Whiteflies in the Landscape

April 2011
Whiteflies

- Approximately 75 species of whiteflies in Florida.
- Common pests of many ornamental plants and other crops
- Some feed on many types of plants; some feed on only one type
- Some are capable of transmitting viruses
- Most typically cause yellowing and leaf drop

Photos: H. Glenn, UF/IFAS
Whiteflies

- Adults are small, moth-like, usually with white wings
- Immature stage are usually oval and flat
- Whiteflies excrete a sticky, clear substance called honeydew
- Some produce white, flocculent substance
- Whiteflies are NOT flies
Whitefly Life Cycle

Photo: H. Glenn, UF/IFAS

Courtesy University of California: Statewide IPM Program, Agriculture and Natural Resources
Variability in Whitefly Immature Stages

Photo: H. Glenn, UF/IFAS
Whitefly Feeding

- Direct damage
- Indirect damage
  - honeydew, flocculance, sooty mold
- Virus transmission
Recent Whitefly Issues in the Landscape in South Florida

Ficus Whitefly

Rugose Spiraling Whitefly
Ficus Whitefly
*Singhiella simplex* (Hemiptera: Aleyrodidae)

- Only feeds on ficus species
Ficus Whitefly - Damage

- Causes leaf yellowing
- Leaf drop (severe)
- Branch dieback (highly variable)
Ficus Whitefly Life Cycle

1. **Eggs** (10 days)
2. **1st instar – crawler** (4.2 days)
3. **2nd-3rd instars – nymphs**
   - 2nd instar – 3.7 days; 3rd instar – 3.3 days
4. **4th instar – puparia** (5.8 days)
5. **Adult Whitefly** (2-4 days)
Parasitoids Collected in Miami on Ficus Infested with Whitefly

Encarsia protransvena

Amitus bennetti

Photos: H. Glenn, UF/IFAS
Predators Collected in Miami on Ficus Infested with Whitefly

Photos: H. Glenn, UF/IFAS

Harmonia axyridis
Olla v-nigrum
Exochomus childreni
Chilocorus nigritis
Curinus coeruleus
Lacewing Larvae and Eggs
Ficus Whitefly - Mean Trap Catch

First signs of defoliation (8/28)
Monitoring Ficus Whitefly

• Monitor ficus plants before you see yellowing and leaf drop
  – It takes several months of having the whitefly before you see the damage

• Look for the presence of the whitefly
  – Adult whiteflies (not always present)
  – Immature stages and eggs (very difficult to see but important in decision making)
  – Pupal cases (most obvious stage on the leaves, but not the best indicator of control)
Rugose Spiraling Whitefly
*Aleurodicus rugioperculatus*

- First found at USDA office in Miami on *Bursera simaruba* Spring 2009
- Known from Belize, Guatemala and Mexico
- Eggs are in a spiral pattern
- Adult is relatively large and docile
Plants Hosts

- Acalypha wilkesiana (Copperleaf)
- Annona sp. (Sugarapple)
- Araucaria heterophylla (Norfolk island pine)
- Bucida buceras (Black olive)
- Bursera simaruba (Gumbo limbo)
- Calophyllum species
- Catharanthus roseus (Madagascar periwinkle)
- Chrysobalanus icaco (Cocoplum)
- Chrysophyllum oliviforme (Satinleaf)
- Cocos nucifera (Coconut palm)
- Conocarpus erectus (Buttonwood)
- Cordyline fruticosa (Hawaiian ti)
- Dictyosperma album (Hurricane palm)
- Dypsis lutescens (Areca palm)
- Eugenia spp.
- Ficus aurea (Strangler fig)
- Ficus carica (Edible fig)
- Hyophorbe verschaffeltii (Spindle palm)
- Mangifera indica (Mango)
- Manilkara roxburghiana
- Myrica cerifera (Wax myrtle)
- Musa sp. (Banana)
- Parthenocissus quinquefolia (Virginia creeper)
- Persea americana (Avocado)
- Phoenix roebelenii (Pigmy palm)
- Quercus virginiana (Live oak)
- Sabal palmetto (Sabal palm)
- Schinus terebinthifolius (Brazilian pepper)
- Simarouba glauca
- Smilax auriculata
- Spondias sp.
- Spondias purpurea
- Strelitzia nicolai (White bird of paradise)
- Strelitzia reginae (Bird of paradise)
- Tabebuia species
- Terminalia catappa (Tropical almond)
- Veitchia species
- Washingtonia palm
- Zeuxine strateumatica

And, the list continues to grow
Rugose Spiraling Whitefly

- Not much known about biology
- Closely related to giant whitefly, *A. dugesii*
- Adult is about 3 times larger than other whiteflies
- Adult whiteflies congregate on the undersides of leaves to feed and reproduce
- Some of the immature stages will secrete long white filaments of wax.
- It will likely survive year round in south Florida.
Rugose Spiraling Whitefly
Spiraling Eggs

Rugose Spiraling Whitefly
Effect of Temperature on the Life Cycle of the Rugose Spiraling Whitefly
Natural Enemies

Parasitoid: *Encarsia guadalupae*

Beetle predator: *Nephaspis oculatus*

Lacewing Predator:
Whitefly Management
Managing Insects with Piercing/Sucking Mouthparts

