

**THRIPS SPECIES INFESTING SEEDLING
COTTON IN LOUISIANA, 1996-1998**
D. R. Cook, E. Burris and B. R. Leonard
Louisiana State University Agricultural Center
Louisiana Agricultural Experiment Station
Baton Rouge, LA

Abstract

Thrips were collected from cotton seedlings at four research stations representing distinct areas within the cotton production region of Louisiana during 1996 to 1998. Tobacco thrips, *Frankliniella fusca* (Hinds) were the most abundant species of thrips at all locations each year. Western flower thrips, *Frankliniella occidentalis* (Pergande) were collected in significant numbers (28% to 30% of thrips adults collected) at the Macon Ridge Station and the Red River Research Station in 1996. However, in 1997 and 1998 the occurrence of this species was very low at all locations.

Introduction

Several species of thrips are considered pests of cotton during the seedling stages of development. These include flower thrips, *Frankliniella tritici* (Fitch); tobacco thrips, *Frankliniella fusca* (Hinds); western flower thrips, *Frankliniella occidentalis* (Pergande); onion thrips, *Thrips tabaci* (Lindeman); and soybean thrips, *Neohydatothrips variabilis* (Beach). Previous surveys of cotton indicate that tobacco thrips are the most abundant thrips species infesting cotton seedlings in Louisiana (Sharp and Eddy 1938, Newsom et al. 1953, Burris 1980, Graves et al. 1987, Burris et al. 1989). Although western flower thrips are considered to be pests of seedling cotton in other states (Bailey 1938, Race 1961, Gaines 1965, Leigh 1984, Reed 1988, Karner and Cole 1992, DuRant et al. 1994, All et al. 1995), this species has only recently been reported on cotton seedlings in Louisiana. In earlier surveys, soybean thrips were not detected on cotton seedlings in Louisiana (Sharp and Eddy 1938, Newsom et al. 1953). However, recent surveys did report soybean thrips on cotton seedlings in Northeast Louisiana (Burris 1980, Burris et al. 1989).

Objective

The objective of this project was to survey and identify thrips species infesting seedling cotton in Louisiana.

Materials and Methods

Thrips adults were collected from cotton seedlings at the Northeast Research Station (NERS), St. Joseph, LA; Macon

Ridge Station (MRS), Winnsboro, LA; Dean Lee Research Station (DLRS), Alexandria, LA; and the Red River Research Station (RRRS), Bossier City, LA during 1996 to 1998 (Figure 1). The sample areas consisted of 8 to 12 rows of cotton approximately 200 ft. in length. Plants were sampled beginning at 7 days after emergence (DAE) and continued until 42 DAE at 7-day intervals. Each sample consisted of forty plants that were processed with whole plant washing procedures (Burris et al. 1990). Insect samples were preserved in a water (30%): ethanol (70%) solution. Thrips adults were mounted with CMC 10 mounting media (Master Chemical Com., Bensenville, IL) on microscope slides and covered with 22mm diameter glass slips. Thrips were identified by morphological characteristics (Stannard 1968 and Childers and Beshear 1992) utilizing an Olympus compound microscope.

Results and Discussion

Flower thrips, tobacco thrips, western flower thrips, and soybean thrips accounted for >99% of all thrips adults collected at all locations for each year. At the NERS location, tobacco thrips accounted for 65% of the thrips adults, while flower thrips and soybean thrips represented 19% and 16%, respectively, of the total collected during 1996 (Figure 2). In 1997 and 1998, tobacco thrips accounted for 93% and 96% of the thrips adults collected, respectively. Western flower thrips were collected in 1998, but represented only 1% of the total. Although western flower thrips were not collected in the 1996 and 1997 surveys, this species was collected from the untreated plots of at-planting insecticide efficacy trials conducted during 1996 and 1997. The occurrence of western flower thrips in these trials ranged from 0% to 6% (Cook et al. unpublished).

At the MRS location, tobacco thrips (39%) were the most abundant thrips species in 1996 (Figure 3). Western flower thrips, soybean thrips, and flower thrips accounted for 30%, 20%, and 11%, respectively, of the total thrips adults collected. In 1997, tobacco thrips represented 64% of the total thrips adults, followed by soybean thrips (20%) and flower thrips (15%). In 1998, tobacco thrips and soybean thrips accounted for 84% and 16% of the thrips adults collected, respectively. No western flower thrips or flower thrips were collected during 1998.

At the DLRS location, tobacco thrips accounted for 90%, 89%, and 98% of the thrips adults collected in 1996, 1997, and 1998, respectively (Figure 4). Western flower thrips represented 3% and 1% of the total in 1996 and 1998, respectively. No western flower thrips were collected during 1997. The occurrence of soybean thrips and flower thrips was low and ranged from 0% to 6% and 1% to 5%, respectively, during 1996 to 1998.

