

Whiteflies on Landscape Ornamentals¹

E. A. Buss²

Whiteflies are common pests on many ornamental plants. Some of the most economically important species in Florida are the silverleaf whitefly, fig or ficus whitefly, citrus whitefly, and the rugose spiraling whitefly. The most frequently attacked plants include allamanda, avocado, chinaberry, citrus, fig, fringe tree, gardenia, gumbo limbo, ligustrum, mango, various palms, persimmon, viburnum, and many annuals.

Adult whiteflies (Figure 1) look like tiny white moths, but are more closely related to scale insects. Most are about 1/16 inch long and have four wings. The wings and body are covered with a fine white powdery wax. Reliable identifications are based on the adults. The immature whiteflies (nymphs) typically occur on the undersides of leaves, are flat, oval in outline, and slightly smaller than a pin head. Some species are light green to whitish and somewhat transparent (Figure 2). Others are black in the center and have a white waxy fringe around the edge.

A generalized life cycle of the whitefly is as follows: The eggs are laid on the undersides of the leaves and hatch in 4 to 12 days into active, six legged nymphs (crawlers). The crawlers move around for several hours, then insert their mouthparts into the leaves and stay there. After molting three times, they pupate and then become adults. The pupal case remains on the plant tissue even after the adult has emerged. How long it takes for the insects to develop from eggs to adults varies from 4 weeks (summer) to 6 months (winter).



Figure 1. Spiraling whitefly adult.



Figure 2. Giant whitefly adult and nymphs.

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2. E. A. Buss, associate professor, Entomology and Nematology Department, UF/IFAS Extension, Gainesville, FL 32611.

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Whiteflies have piercing-sucking (needle-like) mouthparts with which they puncture the leaf and suck the plant fluids. The top sides of leaves on infested plants become pale or spotted due to these insects feeding on the undersides of the leaves. Oftentimes an infestation goes unnoticed until leaves turn yellow or drop unexpectedly, or until an infested plant is disturbed and small clouds of whiteflies emerge from it. Some whitefly species can cause greater damage by transmitting plant viruses.

Whiteflies (as well as soft scales, mealybugs, and aphids) excrete a sugary substance called honeydew, and an unsightly black fungus called sooty mold grows on the honeydew. Besides being unattractive, sooty mold may interfere with photosynthesis, reduce plant growth, and cause early leaf drop. Sooty mold usually weathers away after an insect infestation is controlled. Ants also feed on the honeydew, so if ants become a problem, plants should be examined closely for these sucking pests.

Biological Control

Citrus whitefly nymphs (Figure 3), one of the more common whitefly species attacking ornamental plants other than citrus, are highly parasitized by a small wasp, *Prospaltella lahorensis*. Citrus is the primary host of the cloudy winged whitefly, a species closely related to the citrus whitefly. Populations of citrus blackfly are also suppressed throughout the state by two tiny wasps. Certain predatory mites and lady beetles (lady bugs) also help suppress pest populations.



Figure 3. Citrus whitefly nymphs.
Credits: Lyle Buss, University of Florida

Carefully examine infested plants for evidence of parasitism. Parasitized whitefly nymphs will contain the larva or pupa of the parasitoid or an emergence hole may be visible on a nymph. The parasitoid does not attack the

adult whitefly. If parasitism is evident, minimize the use of contact insecticides so the natural enemies have a chance to get better established.

Some whiteflies may also be naturally attacked by beneficial fungi (*Paecilomyces*) (Figure 4).

The silverleaf (sweet potato) whitefly replaced the citrus whitefly within the last 15–20 years as the most damaging whitefly species attacking ornamental plants. This whitefly is not strongly parasitized and is tough to control with insecticides. This species is not attacked by *Prospaltella lahorensis*. However, new invasive pests keep entering Florida and are currently causing considerable aesthetic damage.



Figure 4. Infected whiteflies.
Credits: Lyle Buss, University of Florida

Chemical Control

Insecticides that are labeled for whitefly control by homeowners are listed in Table 1, and professional products are listed in Table 2.

The first type of product to try is an insecticidal soap or horticultural oil spray. These products are safer for people, animals, and the environment, but they can still kill whitefly natural enemies. Be sure to read and understand the label instructions before doing any applications. If spraying, thorough coverage on the undersides of the leaves to the point of run-off is especially important. Repeat at weekly intervals as needed.

For synthetic insecticides, be very cautious of overusing the chemical class of neonicotinoids because of the possibility of developing pesticide resistance. Foliar applications tend to be with contact insecticides like pyrethroids. Foliar applications may provide quick control, but do not provide

longterm control. Contact insecticides will also disrupt natural enemies and should be used selectively. Other application options include basal bark sprays, granular broadcast applications, tree injections, and soil drenches or injections. The active ingredient of a commonly used systemic insecticide is imidacloprid (ie., Merit, Marathon), but many other products are effective at reducing whitefly populations.

