

## Thrips Population Trends in Peppers in Southwest Florida

Galen Frantz, Felicia Parks & H. Charles Mellinger Glades Crop Care, Inc. 949 Turner Quay Jupiter, FL 33458 USA

**ABSTRACT** Seasonal abundance of *Frankliniella bispinosa*; western flower thrips (WFT), and *Thrips palmi* in blooms of pepper, *Capsicum annuum* L., was determined during 1992-93 in southwest Florida. Incidence of *F. bispinosa* was similar in peppers and in water pan traps. The abundance of WFT and *T. palmi* was influenced by planting schedules and crop destruction practices in greenhouses and field peppers.

## INTRODUCTION

Western flower thrips (WFT) was discovered in north Florida in 1985, followed in 1986 by the detection of thrips-transmitted tomato spotted wilt virus (TSWV). Surveying potential vectors of TSWV in crops and associated weeds has become an important component of Glades Crop Care's integrated pest management program (Frantz & Mellinger 1990). When the highly destructive pest, *Thrips palmi*, was discovered in Homestead, FL in 1990, the present study was undertaken to determine the relationships between the various thrips species and cultural and pesticide practices.

## MATERIALS AND METHODS

This study was conducted in commercial pepper fields in Collier, Hendry and Lee Counties in southwest Florida during 1992-93. The Hendry Co. (Hendry) site was a greenhouse with year-round sequential plantings, and surrounding fields of pepper, grown from September to April. The Lee Co. (Lee) site contained two 14-wk crops. Plantings of 8.1 ha each began in August 1992 and continued for 8 wk. After harvest the oldest block was destroyed and replanted 2 wk later. This sequence was repeated through mid- January 1993. The third site (Collier), was a transplant production facility, 8 km from commercial vegetable fields.

Biweekly samples of 25 or more blooms were bagged in 70% isopropyl alcohol, and poured over mesh strainers to remove the thrips. The blooms were washed twice with fresh water to remove any remaining thrips. At the Collier site, thrips were collected in water pan traps (15 x 15 cm), using a yellow Plexiglas plate on the bottom of the trap as an attractant. Catches were collected twice a week.

Adult thrips were identified under 43x magnification, based on the setation of the head and prothorax. The accuracy of the identifications was periodically confirmed by mounting specimens on microscope slides for closer study. Thrips larvae collected at the Lee site, were mounted and separated by genus. All *Thrips* spp. larvae were assumed to be *T. palmi*. Larvae of *Frankliniella* spp. were not identified to species.

## RESULTS AND DISCUSSION

At Collier, *Frankliniella bispinosa* and *Microcephalothrips abdominalis* were the most abundant species. *F. bispinosa* populations were highest in September (~20 per trap), January (~ 17 per trap) and March (~ 53 per trap), corresponding roughly to the blooming of such major hosts as oak (*Quercus* spp.) and citrus. *M. abdominalis* was most abundant during October and November, when up to 27 per trap were caught. WFT was not detected in the water pan traps. *T. palmi* was caught between September and March, but in very low numbers (~ 1 per trap). *F. bispinosa*, the major thrips infesting southwest Florida peppers, was detected in the Hendry field site, with peak numbers in October and April (Fig. 1). *T. palmi* occurred in low numbers in January and May. WFT was detected in December and May.

At the intensively farmed Lee site, the *F. bispinosa* population had peaks in October and March-April (Fig. 2). Peak numbers of WFT occurred in November and April, but persisted longer between peaks than *F. bispinosa*. *T. palmi* populations increased from November through February, and where more than two per bloom occurred, fruit damage resulted in economic losses. Losses were minimized through regular insecticide applications. *T. palmi* declined only after crop destruction and replanting ended. Larval abundance corresponded with adult thrips.

*T. palmi* larvae occurred between December and March. High numbers of *Frankliniella* spp. larvae coincided with high numbers of WFT adults, suggesting that this species reproduces well in pepper blooms. *F. bispinosa* does not reproduce well on peppers. Larvae are rarely found in collections containing only *F. bispinosa* adults (unpublished data).

In the Hendry greenhouse, where frequent setting of new plants among mature plots resembled the Lee site, WFT was the dominant species, but was absent from adjacent fields (Fig. 3). *F. bispinosa* was rarely present. *T. palmi* was not detected inside the greenhouse, but was collected outdoors in late May. Establishing new plantings near infested crops, or destroying adjacent plantings regularly during the season increased the chances of WFT and *T. palmi* problems. The standard practice in southwest Florida is to plant peppers in September and October and again in December and January. Fields planted in the fall are often not destroyed until spring, delaying insect emigration. The

The absence of *F. bispinosa* in the Hendry greenhouse, an open structure allowing] unrestricted thrips movement, is related to two factors: 1) WFT has a greater ability to reproduce on peppers, 2) *F. bispinosa* is more susceptible than WFT to insecticides used to control other pests, such as pepper weevils, *Anthonomus eugeni* Cano.