Tobacco thrips and western flower thrips represented 68% and 28%, respectively, of the total thrips adults collected at the RRRS location in 1996 (Figure 4). While in 1997, tobacco thrips (77%) and flower thrips (19%) were the most abundant species of thrips collected. However in 1997, western flower thrips represented only 3% of the total. Tobacco thrips represented 98% of the thrips adults collected in 1998. No western flower thrips were collected during 1998.

Tobacco thrips were the most abundant thrips species collected from cotton seedlings during 1996 to 1998 at all locations. Surveys (Lambert 1985, All et al. 1992, All et al. 1995) have indicated that tobacco thrips are the most common thrips species infesting seedling cotton in Georgia. Western flower thrips have been reported to be the predominate thrips species infesting seedling cotton in Oklahoma (Karner and Cole 1992) and South Carolina (DuRant et al. 1994). The first report of western flower thrips on cotton in Louisiana was during 1984 (Greenough et al. 1985). These infestations were discovered in cotton flowers during late July and August in Northwest Louisiana. By 1986, western flower thrips were present in cotton flowers throughout much of North Louisiana, but were not reported on seedling cotton (Graves et al. 1987). Western flower thrips were collected from cotton seedlings in our surveys, but their occurrence was variable, and did not exceed 30% of the total at any location within any year. The occurrence of soybean thrips varied greatly (0% to 20%) between locations and among years, but was more consistent at the MRS location. Across locations and years, the occurrence of flower thrips (0% to 19%) was variable, as well. Watts (1937) reported that during the years 1931 to 1935 flower thrips were more abundant than all other thrips species infesting cotton combined in South Carolina. However in 1936, soybean thrips represented approximately 75% of the thrips adults collected. Other factors, such as environmental conditions or availability of winter host plants may influence the species of thrips infesting seedling cotton.

Acknowledgments

The authors wish to thank Steve Moore, Roy Vidrine, Steve Micinski, Karen Williams, Ralph Sheppard, the summer personnel at both locations of the Northeast Research Station, and the student employees of the cotton entomology program in the LSU Department of Entomology for their assistance with these studies. Also, the authors would like to thank the LSU Agricultural Center, Cotton Incorporated, and Louisiana cotton producers for their financial support.

References

All, J. N., B. H. Tanner, and P. M. Roberts. 1992. Influence of no-tillage practices on tobacco thrips infestations in cotton,

pp. 77-78. *In* 1992 Proc. South. Conservation Tillage Conf. Jackson and Milan, TN.

All, J. N., W. K. Vencill, and W. Langdale. 1995. Habitat management of thrips in seedling cotton, pp. 1066-1067. *In* Proceedings 1995 Beltwide Cotton Conf., National Cotton Council, Memphis, TN.

Bailey, S. F. 1938. Thrips of economic importance in California. California Agric. Expt. Stn. Circular. 346. 77 pp.

Burris, E. 1980. Observations on tobacco thrips (*Frankliniella fusca*) and soybean thrips (*Sericothrips variabilis*) damage to and control in cotton. *In* 1980 Northeast Louisiana Agric. Expt. Stn. Prog. Rept. pp. 204-206.

Burris E., K. J. Ratchford, A. M. Pavloff, D. J. Boquet, B. R. Williams, and R. L. Rogers. 1989. Thrips on seedling cotton: related problems and control. Louisiana Agric. Expt. Stn. Bull. 811. 19 pp.

Burris, E., A. M. Pavloff, B. R. Leonard, J. B. Graves, and G. Church. 1990. Evaluation of two procedures for monitoring populations of early season insect pests (Thysanoptera: Thripidae and Homoptera: Aphididae) in cotton under selected management strategies. *J. Econ. Entomol.* 83: 1064-1068.

Childers, C. C. and R. J. Beshear. 1992. Thrips (Thysanoptera) species associated with developing citrus flowers in Florida and a key to adult Terebrantian females. *J. Entomol. Sci.* 27:392-412.

DuRant, J. A., M. E. Roof, and C. L. Cole. 1994. Early season incidence of thrips (Thysanoptera) on wheat, cotton, and three wild host plant species in South Carolina. *J. Agric. Entomol.* 11: 61-71.

Gaines, J. C. 1965. Cotton insects. Texas Agric. Expt. Stn. Ser. Bull. 933. 16 pp.

Graves, J. B., J. D. Powell, M. E. Farris, S. Micinski, and R. K. Story. 1987. Pest status of western flower thrips on cotton in Louisiana, pp. 229-231. *In* Proceedings 1987 Beltwide Cotton Conf., National Cotton Council, Memphis, TN.

Greenough, D. R., L. L. Black, R. N. Story, L. D. Newsom, and W. P. Bond. 1985. Occurrence of *Frankliniella occidentalis* in Louisiana: a possible cause for the increased incidence of tomato spotted wilt virus. *Phytopathology* 75: 1362.

