure 1/8 to 1/4 inch long.</p> <p>Leafhoppers and treehoppers are somewhat wedge-shaped insects that are drab to brightly colored. These sucking insects readily jump when disturbed. Treehoppers often have extreme ornamentation just behind the head.</p> <p>Active during growing season.</p> <p>Feeding results in leaf discoloration, but rarely harmful to plant. Several leafhoppers are important vectors of leaf scorch diseases.</p>	acephate + fenbutatin-oxide	Ortho Systemic Insect Killer Concentrate	3 tbs per gal water	Do not use acephate products on American elm, crabapple, red or sugar maple, cottonwood, redbud, or weigela.
	acetamiprid	Ortho Max Flower, Fruit and Vegetable Insect Killer RTU	Apply per label	
	carbaryl	GardenTech Sevin Concentrate Bug Killer	3 tbs per gal water	See note at end of section on Sevin.
	cyfluthrin	Bayer Advanced Power Force Multi-Insect Killer	1 tbs per gal water	
	imidacloprid	Bayer Advanced Tree & Shrub Insect Control	Apply per label	Use imidacloprid as a drench around base of trunk for trees and shrubs. Determine rate based on the trunk diameter or height of shrub.
	malathion	Green Light 50% Malathion Insect Spray	Apply per label	Carefully read label of malathion products for phytotoxicity statements.
	neem oil	Safer Bioneem or Bonide Bon-Neem	Apply per label	

<i>Pest, Time Most Prevalent, &amp; Other Information</i>	<i>Pesticide Common Name</i>	<i>Pesticide Trade Name</i>	<i>Application Instructions</i>	<i>Comments</i>
<p><b>LEAFMINERS</b></p> <p>Includes blotch, serpentine, and tentiform leafminers, so named for the shape of their tunnels.</p> <p>Larvae measure 1/8 to 1/4 inch long.</p> <p>Leafminers are the tiny larvae of several moth, fly, and sawfly species that feed between the upper and lower leaf surfaces.</p> <p>Active spring through summer.</p> <p>Seldom cause extensive damage. Prune and burn twigs or leaves when possible.</p>	acephate + fenbutatin-oxide	Ortho Systemic Insect Killer Concentrate	3 tbs per gal water	Do not use acephate products on American elm, crabapple, red or sugar maple, cottonwood, redbud, or weigela.
	acetamiprid	Ortho Max Flower, Fruit and Vegetable Insect Killer RTU	Apply per label	
	dinotefuran	Green Light Tree and Shrub Insect Control w/ Safari 2G	Apply per label	Applied as a granular treatment around base of trunk. Determine rate based on trunk diameter or height of shrub.
	imidacloprid	Bayer Advanced Tree & Shrub Insect Control	Apply per label	Use imidacloprid as a drench around base of trunk for trees and shrubs. Determine rate based on the trunk diameter or height of shrub.
	malathion	Green Light 50% Malathion Insect Spray	Apply per label	Carefully read label of malathion products for phytotoxicity statements.
	neem oil	Safer Bioneem or Bonide Bon-Neem	Apply per label	
	spinosad	Ferti-Lome Borer, Bagworm, Leafminer and Tent Caterpillar Spray	4 tbs per gal water	
<p><b>MILLIPEDES</b></p> <p>Measure up to 1 inch long. Coil up when disturbed.</p> <p>Active during growing season.</p> <p>Heavy mulch and continuous damp conditions favor build-up of millipedes. Apply spray to soil surface in beds and around plants</p>	carbaryl + metaldehyde	Ortho Bug-Geta Plus Snail, Slug and Insect Killer (granules)	1 lb per 2,000 sq ft.	Ortho Bug-Geta Plus is recommended for use with a spreader (see label).
	permethrin	Ortho Bug-B-Gon Multi-Purpose Insect Killer Ready Spray	Apply per label	
<p><b>MITES</b></p> <p><b>SPIDER MITES and CYCLAMEN MITES</b></p> <p>Measure 1/60 inch long.</p> <p>Active spring to early fall; spider mites frequently become a severe problem in hot, dry weather.</p> <p>Frequently, 2 or more applications at 7-day intervals will be needed to reduce mite populations.</p> <p>Mites can be difficult to control, thus, consider alternating chemicals at the different treatment intervals.</p> <p>Do not interplant marigolds with other plants because spider mites frequently build up on marigolds and move to adjacent plants.</p>	acephate + fenbutatin-oxide	Ortho Systemic Insect Killer Concentrate	3 tbs per gal water	Do not use acephate products on American elm, crabapple, red or sugar maple, cottonwood, redbud, or weigela.
	esfenvalerate	Ortho Bug-B-Gon Multi-Purpose Insect Killer Ready Spray	Apply per label	
	insecticidal soap	Safer Insect Killing Soap Concentrate II	5 tbs per gal water	Carefully read label of insecticidal soap products for phytotoxicity statements.
	malathion	Green Light 50% Malathion Insect Spray	Apply per label	Carefully read label of malathion products for phytotoxicity statements.
	paraffinic oil	Gordon's Dormant Oil Spray (Superior oil grade of 60 or 70 or one specifying unsulfonated residue of 91% or 92%) or Sunspray Ultra Fine Year-Round Pesticidal Oil (growing season oil)	Apply per label	Do not apply dormant oil to actively growing plants nor to broadleaf evergreens, maple, mountain ash, or beech.  Growing season oil can be used during growing season alone or mixed with an insecticide (see above list).

