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Whiteflies in the Landscape

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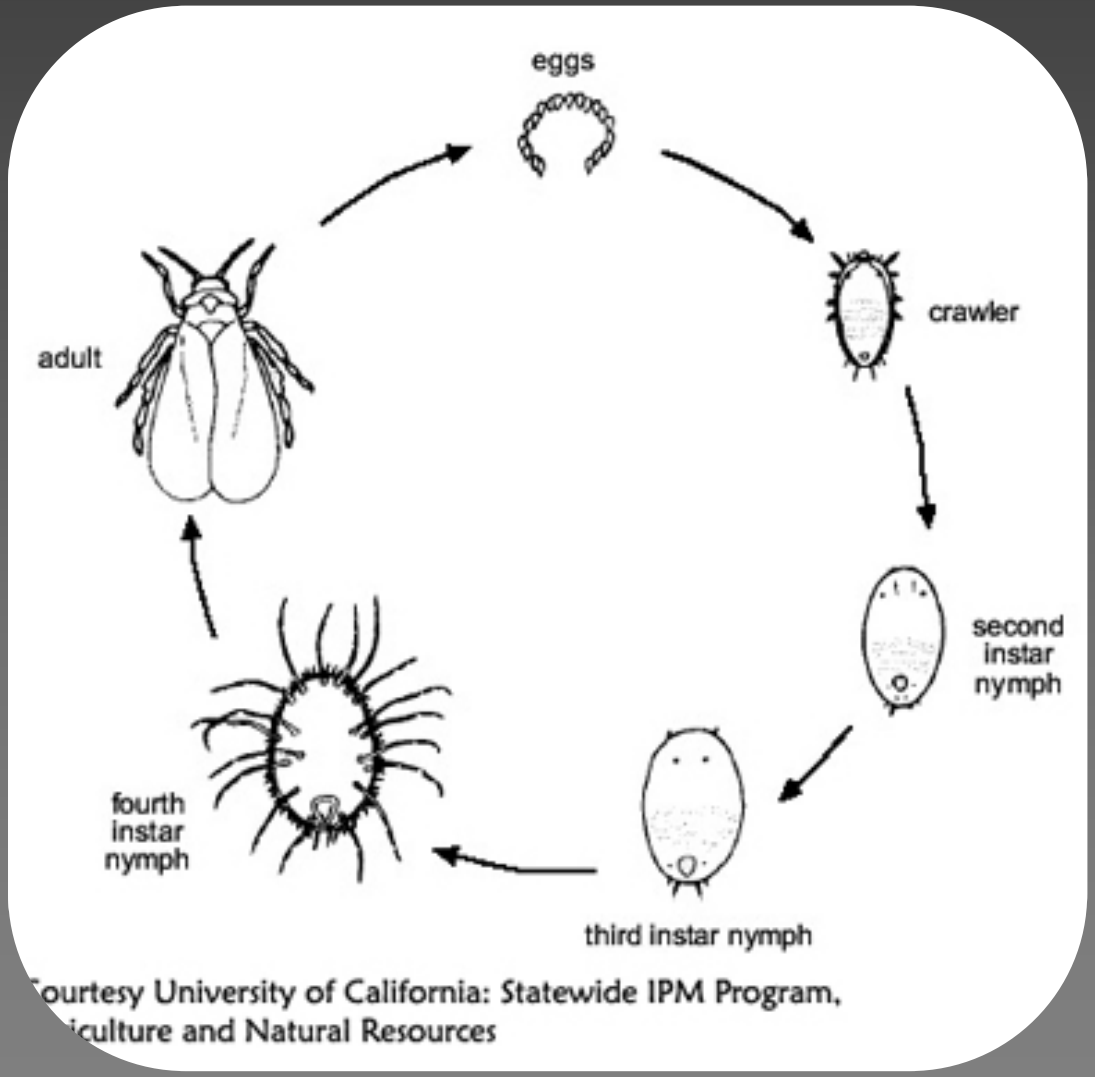
UF UNIVERSITY of FLORIDA
IFAS Extension

Whiteflies

- Approximately 75 species of whiteflies in Florida.
- Common pests of many ornamental plants
- Narrow and wide host range depending on the species
- Piercing-sucking mouthparts
- Excrete honeydew
- Capable of transmitting viruses
- Adults are small, moth-like, usually with white wings.

Photos: H. Glenn, UF/IFAS

Whitefly Life Cycle



Courtesy University of California: Statewide IPM Program, Agriculture and Natural Resources

Photo: H. Glenn, UF/IFAS

Variability in Whitefly Immature Stages

Photo: H. Glenn, UF/IFAS

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
- Currently in several south and central Florida Counties
- Will likely spread to areas where ficus is grown

