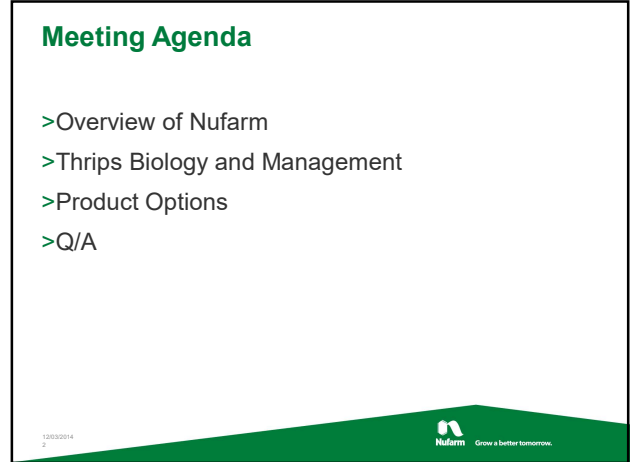




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PLANT GROWTH REGULATOR

Sumagic®
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Thrips Management

Introduction

- >Ornamental management of sucking insect pests (thrips) requires an understanding of:
 - insect biology
 - individual grower site conditions
- >Open discussion on these factors and how to develop a local IPM program for effective management

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Product Development


- >Today, from the “eureka” moment to registration is about 8 years and costs between \$40-80 M
- >Years of research expose potential strengths and weaknesses
- >On the label, we provide you with
 - Best practices for use
 - What it can manage
 - How much to use
 - When to reapply it




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Cicra 1919, Oregon State Extension




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Understanding Thrips



University of Florida




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Understanding Thrips

Overview

- >Thrips (order Thysanoptera) tiny, slender insects with fringed wings
- >They feed by puncturing the epidermal (outer) layer of host tissue and sucking out the cell contents, which results in stippling, discolored flecking, or silvering of the leaf surface
- >Thrips can readily move long distances floating with the wind or transported on infested plants, and exotic species are periodically introduced



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Western Flower Thrips



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Understanding Thrips

Overview



- >The most common species found in greenhouses is western flower thrips (WFT), *Frankliniella occidentalis*
- >Other thrips species that are also problematic in greenhouse production include
 - Onion thrips (*Thrips tabaci*),
 - Echinothrips (*Echinothrips americanus*)
 - Chilli thrips (*Scirtothrips dorsalis*).



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Understanding Thrips

Western Flower Thrips

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Understanding Thrips

Onion Thrips



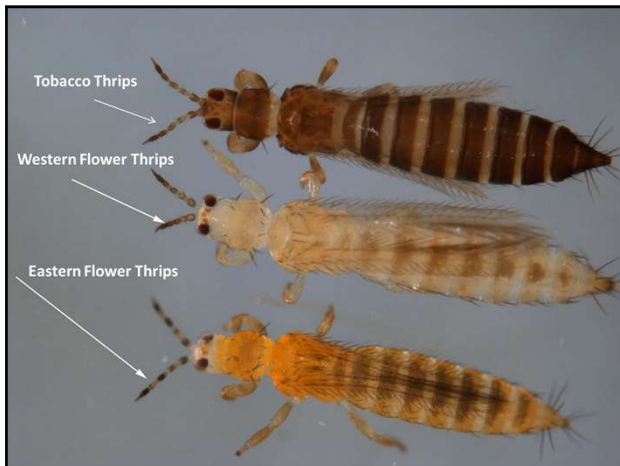

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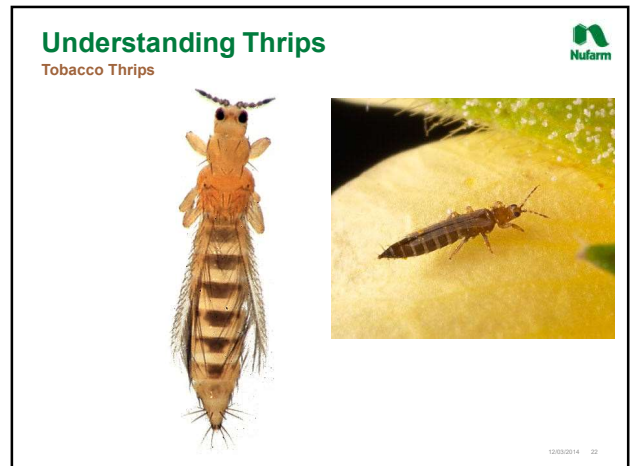
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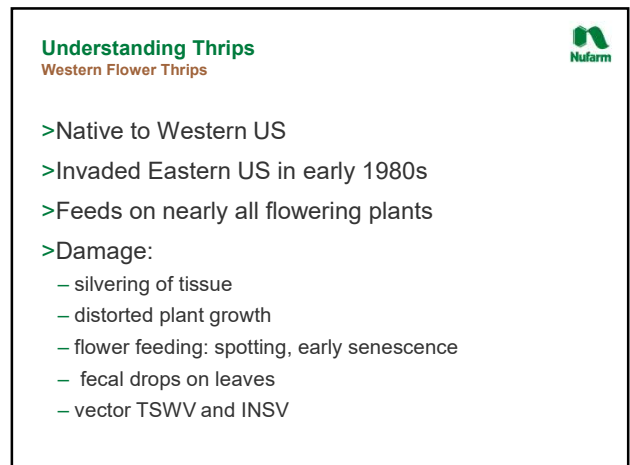
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Understanding Thrips