<i>Pest, Time Most Prevalent, &amp; Other Information</i>	<i>Pesticide Common Name</i>	<i>Pesticide Trade Name</i>	<i>Application Instructions</i>	<i>Comments</i>
<p><b>PINE TIP MOTH</b></p> <p>Larvae measure 1/2 inch long.</p> <p>Active March to September.</p> <p>Larvae bore into buds and twigs. Most species of 2- and 3-needle pines are subject to attack; however, slash, Austrian, and long-leaf pines are somewhat resistant. Infested shoots usually turn yellow and later, red and brown. Dead, hollowed-out buds and twigs are usually present.</p> <p>Females emerge and lay eggs from late March through late May. Larvae must be controlled before they bore into plant.</p> <p>For best protection with sprays, applications should be applied at about 20-day intervals from late March through the end of June.</p> <p>For more information, see OSU Fact Sheet EPP-7645: Nantucket Pine Tip Moth.</p>	acephate + fenbutatin-oxide	Ortho Systemic Insect Killer Concentrate	3 tbs per gal water	
	carbaryl	GardenTech Sevin Concentrate Bug Killer	3 tbs per gal water	See note at end of section on Sevin.
	imidacloprid	Bayer Advanced Tree & Shrub Insect Control	Apply per label	Use imidacloprid as a drench around base of trunk for trees and shrubs. Determine rate based on the trunk diameter or height of shrub.
<p><b>PUSS CATERPILLAR/ IO MOTH and OTHER "STINGING CATERPILLARS"</b></p> <p>Active late summer and fall.</p> <p>Tiny stinging spines are present beneath the fluffy, long, flowing body hair.</p>	<i>Bacillus thuringiensis</i> (B.t.) var. <i>kurstaki</i>	Safer Garden Dust	Apply per label	Thoroughly apply dust to cover all plant surfaces.
	carbaryl	GardenTech Sevin Concentrate Bug Killer	3 tbs per gal water	See note at end of section on Sevin.
	malathion	Green Light 50% Malathion Insect Spray	Apply per label	Carefully read label of malathion products for phytotoxicity statements.
<p><b>SCALES and MEALYBUGS</b></p> <p>Includes brown elm scale, euonymus scale, and longtailed mealybug.</p> <p>Active during growing season.</p> <p>Soft scales produce honeydew while armored scales do not.</p> <p>Some insecticide products work only against soft scales, so consult your OSU County Extension Office if identification is in doubt.</p> <p>Most non-systemic contact insecticides cannot penetrate protective, waxy layer of scales. Thus, apply sprays to target crawler stage.</p>	acephate + fenbutatin-oxide	Ortho Systemic Insect Killer Concentrate	3 tbs per gal water	Do not use acephate products on American elm, crabapple, red or sugar maple, cottonwood, redbud, or weigela.
	acetamiprid	Ortho Max Flower, Fruit and Vegetable Insect Killer RTU	Apply per label	
	dinotefuran	Green Light Tree and Shrub Insect Control w/ Safari 2G	Apply per label	Applied as a granular treatment around base of trunk. Determine rate based on trunk diameter or height of shrub.
	imidacloprid	Bayer Advanced Tree & Shrub Insect Control	Apply per label	Use imidacloprid as a drench around base of trunk for trees and shrubs. Determine rate based on the trunk diameter or height of shrub. Only controls soft scales.
	insecticidal soap	Safer Insect Killing Soap Concentrate II	5 tbs per gal water	Carefully read label of insecticidal soap products for phytotoxicity statements.
	malathion	Green Light 50% Malathion Insect Spray	Apply per label	Carefully read label of malathion products for phytotoxicity statements.
	paraffinic oil	Gordon's Dormant Oil Spray (Superior oil grade of 60 or 70 or one specifying unsulfonated residue of 91% or 92%) or Sunspray Ultra Fine Year-Round Pesticidal Oil (growing season oil)	Apply per label  Apply per label	Do not apply dormant oil to actively growing plants nor to broadleaf evergreens, maple, mountain ash, or beech.  Growing season oil can be used during growing season alone or mixed with an insecticide (see above list).



