UNIVERSITY OF FLORIDA
EXTENSION
Institute of Food and Agricultural Sciences

ENY-338

Insect Management on Landscape Plants[1]

Eileen A. Buss and Don E. Short[2]

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

1. This document is ENY-338, formerly CIR-379, one of a series of the Department of Entomology and Nematology, Florida Cooperative Extension Service, Institute of Food and Agricultural Sciences, University of Florida. Date frist printed: October 1993. Revised: July 2003. Please visit the EDIS Website at **http://edis.ifas.ufl.edu**.

2. Eileen A. Buss, assistant professor and Don E. Short, retired professor, Entomology and Nematology Department, Cooperative Extension Service, Institute of Food and Agricultural Sciences, University of Florida, Gainesville, 32611.

The use of trade names in this publication is solely for the purpose of providing specific information. UF/IFAS does not guarantee or warranty the products named, and references to them in this publication does not signify our approval to the exclusion of other products of suitable composition. All chemicals should be used in accordance with directions on the manufacturer's label. Use pesticides safely. Read and follow directions on the manufacturer's label.

The Institute of Food and Agricultural Sciences is an equal opportunity/affirmative action employer authorized to provide research, educational information and other services only to individuals and institutions that function without regard to race, color, sex, age, handicap, or national origin. For information on obtaining other extension publications, contact your county Cooperative Extension Service office. Florida Cooperative Extension Service/Institute of Food and Agricultural Sciences/University of Florida/Christine Taylor Waddill, Dean.

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

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

AZALEA
Azalea caterpillar
Azalea lace bug
Azalea leafminer
Rhododendron borer
Rhododendron gall midge
Spider mites

BALD CYPRESS
Bagworm
Cypress leaf beetle
Cypress twig gall midge
Diaprepes weevil
Fall webworm
Mealybugs

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

BOXWOOD
Black citrus aphid
Boxwood leafminer
Boxwood psyllid
Florida red scale
Hemispherical scale
Magnolia white scale
Peony scale
Twospotted spider mite

BROMELIADS
Bromeliad pod borer

BUCKTHORN (TALLHEDGE)
Bagworm

CAMELLIA
Aphids
Spider mites
Scales
Southern red mite
Thrips
Twospotted spider mite

CARNATION
Aphids
Leafminer
Spider mites
Thrips

CATALPA
Catalpa sphinx

CHESTNUT
Asiatic oak weevil
Leafhoppers

CHRYSANTHEMUM
Aphids
Beet armyworm
Cabbage looper
Corn earworm
Leafhoppers
Leafminer
Omnivorous leafroller
Twospotted spider mite
Thrips
Whitefly

CRAPE MYRTLE
Crape myrtle aphid
Diaprepes weevil
Metallic leaf beetle
Twig girdler

CYCAD
Cycad scale
Mealybugs
Scales

DAYLILY
Brown soft scale
Cucumber beetle
Daylily aphid
Slugs
Twospotted spider mite
Western flower thrips

DOGWOOD
Aphids
Cottony maple scale
Dogwood borer
Dogwood club gall midge
Mulberry whitefly
Scales

ELM
Aphids
Bark beetles (native)
Cankerworms
Cottony maple scale
Elm leafminer
Eriophyid mites
European elm scale
Fall webworm
Flatheaded appletree borer
Leaf beetles
Leafhoppers
Twig girdler
Woolly aphid

EUCALYPTUS
Redgum lerp psyllid
Scales
Thrips

EUONYMUS
Aphids
Bagworm
Black vine weevil
Euonymus scale
Leafhoppers
Twospotted spider mite
Winged euonymus scale

FIG
Diaprepes weevil
Mealybugs
Scales
Thrips
Whitefly

FIRETHORN
Aphids
Hawthorn lace bug
Scales
Southern red mite
Tussock moth larvae

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

GOLDEN RAINTREE
Jadera bugs
Leafhoppers
Scales

HACKBERRY
Hackberry nipplegall psyllid
Lace bugs
Putnam scale
Whitefly

HIBISCUS
Aphids
Diaprepes weevil
Gall midge
Mealybug
Scales
Spider mites
Thrips
Whitefly

HICKORY
Caterpillars
Elm spanworm
Hickory petiole gall adelgid
Hickory shuckworm
Twig girdler

HOLLY
Aphids
Florida wax scale
Holly bud moth
Holly leafminer
Holly whitefly
Southern red mite
Tea scale
Twolined spittlebug

HONEYSUCKLE
Aphids
Honeysuckle leafminer
Spider mites
Tataricae aphid

HORNBEAM
Bagworm
Leafhoppers

HOSTA
Slugs
Thrips
Twospotted spider mite

INDIAN HAWTHORN
Aphids
Bagworm
Diaprepes weevil
Florida wax scale

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

IXORA
Aphids
Bagworm
Scales
Whitefly

JUNIPER
Bagworm
Eriophyid mites
Scales
Southern red mite
Spruce spider mite

LANTANA
Lantana lace bug
Planthoppers
Thrips
Whitefly

LIGUSTRUM
False spider mite
Privit mite
Scales
Twospotted spider mite
Whitefly

LOQUAT
Aphids
Scales

MAGNOLIA
Black twig borer
Magnolia borer
Magnolia leafminer
Scales
Thrips

MAHOGANY
Leafminers
Mahogany tip moth
Mahogany webworm
Scales

MAHONIA
Barberry aphid
Barberry looper/caterpillar
Barberry webworm

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

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

OLEANDER
False oleander scale
Oleander aphid
Oleander caterpillar
Oleander scale

ORCHID
Aphids
Black twig borer
Boisduval scale
Orchid mealybug
Orchid weevil
Phalaenopsis mite
Snails
Thrips

PACHYSANDRA
Euonymus scale
Oystershell scale
Two-spotted spider mite

PALMS
Cabbage palm caterpillar
Coconut mealybug
Giant palm weevil
Palm aphids
Palm leaf skeletonizer
Palm seed weevil
Palmetto weevil
Scales
Thrips

PENTAS
Sphinx moth

PHOTINIA
Aphids
Scales
Southern red mite

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

PITTOSPORUM
Aphids
Cottony cushion scale
False spider mite
Slugs and snails
Twospotted spider mite

PODOCARPUS
Aphids
Eriophyid mite
Scales

POINSETTIA
Whitefly

POPLAR
Eastern tent caterpillar
Forest tent caterpillar
Oystershell scale
Poplar tent-maker

PRIMROSE
Two-spotted spider mite

PRIVET
Privet rust mite
Privet thrips
White peach scale

PYRACANTHA
(See Firethorn)

REDBUD
Fall webworm
Leafhoppers
Redbud leaftier
Thornbugs

RHODODENDRON
Azalea bark scale
Black vine weevil
Rhododendron borer
Rhododendron lace bug
Southern red 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 leaftier
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 *Bacillus thuringiensis* 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 *Bacillus thuringiensis* 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 numphs 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 *Bacillus thuringiensis* 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 Permenthrin	If mealybugs have formed ovisacs (cottony masses in which egs are laid), additional applications may be needed at 7-10 day intervals until no new mealybugs are found.
Mites	Abamectin Azadiractin 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 probram 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 Azadirachtin Bifenthrin Carbaryl Horticultural oil Imidacloprid Insecticidal soap Lambda-cyhalothrin Malathion Pymetrozine	Treat when first noticed and repeat in 5-10 days. Repeat applications as needed.

[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
Bacillus thuringiensis var. kurstaki[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 Aquaflow	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	Mesurol 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

*** Restriced Use Pesticide**
[1] Some products exist for homeowner use