Western Flower Thrips



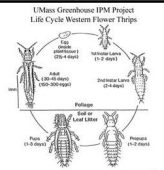
- >Body 1 to 2 mm long, tubular or cigar-shaped; color ranges from yellow to black
- >Adults have fringed. Or feathery wings, that are folded flat over the back
- >Nymphs are wingless; pupae, of some species, hide in soil



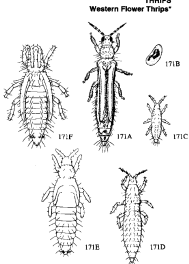

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Understanding Thrips

Western Flower Thrips





- >Egg laid in plant tissue
- >Four instars, last called pupae
- >Develops in 14 to 30 days
- >Development temp dependent (60-85)
- >Adult used for id

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Western Flower Thrips

Chemical Management Problems






- >First indications of insecticide resistance in mid 70s
 - Orthene
 - Lannate
- >Began to spread across Canada and the US late 70s
 - No registered insecticides were effective for curative trtmt
 - Biological Control and rotation of insecticide by necessity
- >Avid used by growers in mid 80s
 - Did not have a federal label for thrips
 - Rotated with Lannate

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Western Flower Thrips

Chemical Management Problems





- >In 90s some populations were not as susceptible
 - Did not have a federal label for thrips
 - Rotated with Lannate
 - Lannate taken off the market
 - Added horticultural oil in improve efficacy
- >Conserve added in late 90s
- >Several insecticides suppress or help with management
- >Pylon and Overture added
- >2009 – Thrips a major problem and populations heavy

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Western Flower Thrips Management


- >Nothing can be relied upon as a “silver” bullet
- >Must apply 3 applications to get control because of life stages in leaf and soil
- >Must rotate among different MOA Rotation based on developmental time or repeat with same compound for 2 or 3 applications
- >Probably require 3-7 day interval (depending upon temperature and residual activity) but check label for resistance management instructions and application interval or restrictions



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Western Flower Thrips Management

<ul style="list-style-type: none"> >Name-Tradename-MOA - Abamectin-Avid-6 - Acephate-Orthene-1B - Azadirachtin-18B - <i>Beauveria bassiana</i>-Und - Chlorpyrifos-Dursban-1B - Chlorfenapyr-Pylon-13 - Cyantraniliprole-Mainspring (28) - Cyfluthrin-Decathlon-3 (Other pyrethroids) - Dinotefuran-Safari-4A 	<ul style="list-style-type: none"> >Name-Tradename-MOA - Fonicamid-Aria-9C - Imidacloprid-Marathon-4A - Methiocarb-Mesuroil-1A - Neem Oil-Triact-desiccant (other oils and soaps) - Novaluron-Pedestal-15 - Pyridaben-Sanmite-21A - Pyridalyl-Overture-Und - Spinosad-Conserve-5 - Spinetoram (5)+ Isoclast (4C)-XXpire - Thiamethoxam-Flagship-4A - Tolfenpyrad-Hachi-Hachi-21A ??
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Understanding Thrips

Newer Chemical Controls

- >Hachi-Hachi - Tolfenpyrad-21A
- >Mainspring - Cyantranilprole- 28
- >Xxpire - Spinetoram (5)+ Isoclast (4C)



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Table based on data from: Clomperik, Ludwig, Osborne, Seal

Effective Products


7 Different Modes of Action

Lance Osborne
UFL-IFAS

Acephate	Foliar	N, G, L
Acetamiprid	Foliar	N, G, L
Clothianidin	Foliar	N, G, L
Dinotefuran	Foliar	N, G, L
Imidacloprid	Foliar	N, G, L
Thiamethoxam	Foliar	N, G, L
Spinosad	Foliar	N, G, L
Abamectin	Foliar	N, G, L
Fonicamid	Foliar	G
Chlorfenapyr	Foliar	G
Pyridalyl	Foliar	G

