



Insect Management on Landscape Plants¹

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The urban landscape is a diverse area that includes many different plants, ranging from annual foliage plants to perennial trees and shrubs. It is a complicated system to manage because, unlike in agriculture, plantings are fragmented and separated by developed areas. Each home or commercial area is also maintained differently, and the owners or managers have different goals for their landscapes. Some may desire a perfect, well-manicured look, while others may prefer a more natural appearance that requires less work to maintain.

A lot of insects, mites, and other insect-relatives feed on ornamental landscape plants. Many are harmless, some are beneficial, and some are pests. Some pests may need immediate control, especially if present in great numbers, but others may not be worth the time, effort, or cost of control. Feeding by pests may cause real damage to the plants or just make the plants look bad or unhealthy. However, insects are only one of many potential causes for unhealthy-looking plants. Diseases, nematodes, drought, nutritional disorders, and improper chemical applications can also be damaging. Correct identification of the problem can save money and prevent unnecessary chemical use. After the pest is

correctly identified, information can be found on its life cycle, food preference, and habits. It is important to understand these things to properly time any corrective measures.

Scouting or monitoring for damage or pests is an important part of plant health care. Examine plants weekly in the spring, summer and fall. Exactly how to monitor for each pest depends on where the insect lives or feeds. Look for pests under a few leaves and the stems or branches of each plant. If thrips or mites are suspected, hold a sheet of white paper under the leaves or flowers and shake the plant. Watch for moving specks on the paper and place them into a small jar or vial of rubbing alcohol for identification. Use a hand lens (10 or 15X) or magnifying glass to find tiny insects or mites on the foliage.

Pest Management on Ornamentals

Several options exist for managing insects and mites on ornamentals without the use of pesticides. These options include handpicking, knocking, or hosing pests off plants with water, and then destroying the pests. Removing infested plants or plant parts (e.g., pruning) and then burning or destroying them

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reduces the chance of pests moving among plants. Buying or using plants that are naturally resistant or tolerant to certain pests greatly reduces the need for future control. Any mechanical or cultural method that prevents or excludes pests from the plants should be attempted before using a pesticide.

However, if pesticide use is necessary to prevent economic damage to plants, consult Tables 1 and 2. Most of these pesticides kill by either contact with the insect or as a stomach poison. Some may also exert a fumigating or vapor action under certain conditions. Products should be selected that will effectively control the pests without injuring the plant, result in another pest outbreak, or kill beneficials and other non-target organisms. Before using a pesticide, consider the following points:

- Select the right product. Only use an insecticide that is recommended to control the target pest and is safe on the host plants.
- Use the label rate or recommended amount. Too little won't control the pest; too much is illegal. **Read the container label carefully.**
- Apply it correctly. Thorough coverage of the leaves (especially the underside), stems, and branches is essential. The pesticide must reach the area of the plant where the pest is feeding. Most failures to control pests result from incorrect applications, not product failure. The addition of a spreader-sticker to the spray mixture is suggested when spraying ornamental plants. Spreader-stickers help the pesticide to adhere to the leaves and improve coverage for better control.

Groups of Pests

Pests of ornamentals may be divided into five groups according to how they damage plants.

1. *Insects with Piercing-Sucking Mouthparts.*

These insects have general straw-like mouthparts, which pierce the plant tissue and suck out the plant fluids. **Examples:** Scales, mealybugs, aphids, whiteflies, mealybugs, lace bugs, spittlebugs, thrips.

2. ***Spider Mites.*** These pests are not insects, but are closely related to spiders and scorpions. They suck plant fluids with their piercing-sucking mouthparts.

3. ***Foliage-Feeding Insects.*** They may feed on leaves or flowers. **Examples:** Caterpillars, beetles, grasshoppers, katydids.

4. ***Leafminers.*** These are very small larvae of flies, beetles, or moths that tunnel between the upper and lower leaf surfaces. **Examples:** Blotch leafminers and serpentine leafminers.

5. ***Borers.*** There are many species of insects which bore into the twigs or trunks of plants and trees. These are usually the larvae of moths or beetles. **Examples:** Pine bark beetles, sea grape borer, carpenterworm, dogwood borer.

For a list of key plants and their associated pests see List 1.