Ficus Whitefly - Damage

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

Photo: H. Glenn, and C. Mannion, UF/IFAS

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

Adults

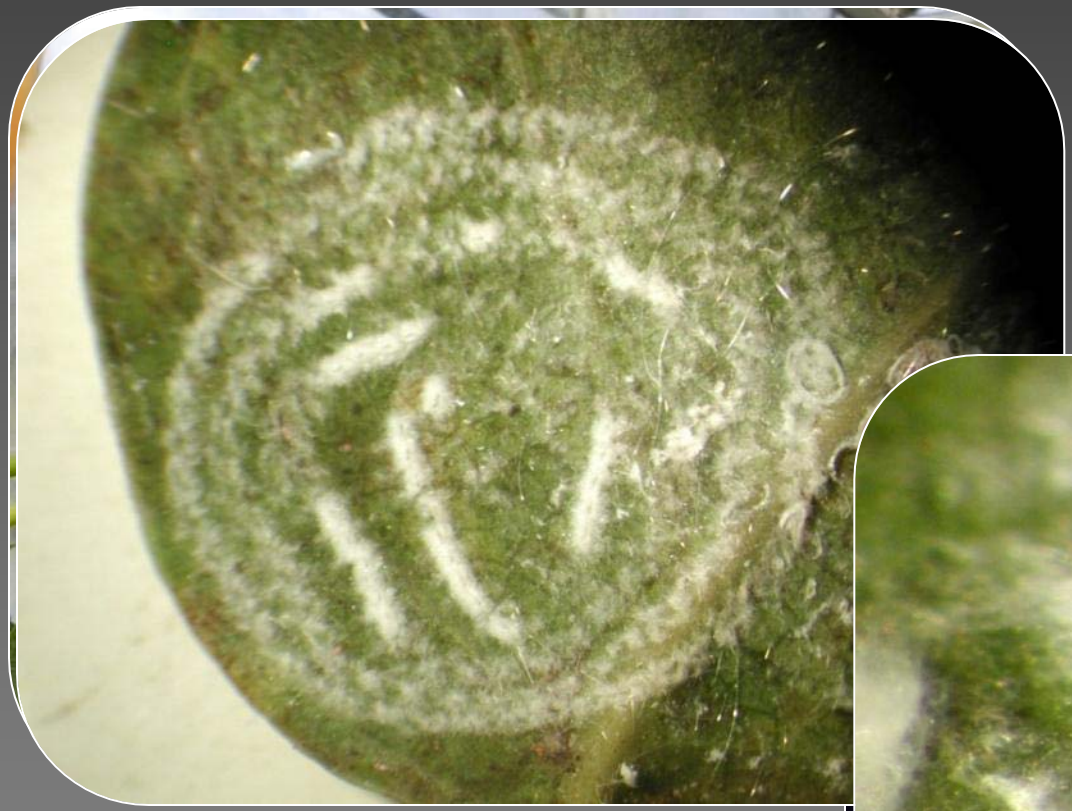
