New Pest Update for the Florida Landscape
The Landscape
A Reservoir of Pests

Diversity of host material and habitat make the landscape an ideal place for new pest establishment.

Photo: myfloridalandscapes.com
Challenges in Managing Invasive Pests in the Landscape

• Detection and identification
• Management strategies for the landscape
• Dealing with everyone from the homeowner to the grounds keeper or landscape manager to the politician
• Attention to high risk pests but little or no reaction to lower risk pests.
Impact of “Lower Risk” Pests

- High risk of spreading
- High visual or local impact
- Public, press and politic pressure
- Lack of funding/resources
- Could be more problematic in isolated areas
- Reliance on pesticides
Some Recent Introductions

2011
- Brown marmorated stink bug, *Halyomorpha halys*
- Giant African snail, *Lissachatina fulica*

2010
- Passionvine mealybug, *Planooccus minor*
- European pepper moth, *Duponchelia fovealis*
- Ash whitefly, *Siphoninus phillyreae*
Some Recent Introductions

2009
• Rugose spiraling whitefly, *Aleurodicus rugioperculatus*
• A mealybug, *Nipaecoccus viridis*
• An orchid mealybug, *Pseudococcus dendrobiorum*

2008
• Croton scale, *Phalacrocoroccus howertonii*

2007
• Ficus whitefly, *Singhiella simplex*
• Red palm mite, *Raoiella indica*
Brown Marmorated Stink Bug

*Halyomorpha halys*

- Wide host range; pest of crops and ornamentals
- Significant urban nuisance
- Often moved by vehicular transit
- Some specimens found in FL
- No established population in FL
- Can resemble brown stink bug species and bark stink bugs


Photo: Jeffrey W. Lotz, DPI
Giant African Land Snail

*Lissachatina fulica*

(formerly *Achatina fulica*)

- Wide host range (more than 500 types)
- One of the most damaging land snails worldwide
- Causes significant plant damage; carry disease organisms
- Found in Miami-Dade County

Passionvine Mealybug
*Planooccus minor*

- Detected in 2010 in Miami
- Detected in 2011 in Palm Beach County
- Also in the Caribbean, and Hawaii
- Wide host range (more than 250 plant species)
- Similar to the citrus mealybug

European Pepper Moth

*Duponchelia fovealis*

- Detected in Orange County; in at least 7 counties
- Wide host range (larvae) host range (field crops and ornamentals)
- Insect often concealed
- [http://mrec.ifas.ufl.edu/lso/DUPON/default.asp](http://mrec.ifas.ufl.edu/lso/DUPON/default.asp)
Ash Whitefly
*Siphoninus phillyreae*

- Pest of numerous ornamental and fruit crops, including citrus
- Can cause leaf wilt, leaf drop and small fruit
- In the U.S in California and Florida
- [http://edis.ifas.ufl.edu/pdffiles/IN/IN30400.pdf](http://edis.ifas.ufl.edu/pdffiles/IN/IN30400.pdf)
2009

Rugose Spiraling Whitefly
*Aleurodicus rugioperculatus*

- First found 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
- Excessive honeydew and white flocculant
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
Eggs

1st Instar

2nd Instar

3rd Instar

4th Instar

Adult

Rugose Spiraling Whitefly
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
A Mealybug
*Nipaecoccus viridis*

- Wide host range (fruit and ornamentals; cotton)
- Agricultural pest in Asia
- Widespread throughout the tropics and subtropics
- First found in Palm Beach County on dodder


Photos: K. Griffiths, PPQ-CAPS
An Orchid Mealybug
*Pseudococcus dendrobiorum*

- New hemisphere and continental US record
- Lives on the roots of orchids
- Can be confused with several other common mealybugs
- Economic impact unknown

http://www.freshfromflorida.com/pi/pest_alerts/pseudococcus_dendrobiorum.html
Croton Scale

*Phalacrocoroccus howertoni*

- New to science
- Numerous hosts; many native plants in Florida
- Similar to *Philephedra* species
- Does not produce an ovisac
Croton Scale Damage

- Plant decline; leaf drop
- Excessive amount of honeydew and sooty mold

Photo: C. Mannion, UF/IFAS
Photo: D. Caldwell, UF/IFAS; Collier Co. Ext.

