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History, Background, and Overview of the Chilli Thrips, *Scirtothrips dorsalis*

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S. dorsalis

Synonyms: Chilli, Castor, Berry, Assam and Yellow Tea Thrips

Host Plants:

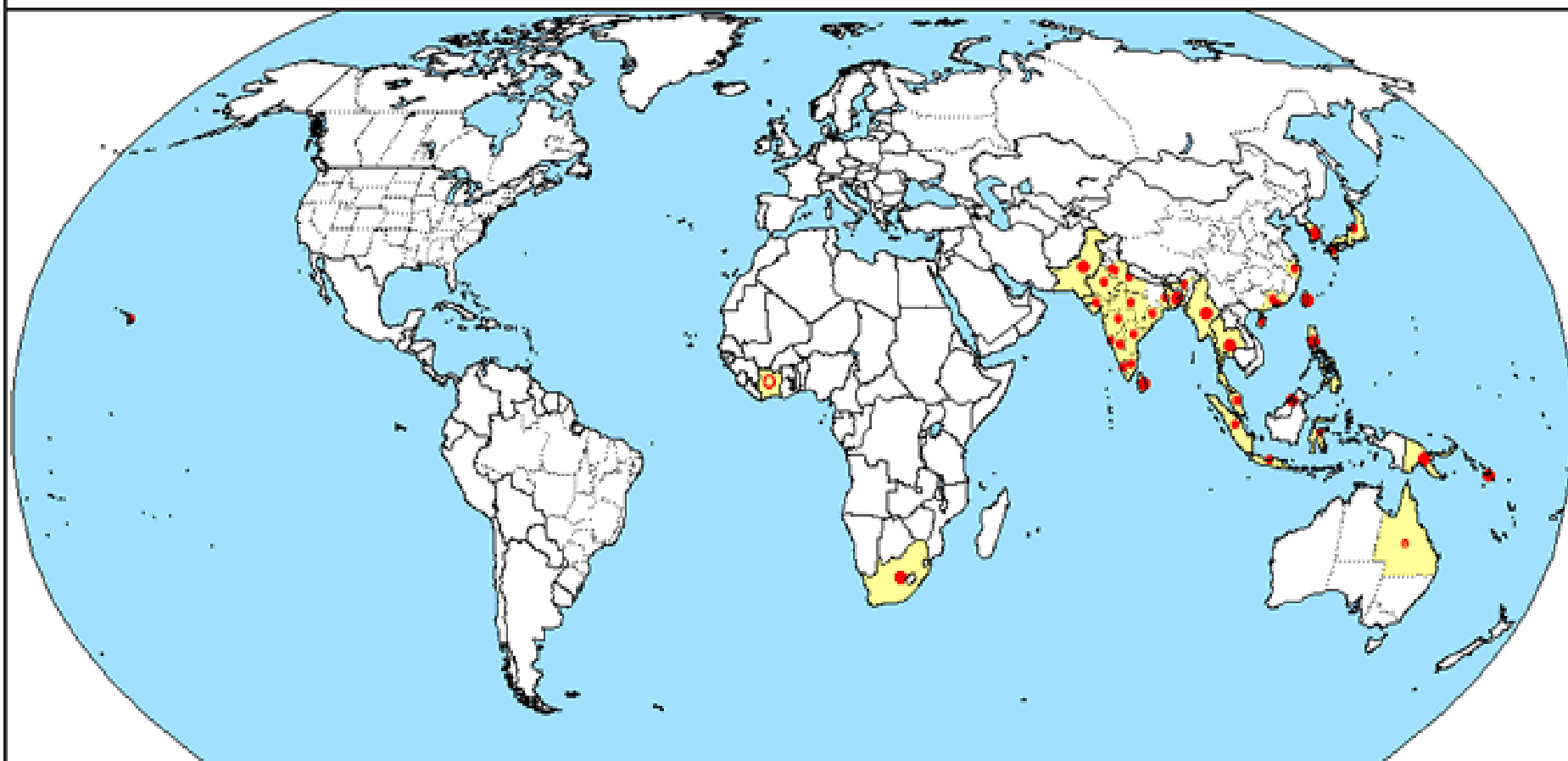
Over 112 host plants including banana, beans, chrysanthemum, citrus, corn, cotton, cocoa, eggplant, ficus, grape, grasses, holly, jasmine, kiwi, litchi, longan, mango, onion, peach, peanut, pepper, rose, soybean, strawberry, tea, tobacco, tomato, viburnum, etc.