Compounds in blue = the same MOA

N=Nursery
G=Greenhouse
L=Landscape




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Most Effective Insecticides

Historical IR-4 reporting - 2014

- >Conserve - Spinosad-5
- >Mesurol-Methiocarb-1A
- >Overture-Pyridalyl-Und
- >Pylon-Chlorfenapyr-13



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Understanding Thrips

Examples of a Rotational program [R. Cloyd UGA]

Rotational schemes based on using insecticides with different modes of action. Each insecticide is applied once per week over a two week period before a new insecticide with a different mode of action is used.

Week 1	Week 3	Week 5	Week 7
Conserve	Pylon	Minx 2	Mesurol
Pedestal	Overture	Pylon	Conserve
Botanigard	Pedestal	Orthene	Conserve
Minx 2	Overture	Pylon	Conserve
Chloropyrifos	Pedestal	Minx 2	Talstar/Menace


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Biological Control Advantages


- >Environmentally friendly
- >Less Chemical contamination
- >Safer environment for workers
- >No concern about REIs
- >Less concern about pesticide resistance
- >Can be long term pest control
- >Can be a marketing advantage-organic
- >Cost is not as big of an issue



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Biological Control Concerns

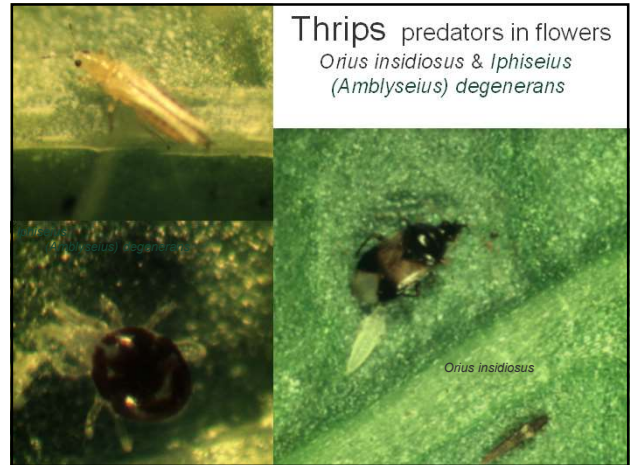
- >Slow and not 100%
- >More work than chemical, takes more knowledge, and may require change in practices
- >Often highly susceptible to pesticides
- >Must start when pest populations are low
- >Temperature and relative humidity requirements
- >Efficacy may be different on different plants
- >Short duration crops do not allow time for control
- >If all pests are destroyed the natural enemies will die
- >Quality of BC product, what happens during shipping?