Additional Information

For additional information, please see these extension publications (<http://edis.ifas.ufl.edu>):

Beneficial Insects and Mites (ENY-276)

Insect Attractants and Traps (ENY-277)

Microbial Insecticides (ENY-275)

Natural Enemies and Biological Control (ENY-822)

Featured Creatures (<http://creatures.ifas.ufl.edu>)

AMARYLLIS Convict caterpillar	BUCKTHORN (TALLHEDGE) Bagworm	ELM Aphids Bark beetles (native) Cankervorms Cottony maple scale Elm leafminer Eriophyid mites European elm scale Fall webworm Flatheaded appletree borer Leaf beetles Leafhoppers Twig girdler Woolly aphid	GOLDEN RAIN TREE Jadera bugs Leafhoppers Scales
ASH Aphids Ash flowergall mite Ash sawflies Banded ash clearwing Elm spanworm Fall webworm Flatheaded apple tree borer Forest tent caterpillar Leafhoppers Leafroller Lilac (ash) borer May/June beetles Oystershell scale Plant/leaf bugs Putnam scale Scurfy scale	CAMELLIA Aphids Spider mites Scales Southern red mite Thrips Twospotted spider mite	EUCALYPTUS Redgum lerp psyllid Scales Thrips	HACKBERRY Hackberry nipplegall psyllid Lace bugs Putnam scale Whitefly
AZALEA Azalea caterpillar Azalea lace bug Azalea leafminer Rhododendron borer Rhododendron gall midge Spider mites	CARNATION Aphids Leafminer Spider mites Thrips	EUONYMUS Aphids Bagworm Black vine weevil Euonymus scale Leafhoppers Twospotted spider mite Winged euonymus scale	HIBISCUS Aphids Diaprepes weevil Gall midge Mealybug Scales Spider mites Thrips Whitefly
BALD CYPRESS Bagworm Cypress leaf beetle Cypress twig gall midge Diaprepes weevil Fall webworm Mealybugs	CATALPA Catalpa sphinx	FIG Diaprepes weevil Mealybugs Scales Thrips Whitefly	HICKORY Caterpillars Elm spanworm Hickory petiole gall adelgid Hickory shuckworm Twig girdler
BIRCH Aphids Bagworm Birch beadgall mite Birch leafminer Bronze birch borer Eastern tent caterpillar Fall webworm Forest tent caterpillar Leafhoppers Scales Spiny witch hazel gall aphid	CHRYSANTHEMUM Aphids Beet armyworm Cabbage looper Corn earworm Leafhoppers Leafminer Omnivorous leafroller Twospotted spider mite Thrips Whitefly	FIRETHORN Aphids Hawthorn lace bug Scales Southern red mite Tussock moth larvae	HOLLY Aphids Florida wax scale Holly bud moth Holly leafminer Holly whitefly Southern red mite Tea scale Twolined spittlebug
BOXWOOD Black citrus aphid Boxwood leafminer Boxwood psyllid Florida red scale Hemispherical scale Magnolia white scale Peony scale Twospotted spider mite	CRAPE MYRTLE Crape myrtle aphid Diaprepes weevil Metallic leaf beetle Twig girdler	FLOWERING FRUIT TREES Aphids Bagworm Borers, flatheaded Clearwing borers Eastern tent caterpillar Fall webworm Leafhoppers Lesser peach tree borer Peach tree borer Pear slug (sawfly) Pear psylla Scales Spider mites Spring cankerworm Woolly aphids	HONEY SUCKLE Aphids Honeysuckle leafminer Spider mites Tataricae aphid
BROMELIADS Bromeliad pod borer	CYCAD Cycad scale Mealybugs Scales	HORNBEAM Bagworm Leafhoppers	HOSTA Slugs Thrips Twospotted spider mite
	DAYLILY Brown soft scale Cucumber beetle Daylily aphid Slugs Twospotted spider mite Western flower thrips	INDIAN HAWTHORN Aphids Bagworm Diaprepes weevil Florida wax scale	
	DOGWOOD Aphids Cottony maple scale Dogwood borer Dogwood club gall midge Mulberry whitefly Scales	INKBERRY Inkberry leafminer Southern red mite	
		IRIS Iris borer	

List 1 (Part 1). Plant/pest guide to insects and mites infesting foliage and woody ornamentals in Florida.