ECONOMIC IMPORTANCE

Major pest of:

- **strawberries** in Queensland, Australia
- **tea** in Japan and Taiwan
- **citrus** in Japan and Taiwan (Chiu *et al.* 1991, Tatara and Furuhashi 1992, Tschuchiya *et al* 1995)
- **cotton** in the Ivory Coast (Bournier 1999)
- **soybeans** in Indonesia (Miyazaki *et al.* 1984)
- **chillies** and **castor bean** in India
- **peanuts** in several states in India (Mound and Palmer 1981).
- Ananthakrishnan (1984) also reports damage to the following hosts: **cashew, tea, chillies, cotton, tomato, mango, castor bean, tamarind, and grape.**
- **Rose** in India

Scirtothrips dorsalis



National record



Subnational record



Present

Present only in some areas

EPPO 2003-06

Old World Distribution:

Japan, China, India, Pakistan, Taiwan, Korea, Thailand, Africa, and Australia

Is *Scirtothrips dorsalis* a Serious Economic Pest for the US?

Preliminary Economic Analysis:

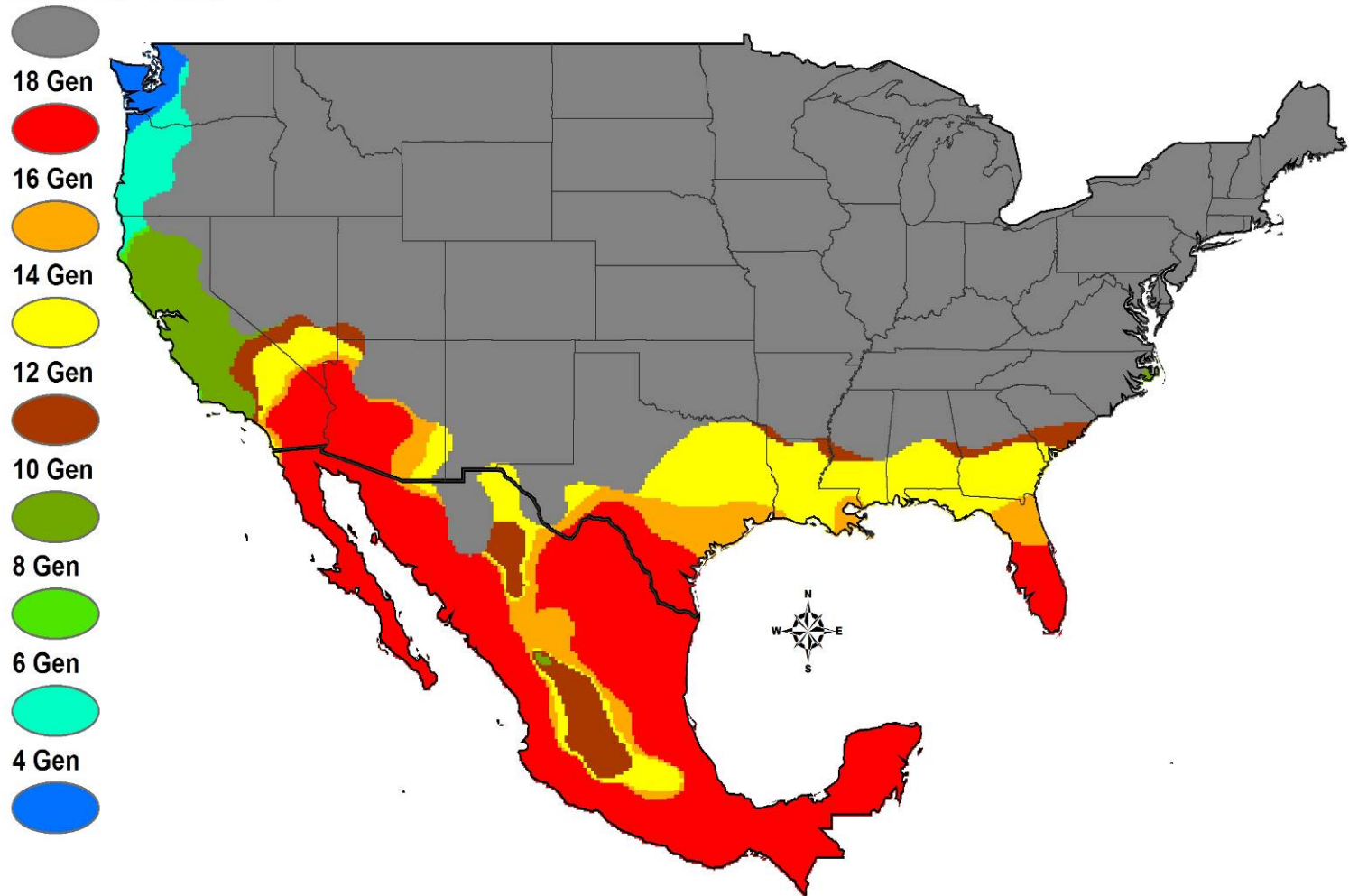
Lynn Garrett (Agricultural Economist, USDA APHIS
PPQ CPHST)