Rugose Spiraling Whitefly

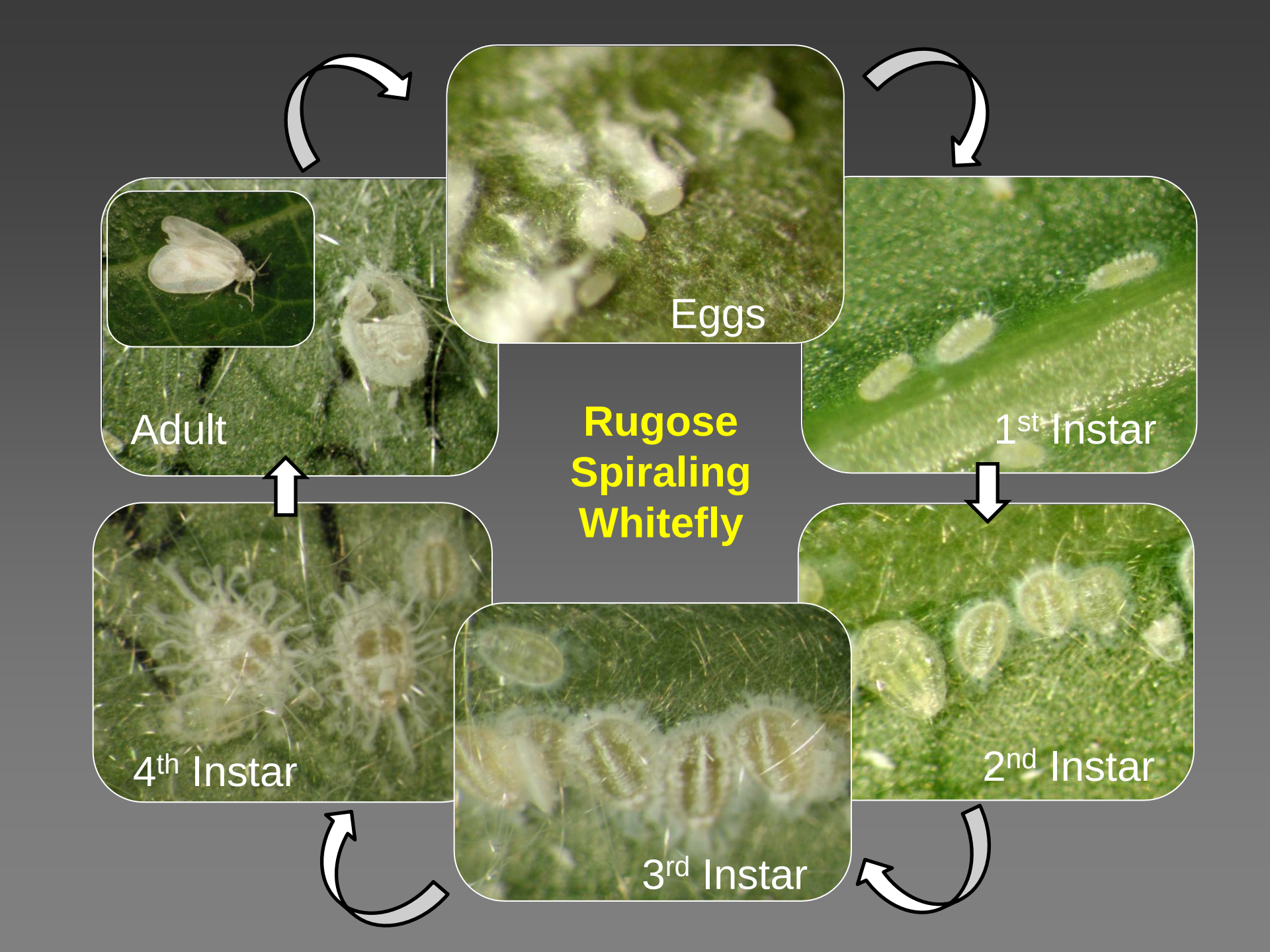
Immature Stages

Rugose Spiraling Whitefly

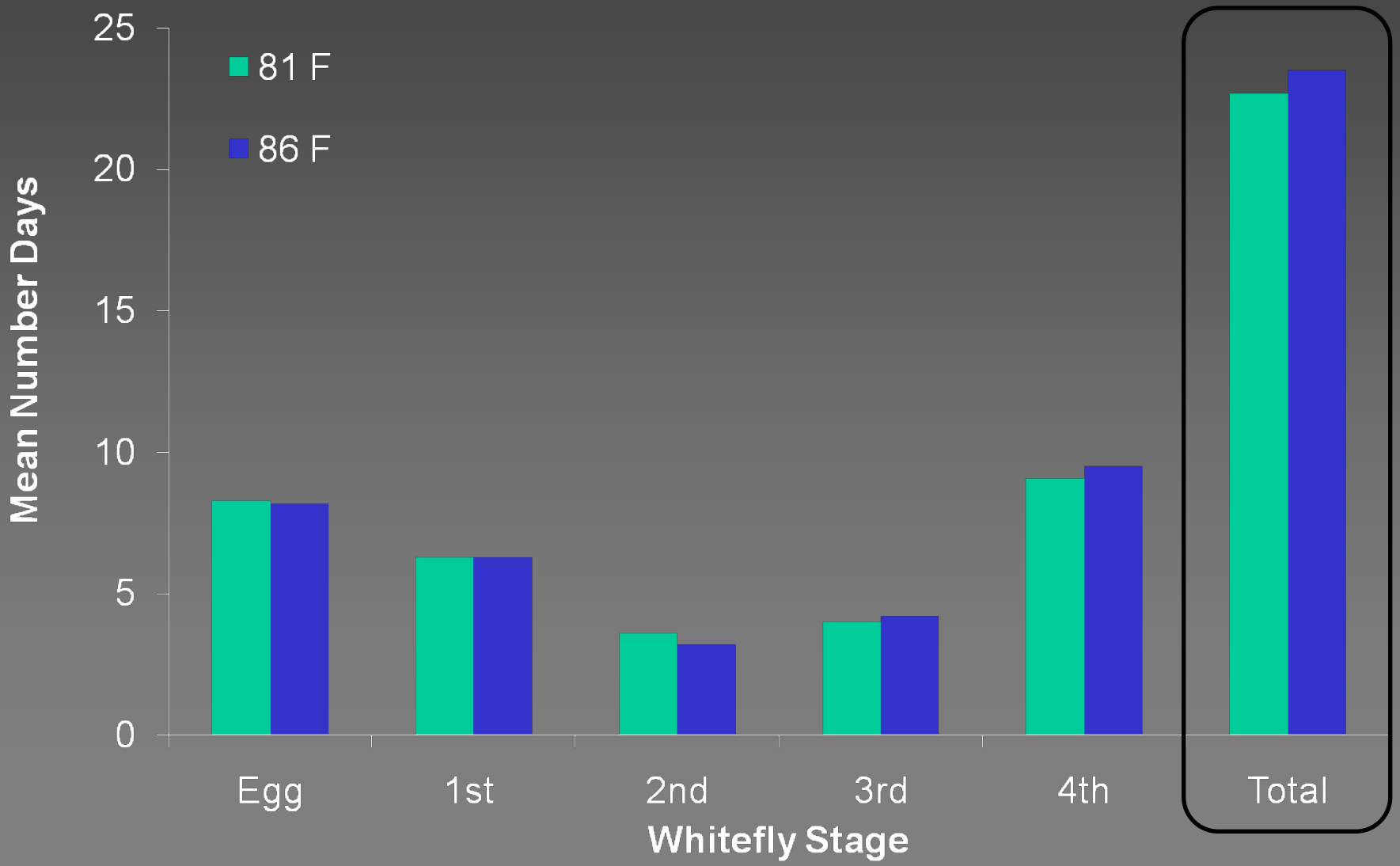
Spiraling Eggs

Rugose Spiraling Whitefly

