

Education and Training to Increase Adoption of IPM for Western Flower Thrips, *Frankliniella occidentalis* (Thysanoptera: Thripidae)

Amanda Hodges, Norm Leppla, Jennifer
Gillett-Kaufman, and Joyce Merritt

Issues

- Correct Identification
 - Knowing damage symptoms
 - Species-level is important
- Pesticide Resistance
- Understanding Thrips Behavior, Ecology, and Natural Enemy Complexes

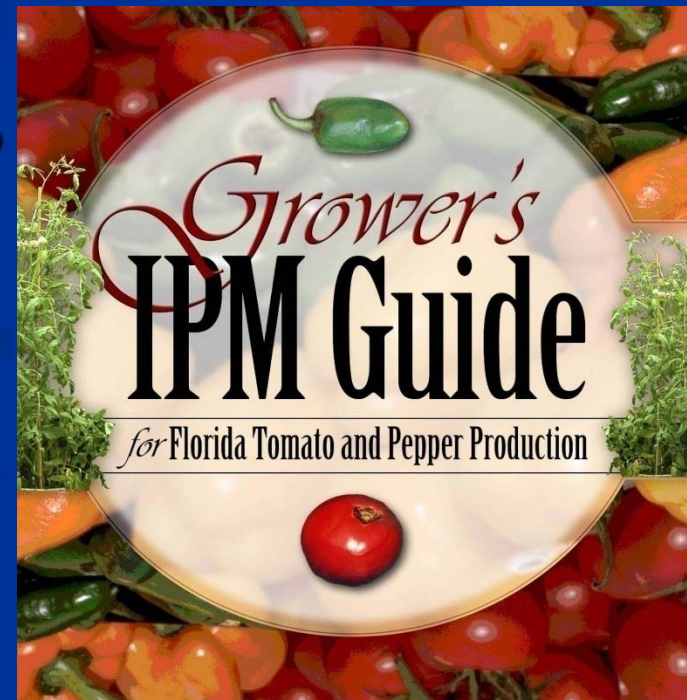


Photo Credit: Lyle Buss, UF

Approach



- Partnerships
 - Local
 - Thrips Specialist Working Group
 - Regional
- Multiple Delivery Methods
 - Workshops
 - Web
 - Publications



IPM Florida provides statewide, interdisciplinary and inter-unit coordination and assistance for UF/IFAS integrated pest management research, extension, and education faculty



▶ **IPM Resources**

About Us, Contact Us, FAQ's, Success Stories, Projects, Reports, Extension Resources, Presentations, Teaching Resources, Training, UF/IFAS Grants Program, Grants Showcase, Funding, Employment, ListServ, Links

▶ **Agricultural IPM**

Citrus, Field Crops, Greenhouse, Herbs, Livestock, Non-Citrus, Ornamental, Sustainable and Organic, Turf, Vegetables

▶ **Community IPM**

Landscape IPM, Home Gardening, Master Gardener, School IPM, Structural IPM



Thrips Pest Management

A new section on Thrips pest management. [More...](#)



Grower's IPM Guide for Florida Tomato and Pepper Production

An IPM decision making resource for Florida's peppers and tomatoes. [More...](#)

Solutions for Your Life

UF/IFAS Extension launches an easy-to-use, comprehensive Web site, Solutions for Your Life. [More...](#)

Did You Know?

IPM is a sustainable approach to managing pests through biological, cultural, physical and chemical tools in a way that minimizes risks to the community.

- ▶ **Weather Information**
- ▶ **EDIS: Publications**
- ▶ **IFAS Research**

▶ **IPM Resources**

About Us, Contact Us,
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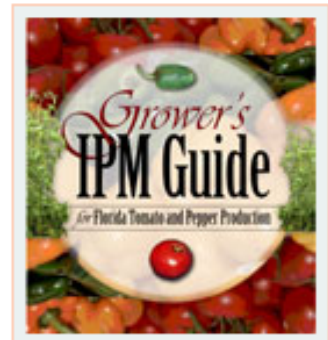
Landscape IPM, Home
Gardening, Master
Gardener, School IPM,
Structural IPM