28 host crops (10 primary + 18 secondary)
(tomatoes, beans, peppers, grapes, cotton, citrus,
etc.)

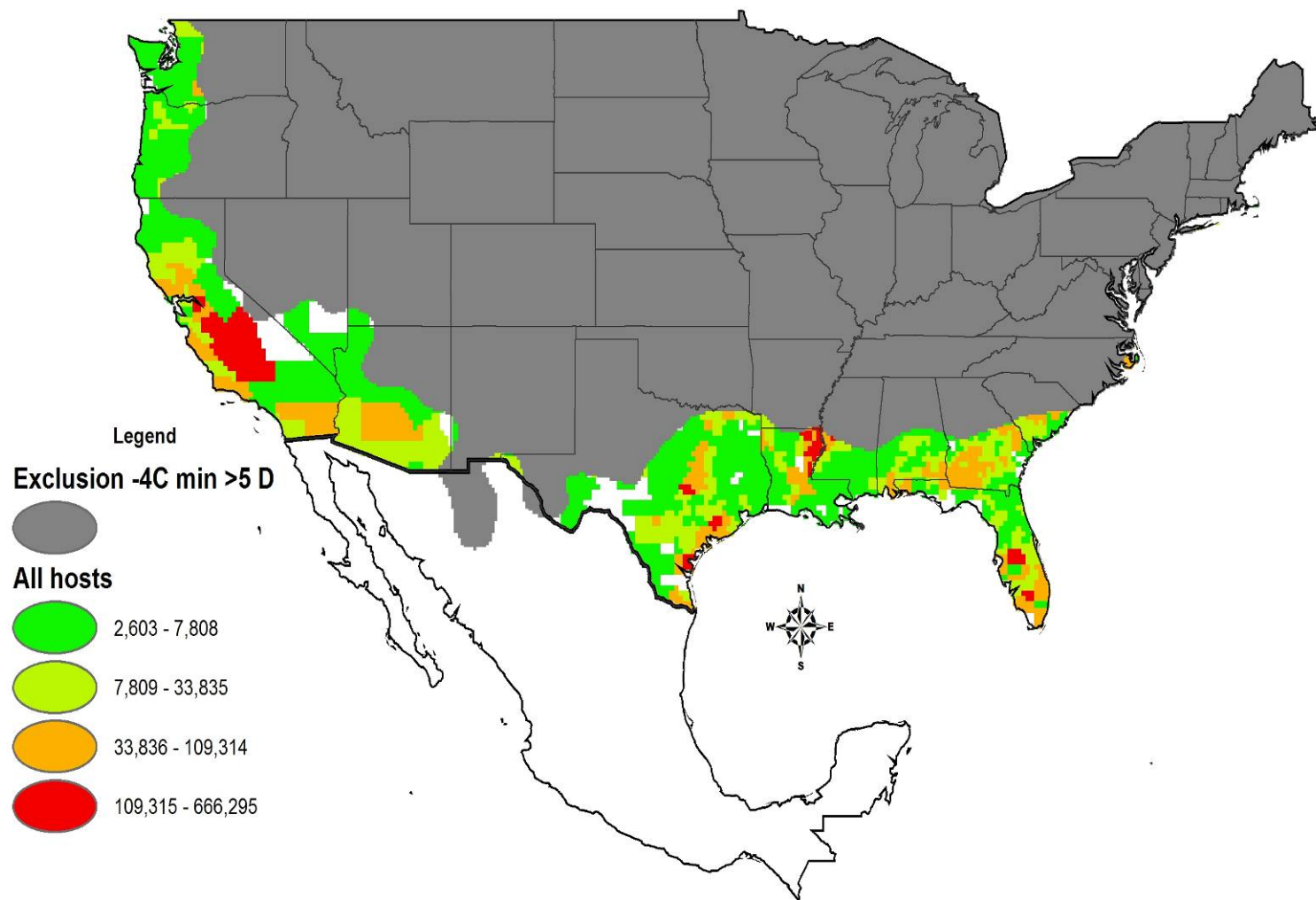
Is *Scirtothrips dorsalis* a Serious Economic Pest for the US?