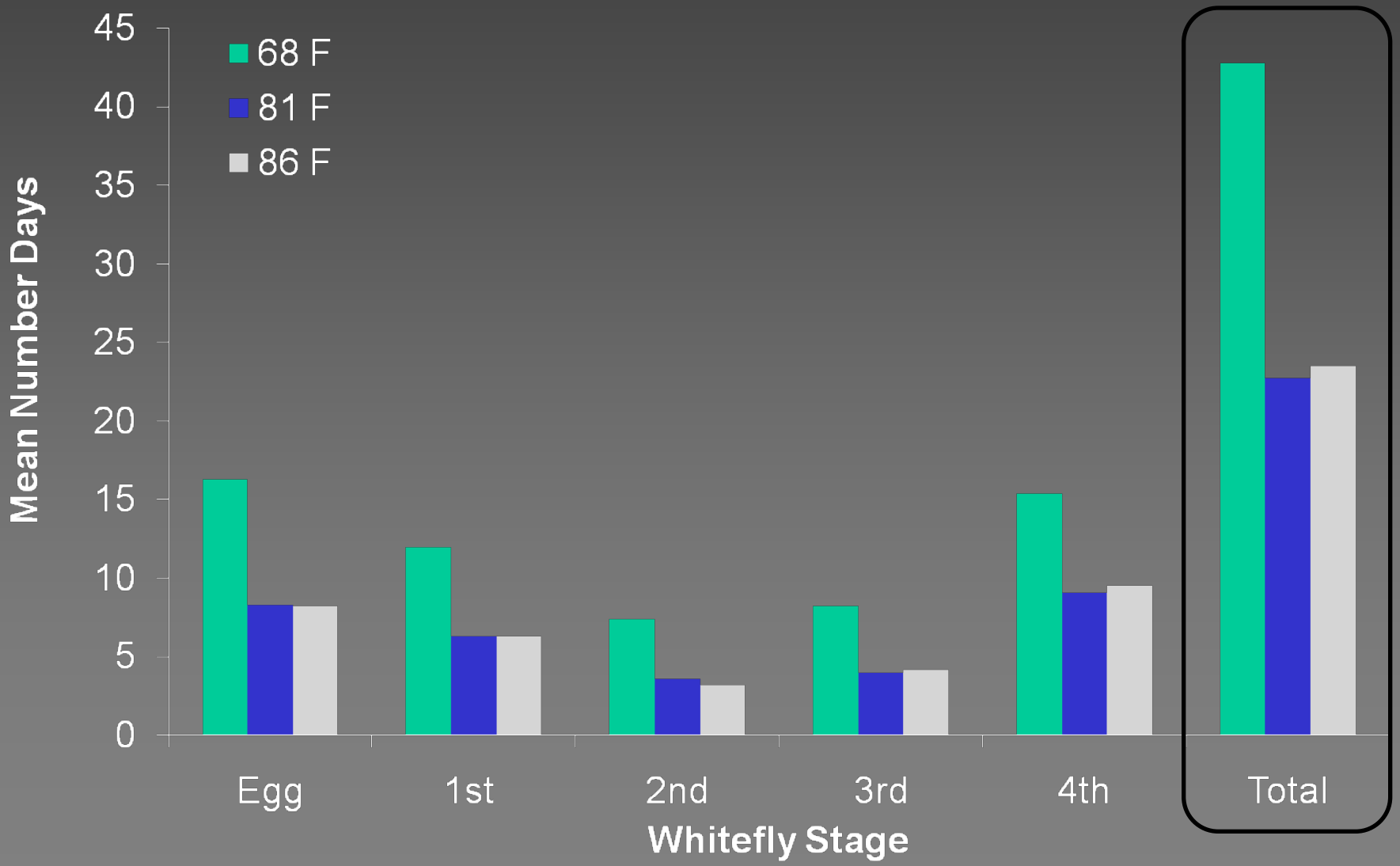



Eggs
1st Instar
2nd Instar
3rd Instar
4th Instar
Adult
Rugose
Spiraling
Whitefly

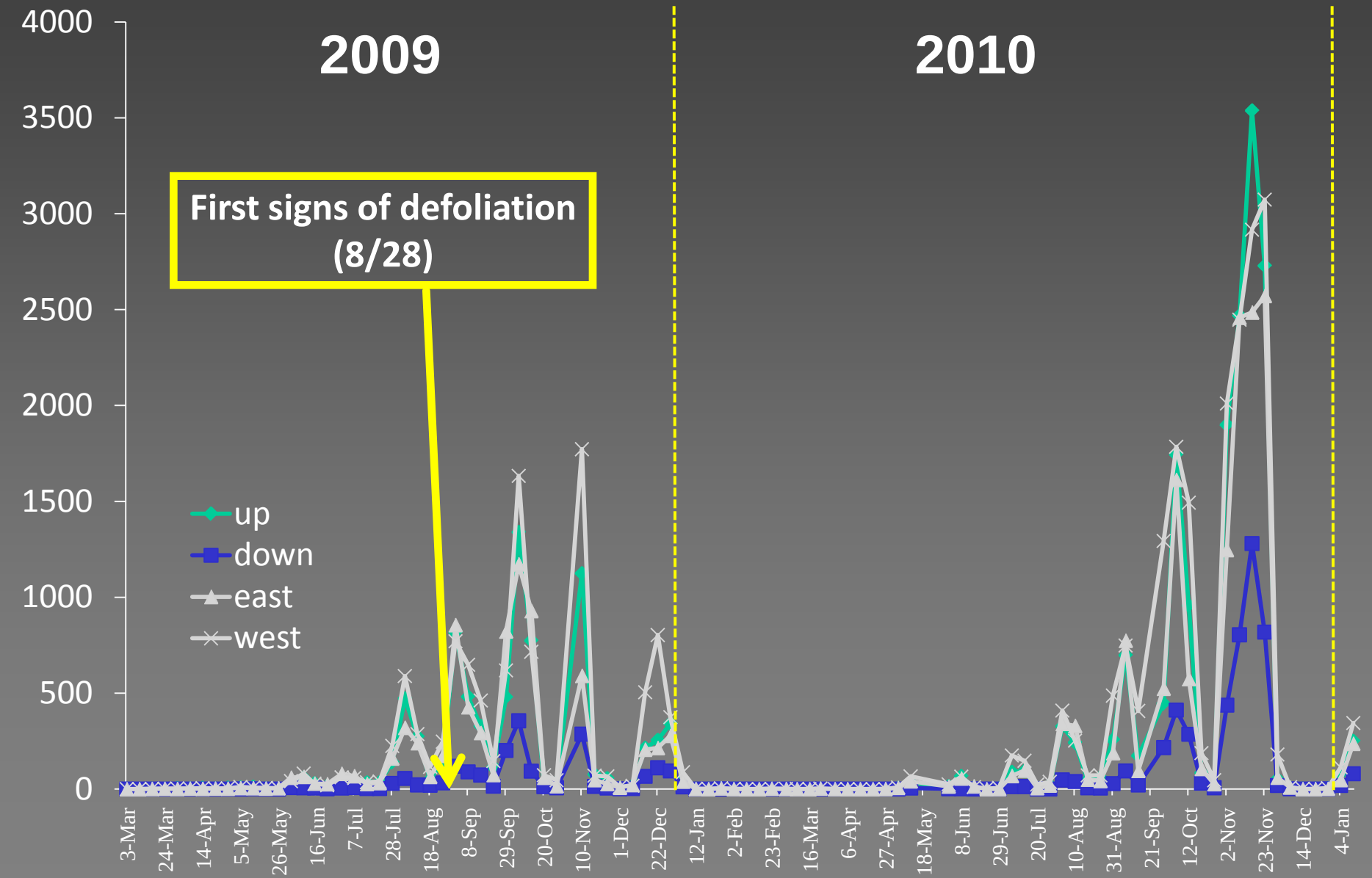
Rugose Spiraling Whitefly Life Cycle at Three Temperatures



