

2nd International Webinar Conference

Don't Get Tripped By Thrips: Effective Thrips Management Raymond A. Cloyd

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1:00 to 1:25 Eastern




DON'T GET TRIPPED BY THRIPS: EFFECTIVE THRIPS MANAGEMENT

Ray Cloyd
Greenhouse Entomology
rcloyd@ksu.edu





Overview: What To Expect

- Introduction
- **Biology, behavior, and life cycle of western flower thrips**
- Management of western flower thrips during spring annual production
- **Questions and discussion**


How Can You Minimize Problems With Western Flower Thrips During Spring Annual Production?

Western Flower Thrips, *Frankliniella occidentalis*



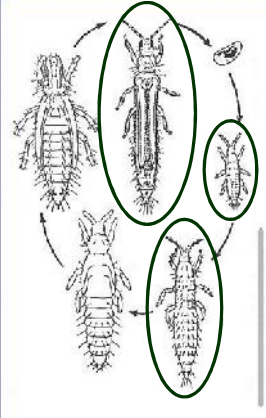
Plant Damage

- * Direct: feeding injury to leaves and flowers.
- * Indirect: transmit the tospoviruses—impatiens necrotic spot virus (INSV) and tomato spotted wilt virus (TSWV).

Western Flower Thrips Life Cycle





- * Egg
- * Nymphs (n=2)
- * Pupae (n=2)
- * Adult

Lifecycle may be completed in 18 to 24 days depending on temperature



Why Western Flower Thrips Are A Major Insect Pest Of Greenhouse-Grown Horticultural Crops

- High reproductive capacity
- **Broad host range**
- Rapid life cycle
- **Resistance to insecticides**
- Virus vector
- **Feeding habit**
- Small size

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Plan Of Attack Against Western Flower Thrips

- * Sanitation
- * Physical
- * Insecticidal
- * Biological

Non-Insecticidal Means Of Managing Western Flower Thrips

Scouting Crops Using Yellow Sticky Cards

Many Weeds Serve As Reservoirs For Western Flower Thrips

Insect Or Micro-Screening: Prevent Western Flower Thrips Adults From Migrating Into The Greenhouse

OK Guys And Gals Lets Go!

Weeds Outside Greenhouse: Source Of Western Flowers Thrips That Can Migrate Into Greenhouse

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The Primary Means Of Dealing With Western Flower Thrips Populations, In General, Is The Application Of Insecticides.





Insecticides: Western Flower Thrips

- Abamectin (Avid)
- Acephate (Orthene)
- Bifenthrin (Talstar)
- Chlorfenapyr (Pylon)
- Kinoprene (Enstar)
- Methiocarb (Mesuro)
- Novaluron (Pedestal)
- Pyridalyl (Overture)
- Spinosad (Conserve)

Factors Associated With Maximizing Insecticide Effectiveness Against Western Flower Thrips

- Timing
- Coverage
- Frequency



READ THE LABEL OF ALL INSECTICIDES





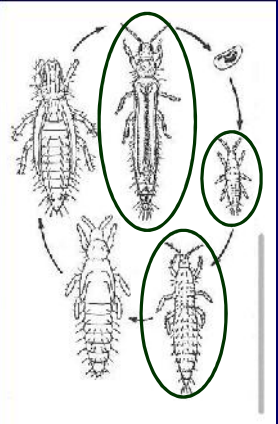

Avid® 0.15 EC
Miticide/Insecticide
For control of leafminers and mites and suppression of aphids, whiteflies, and thrips on ornamental plants. Recommended for Agricultural/Commercial Use.

Active Ingredients:
Abamectin (CAS No. 65195-56-4 and 65195-55-3) 2.0%
Other Ingredients: 98.0%
Total: 100.0%
*1 gal. contains 0.15 lb. abamectin.

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Western Flower Thrips
(Cryptic Or Thigmotactic Behavior)

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Behavioral Resistance

- The natural cryptic or thigmotactic behavior of western flower thrips, in which individuals reside in enclosed, concealed locations on plants may reduce direct exposure to contact insecticides.  
- It is possible that spray applications may select for increased cryptic behavior (avoidance factor). 

The Primary Means Of Managing Western Flower Thrips Resistance Is By Rotating Insecticides With Different Modes Of Action



The Rotation Of Insecticides Assumes That The Frequency Of Individuals Resistant To One Insecticide Will Decrease During The Application Of Another Insecticide—With A Different Mode Of Action.