▶ **Natural Areas IPM**

Woods, Arthropods

Thrips Pest Management

- [Thrips 101](#)
- [Scouting](#)
- [Identification of thrips](#)
- [Identification of natural enemies of thrips](#)
- [General IPM practices that reduce thrips populations](#)
- [Thrips management in specific crops](#)
- [Challenges of thrips management](#)
- [Tracking thrips resistance to insecticides](#)
- [Insecticides](#)
- [News releases](#)
- [Specialist working group](#)
- [Education and training activities](#)
- [Grower's IPM Guide for Florida Tomato and Pepper Production](#)
- [Grower's IPM Guide for Florida Tomato and Pepper Production Screensaver](#)
- [Links](#)



Downloads

[Adobe Acrobat](#)

[Microsoft Powerpoint](#)

Thrips Specialists Working Group

➤ Identification and Management

15 specialists

➤ Extension

15 specialists

➤ Industry Management

9 specialists

➤ Education

3 specialists

Easy email access to specialists

Thrips Specialists Working Group

IDENTIFICATION AND MANAGEMENT

- **Steven Arthurs, Ph.D.**, Professor of Entomology, UF/IFAS
Mid-Florida REC
- Lyle Buss, UF/IFAS Entomology & Nematology, Insect ID Lab
- G. B. Edwards, Ph.D., Taxonomic Entomologist, Curator, Florida Department of Agriculture & Consumer Services
- Joseph Funderburk, Ph.D., Professor of Entomology, University of Florida

WORKSHOPS

Entomology Diagnostic Training

- SPDN/FPDN Thrips Workshop
- March 2006, Gainesville, FL



SPDN Invasive Arthropod Workshop



Photo Credits: Suzanne Wainright-Evans, Buglady Consulting, Inc.

Florida Thrips Landscape and Ornamental Workshop

- August 2007
- 25 participants
- Primarily UF and USDA employees
- 18 post-workshop surveys
- Workshop Instructors, Learning Environment, and workshop Design-averaged good to very good ratings
- Participants interested in more homeowner/Master Gardner information



Western Flower Thrips Workshops, 2008-09

- August 2008:
Immokalee, FL
- October 2008:
West Palm Beach, FL
- February 2009:
Palmetto, FL

The screenshot displays the IPM Florida website with the following content:

- Navigation:** Home, Agricultural, Community, Natural Areas, Applying IPM, Projects, Search, Go.
- IPM Resources:** About Us, Contact Us, FAQ's, Success Stories, Projects, Reports, Extension Resources, Presentations, Teaching Resources, Training, UF/IFAS Grants Program, Grants Showcase, Funding, Employment, ListServ, Links.
- Agricultural IPM:** Citrus, Field Crops, Greenhouse, Herbs, Livestock, Non-Citrus, Ornamental, Sustainable & Organic, Turf, Vegetables.
- Community IPM:** Landscape IPM, Home Gardening, Master Gardener, School IPM, Structural IPM.
- Natural Areas IPM:** Weeds, Arthropods, Animals.
- Applying IPM:** IPM Planning, Scouting, Methods, Pest Identification & Diagnosis, Measuring IPM, GMOs, Invasive Species, Soil Quality, Water Quality.
- Projects:** (Empty section)
- Education and Training:**
 - Entomological Society of America - Southeastern Branch 2009 Annual Meeting: Renaissance Montgomery Hotel and Spa at the Convention Center, Montgomery, Alabama, Management of Flower Thrips Symposium, Tuesday, March 10, 2009, 10:20 am - 12:00 pm.
 - Western Flower Thrips IPM Workshop: Palm Beach County Extension Exhibit Hall A, 559 N. Military Trail, West Palm Beach, FL, Wednesday, October 1, 2008. Includes a link to view the Palm Beach County Extension Workshop agenda and presentations.
 - Western Flower Thrips Workshop: SW Florida Research and Education Center, Immokalee, FL, Friday, August 29, 2008, 10:00 am - 3:00 pm. Includes a link to view the Immokalee WFT Workshop agenda and presentations.
 - Florida Entomological Society Annual Meeting: Jupiter Beach, FL, Western Flower Thrips in Florida Symposium, Tuesday, July 15, 2008, 2:00 - 5:00 pm.
- Downloads:** Adobe Acrobat, Microsoft Powerpoint.
- UF/IFAS Publications:** Agribusiness and Community Development, Agricultural Laws and Regulations, Agricultural Safety Crops, Florida Land Value.
- Footer Links:** Thrips Pest Management Page, Vegetables Page, Agriculture IPM Page.