Rugose Spiraling Whitefly Life Cycle at Three Temperatures



Ficus Whitefly - Mean Trap Catch



Parasitoid Identified

Encarsia guadalupae

Predator Identified

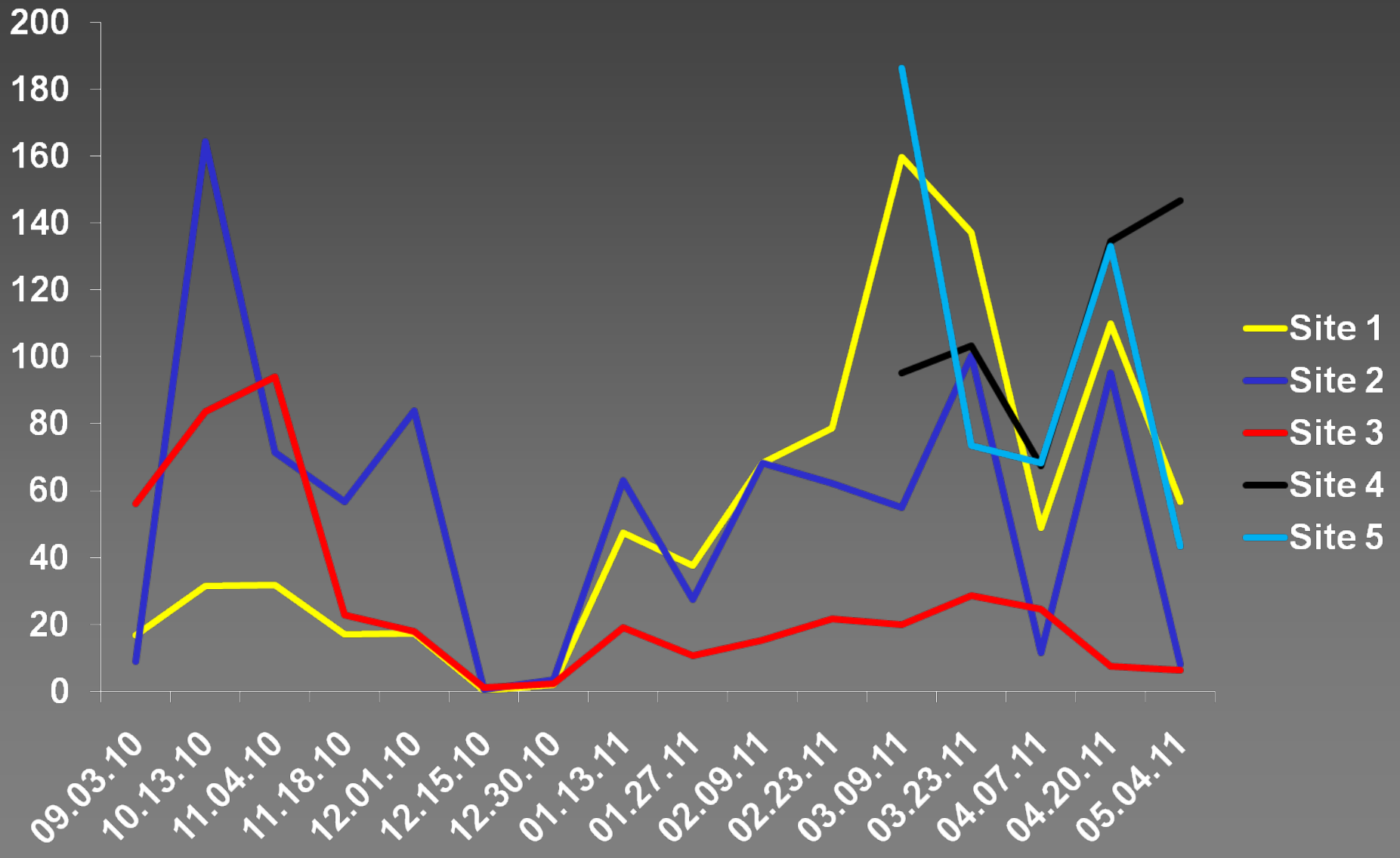
Nepasphis oculata

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

Population of Rugose Spiraling Whitefly



Rugose Spiraling Whitefly

- Not much known about biology
- Closely related to giant whitefly and the keys whitefly (*A. dugesii* and *A. dispersus*)
- Adult is about 3 times larger than other whiteflies
- Adult whiteflies congregate on the undersides of leaves to feed and reproduce
- Whiteflies secrete long white filaments of wax.
- It survives year round in south Florida.

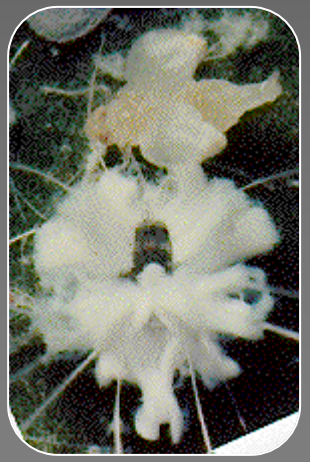
Giant Whitefly
(*Aleurodicus dugesii*)

- Pest of hibiscus and several other hosts (ornamentals, citrus, banana, weeds)
- Found in Florida in 1996
- In California it has been reported on more than 43 hosts
- Approximately 3 times lager than most whiteflies
- Eggs laid in spiral pattern
- Florida released parasites for control
  - Established but no impact recorded

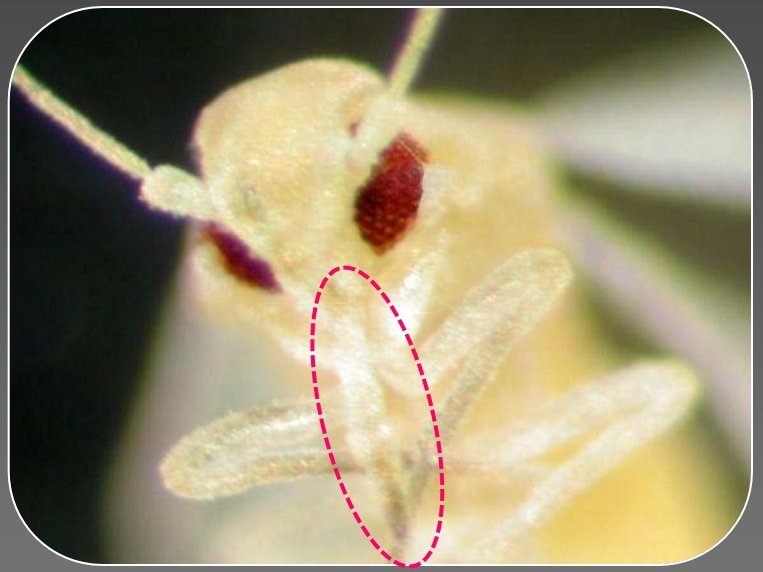
FDACS-DPI, Lotz

Keys Whitefly
(*Aleurodicus dispersus*)

- Attacks more than 100 species of plants (vegetable, ornamental and fruit plants)
- Reported in south Florida (been in Hawaii since 1978)
- Adult is small like a typical whitefly; produce large quantities of wax
- In Hawaii, released several natural enemies and *Encarsia haitiensis* were most effective
- Not really a problem now in Florida



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

Damage from Whiteflies

- Direct damage
  - Caused by the piercing and sucking of sap from the foliage; leaf drop
  - Usually not sufficient to kill plants
- Indirect damage
  - Accumulation of honeydew and white, waxy flocculent material
  - Sooty mold growth on honeydew
- Virus transmission
  - Some whiteflies can transmit disease
  - Currently, no known viruses associated with the Rugose spiraling whitefly

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

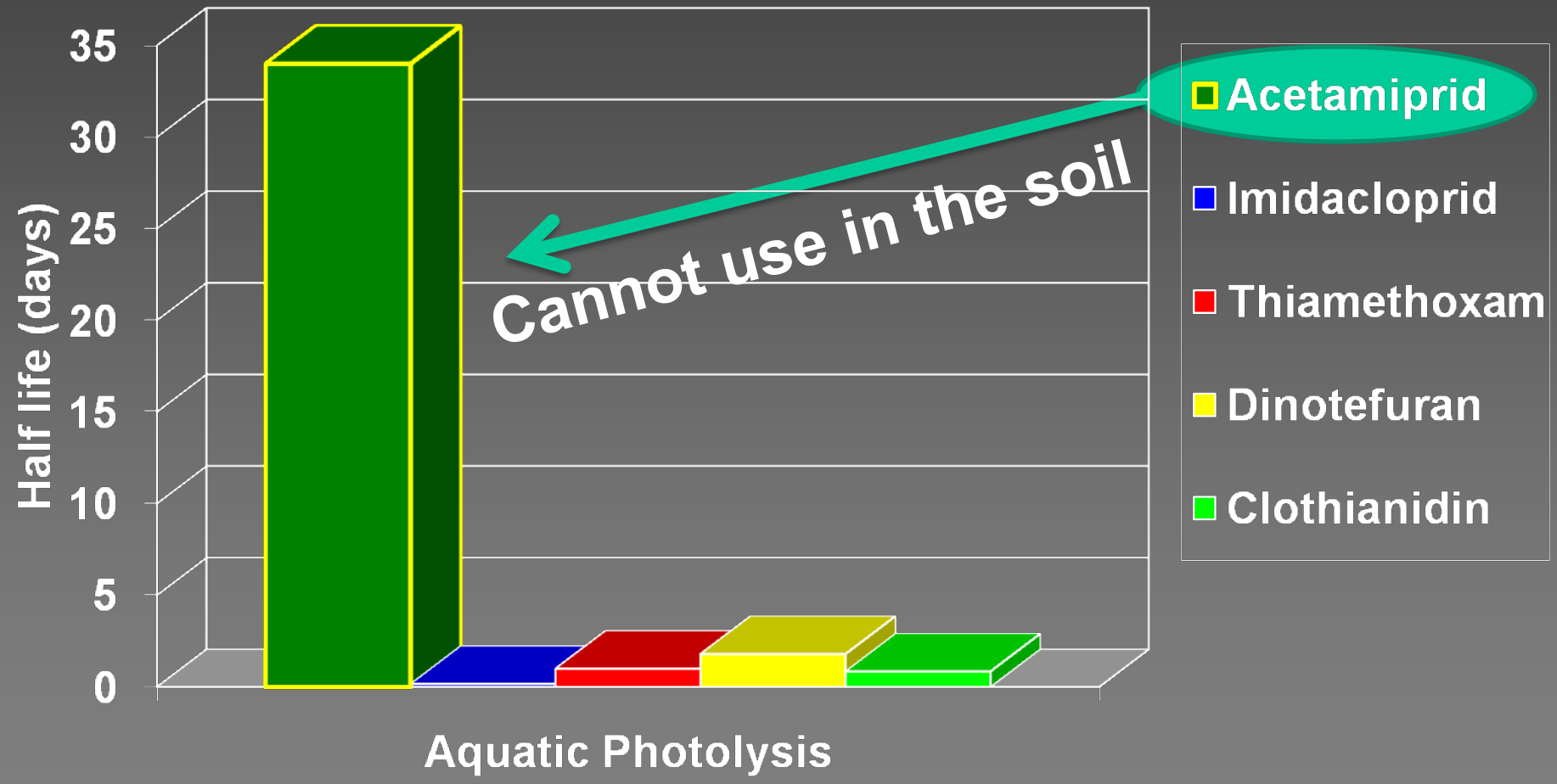
- Apply a systemic (neonicotinoid) insecticide to the soil or trunk
  - Soil application (drench, granular, pellets)
  - Trunk application (basal spray, injection)
  - Expect approximately 1 year control; spring application

