



MIAMI BEACH

OFFICE OF THE CITY MANAGER

NO. LTC # **289-2010**

LETTER TO COMMISSION

TO: Mayor Matti H. Bower and Members of the City Commission

FROM: Jorge M. Gonzalez, City Manager

DATE: October 28, 2010

SUBJECT: New Tree Pest: Gumbo Limbo Spiraling Whitefly

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This Letter to Commission is intended to provide you with information on a new pest that has been identified in Miami Beach and Miami-Dade County and is impacting trees, palms and landscape plants. In March 2009, the Gumbo Limbo Spiraling Whitefly insect, which is believed to originate from Central America, was first found in Miami-Dade County. Since then it has spread extensively throughout the county (including Miami Beach), where it has infested trees and palms all over the city. This pest causes trees to drop their leaves and produces a messy white, waxy substance that falls into pools and on surfaces near infested trees. This is not the same whitefly that first appeared a few years ago and defoliates ficus trees.

Gumbo Limbo Spiraling Whitefly infests a variety of tree and palm species. A partial list of host species includes gumbo limbo, calophyllum, black olive, ficus, mango, live oak, coconut, areca palm, and veitchia palms. Because this pest is so new in Florida, little specific information about it is available. However, it is known that whiteflies typically feed on the underside of leaves and can harm the host plant by sucking nutrients from the leaves, causing wilting, yellowing and leaf drop. The effect an infestation of the new whitefly will have on tree health is unknown; however, whiteflies in general can cause plant decline, defoliation and branch dieback. Repeated infestations and defoliations might kill trees, but so far this has not been reported for Gumbo Limbo Spiraling Whitefly.

This whitefly is generally three times larger and slower moving than the Ficus Whitefly that defoliates ficus trees and hedges. Mature females lay eggs in a spiral pattern on the underside of leaves and deposit a white waxy substance on the eggs. When the eggs hatch, tiny "crawlers" emerge and start feeding on the leaf and, during certain stages of maturity, often secrete long, white filaments of wax. The abundance of this white waxy material is often the most noticeable symptom of an infestation, but infestations are also accompanied by black sooty mold that grows on "honeydew" produced by the whiteflies.

Management

New pests can rapidly reach high population levels and be very damaging when they first arrive in an area. However, after several years as populations of natural enemies of the pest increase, the pest's impact is often reduced. Protection of a pest's predators and parasites is, therefore, a critical component of an effective long-term management strategy. Foliar sprays with an insecticide labeled for whiteflies can be a quick and effective means of controlling the pest, especially on small trees. However, foliar sprays provide only short-term protection, kill all insects indiscriminately, including the pest's predators and parasites, and are not appropriate for spraying large trees in densely populated areas. A soil drench with a systemic pesticide provides slower control, but kills fewer beneficial insects and can provide protection for eight months to a year.

This pest is already so widespread in Miami-Dade County that any control effort would require county-wide coordination and would likely be quite expensive. In Miami Beach, the Greenspace Management Division of the Parks and Recreation Department will treat infested trees and plantings on city property as infestations are identified. Trees in the general vicinity of infested trees will be inspected for whiteflies and treated if necessary. Also, trees known to be hosts of this whitefly, in the general vicinity of an infested tree, will receive treatment as a precautionary measure even if no whiteflies are observed. The Greenspace Management Division will treat only trees on city property. Treatment will consist of a soil drench with a systemic pesticide containing imidacloprid. The estimated treatment cost per tree is \$3 for small trees, \$4 for medium trees and \$6 for large trees.

For homeowner use, products such as Bayer Advanced Tree & Shrub Insect Control are available. More information on this pest, including photos and management recommendations, can be obtained from the University of Florida publication, "Gumbo Limbo Spiraling Whitefly" (Please see attached). Additionally, this publication has been placed on the city's web page and information will be shared with residents using the City's available communications tools.

Should you have additional questions, please contact Kevin Smith at (305) 673-7730.