IVY Aphids Citrus mealybug Leafhoppers Scales Tarsonemid mites Twospotted spider mite	MAPLE Aphids Bagworm Borers (bark beetle & flatheaded) Erenium mites Fall & spring cankerworms Fall webworm Forest tent caterpillar Greenstriped maple worm Leafhoppers Maple bladdergall mite Maple petiole borer Maple shoot moths Scales Spider mites Thrips	ORCHID Aphids Black twig borer Boisduval scale Orchid mealybug Orchid weevil Phalaenopsis mite Snails Thrips	PODOCARPUS Aphids Eriophyid mite Scales
IXORA Aphids Bagworm Scales Whitefly	OAK Aphids Ambrosia beetles Asiatic oak weevil Bagworm Borers Clearwing borer Elm spanworm Fall webworm Forest tent caterpillar Galls Golden oak scale Leafhoppers Lecanium scale May/June beetles Oak kermes scale Oak lace bug Obscure oak scale Orangestriped oak worm Skeletonizers Spider mites Spring cankerworm Treehoppers Tussock moths Twig girdler Twig pruner Twolined chestnut borer Whitemarked tussock moth	PACHYSANDRA Euonymus scale Oystershell scale Two-spotted spider mite	POINSETTIA Whitefly
JUNIPER Bagworm Eriophyid mites Scales Southern red mite Spruce spider mite	PALMS Cabbage palm caterpillar Coconut mealybug Giant palm weevil Palm aphids Palm leaf skeletonizer Palm seed weevil Palmetto weevil Scales Thrips	PALMS Cabbage palm caterpillar Coconut mealybug Giant palm weevil Palm aphids Palm leaf skeletonizer Palm seed weevil Palmetto weevil Scales Thrips	POPLAR Eastern tent caterpillar Forest tent caterpillar Oystershell scale Poplar tent-maker
LANTANA Lantana lace bug Planthoppers Thrips Whitefly	PENTAS Sphinx moth	PHOTINIA Aphids Scales Southern red mite	PRIMROSE Two-spotted spider mite
LIGUSTRUM False spider mite Privet mite Scales Twospotted spider mite Whitefly	PINE Allegheny mound ant Aphids Bagworm Bark beetles Black pine leaf scale Eastern pine shoot borer Nantucket pine tip moth Pales weevil Pine bark adelgid Pine needle midge Pine sawflies Pine spittlebug Pine tip moth Pine webworm Southern pine beetle	PENTAS Sphinx moth	PRIVET Privet rust mite Privet thrips White peach scale
LOQUAT Aphids Scales	PHOTINIA Aphids Scales Southern red mite	PHOTINIA Aphids Scales Southern red mite	PYRACANTHA (See Firethorn)
MAGNOLIA Black twig borer Magnolia borer Magnolia leafminer Scales Thrips	OLEANDER False oleander scale Oleander aphid Oleander caterpillar Oleander scale	PINE Allegheny mound ant Aphids Bagworm Bark beetles Black pine leaf scale Eastern pine shoot borer Nantucket pine tip moth Pales weevil Pine bark adelgid Pine needle midge Pine sawflies Pine spittlebug Pine tip moth Pine webworm Southern pine beetle	REDBUD Fall webworm Leafhoppers Redbud leaftier Thornbugs
MAHOGANY Leafminers Mahogany tip moth Mahogany webworm Scales	OLEANDER False oleander scale Oleander aphid Oleander caterpillar Oleander scale	PITTOSPORUM Aphids Cottony cushion scale False spider mite Slugs and snails Twospotted spider mite	RHODODENDRON Azalea bark scale Black vine weevil Rhododendron borer Rhododendron lace bug Southern red mite
MAHONIA Barberry aphid Barberry looper/caterpillar Barberry webworm		PITTOSPORUM Aphids Cottony cushion scale False spider mite Slugs and snails Twospotted spider mite	ROSE Aphids Leafhoppers Leafminers Omnivorous leafroller Rose chafer Rose midge Spider mites Thrips
			SEA GRAPE Aphids Sea grape borer Sea grape gall midge Sea grape weevil Scales Whitefly
			SPIREA Aphids Spirea leaftier

List 1 (Part 2). Plant/pest guide to insects and mites infesting foliage and woody ornamentals in Florida.