Photos: G. Hodges, DPI/FDOACS
## Development on Croton

<table>
<thead>
<tr>
<th></th>
<th>Mean Days (SD)</th>
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<tbody>
<tr>
<td></td>
<td>Male</td>
<td>Female</td>
<td></td>
</tr>
<tr>
<td>First</td>
<td>12.6</td>
<td>0.6</td>
<td></td>
</tr>
<tr>
<td>Second</td>
<td>10.4</td>
<td>1.3</td>
<td>11.6</td>
</tr>
<tr>
<td>Third</td>
<td>3.9</td>
<td>-0.8</td>
<td>6.9</td>
</tr>
<tr>
<td>Fourth</td>
<td>2.8</td>
<td>0.8</td>
<td></td>
</tr>
<tr>
<td>Adult (cumulative)</td>
<td>29.7</td>
<td>1.9</td>
<td>31.1</td>
</tr>
</tbody>
</table>
Ficus Whitefly
Singhiella simplex

• Only feeds on ficus species

• Currently in several south and central Florida Counties; some areas of Caribbean

• Causes leaf yellowing; leaf drop and branch dieback
**Ficus Whitefly Life Cycle**

- **Adult Whitefly** (2-4 days)
- **Eggs** (10 days)
- **1st instar – crawler** (4.2 days)
- **2nd-3rd instars – nymphs**
  - **2nd instar – 3.7 days**;
  - **3rd instar – 3.3 days**
- **4th instar – puparia** (5.8 days)

*2nd Constant temperature (80º F)*

*3rd*
Ficus Whitefly - Mean Trap Catch

First signs of defoliation (8/28)
Red palm mite
*Raoiella indica*

- Attacks palms, banana, ginger, bird of paradise and other plants within the Musaceae
- Chlorosis and necrosis
- Mites found on the underside of the leaves
THESE ARE NOT MITES

NOT
RED PALM MITE

RED PALM MITE
Other “Mentionables”

- Red palm weevil, *Rhynchophorus ferrugineus* (not in Florida)
Pest Management in the Landscape

• Seek long-term, biologically based management
• Select pest control measures that will maximize beneficial effects and minimize harmful ones
• Integrate control measures
• Changing trends in types and uses of pesticides
  – Biorational products
  – Unique modes of action
Management Complications

- Small, cryptic insects (difficult to recognize until damage is done); short life cycles
- Invasive pests
- **Regulatory** concerns (zero tolerance)
- Effects of different environments
  - Greenhouse, shadehouse, field
  - Locations, weather

Reliance on pesticides
- Resistance
- Negative impact on natural enemies

Need for Integrated Approach
- Prevention
- Scouting/monitoring
- Conservation of natural enemies
Arthropods Prone to Resistance Development

- Mites
  - Many generations per year
  - Exposure of multiple generations to a pesticide
  - Produce many offspring
  - Limited dispersal
  - Exposure to sublethal (less than optimal) pesticide rates

- Aphids

- Whiteflies

- Thrips
Resistance Management

• Proper calibration of spray equipment
• Applications should be timed and directed to the most susceptible life stage of the pest
• Avoid repeat application of the same pesticide, mode of action or chemical class (The hope is that the resistant pest population may lose their resistance in the absence of repeated exposure)
Management of Pests with Systemic Insecticides

- Systemic (neonicotinoid) insecticides often recommended for pests with piercing-sucking mouthparts
  - Several application methods and formulations
    - Soil application (drench, granular, pellets)
    - Trunk application (basal spray, injection)
    - Foliar application
  - Excellent tools for pest control
    - Can provide long term control
    - Prone to overuse
# Neonicotinoid Insecticides

<table>
<thead>
<tr>
<th>Active Ingredient</th>
<th>Trade Names Professional Use</th>
<th>Trade Names Over-the-Counter</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acetamiprid</td>
<td>TriStar (no soil application)</td>
<td></td>
</tr>
<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>
</tr>
<tr>
<td>Imidaclopid</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>
<td></td>
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</tbody>
</table>

* Contains a Neonicotinoid and a pyrethroid
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
Managing Insects with Piercing/Sucking Mouthparts

• Can be difficult to control; often cryptic
• Often not noticed until populations are high
• Many have waxy secretions/coverings that provide protection
• Wash with water
• Insecticidal soaps and oils – need good coverage
• Insecticides
  – Systemic versus contact
  – Resistance
  – Consider effects on natural enemies
Managing Insects with Chewing Mouthparts

• Recognize damaging insect stage and location
• Insecticidal soaps and oils – generally not best for control
• Timing is often critical
• Insecticides
  – Systemic versus contact
  – Biorational products
  – Consider effects on natural enemies
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
Web Resources

- http://trec.ifas.ufl.edu/mannion
- http://mrec.ifas.ufl.edu/lso/IAWG/
- 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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