Neonicotinoid Insecticides

Active Ingredient	Trade Names Professional Use	Trade Names Over-the-Counter
Acetamiprid	TriStar (no soil application)	
Clothianadin	Arena, Aloft*	
Dinotefuran	Safari	Green Light Tree & Shrub Insect Control with Safari
Imidacloprid	Merit, Marathon, Coretect, Discus*, Allectus*, several generic labels	Bayer Advanced Lawn Complete Insect Killer; Bayer Advanced Tree & Shrub Insect Control ; Ortho Max
Thiamethoxam	Flagship, Meridian	

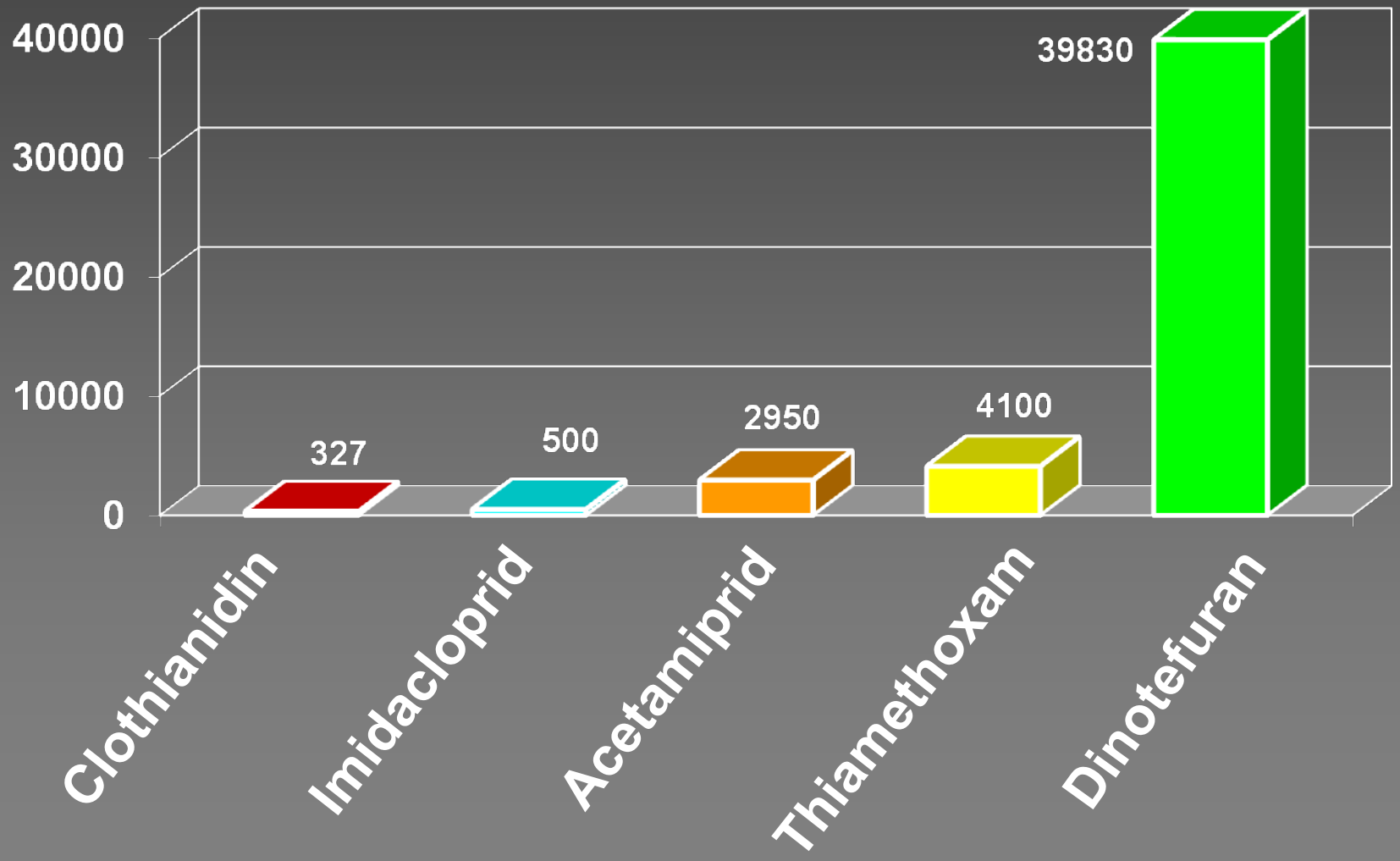
* Contains a Neonicotinoid and a pyrethroid

UV Stability of Neonicotinoids



Slide Credit: Presentation by C. Sclar, Longwood Gardens

Relative Water Solubility of Neonicotinoids



Slide information courtesy C. Sclar. Longwood Gardens

Methods of Application for Neonicotinoids

- There are numerous options on how to apply the neonicotinoids;
- Take advantage of the different methods
- Take advantage of the different formulations
- Fit the method of application for the site
- The site and method needs to be on the label

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

Insecticide Selection
Foliar Application

Professional Use (Landscape and Nursery)

