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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
- **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
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 Chilli 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 Chilli 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).
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 -4ºC 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 TUBULIFEREA (3000+ species)
  - Phlaeothripidae

- Suborder TEREBRANTIA (2000+ species)
  - Merothripidae (17)
  - Melanthripidae (60)
  - Aeolothripidae (200)
  - Adiheterothripidae (4)
  - Heterothripidae (70)
  - Thripidae (1750)
  - Uzellothripidae (1)
  - 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
- *Frankliniellopsis* 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* & *Limothrips* feed in the florets of grasses
- *Scolothrips* predatory on spider mites
- *Thrips* and *Frankliniella* species feed on leaves and flowers
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
Halo spotting on tomato due to egg laying of western flower thrips

Photo Joe Funderburk
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

Photo Renato Ripa
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*
Primary Spread of Tomato spotted wilt virus
Secondary Spread of *Tomato spotted wilt virus*

- **Acquisition** by thrips larvae
- **Viruliferous thrips adults**
- **Incubation**
- **Multiple Transmission**
Web Links for More Information

- Dr. Lance Osborne’s Chilli Thrips Page:  
  [http://mrec.ifas.ufl.edu/lso/thripslinks.htm](http://mrec.ifas.ufl.edu/lso/thripslinks.htm)

- FDACS-DPI Pest Alert Page:  
  [http://www.doacs.state.fl.us/pi/enpp/pi-pest-alert.html](http://www.doacs.state.fl.us/pi/enpp/pi-pest-alert.html)

- UF/IFAS EDIS Publication:  
  [http://edis.ifas.ufl.edu/IN638](http://edis.ifas.ufl.edu/IN638)

- SPDN  
  [http://spdn.ifas.ufl.edu/Chillithrips.htm](http://spdn.ifas.ufl.edu/Chillithrips.htm)