SWEET GUM

Bagworm
 Fall webworm
 Forest tent caterpillar
 Leafminer
 Sweet gum pitmaking scale
 Sweet gum leaf-tier
 Twospotted spider mite

SYCAMORE

Aphids
 Bagworm
 Fall webworm
 Leafhoppers
 Sycamore lace bug
 Whitemarked tussock moth

TULIP POPLAR

Leafminer
 Tulip spot gall midge
 Tulip tree aphid
 Tulip tree scale
 Yellow poplar weevil

VIBURNUM

Aphids
 Citrus whitefly
 False spider mite
 Scales
 Southern red mite
 Thrips
 Whitefly

WALNUT

Aphids
 European red mite
 Fall webworm
 Flatheaded appletree
 borer
 Leafhoppers
 Twospotted spider mite
 Walnut caterpillar
 Walnut petiole gall mite

WAX MYRTLE

Caterpillars
 Eriophyid mites
 Scales
 Striped mealybug

WILLOW

Aphids
 Bagworm
 Borers (beetle)
 Fall webworm
 Flatheaded appletree borer
 Forest tent caterpillar
 Leaf beetles
 Oystershell scale
 Poplar tentmaker
 Sawflies
 Spider mites

YUCCA

Aphids
 Scales
 Yucca weevil

List 1 (Part 3). Plant/pest guide to insects and mites infesting foliage and woody ornamentals in Florida (continued).

Table 1. Insecticides registered for use in Florida landscapes.¹

Insect	Chemical Name	Notes
Aphids	Abamectin Acephate Azadirachtin Bifenthrin Carbaryl Cyfluthrin Horticultural oil Imidacloprid Insecticidal soap Malathion Permethrin Pymetrozine	Treat when aphids first appear and retreat when needed. Do not use Malathion on ferns or Chinese elms.
Bagworm	Acephate Azadirachtin <i>Bacillus thuringiensis</i> k. Bifenthrin Carbaryl Cyfluthrin Lambda-cyhalothrin Permethrin Spinosad	Treat when bagworms are small. Remove and destroy bags from plants in winter.
Beetles (Leaf-feeding)	Acephate Azadirachtin Bifenthrin Carbaryl Cyfluthrin Deltamethrin Imidacloprid Permethrin Spinosad	
Borers	Carbaryl Chlorpyrifos Imidacloprid Permethrin	Apply insecticide to plants before adults oviposit, eggs hatch, or larvae tunnel inside.
Caterpillars (e.g. oleander caterpillar, white marked tussock moth larva)	Acephate <i>Bacillus thuringiensis</i> k. Bifenthrin Carbaryl Cyfluthrin Deltamethrin Lambda-cyhalothrin Permethrin Spinosad	Treat when larvae are small.
Centipedes, Millipedes, Sowbugs, Pillbugs	Bifenthrin Carbaryl Cyfluthrin Deltamethrin Lambda-cyhalothrin Permethrin	

Table 1. Insecticides registered for use in Florida landscapes.¹

Insect	Chemical Name	Notes
Gall Insects	Abamectin Carbaryl Spinosad	Many gall-makers are present near bud break. Treat when insects are laying eggs or early in gall development.
Grasshoppers	Acephate Bifenthrin Carbaryl Cyfluthrin Deltamethrin Lambda-cyhalothrin	Treat when first noticed on plants. Retreat as necessary.
Lace bugs	Acephate Bifenthrin Carbaryl Cyfluthrin Deltamethrin Horticultural oil Imidacloprid Insecticidal soap Lambda-cyhalothrin Malathion Permethrin	Treat when lace bug nymphs are first seen. Repeat as needed to protect foliage.
Leafhoppers	Acephate Azadirachtin Bifenthrin Carbaryl Cyfluthrin Deltamethrin Horticultural oil Imidacloprid Insecticidal soap Lambda-cyhalothrin Permethrin	Treat when leafhoppers are seen and repeat as needed.
Leafminers	Abamectin Acephate Azadirachtin Bifenthrin Carbaryl Imidacloprid Permethrin Spinosad	Standard contact insecticides may be used against adult leafminers at oviposition. Some systemic insecticides may be active against larvae in mines.
Leafrollers	Acephate Azadirachtin <i>Bacillus thuringiensis</i> k. Bifenthrin Carbaryl Lambda-cyhalothrin Permethrin Spinosad	Often not damaging enough to warrant control in the landscape. Time applications before leaf rolls are complete and insects are protected inside the plant material.