- Assuming an overall U.S. crop yield loss from Chili Thrips of 5 percent the total crop value loss would equal \$3.0 billion (primary hosts \$583 million and secondary hosts \$2.43 billion).
- Assuming an overall U.S. crop yield loss from Chili Thrips of 10 percent the total crop value loss would equal \$5.98 billion (primary hosts \$1.2 billion and secondary hosts \$4.78 billion).

Legend
Exclusion -4C min >5 D



Predicted cold temperature exclusion boundary for *S. dorsalis* in the U.S. and Mexico (based on areas where the minimum daily temperature reaches -4°C or below on at least 5 days per year).



U.S. distribution and cumulative acres grown per county in 2002 of *S. dorsalis* hosts; peppers, eggplant, tomatoes, soybean, peanuts, citrus, cotton, grapes, asparagus, dry onions, green onions, lima beans, passion fruit, peaches, buckwheat, persimmon, strawberries, sweet potatoes, mangos, tobacco, snap beans, pears, plums, prunes, potatoes, sweet corn, grain corn, raspberries, figs, cucumbers, cantaloupes, pumpkins, squash and watermelons (with a cold temperature exclusion boundary where the minimum daily temperature reaches -4°C or below on at least 5 days per year).

Florida Distribution

- To date, 65 positive records have been identified from 16 counties.
- These counties are:
Alachua, Charlotte, Citrus, Dade, Hernando, Highlands, Hillsborough, Lake, Marion, Monroe, Orange, Palm Beach, Pinellas, Polk, Seminole, Sumter
- Landscape Records:
Orange and Palm Beach

Most of these records have been from rose, but a few were from *Capsicum annuum*, and one was from *Jasminum*.

Thrips (Order Thysanoptera) Pest Overview

FAMILIES OF THYSANOPTERA

- Suborder TUBULIFERA (3000+ species)
 - Phlaeothripidae
- Suborder TEREBRANTIA (2000+ species)

Merothripidae (17)	Heterothripidae (70)
Melanthripidae (60)	Thripidae (1750)
Aeolothripidae (200)	Uzellothripidae (1)
Adiheterothripidae (4)	Fauriellidae (5)

Phlaeothripidae

- Most species feed on fungal hyphae
- Lineage between species not understood; taxonomy of the family not stable
- *Liothrips* species in the tropics feed on peppers, avocados, *Liliaceae*, and *Orchidaceae*
- *Gynaikothrips* species important in trade of *Ficus*

Aeolothripidae

- Most commonly associated with crops
- Species have a range of feeding habits
- *Melanthrips* purely phytophagous
- *Franklinothrips* predaceous
- *Aeolothrips* facultative predators feeding on pollen and other arthropods

Thripidae

- Most pest species in this family
- *Heliothrips* feed on older leaves
- *Scirtothrips* feed on young leaves and fruit
- *Chirothrips* & *Limoethrips* feed in the florets of grasses
- *Scolothrips* predatory on spider mites
- *Thrips* and *Frankliniella* species feed on leaves and flowers

