UF IFAS Extension UNIVERSITY of FLORIDA

EENY639

Florida Flower Thrips (suggested common name) *Frankliniella bispinosa* Morgan (Insecta: Thysanoptera: Thripidae)[1]

Steven P. Arthurs, Moh Leng Kok-Yokomi, and Hugh Smith[2]

Introduction

Frankliniella bispinosa Morgan is a common flower thrips species native to Florida and southern Georgia. Often found in association with other flower thrips, Florida flower thrips is considered to be of secondary importance relative to the more invasive western flower thrips, *Frankliniella occidentalis*. Nonetheless, Florida flower thrips can attain large populations quickly following flowering of susceptible crops, especially before predator populations build up. This species causes significant economic damage to a range of crops, including citrus, blueberries, strawberries, and field pepper. Field identification of different flower thrips species is difficult without expert help.

Figure 1. Adult Florida flower thrips, *Frankliniella bispinosa* Morgan.
Credits: Lyle Buss, UF/IFAS

Figure 2. Larva of Florida flower thrips, *Frankliniella bispinosa* Morgan, on a bean leaf.
Credits: Jeff D. Cluever, UF/IFAS

Synonymy

After Hoddle et al. (2012), PaDIL (2015) and Watson (1923)

- *Euthrips projectus* Watson
- *Euthrips masoni* Watson
- *Euthrips tritici bispinosa* Morgan
- *Frankliniella cephalica masoni*
- *Frankliniella tritici bispinosa* Morgan

1. This document is EENY639, one of a series of the Entomology and Nematology Department, UF/IFAS Extension. Original publication date November 2015. Visit the EDIS website at http://edis.ifas.ufl.edu. This document is also available on the Featured Creatures website at http://entnemdept.ifas.ufl.edu/creatures/.

2. Steven P. Arthurs, assistant professor; Moh Leng Kok-Yokomi, senior biological scientist, Entomology and Nematology Department, Mid-Florida Research and Education Center; and Hugh Smith, Gulf Coast REC; UF/IFAS Extension, Gainesville, FL 32611.

Distribution

Florida flower thrips occurs in the southeastern US and has been reported throughout Florida, southern Georgia, Bermuda, and the Bahamas, but is not known to occur in California (Hoddle et al. 2012).

Description

Flower thrips undergo partial metamorphosis, developing through five distinct stages: egg, larva I and II, pupa I (propupa) and II (pupa), and adult.

Eggs

The eggs are kidney-shaped, pale yellow, and approximately 0.4 mm (0.015 in) long. Eggs are inserted into plant tissues.

Immatures

Larvae are yellow and elongate-oval, resembling adults without wings. Pupae are non-feeding and contain wing buds, which are longer pupa II. Propupa's antennae are curved backward (posteriorly) over the head—a distinct characteristic feature compared to the pupa's antennae (pointing anteriorly).

Adults

Both sexes of *Frankliniella bispinosa* possess two pairs of narrow, feathery wings. The body is elongate, approximately 1 mm (0.039 in) in length, typically with the female slightly larger. The body and legs are yellow, with brown setae (hairs). Antennae are eight-segmented with stout, brown spines on the second segment.

Figure 3. Antennal segment II of *Frankliniella bispinosa* Morgan has prominent spines, and the segment III pedicel has a sharp edged ring (circled).
Credits: Moh Leng Kok-Yokomi, UF/IFAS

Like the immature stages, *Frankliniella bispinosa* adults resemble other *Frankliniella* species, and are commonly found in association with *Frankliniella triciti* and *Frankliniella occidentalis*. This species is particularly similar to a Caribbean species, *Frankliniella cephalica*; the only recorded difference being the shape of the pedicel ring on the third antennal segment. Several diagnostic features are provided below.