Photo courtesy Eric R. Day, Virginia Polytechnic Institute and State University, Bugwood.org



**Bagworm**

Photo courtesy John A. Weidhass, Virginia Polytechnic Institute and State University, Bugwood.org



**Eastern Tent Caterpillar**

Photo courtesy James Solomon, USDA Forest Service, Bugwood.org



**Poplar Borer**

Photo courtesy Frank Pears, Colorado State University, Bugwood.org



**Two-spotted Spider Mite**

Photo courtesy Whitney Cranshaw, Colorado State University, Bugwood.org



**Two-spotted Spider Mite Webbing**

Photo courtesy Clemson University - USDA Cooperative Extension Slide Series, Bugwood.org



**Elm Leaf Beetle**

Photo courtesy Whitney Cranshaw, Colorado State University, Bugwood.org



**Elm Leaf Beetle (larvae)**

Photo courtesy Steven Katovich, USDA Forest Service, Bugwood.org



**May-June Beetle**

Photo courtesy Steven Katovich, USDA Forest Service, Bugwood.org



**May-June Beetle Larva**

Photo courtesy Rayanne Lehman, Pennsylvania Department of Agriculture, Bugwood.org



**Clover Mite**

Photo courtesy James A. Richmond, USDA Forest Service, Bugwood.org



**Pine Tip Moth (adult)**

Photo courtesy Darrell Ross, Oregon State University, Bugwood.org



**Pine Tip Moth (larvae)**

Photo courtesy Eric R. Day, Virginia Polytechnic Institute and State University, Bugwood.org



**Pine Tip Moth Damage**



Photo courtesy Eric Rebek, Oklahoma State University, Bugwood.org



Woolly Maple Aphids

Photo, courtesy Clemson University - USDA Cooperative Extension Slide Series, Bugwood.org



Euonymus Scale

Photo courtesy United States National Collection of Scale Insects Photographs Archive, USDA Agricultural Research Service, Bugwood.org



Mealybugs

Photo, courtesy Whitney Cranshaw, Colorado State University, Bugwood.org



Harvester Ants

Photo courtesy Clemson University - USDA Cooperative Extension Slide Series, Bugwood.org



Fall Armyworm

Photo courtesy Mat Pound, USDA Agricultural Research Service, Bugwood.org



American Dog Ticks

Photo courtesy James B. Hanson, USDA Forest Service, Bugwood.org



Spring Cankerworm

Photo courtesy Nancy Hinkle, University of Georgia, Bugwood.org



Cicada Killer Wasp

Photo courtesy Pest and Diseases Image Library, Bugwood.org



Flea

Photo courtesy David Cappaert, Michigan State University, Bugwood.org



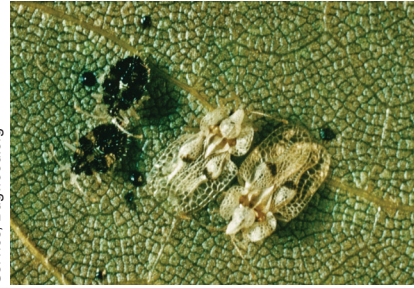
Candy-striped Leafhopper

Photo courtesy Purdue University, Department of Entomology



Sod Webworm

Photo courtesy USDA Forest Service - Northeastern Area Archive, USDA Forest Service, Bugwood.org