- Can be difficult to control
- Often have short life cycles
- Often not noticed until populations are high
- Many have waxy secretions/coverings that provide protection
- Production of honey dew (for some insects)
Management of Whitefly in the Landscape

- Need long term management which requires other options other than complete reliance on insecticides
  - Natural enemies
  - Alternate plant choices
  - Cultural control

- Scouting and monitoring
Management of Whitefly in the Landscape

• Insecticides
  – Sometimes important in the early management of a pest
  – Appropriate choices of insecticide, formulation, methods of application and frequency of application
  – Effects on natural enemies
Management of Whitefly in the Landscape

• Insecticides
  – Misuse or overuse can cause problems such as insect resistance, secondary pest problems, environmental contamination, and detrimental effects on non-target organisms
  – Follow label instructions - The site and method of application must be on the label (i.e. landscape, nursery, etc.)
Management Options

• Washing plants off with water
  – Small infestations or small plants
  – Must remove the immature stages and eggs.

• Horticultural oil or insecticidal soap
  – Strictly contact so thorough coverage is required
  – Several applications are required 7-10 days
  – Phytotoxicity under high temperatures
Management Options

- Apply a systemic (neonicotinoid) insecticide to the soil or trunk
  - Soil application (drench, granular, pellets)
  - Trunk spray or trunk injection
  - Expect approximately 1 year control; spring application

- Apply a foliar insecticide for quick knockdown – typically not long lasting
# Neonicotinoid Insecticides

<table>
<thead>
<tr>
<th>Active Ingredient</th>
<th>Trade Names Professional Use</th>
<th>Trade Names Over-the-Counter</th>
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<tbody>
<tr>
<td>Acetamiprid</td>
<td>TriStar (no soil application)</td>
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<tr>
<td>Clothianadin</td>
<td>Arena, Aloft*</td>
<td></td>
</tr>
<tr>
<td>Dinotefuran</td>
<td>Safari</td>
<td>Green Light Tree &amp; Shrub Insect Control with Safari</td>
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<tr>
<td>Imidacloprid</td>
<td>Merit, Marathon, Coretect, Discus*, Allectus*, several generic labels</td>
<td>Bayer Advanced Lawn Complete Insect Killer; Bayer Advanced Tree &amp; Shrub Insect Control ; Ortho Max</td>
</tr>
<tr>
<td>Thiamethoxam</td>
<td>Flagship, Meridian</td>
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</tbody>
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* Contains a Neonicotinoid and a pyrethroid
Management Options

Foliar Insecticide Application

• Whitefly should be present
• Foliar insecticides may provide quick control, most will not provide long-term control.
• Some foliar insecticides (i.e. pyrethroids) may disrupt the natural enemies and should be used very selectively.
• It is not recommended to use the same insecticide on both the foliage and in the soil.
<table>
<thead>
<tr>
<th>Trade Name(s)</th>
<th>Active Ingredient</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flower, Fruit &amp; Vegetable Insect Killer (Ortho)</td>
<td>Acetamiprid</td>
</tr>
<tr>
<td>Bug-B-Gon Max Lawn &amp; Garden Insect Killer (Ortho)</td>
<td>Bifenthrin</td>
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<tr>
<td>Rose &amp; Flower Insect Killer (Bayer Advanced); Lawn &amp; Garden Insect Killer (Schultz)</td>
<td>Cyfluthrin</td>
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<tr>
<td>Triazicide Once &amp; Done Insect Killer (Spectracide)</td>
<td>Lambda-cyhalothrin</td>
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<tr>
<td>Indoor/Outdoor Broad Use Insecticide (Hi-Yield)</td>
<td>Permethrin</td>
</tr>
<tr>
<td>Yard &amp; Garden Insect Killer (Bonide); Rose &amp; Flower Insect Spray (Spectracide)</td>
<td>Pyrethrin</td>
</tr>
</tbody>
</table>
Specific Management Tips

Ficus Whitefly

• Scout – immature stages; do not rely on the presence of adults

• Foliar insecticides – only when live whitefly are present

• Soil or trunk insecticides – can be preventative; provide long term control
Specific Management Tips

Gumbo Limbo Whitefly

- Scout – spiraling eggs on undersides of leaves; easy to see
Specific Management Tips
Gumbo Limbo Whitefly

• Foliar insecticides – contact may be difficult due to heavy wax production

• Soil or trunk insecticides – use for heavily infested trees; can use for nearby plants or if eggs are present
Remember - the below symptoms do not stop or go away immediately even if you are controlling the pest.

Leaf drop

Sooty mold

White, waxy flock

Do not apply additional insecticide unless you are sure it is necessary.
More Information

• Rugose spiraling whitefly

• Whiteflies on landscape ornamentals
  http://edis.ifas.ufl.edu/pdffiles/MG/MG25400.pdf

• Homeowner’s guide to pesticide safety
  http://edis.ifas.ufl.edu/pi051

• Selecting a professional pest control service
  http://edis.ifas.ufl.edu/pi075
Web Resources

- http://trec.ifas.ufl.edu/mannion
- http://edis.ifas.ufl.edu/
- http://creatures.ifas.ufl.edu/
- Pest Alerts
  - University of Florida (http://extlab7.entnem.ufl.edu/pestalert/)
  - DOACS (http://doacs.state.fl.us/~pi/enpp/pi-pest-alert.html)
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