Figure 4. Head of *Frankliniella bispinosa* Morgan is wider than it is long, with well-developed interocellar setae (hairs) (left arrow), longer than postocular setae (right arrow).
Credits: Moh Leng Kok-Yokomi, UF/IFAS

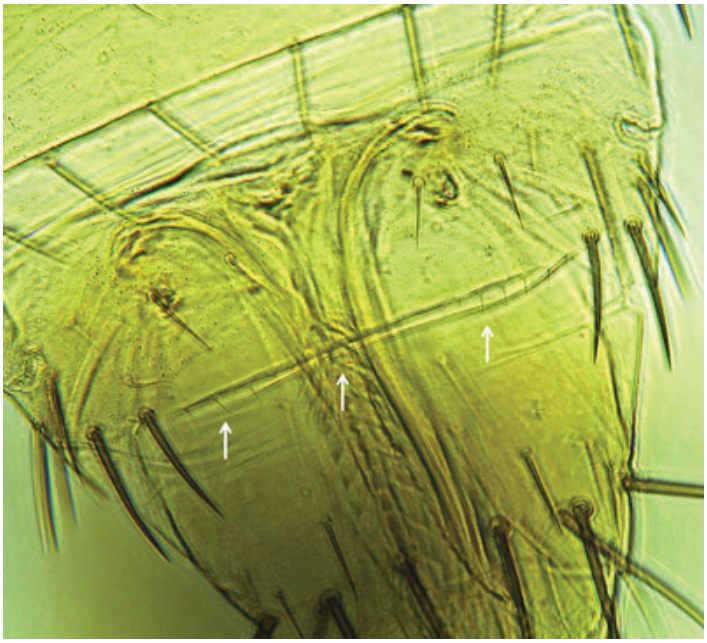

Figure 5. Abdominal segment VII of *Frankliniella bispinosa* Morgan with incomplete comb (arrowed); *Frankliniella occidentalis* has a complete comb.
Credits: Moh Leng Kok-Yokomi, UF/IFAS

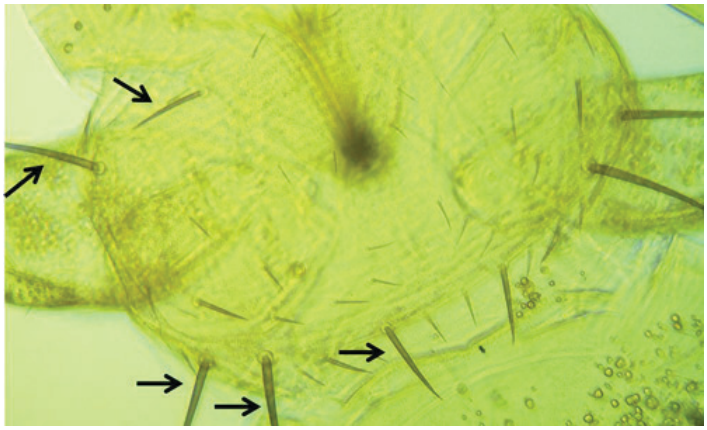

Figure 6. Pronotum of *Frankliniella bispinosa* Morgan with five pairs of major setae (arrowed); anteromarginal setae distinctly shorter than anteroangulars.
Credits: Moh Leng Kok-Yokomi, UF/IFAS

Figure 7. Slide mount of *Frankliniella bispinosa* Morgan in copulo.
Credits: Moh Leng Kok-Yokomi, UF/IFAS

Life Cycle

Like other flower thrips, adult Florida flower thrips are highly mobile and anthophilous (seeking out and reproducing in flowers), although they also feed on developing fruits when populations are high. Mated females produce offspring of both sexes, while unmated, parthenogenetic females produce only males (Ananthakrishnan 1993). The insect feeds during both larval and adult instars, but the propupa and pupa are found in the soil and do not feed. The Florida flower thrips infests a wide range of crops and uncultivated hosts. During the summer in southeastern Florida, flower thrips can attain maturity in 11 days and have more than 10 generations per year (Childers and Nakahara 2006). The adults may live for several weeks, feeding primarily on flower tissues and pollen. Flower thrips often migrate into cropping systems from adjacent vegetation following the blooming patterns of their host plants (Frantz and Mellinger 1990). Flower thrips are naturally controlled by various predators, especially the minute pirate bug, *Orius* spp. Protecting these predators is an important part of integrated pest management (IPM) for flower thrips. Ramachandran et al. (2001) showed that adult Florida flower thrips moved more rapidly in field peppers compared to western flower thrips, which may allow them to better escape predation.