Abamectin (Avid)

Acetamiprid (TriStar)

Azadirachtin (Azatin XL)

Bifenthrin (Talstar)

Buprofezin, (Talus)

Clothianidin (Arena)

Endosulfan (Endosulfan; Thiodan)

Flonicamid (Aria)

Horticultural oil

Imidacloprid (Merit, Marathon, Discus, Allectus)

Pymentrozine (Endeavor)

Pyriproxyfen (Distance)

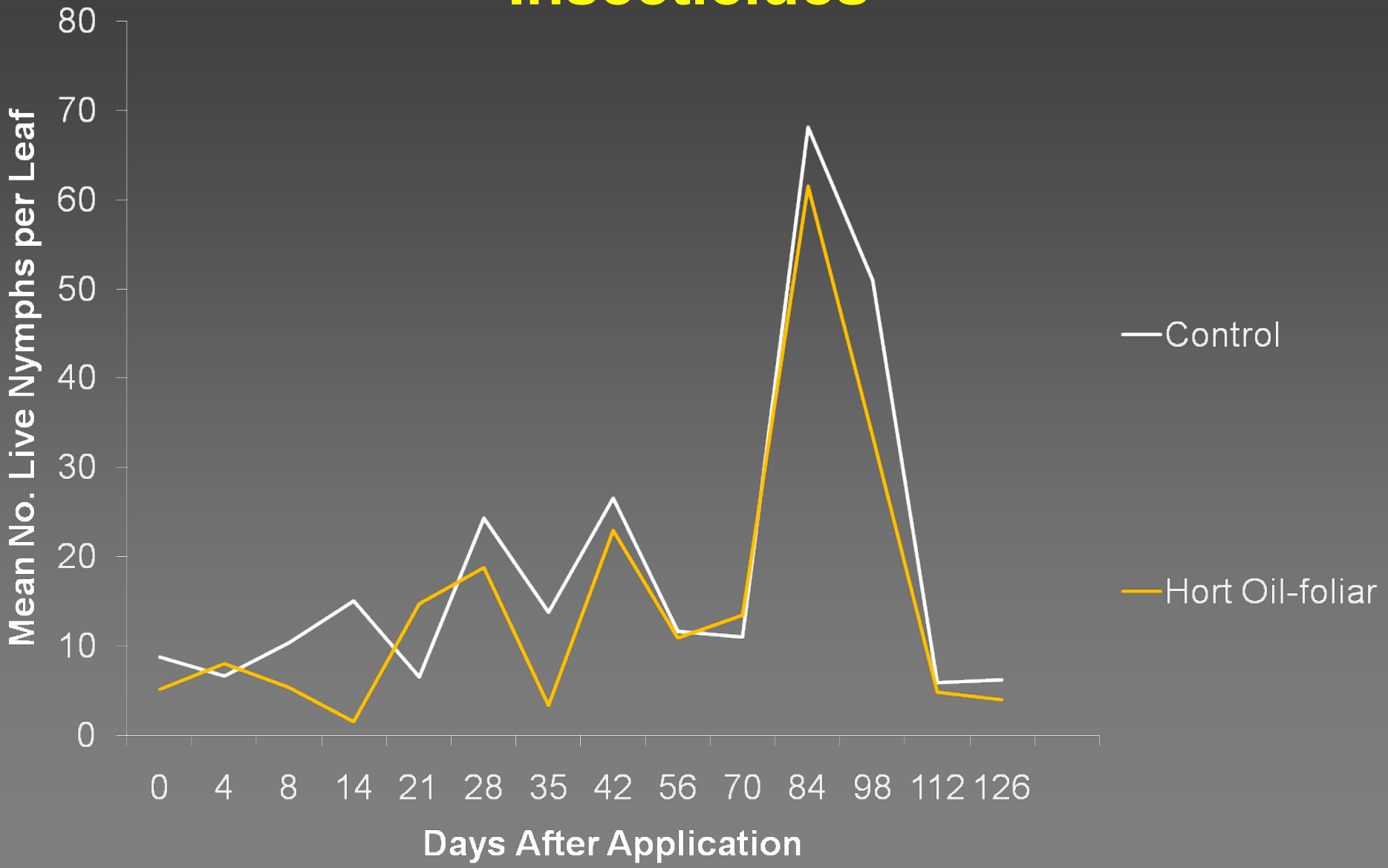
Spiromesifen (Judo)

Beauveria bassiana (BotaniGard)

