Biology and Population Dynamics of the Ficus Whitefly, *Singhiella simplex*
Ficus Whitefly

Singhiella simplex (Hemiptera: Aleyrodidae)

- First observed in 2007
- U.S. continental record
- Distribution: Burma, China and India
- Only feeds on ficus species
- Currently in several south Florida Counties
Ficus Species (Moraceae)

- One of the most widely produced foliage plants for commercial interiorscapes
- In south Florida, they are common landscape plants
  - Grow quickly; few pest and disease problems
  - Commonly used as privacy hedges
  - Resulted in overuse in the landscape
Ficus Whitefly - Damage

- Causes leaf yellowing
- Leaf drop (severe)
- Branch dieback (highly variable)
### Ficus Hosts

<table>
<thead>
<tr>
<th>Previously Reported (other countries)</th>
<th>Tested (Florida)</th>
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<tbody>
<tr>
<td><strong>F. benjamina</strong></td>
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<tr>
<td><strong>F. microcarpa</strong></td>
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<tr>
<td><strong>F. aurea</strong></td>
<td><strong>F. aurea (native)</strong></td>
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<tr>
<td><strong>F. altissima</strong></td>
<td><strong>F. citrifolia (native)</strong></td>
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<tr>
<td><strong>F. bengalensis</strong></td>
<td><strong>F. binnenjikii “Alii”</strong></td>
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<td><strong>F. maclellandii</strong></td>
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Photo: H. Glenn, UF/IFAS
Ficus Hosts Not Susceptible to the Whitefly

- *F. microcarpa* “Green Island”
- *F. religiosa*
- *F. carica* (edible fig)
- *F. lyrata*
- *F. pumila* (= *F. repens*)
- *F. elastica* “Burgundy”

Photo: H. Glenn, UF/IFAS
Ficus Whitefly

• Unlike many other whiteflies, immature stages can be found on both the lower and upper surface of leaves.
• The majority of eggs are laid along the mid-vein on the leaf underside.

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

Photos: H. Glenn, UF/IFAS

Amitus bennetti

Encarsia protransyvena
Predators Collected in Miami on Ficus Infested with Whitefly

- *Harmonia axyridis*
- *Olla v-nigrum*
- *Exochomus childreni*
- *Chilocorus nigritis*
- *Curinus coeruleus*
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
Effect of Temperature on Length of Life Cycle

- 20°C (68°F) 50.00 days
- 27°C (80.6°F) 30.00 days
- 30°C (86°F) 20.00 days
Effect of Temperature on Egg Hatch

- 15°C: High hatch rate
- 20°C: Moderate hatch rate
- 27°C: Low hatch rate
- 30°C: Very low hatch rate

Mean Number Days to Hatch

- 15°C: 30 days
- 20°C: 20 days
- 27°C: 10 days
- 30°C: 5 days
Effect of Temperature on Egg Hatch

Percent Egg Hatch

- 15°C
- 20°C
- 27°C
- 30°C
Ficus Whitefly Trapping

- *Ficus benjamina*
- Isolated area
- Sticky traps for adult whiteflies
- Defoliation

Photo: H. Glenn, UF/IFAS
Ficus Whitefly
Mean Trap Catch

First signs of defoliation
(8/28)

Freezing Temperatures
Ficus Whitefly
Mean Trap Catch

2009

2010
August: approx. 600/trap
September: approx. 100/trap
October: approx. 1600/trap
December: approx. 800/trap
Management with Insecticides

Systemic versus contact
Neonicotinoid insecticides
Length of control
3-gal container; *F. benjamina*
Infested shade house
Soil and Foliar Application of Insecticides
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Final Comments

Management is heavily reliant on insecticides
– Annual application of a soil/trunk neonicotinoid insecticide – provide 8-12 months of control
– Expensive

Areas of future research
– Impact of natural enemies
– Introduction/conservation of natural enemies
– Impact of fertilization and irrigation
– Relationship between population level and leaf drop