JMG/HMF/KS/JO/cl/mm/dm

C: Hilda M Fernandez Assistant City Manager
Kevin Smith Parks Recreation Director
John Oldenburg Assistant Parks Recreation Director

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Gumbo Limbo Spiraling Whitefly A New Whitefly in South Florida



Adult whitefly

Introduction: In March, 2009, a whitefly (*Aleurodicus rugioperculatus* Martin: Hemiptera: Aleyrodidae), was collected in Miami-Dade County from gumbo limbo. This was the first report of this insect on the U.S. continent and it is believed to originate from Central America. Since the initial find, there have been numerous other reports, all in Miami-Dade County. It will likely spread to other southern Florida counties.

NOTE: This is not the same whitefly (figus whitefly) that is currently causing defoliation and branch dieback of ficus in south Florida.

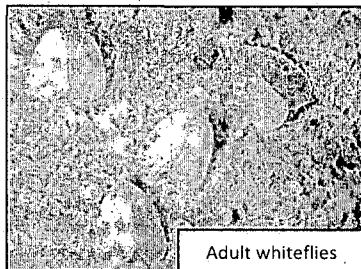
Host Plants: This whitefly appears to have a very broad host range from palms to woody ornamentals and fruits. Thus far, it has been seen on gumbo limbo (*Bursera simaru*), *Calophyllum* species, black olive (*Bucida bucerus*), copperleaf (*Acalypha wilkesiana*), broadleaf arrowhead (*Sagittaria latifolia*), cocoplum (*Chrysobalanus icaco*), Brazilian pepper (*Schinus*), wax myrtle (*Myrica cerifera*), live oak (*Quercus virginiana*) and mango (*Mangifera indica*). It has also been reported on several palms which include areca palm (*Dypsis lutescens*), *Veitchia* species, and coconut (*Cocos nucifera*). Additional hosts are likely to be added to the current list.

What are Whiteflies?

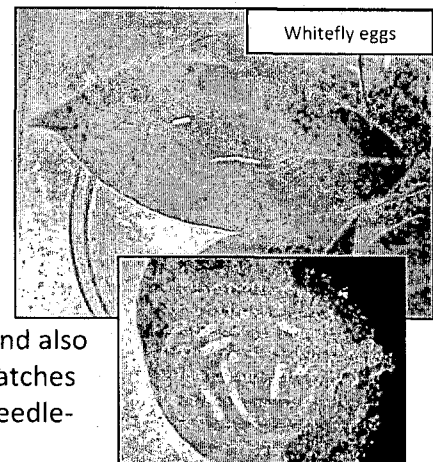
They are small, winged insects that belong to the Order Hemiptera which also includes aphids, scales, and mealybugs. These insects typically feed on the underside of leaves with their "needle-like" mouthparts. Whiteflies can seriously injure host plants by sucking nutrients from the plant causing wilting, yellowing, stunting, leaf drop, or even death. There are more than 75 different whiteflies reported in Florida.

Biology: There is little information on the biology of this new whitefly, however, research is ongoing to describe the life cycle and host range. This whitefly is closely related to giant whitefly, *Aleurodicus*

dugesii, and shares some similarities. Like giant whitefly, the adult is about 3 times larger than other whiteflies that occur in the U.S., and are more docile (slower moving) than other types of whiteflies. The adult whiteflies congregate on the undersides of the leaves to feed and reproduce.

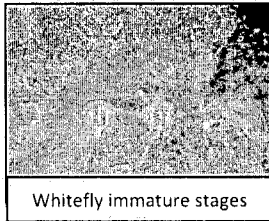


Adult whiteflies



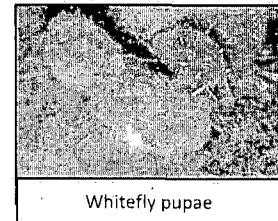
Whitefly eggs

The female whitefly lays her eggs in a spiral pattern on the leaves and also deposits a white, waxy substance on the eggs. The crawler stage hatches from the eggs and crawls around before it starts to feed with its "needle-like" mouthparts. This stage is very small and difficult to see.