Sycamore Lace Bugs

<i>Pest, Time Most Prevalent, &amp; Other Information</i>	<i>Pesticide Common Name</i>	<i>Pesticide Trade Name</i>	<i>Application Instructions</i>	<i>Comments</i>
<p><b>THRIPS</b></p> <p>Measure 1/16 inch long.</p> <p>Active spring and summer.</p> <p>These tiny insects are difficult to control due to their small size and tendency to hide in flowers and under foliage. The body tapers toward the end of the abdomen and both pairs of wings are fringed with hairs.</p> <p>Feeding causes small spots of discoloration on leaves and flowers. As feeding continues and population increases, small spots often coalesce into large blotches.</p> <p>Thorough coverage of sprays is important for effective thrips control.</p>	acephate + fenbutatin-oxide	Ortho Systemic Insect Killer Concentrate	3 tbs per gal water	Do not use acephate products on American elm, crabapple, red or sugar maple, cottonwood, redbud, or weigela.
	acetamiprid	Ortho Max Flower, Fruit and Vegetable Insect Killer RTU	Apply per label	
	carbaryl	GardenTech Sevin Concentrate Bug Killer	3 tbs per gal water	See note at end of section on Sevin. Only effective against exposed thrips.
	dinotefuran	Green Light Tree and Shrub Insect Control w/ Safari 2G	Apply per label	Applied as a granular treatment around base of trunk. Determine rate based on trunk diameter or height of shrub.
	imidacloprid	Bayer Advanced Tree & Shrub Insect Control	Apply per label	Use imidacloprid as a drench around base of trunk for trees and shrubs. Determine rate based on the trunk diameter or height of shrub.
	insecticidal soap	Safer Insect Killing Soap Concentrate II	5 tbs per gal water	Carefully read label of insecticidal soap products for phytotoxicity statements.
	neem oil	Safer Bioneem or Bonide Bon-Neem	Apply per label	For flower thrips, 2 to 3 sprays at 7- to 10-day intervals may be needed.
<p><b>WHITEFLIES</b></p> <p>Measure 1/8 inch long.</p> <p>Active summer through early fall.</p> <p>Tiny insects. Adults have yellow bodies and white wings. Adults and nymphs commonly found on underside of leaves.</p> <p>Adults and nymphs feed on plant sap with piercing-sucking mouthparts and cause yellowing of leaves. Often "white clouds" of adults fly out of disturbed foliage.</p> <p>For effective whitefly control, ensure thorough coverage by wetting plants to the dripping point. Try to insure coverage of the underside of leaves and penetrate dense foliage. Repeat applications are frequently needed.</p> <p>Alternative insecticide options exist, including botanical insecticides; see Note 2 at end of section.</p>	acephate + fenbutatin-oxide	Ortho Systemic Insect Killer Concentrate	3 tbs per gal water	Do not use acephate products on American elm, crabapple, red or sugar maple, cottonwood, redbud, or weigela.
	acetamiprid	Ortho Max Flower, Fruit and Vegetable Insect Killer RTU	Apply per label	
	dinotefuran	Green Light Tree and Shrub Insect Killer w/ Safari 2G	Apply per label	Applied as a granular treatment around base of trunk. Determine rate based on trunk diameter or height of shrub.
	esfenvalerate	Ortho Bug-B-Gon Multi-Purpose Insect Killer Ready Spray	Apply per label	
	insecticidal soap	Safer Insect Killing Soap Concentrate II	5 tbs per gal water	Carefully read label of insecticidal soap products for phytotoxicity statements.
	imidacloprid	Bayer Advanced Tree & Shrub Insect Control	Apply per label	Use imidacloprid as a drench around base of trunk for trees and shrubs. Determine rate based on the trunk diameter or height of shrub.
	neem oil	Safer Bioneem or Bonide Bon-Neem	Apply per label	
	paraffinic oil	Gordon's Dormant Oil Spray (Superior oil grade of 60 or 70 or one specifying unsulfonated residue of 91% or 92%) or Sunspray Ultra Fine Year-Round Pesticidal Oil (growing season oil)	Apply per label	Do not apply dormant oil to actively growing plants nor to broadleaf evergreens, maple, mountain ash, or beech.
	paraffinic oil + resmethrin	Ferti-Lome Whitefly and Mealybug Killer	Apply per label	
	pyrethrins + piperonyl butoxide	Garden Safe Multi-purpose Garden Insect Killer	Apply per label	Growing season oil can be used during growing season alone or mixed with an insecticide (see above list).