For More Information

- Florida Whitefly: <http://www.flwhitefly.org>
- FDACS website: <http://www.freshfromflorida.com/Divisions-Offices/Plant-Industry/Pests-Diseases/Whiteflies-Found-in-Florida>
- FDACS Pest Alert <http://www.freshfrom-florida.com/Divisions-Offices/Plant-Industry/Plant-Industry-Publications/Pest-Alerts>
- Solutions for Your Life (http://solutionsforyourlife.ufl.edu/hot_topics/agriculture/whiteflies.html)

- Factsheets on the fig whitefly:
 1. <http://mrec.ifas.ufl.edu/lso/IAWG/FIG/The%20Fig%20Whitefly.htm>
 2. http://miami-dade.ifas.ufl.edu/pdfs/urban_hort/Ficus%20whitefly%20flier%20updated%2008.pdf
- Factsheets on the rugose spiraling whitefly on gumbo limbo (<http://miami-dade.ifas.ufl.edu/documents/Thegumbolimbospiralingwhiteflyfactsheet.pdf>)
- Entomology and IPM for Foliage Plants (<http://www.mrec.ifas.ufl.edu/LSO/bemisia/bemisia.htm>)
- Insecticide Resistance Action Committee Website (IRAC) (<http://www.irc-online.org>)
- Whitefly Knowledgebase (<http://entomology.ifas.ufl.edu/fasulo/whiteflies>)

Table 1. Insecticides labeled for non-commercial (homeowner) use against whiteflies in Florida.

Active Ingredient	Trade Name	Chemical Class
Bifenthrin	Ortho Bug-B-Gon Max Lawn & Garden Insect Killer	Pyrethroid
Cyfluthrin	Bayer Advanced Rose & Flower Insect Killer Schultz Lawn & Garden Insect Killer	Pyrethroid
Imidacloprid	Bayer Advanced Lawn Complete Insect Killer Bayer Advanced Tree & Shrub Insect Control	Neonicotinoid
Lambda-cyhalothrin	Spectracide Triazicide Once & Done Insect Killer	Pyrethroid
Malathion	Green Light Malathion Ortho Malathion Plus Insect Spray	Organophosphate
Neem oil	Bonide Safer BioNeem Green Light Neem Green Light Rose Defense Southern Ag Triple Action Neem Oil	Botanical
Paraffinic oil	Sun Spray Horticultural Oil	Biorational
Permethrin	Hi-Yield Indoor/Outdoor Broad Use Insecticide	Pyrethroid
Potassium salts	Safer's Insecticidal Soap	Biorational
Pyrethrins	Bonide Yard & Garden Insect Killer Spectracide Rose & Flower Insect Spray	Botanical

Table 2. Insecticides suggested for professional use against whiteflies on Florida ornamentals.

Active Ingredient	Trade Name	Chemical Class	IRAC Class
Abamectin	Avid	Avermectins	6
Acetamiprid	TriStar	Neonicotinoid	4
Azadirachtin	Azatin XL, Azatrol	Botanical	26
<i>Beauveria bassiana</i>	Botanigard	Microbial	N/A
Bifenthrin	Bifenthrin Pro, Onyx, Talstar	Pyrethroid	3
Bifenthrin + clothianidin	Aloft	Pyrethroid + Neonicotinoid	3, 4
Bifenthrin + imidacloprid	Allectus	Pyrethroid + Neonicotinoid	3, 4
Buprofezin	Talus*	IGR	16
Clothianidin	Arena, Aloft	Neonicotinoid	4
Cyfluthrin + imidacloprid	Discus	Pyrethroid + Neonicotinoid	3, 4
Dinotefuran	Safari, Zylam	Neonicotinoid	4
Fonicamid	Aria*	Antifeedant	9C
Imidacloprid	Marathon*, Merit	Neonicotinoid	4
Paraffinic Oil	Horticultural Oil	Oil	N/A
Potassium Salts of Fatty Acids	Insecticidal Soap	Soap	N/A
Pymetrozine	Endeavor	Antifeedant	9B
Pyridaben	Sanmite	Acaricide	21
Pyriproxyfen	Distance	IGR	21
Spiromesifen	Forbid 4F, Judo*	IGR	23
Spirotetramat	Kontos*	IGR	23
Thiamethoxam	Flagship	Neonicotinoid	4

*** For production nursery, greenhouse and/or interiorscape use only.**

The inclusion of a trade name does not imply that the University of Florida endorses that particular product, nor does the omission of a product imply that other products do not work. Information included in these tables is obtained from insecticide trial reports, peer-reviewed publications, product labels, and the experience of subject matter experts.