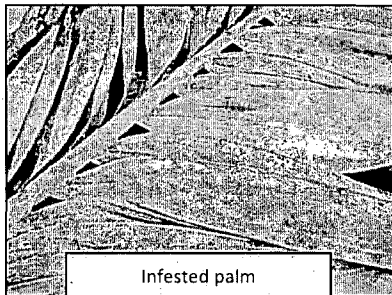
Whitefly immature stages

The crawler will molt and go through several immature stages that are oval and initially flat, then more convex. These stages do not resemble a typical insect. Some of these immature stages will secrete long white filaments of wax. It will likely survive year round in south Florida.

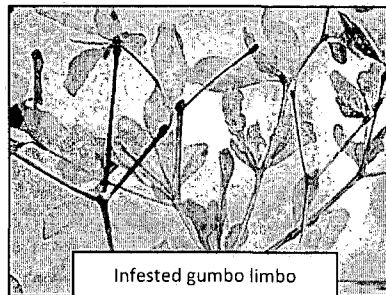


Whitefly pupae

Plant Damage: The most noticeable symptoms of an infestation of this whitefly is the abundance of the white, waxy material covering the leaves and also excessive sooty mold. Like other similar insects, these whiteflies will produce "honeydew", a sugary substance, which causes the growth of sooty mold. The actual effect of an infestation on the health of a plant is unknown; however, whiteflies in general can cause plant decline, defoliation and branch dieback.



Infested palm



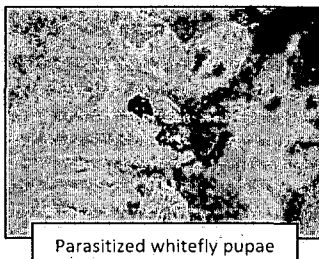
Infested gumbo limbo



Sooty mold on black olive

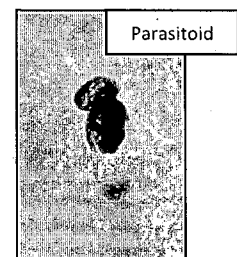
Management in the Landscape: Often, when new pests arrive, they can reach very high populations and can be extremely damaging. It is not uncommon, however, that after several years, the impact is greatly reduced. Although it may be necessary to use insecticides for this pest, it is very important to understand the importance of natural enemies and the need to focus on long-term, biologically based management.

- Monitor plants for early signs of an infestation because it will be easier to manage the pest before it builds to high populations and causes major damage. If you have an infestation on a tree, be sure to search nearby trees as well because this whitefly feeds on many types of trees.
- In the landscape, one parasitoid attacking this whitefly has been identified, *Aleuroctonus vittatus* (Eulophidae), at very high levels. Awareness of natural enemies is very important so they are not also killed while trying to control the whitefly. Protecting natural enemies is a critical component in the long-term control of this pest. Broad spectrum or persistent insecticides often kill a high proportion of predators and parasites, particularly when applied as a foliar spray. Carbamates (i.e. carbaryl), organophosphates (i.e. malathion) and pyrethroids (i.e.



Parasitized whitefly pupae

bifenthrin, cyfluthrin) are especially toxic to natural enemies.