PUBLICATIONS AND PRODUCTS

Website Highlights

- July 1, 2008-November 20, 2008
 - Thrips Website: 5,016 hits
 - Thrips Pest Management Homepage: 1,192 hits
- January 1, 2008-November 20, 2008
 - Grower's IPM guide for Florida Tomato and Pepper Production: 50,131 hits



PEST MANAGEMENT: Monitoring

ACTION THRESHOLDS:

The cornerstone of IPM is knowledge of the pests attacking a crop and an understanding of the relationship of density of those pests to crop damage. Therefore, every IPM program is dependent upon periodic scouting to ascertain pest density and upon establishment of densities when treatment is warranted, i.e. thresholds.

Although thresholds based upon the economics of the crop and upon the cost of treatment have been developed for some pests of vegetables, these "economic" thresholds generally have not been used because of the variability and unpredictability of the ultimate market value of winter vegetables. Therefore, action thresholds have been utilized.

PEST OUTBREAKS:

All pests are attacked by a complement of natural enemies including insects, mites, viruses, fungi and bacteria. Natural enemies keep many, if not most, insects or mites under sufficient control so that economic damage is avoided. When these natural enemies provide insufficient control (Figure 1) or provide control only after serious damage has been inflicted (Figure 2), an insect or mite becomes a major pest.

Favorable weather may permit insects or mites to increase to high densities and escape the controlling influences of natural enemies and, thus, become pests.

Secondary outbreaks of pests are caused by applications of broad spectrum pesticides that decimate natural enemies, thus allowing an insect or mite population to increase to damaging levels (Figure 3).

When insects or mites develop resistance to pesticides applied for their control or for the control of other insects, not only do they escape the controlling effects of the pesticide, but they also escape the controlling effects of natural enemies which are not pesticide resistant and which are killed.

Non-native insects or mites may become pests when introduced into Florida without their natural enemies. Native natural enemies may eventually switch to the introduced insects and mites and exert some level of natural control.

Why do we experience pest outbreaks?

- Disruption of natural control
- Pesticide resistance
- Invasive species
- Secondary pest problems
- Weather
- Migration

Figure 1. Natural enemies provide insufficient control of the pepper weevil, *Anthonomus eugenii*. Photograph by: Skip Choate.

Figure 2. Natural enemies provide control only after serious damage has been inflicted by the beet armyworm, *Spodoptera exigua*. Photograph by: Dave Schuster.

Figure 3. *Liriomyza* spp. leafminers on tomato are an example of a secondary pest. Photograph by: James Castner.

Prepared by: Dr. David Schuster

Grower's IPM Guide for Florida Tomato & Pepper Production

Table of Contents

Chapter 1- Introduction WHY IPM?

Chapter 2- Tomato & Pepper Production

Chapter 3- Soil & Nutrient Management

Chapter 4- Pest Management

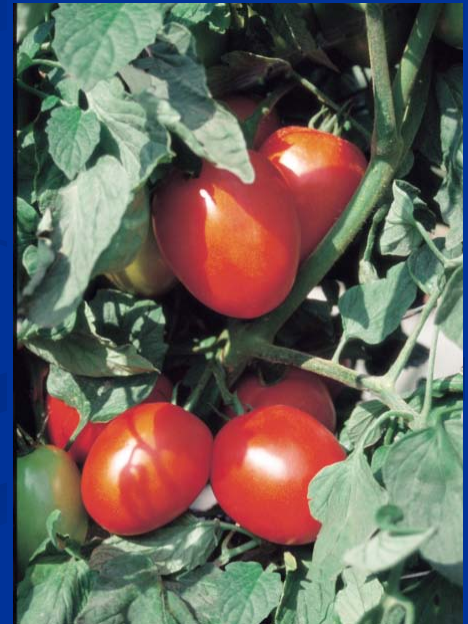
Chapter 5- Disease Management

Chapter 6- Weed Management

Chapter 7- Cultural & Physical Cont.