## LAWN PESTS

<i>Pest, Time Most Prevalent, &amp; Other Information</i>	<i>Pesticide Common Name</i>	<i>Pesticide Trade Name</i>	<i>Application Instructions</i>	<i>Comments</i>
<p><b>ANTS</b></p> <p>Includes harvester ants, fire ants, and other nuisance ants.</p> <p>Active spring and summer.</p> <p>Ants are nuisance pests due to their mound building in lawns and foraging activity. Also, fire ants and harvester ants bite and sting.</p>	acephate	Ortho Orthene Fire Ant Killer	1 tsp per mound	Apply only to ant mounds.
	cyfluthrin	Bayer Advanced Power Force Multi-Insect Killer	1 tbs per gal water	
	esfenvalerate	Ortho Bug-B-Gon Max Garden and Landscape Insect Killer	Apply per label	
	hydramethylnon	Maxforce Complete Brand Granular Insect Bait	Apply per label	For best results, do not apply granular baits to ant mounds.
	permethrin	Ortho Bug-B-Gon Multi-Purpose Insect Killer Ready Spray	Apply per label	
<p><b>ARMYWORMS and CUTWORMS</b></p> <p>Measure up to 1.5 inches.</p> <p>Larval stage of several moths. Some live above, and some below ground.</p> <p>Armyworm and fall armyworm are most likely to feed on turfgrass in lawns. Damage is most evident with feeding activity of large larvae.</p> <p>Monitor by using a soap flush (2 T. lemon-scented dish soap per gal water).</p> <p>Treat when damage is noticeable and 2-3 small (1/2 inch or less) caterpillars per square foot are present.</p>	bifenthrin	Ortho Bug-B-Gon Max Insect Killer for Lawns	Apply per label	
	bifenthrin + carbaryl	Fortify Above and Below Insect & Grub Control	2 lb per 1,000 sq ft	
	carbaryl	GardenTech Sevin Lawn Insect Granules	2.25 lb per 1,000 sq ft	See note at end of section on Sevin.
	chlorantraniliprole	Grubex 1	Apply per label	Apply as a preventative treatment in areas with a history of infestation.
	clothianidin	Green Light Grub Control	3 lb per 1,000 sq ft	Apply as a preventative treatment in areas with a history of infestation.
	cypermethrin	Amdro Quick Kill Lawn & Landscape Insect Killer	Apply per label	
	deltamethrin	Enforcer BugMax Insect Killer Concentrate	Apply per label	
	halofenozide	Hi-Yield Kill-A-Grub or Spectracide Grub Stop Once & Done	1.7 lb per 1,000 sq ft 1.55 lb per 1,000 sq ft	Apply as a preventative treatment in areas with a history of infestation.
<p><b>BILLBUGS</b></p> <p>Measure 1/4 inch long.</p> <p>Adults are typical "weevils" with elongate snout. Body is shiny black with a raised "Y"-shaped area on thorax. Larvae are legless, having a white body and brown head.</p> <p>Adults chew holes in leaves and stems to lay eggs. Larvae burrow in stems and crown. Feeding leaves behind sawdust. Plants may die, and sod loses "holding power."</p> <p>Feeding damage is sometimes mistaken for winter-kill damage.</p> <p>Treat if damage is noticeable in lawn in spring and billbug larvae are present.</p>	bifenthrin	Ortho Bug-B-Gon Max Insect Killer for Lawns	Apply per label	Effective against adults only.
	bifenthrin + carbaryl	Fortify Above and Below Insect & Grub Control	2 - 4 lb per 1,000 sq ft	Effective against adults only.
	chlorantraniliprole	Grubex 1	Apply per label	Apply as a preventative treatment in areas with a history of infestation.
	clothianidin	Green Light Grub Control	2.75 lb per 1,000 sq ft	Apply as a preventative treatment in areas with a history of infestation.
	cyhalothrin	Spectracide Triazicide Insect Killer Once & Done	1.2 lb per 1,000 sq ft	Effective against adults only.
	cypermethrin	Amdro Quick Kill Lawn & Landscape Insect Killer	Apply per label	Effective against adults only.
	imidacloprid	Bayer Advanced Season Long Grub Control	Apply per label	Apply as a preventative treatment in areas with a history of infestation.
	imidacloprid + cyfluthrin	Bayer Advanced Lawn Complete Insect Killer	Apply per label	Apply as a preventative treatment in areas with a history of infestation.
	halofenozide	Hi-Yield Kill-A-Grub or Spectracide Grub Stop Once & Done	3.4 lb per 1,000 sq ft 3 lb per 1,000 sq ft	Apply as a preventative treatment in areas with a history of infestation.
permethrin	Hi-Yield Kill-A-Bug II Lawn Granules	Apply per label	Effective against adults only.	