PEST SPECIES OF THRIPS

- As many as 90 species are listed as pests worldwide although 65 species likely limit crop production significantly
- Most pest species in the *Thrips* & *Frankliniella*
- About 20 species are cosmopolitan-spread by the trade of plants

Order Thysanoptera
Suborder Terebrantia

Family Thripidae

Species *Frankliniella occidentalis*

Common name western flower thrips



Photo Cheryle O'Donnell

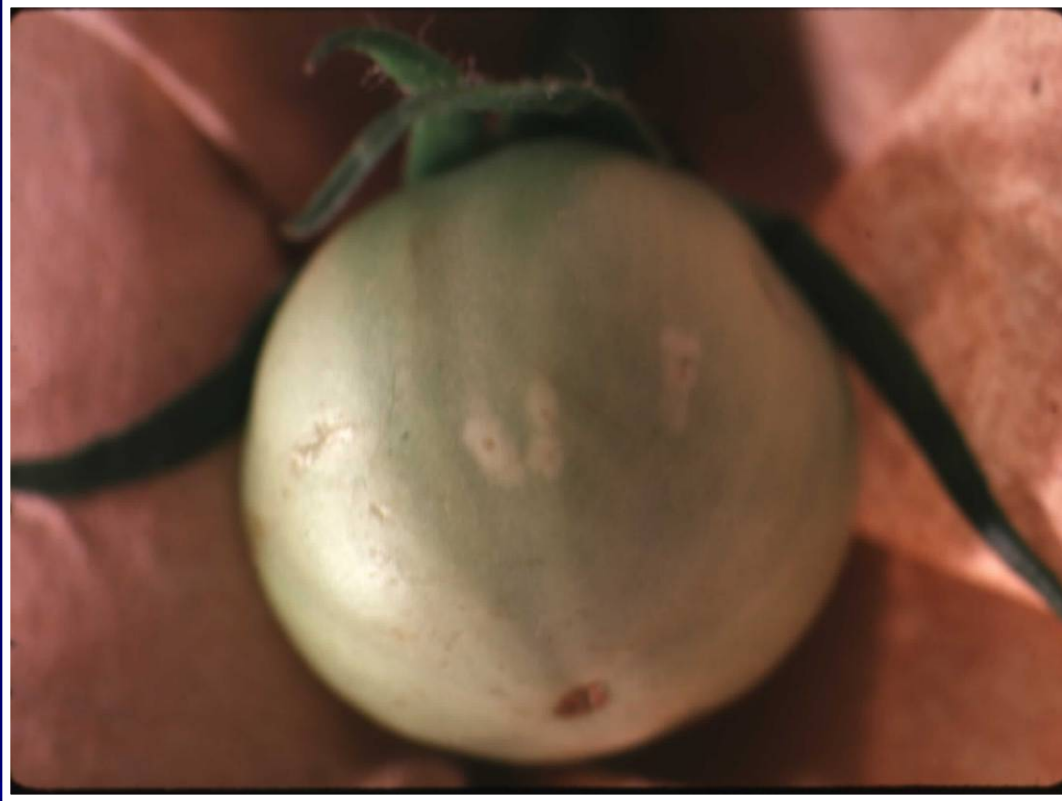


Photo Joe Funderburk

Halo spotting
on tomato due
to egg laying of
western flower
thrips



Photo Renato Ripa

**Corky tissue on nectarine
resulting from western flower
thrips feeding**



Photo Renato Ripa

Severe deformity from
western flower thrips feeding
on nectarine



Photo Renato Ripa

**Fruit rot resulting from western
flower thrips injury on grapes**

Chilli Thrips Damage

Slight Leaf Curl on Hot Peppers (*Capsicum chinense* var West Indies Red) St. Vincent, West Indies



Low population density, less than 1 adult per 6-8 leaves

Significant Stunting & Leaf Curl

West Indies Red Hot Pepper, St. Vincent



High population density, greater than 10 individuals per terminal

Pepper Scarring Symptoms: 2004 - Negeve, Israel Sweet pepper (*Capsicum annuum*)