Table 1. Insecticides registered for use in Florida landscapes.¹

Insect	Chemical Name	Notes
Mealybugs	Acephate Azadirachtin Bifenthrin Cyfluthrin Deltamethrin Imidacloprid Insecticidal soap Lambda-cyhalothrin Permethrin	If mealybugs have formed ovisacs (cottony masses in which eggs are laid), additional applications may be needed at 7-10 day intervals until no new mealybugs are found.
Mites	Abamectin Azadirachtin Bifenthrin Bifenazate Carboxylic acid ester (Floramite) Cyfluthrin Dicofol (Kelthane) Fenpropathrin (Tame) Horticultural oil Insecticidal soap Lambda-cyhalothrin Malathion Neem oil Pyridaben	Correct identification of spider mite species is essential in determining control timing. A spray program is usually necessary. Apply miticide 2 or 3 times, at 7-10 day intervals. Do not use abamectin on conifers.
Scales (Crawlers)	Azadirachtin Carbaryl Cyfluthrin Horticultural oil Imidacloprid Insecticidal soap Malathion	Crawlers (nymphs) are most susceptible to applications, but timing of emergence varies by scale species. Some crawlers settle on plant foliage and others settle on branches and twigs. Armored scales are generally not susceptible to dormant oil sprays.
Slugs and Snails	Methiocarb Metaldehyde	Apply when leaf damage is first seen and reapply as needed.
Spittlebugs	Acephate Carbaryl Cyfluthrin Deltamethrin Lambda-cyhalothrin	Treat when spittle masses first appear.
Thrips	Abamectin Acephate Bifenthrin Carbaryl Cyfluthrin Fluvalinate Imidacloprid Malathion Methiocarb Spinosad	Treat foliage or flowers as soon as thrips are found. Weekly applications may be needed until control is achieved.

Table 1. Insecticides registered for use in Florida landscapes.¹

Insect	Chemical Name	Notes
Whiteflies	Abamectin	Treat when first noticed and repeat in 5-10 days. Repeat applications as needed.
	Azadirachtin	
	Bifenthrin	
	Carbaryl	
	Horticultural oil	
	Imidacloprid	
	Insecticidal soap	
	Lambda-cyhalothrin	
	Malathion	
	Pymetrozine	
¹ The pesticides included in this table have been listed alphabetically, and not based on their effectiveness of control. We do not have information on the effectiveness of each pesticide.		

Table 2. Chemical names, trade names, formulations, and manufacturers of landscape pesticides.

Chemical Name	Florida Registered Products	Chemical Class	Signal Word
Abamectin	Avid 0.15 EC	Avermectin	Warning
Acephate ¹	Acephate Pro 75 Orthene Turf, Tree & Ornamental Spray	Organophosphate	Caution Caution
Azadirachtin	Azatin XL	Botanical	Caution
<i>Bacillus thuringiensis</i> var. <i>kurstaki</i> ¹	Dipel DF Safer Caterpillar Killer XenTari	Microbial	Caution Caution Caution
Bifenazate	Floramite	Miticide	Caution
Bifenthrin ¹	Talstar Lawn & Tree Flowable	Pyrethroid	Caution
Carbaryl ¹	Carbaryl 4L Sevin SL Sevin 80 WSP	Carbamate	Caution Caution Warning
Chlorpyrifos	Dursban Pro	Organophosphate	Caution
Cyfluthrin ¹	Tempo 20 WP Tempo SC Ultra	Pyrethroid	Caution Caution
Deltamethrin	DeltaGard T&O	Pyrethroid	Caution
Dicofol	Kelthane 35	Miticide	Warning
Fenpropathrin	Tame 2.4 EC*	Miticide	Warning
Fluvalinate	Mavrik Aquaflo	Pyrethroid	Caution
Horticultural oil	Sunspray Ultra Fine Ultra-Fine Oil	--	Caution Caution
Imidacloprid ¹	Merit 75 WP / WSP	Chloronicotinyl	Caution
Insecticidal soap ¹	M-Pede Safer's Soap	--	Warning Caution
Lambda-cyhalothrin	Scimitar CS	Pyrethroid	Caution
Malathion	Malathion 5 EC	Pyrethroid	Warning
Metaldehyde	Deadline Bullets Metaldehyde Granules 3.5		Caution Caution

Table 2. Chemical names, trade names, formulations, and manufacturers of landscape pesticides.

Chemical Name	Florida Registered Products	Chemical Class	Signal Word
Methiocarb	MesuroI 75W*	Carbamate	Warning
Neem oil	Triact 70	Botanical	Caution
Permethrin ¹	Astro Permethrin Pro Termite-Turf-Ornamental	Pyrethroid	Caution Caution
Pymetrozine	Endeavor	Neonicotinyl	Caution
Pyridaben	Sanmite 75 WP	Acaracide	Warning
Spinosad	Conserve SC	Microbial	Caution
* Restricted Use Pesticide			
¹ Some products exist for homeowner use			