<i>Pest, Time Most Prevalent, &amp; Other Information</i>	<i>Pesticide Common Name</i>	<i>Pesticide Trade Name</i>	<i>Application Instructions</i>	<i>Comments</i>
<p><b>CHIGGERS and TICKS</b></p> <p>Chiggers are the six-legged stage of a mite that is small and pale yellow. It feeds for about 4 days then drops off and changes to a nymph and finally an adult.</p> <p>The American dog tick, lone star tick, and brown dog tick are commonly found in home lawns. The brown dog tick is often found inside homes and other structures. American dog ticks are considered a major vector of Rocky Mountain Spotted Fever.</p>	bifenthrin	Ortho Bug-B-Gon Max Insect Killer for Lawns	Apply per label	<p>Check label for correct rate to apply for specific pests.</p> <p>See note at end of section on Sevin.</p>
	bifenthrin + carbaryl	Fortify Above and Below Insect & Grub Control	2 - 8 lb per 1,000 sq ft	
	carbaryl	GardenTech Sevin Lawn Insect Granules	2.25 lb per 1,000 sq ft	
	cyhalothrin	Spectracide Triazicide Insect Killer Once & Done	0.8 lb per 1,000 sq ft	
	imidacloprid + cyfluthrin	Bayer Advanced Lawn Complete Insect Killer	Apply per label	
	deltamethrin	Enforcer BugMax Insect Killer Concentrate	Apply per label	
	permethrin	Hi-Yield Kill-A-Bug II Lawn Granules	Apply per label	
<p><b>CHINCH BUGS</b></p> <p>Adults are 1/8 inch long, black with white wings folded over the back into an "hour glass" shape. Nymphs are reddish to brown, with a white stripe across their "shoulders."</p> <p>Chinch bugs suck plant juices and clog phloem and xylem. As they feed, they also inject a toxin. Symptoms resemble drought injury; patchy with yellowing and dying leaves.</p> <p>Most likely a problem in St. Augustine grass or buffalo grass. Keep thatch to a minimum and maintain proper levels of water and fertilizer.</p>	bifenthrin	Ortho Bug-B-Gon Max Insect Killer for Lawns	Apply per label	<p>See note at end of section on Sevin.</p>
	bifenthrin + carbaryl	Fortify Above and Below Insect & Grub Control	2 - 4 lb per 1,000 sq ft	
	carbaryl	GardenTech Sevin Lawn Insect Granules	2.25 lb per 1,000 sq ft	
	cyhalothrin	Spectracide Triazicide Insect Killer Once & Done	1.2 lb per 1,000 sq ft	
	cypermethrin	Amdro Quick Kill Lawn & Landscape Insect Killer	Apply per label	
	imidacloprid + cyfluthrin	Bayer Advanced Lawn Complete Insect Killer	Apply per label	
	permethrin	Hi-Yield Kill-A-Bug II Lawn Granules	Apply per label	
<p><b>DIGGER WASPS</b></p> <p>Includes cicada killer, scoliid, and typhiid wasps.</p> <p>Typical wasp appearance and often colorful. Males often harass people who enter their breeding territory. Rarely sting. Consider not treating unless they become a major nuisance.</p> <p>Sometimes nest in groups. Wasps prefer bare ground over mulched landscapes.</p> <p>Treat nest openings when wasps are not active Repeat treatments may be needed in 2 or 3 days if wasp activity continues.</p>	imidacloprid + cyfluthrin	Bayer Advanced Lawn Complete Insect Killer Granules	1 - 2 tsp per nest	Follow label recommendations.
	permethrin	Hi-Yield Kill-A-Bug II Lawn Granules	1 -2 tsp per nest	Follow label recommendations.

<i>Pest, Time Most Prevalent, &amp; Other Information</i>	<i>Pesticide Common Name</i>	<i>Pesticide Trade Name</i>	<i>Application Instructions</i>	<i>Comments</i>
<p><b>FLEAS</b></p> <p>Small (up to 2/5 inch) brown, wingless insects that are flattened on both sides.</p> <p>Treat areas where pets frequent.</p> <p>Fleas feed on blood using sucking mouthparts. Bites cause small hardened bump that is itchy and/or painful.</p>	bifenthrin	Ortho Bug-B-Gon Max Insect Killer for Lawns	Apply per label	See note at end of section on Sevin.
	bifenthrin + carbaryl	Fortify Above and Below Insect & Grub Control	4 - 8 lb per 1,000 sq ft	
	carbaryl	GardenTech Sevin Lawn Insect Granules	2.25 lb per 1,000 sq ft	
	cyhalothrin	Spectracide Triazicide Insect Killer Once & Done	0.8 lb per 1,000 sq ft	
	imidacloprid + cyfluthrin	Bayer Advanced Lawn Complete Insect Killer	Apply per label	
	permethrin	Hi-Yield Kill-A-Bug II Lawn Granules	Apply per label	
<p><b>GRASSHOPPERS</b></p> <p>1-2 inches, outer wings leathery, inner wings clear or colored. Enlarged hind legs designed for jumping.</p> <p>Grasshoppers feed on foliage of numerous plants but prefer grasses</p> <p>For additional management suggestions, see EPP-7322: Grasshopper Control in Gardens and Landscapes.</p>	bifenthrin	Ortho Bug-B-Gon Max Insect Killer for Lawns	Apply per label	See note at end of section on Sevin.
	bifenthrin + carbaryl	Fortify Above and Below Insect & Grub Control	2 - 4 lb per 1,000 sq ft	
	carbaryl	GardenTech Sevin Lawn Insect Granules	2.25 lb per 1,000 sq ft	
	cyhalothrin	Spectracide Triazicide Insect Killer Once & Done	0.8 lb per 1,000 sq ft	
	cypermethrin	Amdro Quick Kill Lawn & Landscape Insect Killer	Apply per label	
	deltamethrin	Enforcer BugMax Insect Killer Concentrate	Apply per label	
	imidacloprid + cyfluthrin	Bayer Advanced Lawn Complete Insect Killer	Apply per label	
	permethrin	Hi-Yield Kill-A-Bug II Lawn Granules	Apply per label	
<p><b>LEAFHOPPERS</b></p> <p>Tiny, wedge-shaped insects that are yellow, brown, or green. When disturbed, they fly or hop short distances. They feed by sucking sap from leaves and stems.</p> <p>Damaged grass may appear slightly yellow or off white.</p>	bifenthrin	Ortho Bug-B-Gon Max Insect Killer for Lawns	Apply per label	See note at end of section on Sevin.
	bifenthrin + carbaryl	Fortify Above and Below Insect & Grub Control	2 - 4 lb per 1,000 sq ft	
	carbaryl	GardenTech Sevin Lawn Insect Granules	2.25 lb per 1,000 sq ft	
	cyhalothrin	Spectracide Triazicide Insect Killer Once & Done	0.8 lb per 1,000 sq ft	
	cypermethrin	Amdro Quick Kill Lawn & Landscape Insect Killer	Apply per label	
	deltamethrin	Enforcer BugMax Insect Killer Concentrate	Apply per label	
	imidacloprid + cyfluthrin	Bayer Advanced Lawn Complete Insect Killer	Apply per label	
	permethrin	Hi-Yield Kill-A-Bug II Lawn Granules	Apply per label	