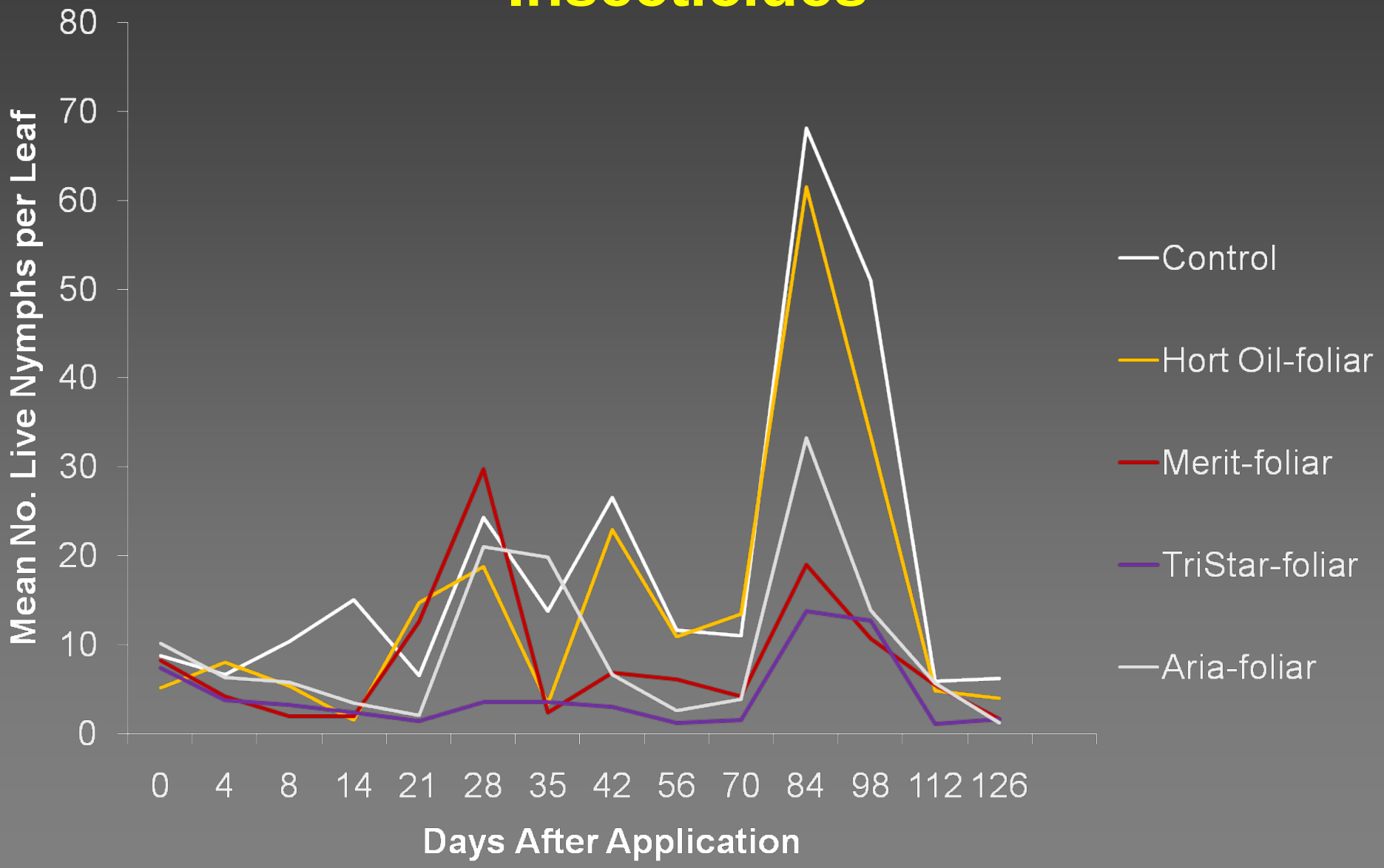
Foliar Insecticides for Homeowner Use

Trade Name(s)	Active Ingredient
Flower, Fruit & Vegetable Insect Killer (Ortho)	Acetamiprid
Bug-B-Gon Max Lawn & Garden Insect Killer (Ortho)	Bifenthrin
Rose & Flower Insect Killer (Bayer Advanced); Lawn & Garden Insect Killer (Schultz)	Cyfluthrin
Triazicide Once & Done Insect Killer (Spectracide)	Lambda-cyhalothrin
Indoor/Outdoor Broad Use Insecticide (Hi-Yield)	Permethrin
Yard & Garden Insect Killer (Bonide); Rose & Flower Insect Spray (Spectracide)	Pyrethrin

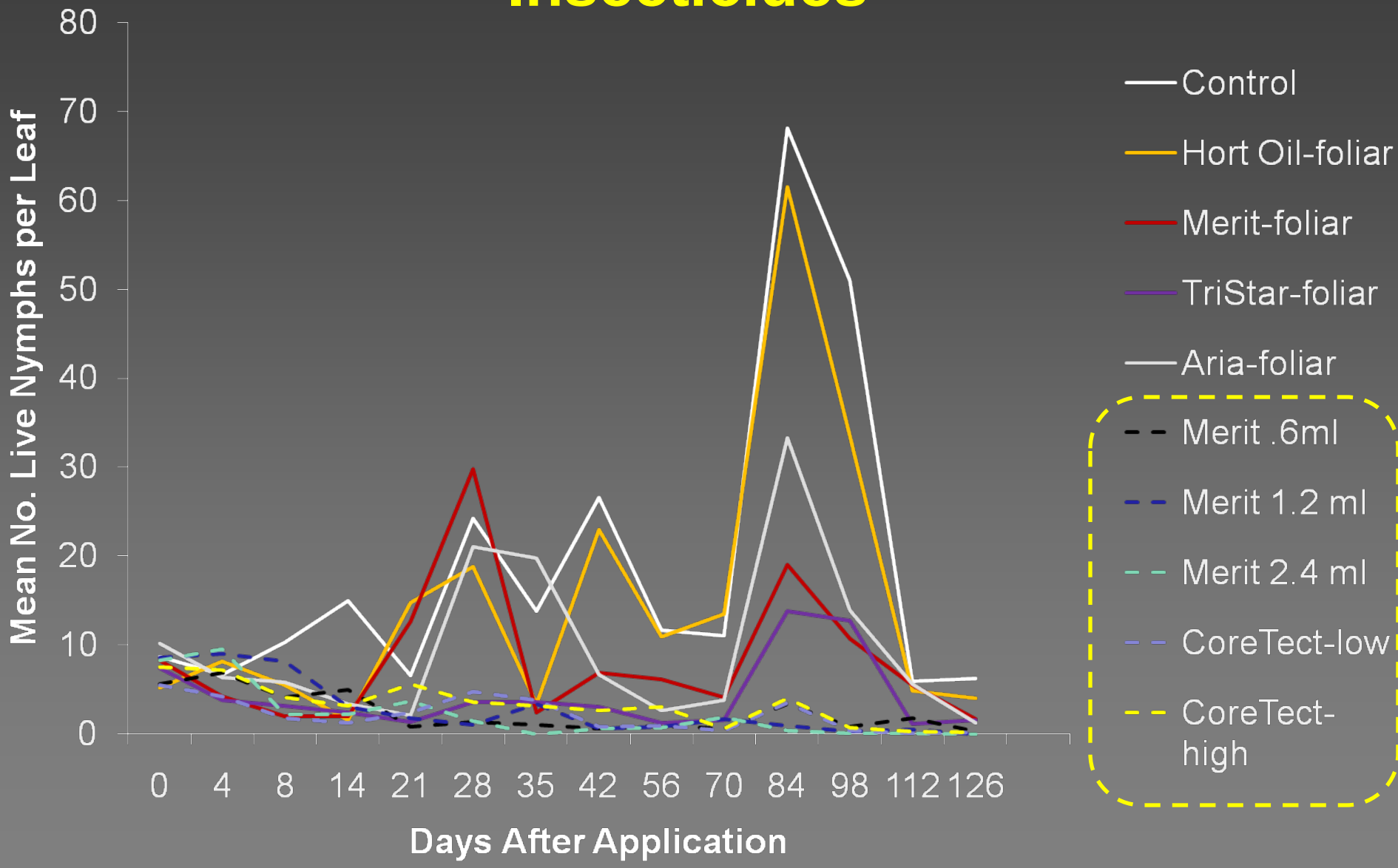
Soil and Foliar Application of Insecticides



Soil and Foliar Application of Insecticides



Soil and Foliar Application of Insecticides



Specific Management Tips

Gumbo Limbo Whitefly

- Scout – spiraling eggs on undersides of leaves; easy to see

Specific Management Tips

Rugose Spiraling 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

Specific Management Tips Rugose Spiraling Whitefly

- Whatever control method you use, there will be impact on natural enemies
- Insecticide use
  - Use appropriate insecticides and methods of application
- DO EVERYTHING POSSIBLE TO CONSERVE NATURAL ENEMIES
  - Necessary for long term control

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

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