Hosts

Florida flower thrips infests a wide range of agricultural crops including citrus, blueberries, tomato, pepper, eggplant, cucumber, watermelon, squash, beans, strawberry, sweet corn, as well as ornamentals (Fisher and Davenport 1989, Frantz and Mellinger 1990, Childers and Nakahara 2006, Rhodes et al. 2012, Tyler-Julian et al. 2014). In addition to agricultural commodities, Florida flower thrips has been recovered from trees including *Quercus, Pinus*, palms including *Phoenix* and *Sabal*, and various other flowering plants such as wild cherry, southern cattail, and flowering weeds such as *Bidens* and *Aster* (Childers and Beshaer 1992, Chellemi et al. 1994, Tsai et al. 1996). Adult flower thrips may occur and feed in flowers of numerous plant species, but only a smaller sub-set of these plants serve as true reproductive hosts for flower thrips (Northfield et al. 2008).

Economic Importance

Flower thrips damage crops through feeding and oviposition, which result in deformation of growing tissues and lead to yield losses in harvested fruits and vegetables, as well as esthetic damage to flowers (Lewis 1997). Florida flower thrips is an economic pest of citrus (Childers and Nakahara 2006), blueberries (Rhodes et al. 2012), field peppers (Tyler-Julian et al. 2014), and ornamentals including chrysanthemum (Frantz and Mellinger 1990). High numbers of flower thrips migrating from post-bloomed citrus groves can inundate nearby vegetable crops. This species also infests crape myrtle in the landscape, appearing to prefer light-colored flowers (Funderburk et al. 2015). The authors confirmed a report of a severe Florida flower thrips infestation in a rose garden in St. Johns County, Florida, where light-colored blooms were preferentially infested and apparently became dwarfed. Flower thrips can be differentiated from the smaller chilli thrips, *Scirtothrips dorsalis* Hood, which are common pests of roses in Florida, based on their larger size as adults.

Laboratory studies have confirmed Florida flower thrips is also a capable vector of the Tomato spotted wilt virus (TSWV) tospovirus (Avila et al. 2006), although it does not appear to be a major cause of TSWV transmission in field vegetables when compared with western flower thrips (Funderburk 2009). When swarming, Florida flower thrips

is known to bite people (Childers et al. 2005). Such biting does not result in any known disease transmission, but skin irritations are known to occur.

Figure 8. Bronzing on strawberry caused by Florida flower thrips, *Frankliniella bispinosa* Morgan.
Credits: Hugh A. Smith, UF/IFAS

Figure 9. Damage to polyantha rose (La Marne) by Florida flower thrips, *Frankliniella bispinosa* Morgan, showing petal and bud scarring.
Credits: Wayne Myers, Jacksonville Florida Rose Society

Figure 10. Damage to hybrid tea rose (Beverly) by Florida flower thrips, *Frankliniella bispinosa* Morgan, showing petal scarring.
Credits: Wayne Myers, Jacksonville Florida Rose Society

Management

Integrated Pest Management approaches, including monitoring, species identification, treatment thresholds, and reduced risk insecticides, are recommended for controlling flower thrips. Florida flower thrips may be monitored with flower tap samples and blue sticky cards (Childers and Brecht 1996). An action threshold of 100 Florida flower thrips per sticky trap per week has been proposed as a threshold in blueberries (Rhodes et al. 2012); while 10 or more adult Florida flower thrips per flower can be tolerated in tomato plants before treatment is recommended (Funderburk 2009). Plastic mulches that reflect UV are used as repellents to prevent colonization of field-grown fruiting vegetables, although the effectiveness of this approach declines as the plants grow, covering the mulch (Demirozer et al. 2012, Tyler-Julian et al. 2014).

Many insecticides are labelled for flower thrips control in vegetables and ornamental plants. However, the use of broad-spectrum insecticides may favor the buildup of western flower thrips, which is more tolerant compared with their predators and competitor native flower thrips leading to more severe pest problems (Funderburk 2009). In fruiting vegetables (peppers and tomatoes) Florida flower thrips and native species, *Frankliniella triciti*, are far less damaging when compared with the invasive western flower thrips or melon thrips, *Thrips palmi* Karny. For this reason, limiting insecticides to those compatible with natural enemies and preserving populations of less damaging native competitor thrips are recommended (Pani et al. 2008, Funderburk 2009).

Managing Thrips in Pepper and Eggplant

2014 Florida Citrus Pest Management Guide: Plant Bugs, Chewing Insect Pests, Caribbean Fruit Fly, and Thrips

Integrated Strategies for Controlling Flower Thrips in Southern Highbush Blueberries

Flower Thrips in Blackberries in Florida

Thrips in Florida Strawberry Crops

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