Parasitoid

- You may achieve excellent control with one of the methods listed below, but remember the white, waxy material and the sooty mold on the plant will take time to wear off unless physically washed off.
- Washing plants off with water can be an effective tool to help manage whiteflies for small infestations or small plants. But, for it to be effective, you must remove the immature stages and eggs from the leaves with the wash.
- Using a **horticultural oil** or **insecticidal soap** can also help control this pest. These types of products are strictly contact so thorough coverage of the infested leaves is required. Typically, several applications are required 7-10 days apart. Be careful about using these types of products under high temperatures because they can cause damage to plants.
- If the infestation is large, an insecticide may be needed to control the whitefly population. It is extremely important to use the appropriate insecticides, methods, and timing in order to get the best control with the least amount of detriment to the natural enemies or the environment. There are several insecticide options for both professional use (Table 1) and homeowner use (Table 2). Many of the insecticides for professional use are available in more than one formulation (i.e. wettable powder, liquid, soluble granules, granules, pellets) so you can choose the best fit for your situation.
- Contact insecticides are typically sprayed on the foliage or other infested parts of the plant or in the soil for soil-dwelling insects. Depending on the insecticide, either the insect must come into contact with the insecticide or must feed on the plant with the insecticide. Spray coverage must be thorough to get the best results, particularly in cases like this when the insect is primarily on the underside of the leaves. In general, foliar sprays are active for a few weeks and usually require more than one application. However, some of these products can be very useful for quick knockdown which can be very important with bad infestations.
- A systemic insecticide can be applied directly to the infested plant or to the soil. Soil applications include drenching the soil, spreading a granular formulation, or burying a pellet. Some products can also be applied as a basal trunk spray or injection into the trunk. Systemic insecticides can also be sprayed on the foliage, but often provide longer control when applied to the soil or trunk. However, it is not recommended to use the same insecticide (active ingredient) on the leaves that you use in the soil or on the trunk.
- Misuse or overuse of any insecticide can cause problems such as insecticide resistance, secondary pest problems, environmental contamination, and detrimental effects on non-target organisms. The **site** and **method of application** must be on the insecticide label. Always follow the label directions – **“The label is the law”**. If it is necessary for you to apply several applications of insecticides, it is recommended to rotate among different chemical classes.

Table 1. Insecticides labeled for professional use against whiteflies in Florida

Active Ingredient	Chemical Class	Trade Name(s)	Contact or Systemic
Abamectin	Avermectins	Avid	Contact
Acephate	Organophosphate	Orthene	Systemic
Acetamiprid	Neonicotinoid	TriStar	Systemic
Azadirachtin	Botanical	Azatin; Azatrol	Contact
<i>Beauveria bassiana</i>	Microbial	Botanigard	Contact
Bifenthrin	Pyrethroid	Bifenthrin Pro; Onyx; Talstar	Contact
Buprofezin	IGR	Talus*	Contact
Carbaryl	Carbamate	Sevin	Contact
Clothianidin	Neonicotinoid	Arena; Aloft**	Systemic
Cyfluthrin	Pyrethroid	Tempo; Decathlon*	Contact
Cypermethrin	Pyrethroid	Demand	Contact
Deltamethrin	Pyrethroid	DeltaGard	Contact
Diflubenzuron	IGR	Adept*; Dimilin*	Contact
Dinotefuran	Neonicotinoid	Safari	Systemic
Fenoxycarb	IGR	Preclude	Contact
Fenpropathrin	Pyrethroid	Tame	Contact
Fonicamid	Antifeedant	Aria*	Contact
Fluvalinate	Pyrethroid	Mavrik; Aquaflow	Contact
Imidacloprid	Neonicotinoid	Marathon*; Merit; CoreTect; Discus* **; Allectus**	Systemic
Lambda-cyhalothrin	Pyrethroid	Scimitar	Contact
Malathion	OP	Malathion	Contact
Novaluron	IGR	Pedestal*	Contact
Paraffinic Oil	Oil	Horticultural Oil	Contact
Soap	Soap	Insecticidal Soap	Contact
Pymetrozine	Antifeedant	Endeavor	Contact
Pyridaben	Acaricide	Sanmite	Contact
Pyriproxyfen	IGR	Distance	Contact
S-Kinoprene	IGR	Enstar II*	Contact
Spinosad	Microbial	Conserve	Contact
Spiromesifen	IGR	Forbid 4F; Judo*	Contact
Thiamethoxam	Neonicotinoid	Flagship; Meridian	Systemic

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

**Product also contains a pyrethroid

Table 2. Insecticides labeled for homeowner use against whiteflies in Florida

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

For more information, contact your local Extension agent for additional information or <http://trec.ifas.ufl.edu/mannion/>

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