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INSECTICIDE SOLUTION CHART
PROVEN DEFENSE FOR GREENHOUSE & NURSERY

INSECT MATRIX	MODE OF ACTION		INSECTICIDE CLASS		INSECTICIDE TYPE		INSECTICIDE RESISTANCE		INSECTICIDE TOXICITY		INSECTICIDE RESISTANCE	
	IRAC	MODE OF ACTION	IRAC	MODE OF ACTION	IRAC	MODE OF ACTION	IRAC	MODE OF ACTION	IRAC	MODE OF ACTION	IRAC	MODE OF ACTION
MODE OF ACTION	IRAC	MODE OF ACTION	IRAC	MODE OF ACTION	IRAC	MODE OF ACTION	IRAC	MODE OF ACTION	IRAC	MODE OF ACTION	IRAC	MODE OF ACTION
Acaricides	IRAC	MODE OF ACTION	IRAC	MODE OF ACTION	IRAC	MODE OF ACTION	IRAC	MODE OF ACTION	IRAC	MODE OF ACTION	IRAC	MODE OF ACTION
Adults (resistant to the site)	IRAC	MODE OF ACTION	IRAC	MODE OF ACTION	IRAC	MODE OF ACTION	IRAC	MODE OF ACTION	IRAC	MODE OF ACTION	IRAC	MODE OF ACTION
Adults	IRAC	MODE OF ACTION	IRAC	MODE OF ACTION	IRAC	MODE OF ACTION	IRAC	MODE OF ACTION	IRAC	MODE OF ACTION	IRAC	MODE OF ACTION
Eggs/larvae	IRAC	MODE OF ACTION	IRAC	MODE OF ACTION	IRAC	MODE OF ACTION	IRAC	MODE OF ACTION	IRAC	MODE OF ACTION	IRAC	MODE OF ACTION
Beetles	IRAC	MODE OF ACTION	IRAC	MODE OF ACTION	IRAC	MODE OF ACTION	IRAC	MODE OF ACTION	IRAC	MODE OF ACTION	IRAC	MODE OF ACTION
Roots	IRAC	MODE OF ACTION	IRAC	MODE OF ACTION	IRAC	MODE OF ACTION	IRAC	MODE OF ACTION	IRAC	MODE OF ACTION	IRAC	MODE OF ACTION
Spring/summer	IRAC	MODE OF ACTION	IRAC	MODE OF ACTION	IRAC	MODE OF ACTION	IRAC	MODE OF ACTION	IRAC	MODE OF ACTION	IRAC	MODE OF ACTION
Leafhoppers	IRAC	MODE OF ACTION	IRAC	MODE OF ACTION	IRAC	MODE OF ACTION	IRAC	MODE OF ACTION	IRAC	MODE OF ACTION	IRAC	MODE OF ACTION
Leafminers	IRAC	MODE OF ACTION	IRAC	MODE OF ACTION	IRAC	MODE OF ACTION	IRAC	MODE OF ACTION	IRAC	MODE OF ACTION	IRAC	MODE OF ACTION
Leafhoppers/mites	IRAC	MODE OF ACTION	IRAC	MODE OF ACTION	IRAC	MODE OF ACTION	IRAC	MODE OF ACTION	IRAC	MODE OF ACTION	IRAC	MODE OF ACTION
Leafhopper	IRAC	MODE OF ACTION	IRAC	MODE OF ACTION	IRAC	MODE OF ACTION	IRAC	MODE OF ACTION	IRAC	MODE OF ACTION	IRAC	MODE OF ACTION
Leafminer	IRAC	MODE OF ACTION	IRAC	MODE OF ACTION	IRAC	MODE OF ACTION	IRAC	MODE OF ACTION	IRAC	MODE OF ACTION	IRAC	MODE OF ACTION
Leafhoppers/mites	IRAC	MODE OF ACTION	IRAC	MODE OF ACTION	IRAC	MODE OF ACTION	IRAC	MODE OF ACTION	IRAC	MODE OF ACTION	IRAC	MODE OF ACTION
Phylla	IRAC	MODE OF ACTION	IRAC	MODE OF ACTION	IRAC	MODE OF ACTION	IRAC	MODE OF ACTION	IRAC	MODE OF ACTION	IRAC	MODE OF ACTION
Multi-colored Flea beetle	IRAC	MODE OF ACTION	IRAC	MODE OF ACTION	IRAC	MODE OF ACTION	IRAC	MODE OF ACTION	IRAC	MODE OF ACTION	IRAC	MODE OF ACTION
Scale, armored	IRAC	MODE OF ACTION	IRAC	MODE OF ACTION	IRAC	MODE OF ACTION	IRAC	MODE OF ACTION	IRAC	MODE OF ACTION	IRAC	MODE OF ACTION
Scale, soft	IRAC	MODE OF ACTION	IRAC	MODE OF ACTION	IRAC	MODE OF ACTION	IRAC	MODE OF ACTION	IRAC	MODE OF ACTION	IRAC	MODE OF ACTION
Spider mite	IRAC	MODE OF ACTION	IRAC	MODE OF ACTION	IRAC	MODE OF ACTION	IRAC	MODE OF ACTION	IRAC	MODE OF ACTION	IRAC	MODE OF ACTION
Spider mite	IRAC	MODE OF ACTION	IRAC	MODE OF ACTION	IRAC	MODE OF ACTION	IRAC	MODE OF ACTION	IRAC	MODE OF ACTION	IRAC	MODE OF ACTION
Thrips	IRAC	MODE OF ACTION	IRAC	MODE OF ACTION	IRAC	MODE OF ACTION	IRAC	MODE OF ACTION	IRAC	MODE OF ACTION	IRAC	MODE OF ACTION
Thrips	IRAC	MODE OF ACTION	IRAC	MODE OF ACTION	IRAC	MODE OF ACTION	IRAC	MODE OF ACTION	IRAC	MODE OF ACTION	IRAC	MODE OF ACTION
Thrips	IRAC	MODE OF ACTION	IRAC	MODE OF ACTION	IRAC	MODE OF ACTION	IRAC	MODE OF ACTION	IRAC	MODE OF ACTION	IRAC	MODE OF ACTION
Thrips	IRAC	MODE OF ACTION	IRAC	MODE OF ACTION	IRAC	MODE OF ACTION	IRAC	MODE OF ACTION	IRAC	MODE OF ACTION	IRAC	MODE OF ACTION

12/03/2014
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West

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