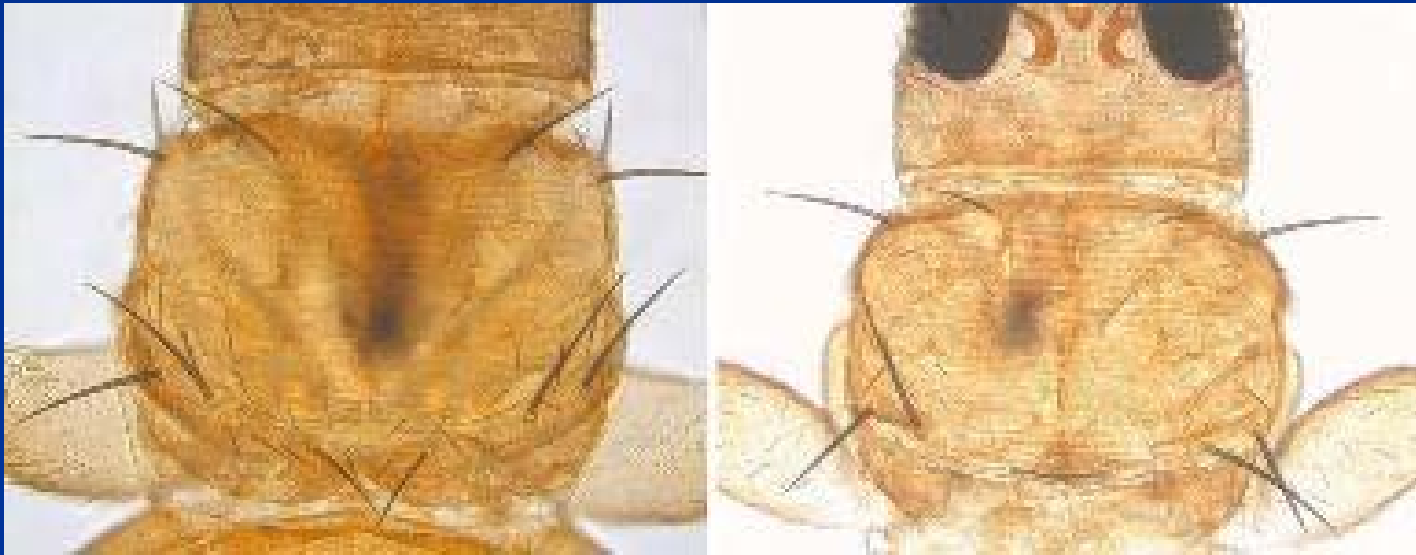
Chapter 8- Biological Control

Chapter 9- Chemical Control



UF/IFAS EDIS Publication

Thrips of Ornamentals in the Southeastern U.S.



Microscopic characters, such as the setae on the prothorax, may be important.

Credit: Funderburk et. al. 2007 (Figure 14).

<http://edis.ifas.ufl.edu/IN754>

2008 Symposium-Western Flower Thrips in Florida

- Biology and Ecology of the Western flower thrips (Thysanoptera: Thripidae): the making of a pest. S.R. Reitz, USDA-ARS-CMAVE
- Shifts in population abundance and damage. C. Mellinger & G. Frantz, Glades Crop Care.
- Management of Western flower thrips in vegetables. J. Funderburk, UF.
- Proceedings, March 2009, Florida Entomologist

<http://www.fcla.edu/FlaEnt/>

2008 Symposium-Western Flower Thrips in Florida

- Importance, sampling, and management of flower thrips in blueberries and strawberries in Florida. H.A. Arevalo, A.B. Fraulo & O.E. Liburd, UF.
- Education and training to increase adoption of IPM for Western flower thrips. J.L. Gillett-Kaufman, N.C. Leppla, A.C. Hodges, & J.L. Merritt. UF.
- Assessment of implementation and sustainability of IPM program. T. Weiss, Dow AgroSciences.
- Proceedings, March 2009, Florida Entomologist

<http://www.fcla.edu/FlaEnt/>

Planned Educational Resources

- Thrips Identification Deck
 - Example format: Mealybugs of the Southeastern U.S.
- Additional Resources?
 - Pending clientele needs and feedback.

The image shows a sample informational card for the Pink Hibiscus Mealybug. The card is white with a green header and a green vertical bar on the left. The text is organized into sections with rounded corners.

001
E X O T I C

Maconellicoccus hirsutus

Pink Hibiscus Mealybug

Field Recognition
Body pink, about 3 mm long, no to few lateral (side) wax filaments, body fluid red to pink. Ovisacs are present covering pink to orange eggs. Feeding from pink hibiscus mealybug can cause twisted or distorted foliage. High populations may result in leaf drop.

Known Southeastern Distribution
Established in Florida (2002) and limited populations detected in Louisiana (2006) and Texas (2007).

Common Hosts
More than 200 known hosts occur, but the most common host detected to date is hibiscus. Pink hibiscus mealybug could be a problematic pest for some of major agronomic crops in the southeastern United States if established populations are nearby. Cotton, a close relative of hibiscus, is of particular concern.

Questions??

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