P. Weintraub, Gilat Research Center, Israel

Rose



L. Osborne, UF/IFAS

Rose-Thrips Damage Symptoms to New Plant Growth



L. Osborne, UF/IFAS

Rose-No Apparent Thrips Damage Symptoms to New Plant Growth



L. Osborne, UF/IFAS

Rose



Photos by L. Osborne, UF/IFAS

Plant Disease Transmission

Tomato spotted wilt virus

- Family BUNYAVIRIDAE
- Genus Tospovirus
- Species *Tomato spotted wilt virus*
- Common name TOMATO SPOTTED WILT (important worldwide species and in Florida)
- About 1000 plant species are known hosts
- Seven species of thrips are known vectors

refer to the COMPLETE TOSPOVIRUS RESOURCE
PAGE

http://www.oznet.ksu.edu/tospovirus/tospo_list.htm

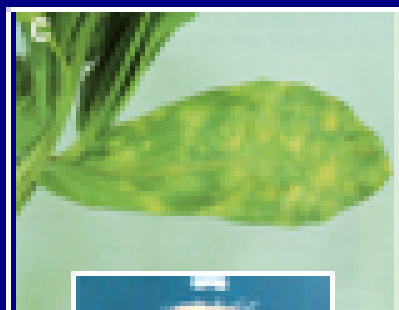
KNOWN VECTORS OF *TOMATO SPOTTED WILT VIRUS*

- *Frankliniella occidentalis*
- *Frankliniella schultzei*
- *Frankliniella fusca*
- *Frankliniella intonsa*
- *Frankliniella bispinosa*
- *Thrips tabaci*
- *Thrips setosus*

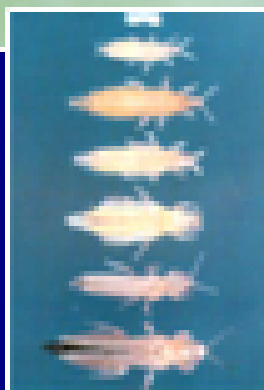
TOSPOVIRUSES VECTORED BY *Scirtothrips dorsalis*

http://www.oznet.ksu.edu/tospovirus/tospo_list.htm

- *Peanut bud necrosis virus*
- *Peanut chlorotic fan virus*
- *Peanut yellow spot virus*



**Infected
Weed Host**



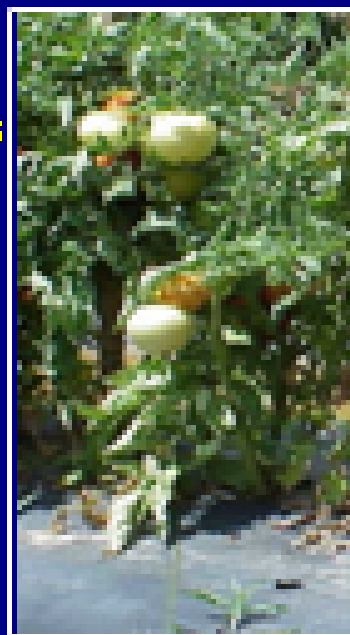
**Acquisition
by larvae (10-15 min)**

**Viruliferous adults
(mobile)**

Transmission

5 min

Transmission



Incubation

7-14 days



Primary Spread of *Tomato spotted wilt virus*

Secondary Spread of *Tomato spotted wilt virus*



Acquisition
by thrips
larvae



Viruliferous thrips
adults

Multiple
Transmission



Incubation



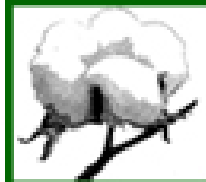
Web Links for More Information

- Dr. Lance Osborne's Chilli Thrips Page:
<http://mrec.ifas.ufl.edu/Iso/thripslinks.htm>
- FDACS-DPI Pest Alert Page:
<http://www.doacs.state.fl.us/pi/enpp/pi-pest-alert.html>
- UF/IFAS EDIS Publication:
<http://edis.ifas.ufl.edu/IN638>
- SPDN
<http://spdn.ifas.ufl.edu/Chillithrips.htm>



UNIVERSITY OF
FLORIDA

IFAS EXTENSION



SPDN

Southern Plant Diagnostic Network

IPM Integrated Pest Management
Florida



Fresh
Florida

Division of

PLANT INDUSTRY

Protection through Detection

Florida Department of Agriculture & Consumer Services

APHIS



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