The effects of cultural practices and pesticides on thrips populations deserve further investigation. In Guadeloupe, heavy insecticide use led to increased *T. palmi* numbers (Etienne et al. 1990). Most pepper farms in southwest Florida seldom need insecticides: other than *Bacillus thuringiensis*. Yet, the intensively farmed Lee site has a history of heavy insecticide use against several pests, not easily controlled with "soft" insecticides, but which are affected by cultural practices much the same as thrips.

REFERENCES CITED Etienne, J., J. Guyot & X. van Waetermuelen. 1990. Effect of insecticides, predation and precipitation on populations of *Thrips palmi* on aubergine (eggplant) in Guadeloupe. Fla. Entomol. 73(2): 339-342. Frantz, G. & H. C. Mellinger. 1990. Flower thrips (Thysanoptera: Thripidae) collected from vegetables, ornamentals and weeds in south Florida. Proc. Fla. State Hort. Soc. 103 134-137.

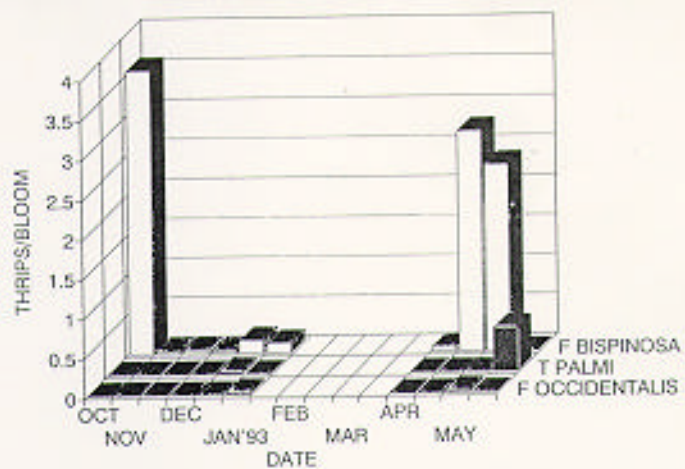


Figure 1. Abundance of thrips in pepper blooms at Hendry site, October 1992-May 1993.

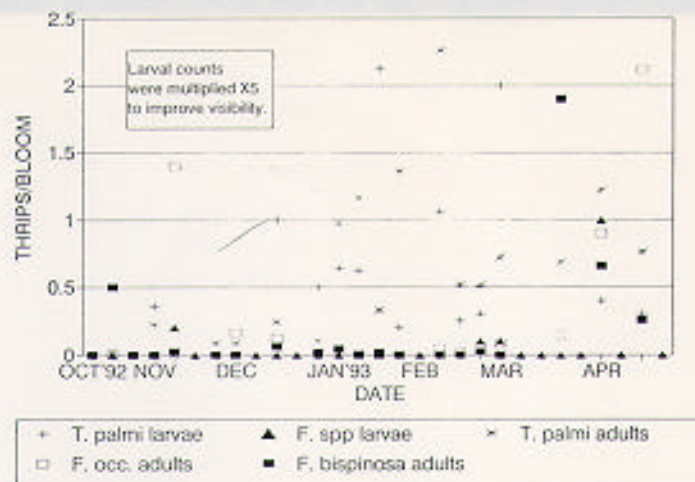


Figure 2. Abundance of adults and larvae of WFT, *F. bispinosa* and *T. palmi* in pepper blooms at the Lee site, October 1992-April 1993.

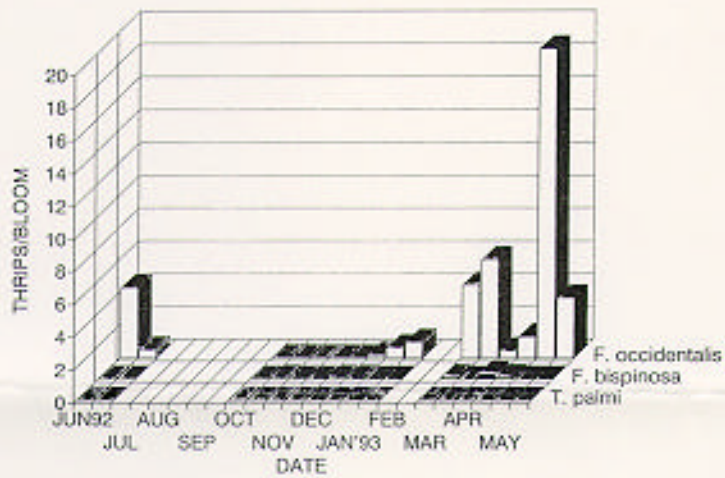


Figure 3. Thrips abundance in peppers at the Hendry greenhouse, June 1992-May 1993.