Examples Of Rotation Programs

- * Conserve→Pylon→Avid→Overture
- * Overture→Avid→Pylon→Conserve
- * Pedestal→Acephate→Overture→Conserve
- * Mesurol→Avid→Overture→Pylon
- * Overture→Pedestal→Pylon→Conserve



Factors Responsible For “Poor” Control Of Western Flower Thrips

- Spray timing: age structure of western flower thrips population
- Spray coverage 
- pH of spray solution
- Frequency of applications
- Migration of western flower thrips into greenhouses or nurseries from other sources

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Immigration Of Insect Pests Such As The Western Flower Thrips Into Greenhouses From Nearby Fields: May Be Exposed To Insecticides With The Same Mode Of Action

Tracer (spinosad) → Conserve (spinosad)

Applying Dolomitic Limestone Underneath Benches To Reduce Potential Thrips Problems: pH Issue

Biological Control: Western Flower Thrips

Predatory Mites

- *Neoseiulus (=Amblyseius) cucumeris*
- *Amblyseius swirskii*
- *Stratiolaelaps scimitus*

Predatory Bug

- Minute pirate bug, *Orius* spp.

Beneficial Fungi

- *Metarhizium anisopliae*
- *Beauveria bassiana*
- *Isaria fumosoroseus*

Entomopathogenic Nematode

- *Steinernema feltiae*

Neoseiulus (=Amblyseius) cucumeris

Minute Pirate Bug (*Orius* spp.)

This Really "Sucks!"

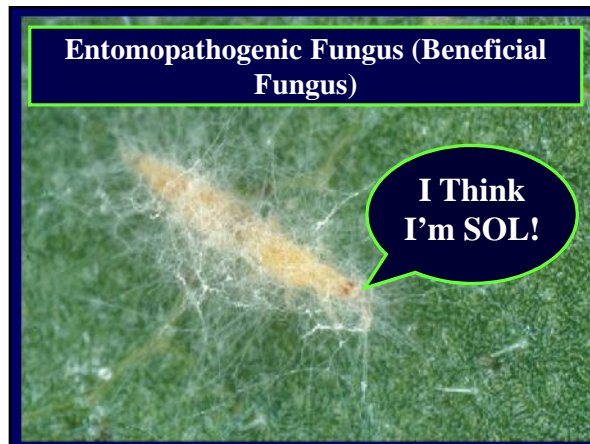
Predatory Mite: *Amblyseius swirskii*

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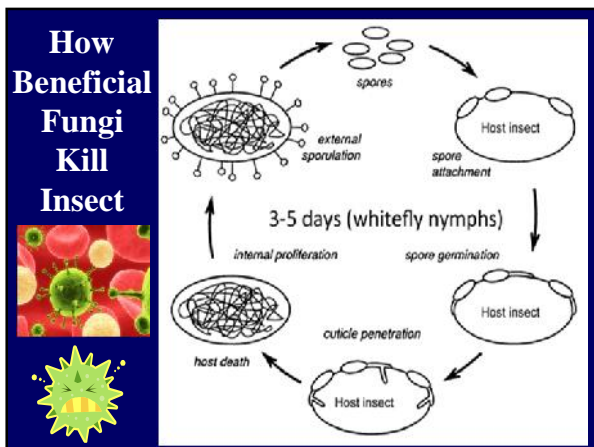
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Neosho Gardens: Council Grove, KS



Entomopathogenic Fungus (Beneficial Fungus)



How Beneficial Fungi Kill Insect



Insecticides Commercially-Available Based On Entomopathogenic (Beneficial) Fungi

- BotaniGard (*Beauveria bassiana*)
- NoFly (*Isaria fumosoroseus* strain FE 9901)
- Preferal (*Isaria fumosorosea* Apopka Strain 97)
- Met52 (*Metarhizium anisopliae*)



Current Research: Kansas State University

Rotation Programs That Incorporate Entomopathogenic Fungi (EPF) Are Just As Effective In Suppressing Western Flower Thrips Populations As Standard Rotation Programs That Only Include Insecticides



Example:



Overture → BotaniGard → Pedestal → Conserve

Extension Publication

- Cloyd, R. A. July 2010. Western Flower Thrips Management On Greenhouse-Grown Crops. 8 pages.



- Website access:

– <http://www.ksre.ksu.edu/library/entml2/mf2922.pdf>

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