<i>Pest, Time Most Prevalent, &amp; Other Information</i>	<i>Pesticide Common Name</i>	<i>Pesticide Trade Name</i>	<i>Application Instructions</i>	<i>Comments</i>
<p><b>MILLIPEDES</b></p> <p>Measure up to 1 inch long.</p> <p>Round body and many (80 to 400) legs.</p> <p>Millipedes rarely cause damage, but can invade households when conditions become dry.</p> <p>Reduce or eliminate moist areas and harborage (grass clippings, leaves, wood debris). Water lawn during early morning to increase the time that turf is dry during a 24-hour period. Dethatch high-maintenance lawns.</p>	bifenthrin	Ortho Bug-B-Gon Max Insect Killer for Lawns	Apply per label	
	ifenthrin + carbaryl	Fortify Above and Below Insect & Grub Control	4 - 8 lb per 1,000 sq ft	
	carbaryl	GardenTech Sevin Lawn Insect Granules	2.25 lb per 1,000 sq ft	See note at end of section on Sevin.
	cyhalothrin	Spectracide Triazicide Insect Killer Once & Done	0.8 lb per 1,000 sq ft	
	cypermethrin	Amdro Quick Kill Lawn & Landscape Insect Killer	Apply per label	
	imidacloprid + cyfluthrin	Bayer Advanced Lawn Complete Insect Killer	Apply per label	
<p><b>SOD WEBWORMS</b></p> <p>Measure 1/2 to 1 inch long.</p> <p>Larvae vary from gray to light green to brown. Adult moths with wingspans 1/2 to 3/4 inch, many with a snout-like projection, and fly in a zigzag pattern when disturbed.</p> <p>Larvae chew on tender leaves, may cut off grass blades as they get older. Injury can be mistaken for disease or drought injury. Most likely to occur during late summer.</p> <p>Bermudagrass usually can outgrow damage. Young larvae present about 2 weeks after peak moth flights. Monitor by using a soap flush (2 T. lemon-scented dish soap per gal water).</p>	bifenthrin	Ortho Bug-B-Gon Max Insect Killer for Lawns	Apply per label	
	bifenthrin + carbaryl	Fortify Above and Below Insect & Grub Control	2 lb per 1,000 sq ft	
	carbaryl	GardenTech Sevin Lawn Insect Granules	2.25 lb per 1,000 sq ft	
	chlorantraniliprole	Grubex 1	Apply per label	Apply as a preventative treatment in areas with a history of infestation.
	clothianidin	Green Light Grub Control	3 lb per 1,000 sq ft	Apply as a preventative treatment in areas with a history of infestation.
	cypermethrin	Amdro Quick Kill Lawn & Landscape Insect Killer	Apply per label	
	deltamethrin	Enforcer BugMax Insect Killer Concentrate	Apply per label	
	halofenozide	Hi-Yield Kill-A-Grub or Spectracide Grub Stop Once & Done	1.7 lb per 1,000 sq ft 1.55 lb per 1,000 sq ft	Apply as a preventative treatment in areas with a history of infestation.
<p><b>WHITE GRUBS</b></p> <p>Large, "C"-shaped larvae with a white body and a brown head. Larval stage of several beetle species.</p> <p>White grubs feed on grass roots at or just below the thatch layer. Grass takes on droughty appearance. Damage may be seen throughout growing season but more pronounced in fall. Vertebrate predators cause secondary damage as they dig for grubs.</p> <p>Monitor by cutting back several 1 square foot sections of lawn and count grubs.</p> <p>Treat when lawn has 15-20 masked chafer grubs per square foot or 4-5 May/June beetle grubs per square foot.</p>	chlorantraniliprole	Grubex 1	Apply per label	Apply as a preventative treatment in areas with a history of infestation.
	clothianidin	Green Light Grub Control	2.75 lb per 1,000 sq ft	Apply as a preventative treatment in areas with a history of infestation.
	cyhalothrin	Spectracide Triazicide Insect Killer Once & Done	1.2 lb per 1,000 sq ft	Effective against adults only.
	cypermethrin	Amdro Quick Kill Lawn & Landscape Insect Killer	Apply per label	Effective against adults only.
	imidacloprid	Bayer Advanced Season Long Grub Control	Apply per label	Apply as a preventative treatment in areas with a history of infestation.
	imidacloprid + cyfluthrin	Bayer Advanced Lawn Complete Insect Killer	Apply per label	Apply as a preventative treatment in areas with a history of infestation.
	halofenozide	Hi-Yield Kill-A-Grub or Spectracide Grub Stop Once & Done	3.4 lb per 1,000 sq ft 3 lb per 1,000 sq ft	Apply as a preventative treatment in areas with a history of infestation.

