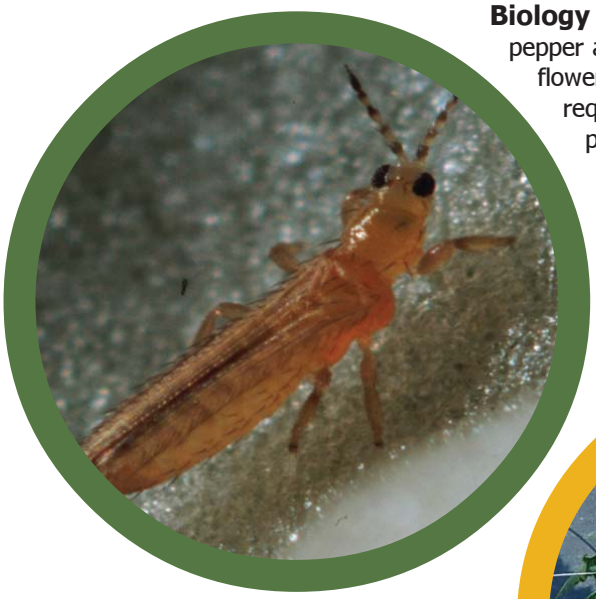
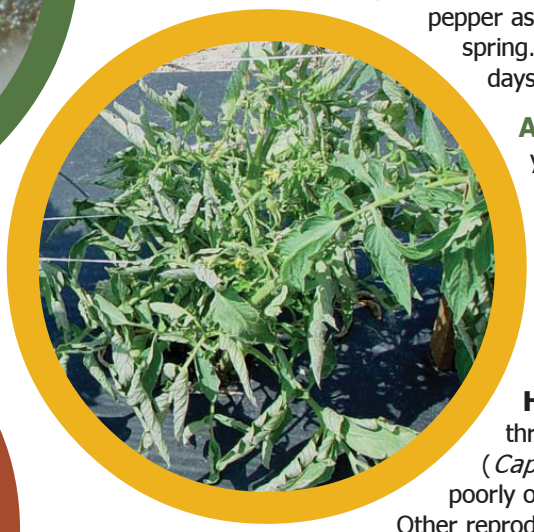
Florida Flower Thrips: *Frankliniella bispinosa*



Biology & Lifecycle: Adult thrips insert individual eggs into the flower tissues of pepper and tomato. The eggs hatch in about 5 days. Larval development in the flowers and small fruits requires 4 to 6 days. Pre-pupal and pupal development requires about 5 days. The pre-pupae move to the soil surface and the pupae occur just under the soil surface under the plant. The adults live 3 weeks or more and they feed primarily on flower tissues and pollen. Pollen-feeding increases fecundity.

Environmental Factors: Florida flower thrips live year-round in southern Florida. Populations are greatest during spring and summer in southern and central Florida and in late spring and summer in northern Florida. Large numbers of thrips migrate into tomato and pepper as the citrus bloom declines in the spring. A generational cycle takes 20 days or less in hot weather.



Adult: Very small ($1/10$ inch), light yellow with fringed wings and 8-segmented antennae. Adults aggregate in the flowers.

Larvae: Minute and white, both larval instars aggregate in the flowers and small fruit.

Host Range: Florida flower thrips reproduce poorly on peppers (*Capsicum* spp.) and even more poorly on tomatoes (*Lycopersicon* spp.). Other reproductive hosts in Florida include a wide range of crops, weeds and native plant species. Adults are commonly found in the flowers of tomato and pepper.

Economic Importance: Vectors *Tomato spotted wilt virus* (TSWV) which is the key pest of tomato, pepper and other crops in northern Florida. Problems with the disease are less severe in central and southern Florida.

Damage: Feeding by the adults and larvae on flowers and small fruits is rarely damaging to tomato or pepper. Feeding in blossoms can result in bloom drop, while feeding on small fruit can result in pitting of large fruit, primarily at the blossom end. TSWV transmission results in unmarketable fruit **(Figure 3)**.

Figure 1. Florida flower thrips adult female. Photograph by: Cheryle O'Donnell.

Figure 2. Tomato plant infected with TSWV. Photograph by: Hank Dankers.

Figure 3. Necrotic ring spots on tomato fruit infected with TSWV. Photograph by: Hank Dankers.

Actual Size:

Adult
About $1/10$ inch

Monitoring:

Scouting: The total number of thrips of all species can be estimated in the field by beating individual flowers onto a white plastic board. Thrips must be placed in vials of alcohol and examined at 40X magnification using a stereoscope in order to distinguish Florida flower thrips from the other thrips species.

Action Thresholds: $\geq$ 10 thrips per flower
Incidence of spotted wilt incidence >5% in the field

Prepared by: Dr. Joe Funderburk

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CULTURAL CONTROLS:

Ultraviolet-Reflective Mulch: UV-reflective mulch reduces the introduction of Florida flower thrips adults into production fields. This is the most effective tactic to control primary spread of TSWV (i.e. thrips acquire the virus when developing on plant hosts outside the field).

Do Not Over-Fertilize: Over-fertilization with nitrogen increases the number of thrips and the incidence of TSWV.

Resistant Cultivars: Cultivars resistant to TSWV are available for tomatoes and peppers.

Monitor: Frequent monitoring of once or twice weekly is needed to assess thrips numbers and to determine the incidence of TWSV.

Distinguishing the adults from the western flower thrips (*Frankliniella occidentalis*) and the eastern flower thrips (*Frankliniella tritici*) is not possible using a hand lens.

CHEMICAL CONTROLS:

- Spraying to control adult flower thrips is not economically justified.
- Insecticidal control of adult Florida flower thrips does **not** prevent primary spread of the TSWV.
- Insecticidal control of larvae developing on plants infected with TSWV is effective in preventing spread.
- Use reduced-risk insecticides that conserve minute pirate bug populations. Natural infestations of this predator in pepper typically control the Florida flower thrips.

RESISTANCE MANAGEMENT:

- Insecticide resistance has not been documented in populations of flower thrips.
- Employ alternative cultural control and plant resistance tactics in an IPM program as the best option to control thrips and avoid insecticide resistance development.

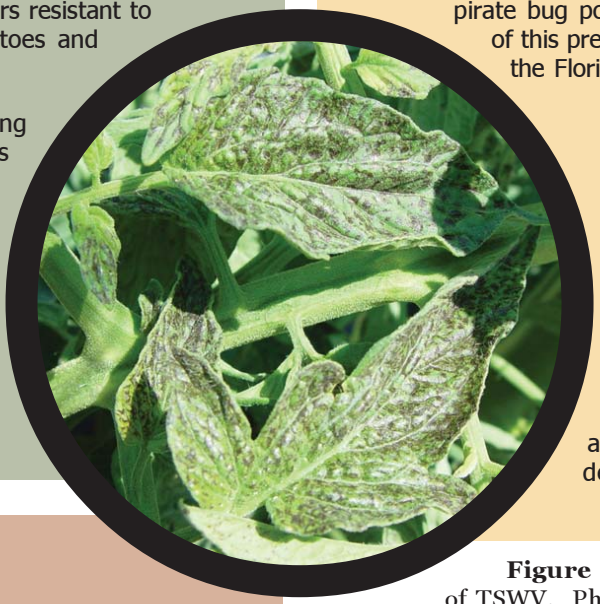

Figure 4. Tomato leaf with symptoms of TSWV. Photograph by: Hank Dankers.

NATURAL ENEMIES:

- The minute pirate bug, *Orius insidiosus,* naturally invades fields and is an important predator. Management programs for pepper and tomato should be designed to conserve its populations.

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