**NOTES:**

1. Sevin - Not all Sevin (carbaryl) labels allow for homeowner use or labels may state "for non-residential use only on trees and ornamentals." The "non-residential use only" restriction limits the use of those products to areas like shelter belts, forests, parks, recreational areas, etc. One should read the Sevin product label carefully prior to purchase to see if these restrictions apply.
2. Botanical Insecticides - Some organic gardeners prefer to use botanicals. Materials that may be available in your area or from garden supply catalogues for these individuals are: Rotenone, Ryania, Sabadilla, Neem products and natural pyrethrum (apply any of these per label directions).

Oklahoma State University does not endorse any products mentioned nor imply criticism of products not mentioned. Products are listed as examples only.

## The Oklahoma Cooperative Extension Service

### *Bringing the University to You!*

The Cooperative Extension Service is the largest, most successful informal educational organization in the world. It is a nationwide system funded and guided by a partnership of federal, state, and local governments that delivers information to help people help themselves through the land-grant university system.

Extension carries out programs in the broad categories of agriculture, natural resources and environment; family and consumer sciences; 4-H and other youth; and community resource development. Extension staff members live and work among the people they serve to help stimulate and educate Americans to plan ahead and cope with their problems.

Some characteristics of the Cooperative Extension system are:

- The federal, state, and local governments cooperatively share in its financial support and program direction.
- It is administered by the land-grant university as designated by the state legislature through an Extension director.
- Extension programs are nonpolitical, objective, and research-based information.
- It provides practical, problem-oriented education for people of all ages. It is designated to take the knowledge of the university to those persons who do not or cannot participate in the formal classroom instruction of the university.
- It utilizes research from university, government, and other sources to help people make their own decisions.
- More than a million volunteers help multiply the impact of the Extension professional staff.
- It dispenses no funds to the public.
- It is not a regulatory agency, but it does inform people of regulations and of their options in meeting them.
- Local programs are developed and carried out in full recognition of national problems and goals.
- The Extension staff educates people through personal contacts, meetings, demonstrations, and the mass media.
- Extension has the built-in flexibility to adjust its programs and subject matter to meet new needs. Activities shift from year to year as citizen groups and Extension workers close to the problems advise changes.

Oklahoma State University, in compliance with Title VI and VII of the Civil Rights Act of 1964, Executive Order 11246 as amended, Title IX of the Education Amendments of 1972, Americans with Disabilities Act of 1990, and other federal laws and regulations, does not discriminate on the basis of race, color, national origin, gender, age, religion, disability, or status as a veteran in any of its policies, practices, or procedures. This includes but is not limited to admissions, employment, financial aid, and educational services.

Issued in furtherance of Cooperative Extension work, acts of May 8 and June 30, 1914, in cooperation with the U.S. Department of Agriculture, the Director of Cooperative Extension Service, Oklahoma State University, Stillwater, Oklahoma. This publication is printed and issued by Oklahoma State University as authorized by the Vice President, Dean, and Director of the Division of Agricultural Sciences and Natural Resources and has been prepared and distributed at a cost of \$2.69 per copy. 0713 Revised. GH