Karner, M. A. and C. L. Cole. 1992. Species composition of thrips inhabiting cotton in Oklahoma, p. 820. *In* Proceedings 1992 Beltwide Cotton Conf., National Cotton Council, Memphis, TN.

Lambert, W. R. 1985. The thrips problem, pp. 130-131. *In* Proceedings of 1985 Beltwide Cotton Conf., National Cotton Council, Memphis, TN.

Leigh, T. F. 1984. Thrips and whitefly in the far west, pp. 181-182. *In* Proceedings 1984 Beltwide Cotton Conf., National Cotton Council, Memphis, TN.

Newsom, L. D., J. S. Roussel, and C. E. Smith. 1953. The tobacco thrips, its seasonal history and status as a cotton pest. Louisiana Agric. Expt. Stn. Tech. Bull. 474. 36pp.

Race, S. R. 1961. Early-season thrips control on cotton in New Mexico. *J. Econ. Entomol.* 54: 974-976.

Reed, J. T. 1988. Western flower thrips in Mississippi cotton. Identification, damage, and control. Mississippi Agric. Forestry. Expt. Stn. Info. Sheet 1320. 4 pp.

Sharp, S. S. and C. O. Eddy. 1938. Thrips in Louisiana. *Entomological progress, Louisiana Bull.* 298. pp. 9-10.

Stannard, L. J. 1968. The thrips, or Thysanoptera, of Illinois. *Illinois Natural Hist. Survey Bull.* Vol. 29, 552 pp.

Watts, J. G. 1937. Species of thrips found on cotton in South Carolina. *J. Econ. Entomol.* 6:857-860.

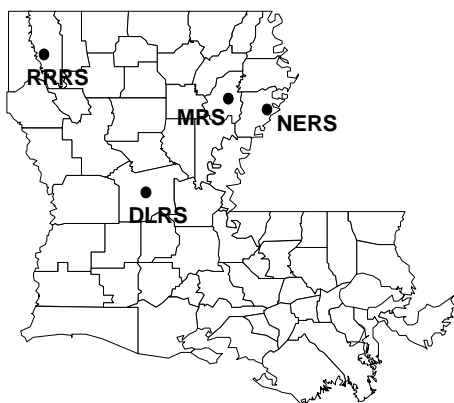


Figure 1. Thrips survey locations during 1996 to 1998.

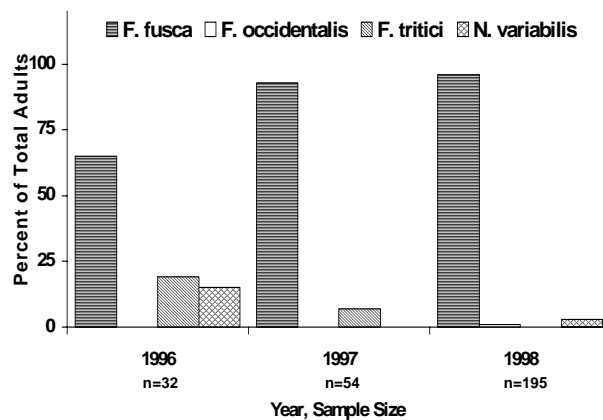


Figure 2. Thrips species composition at the Northeast Research Station during 1996 to 1998.

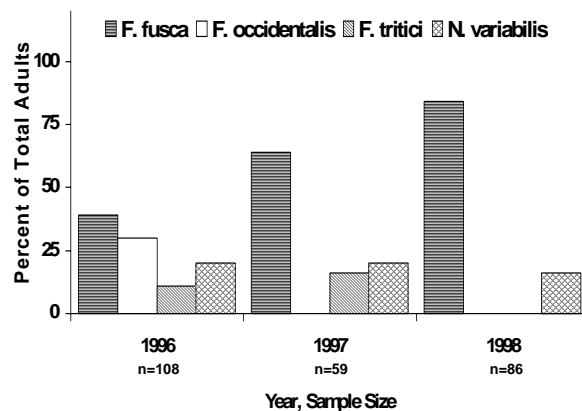


Figure 3. Thrips species composition at the Macon Ridge Station during 1996 to 1998.

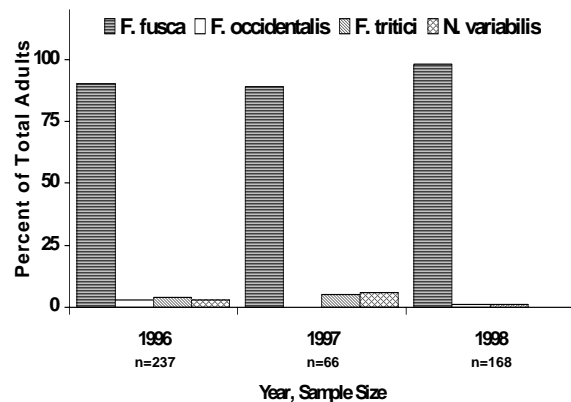


Figure 4. Thrips species composition at the Dean Lee Research Station during 1996 to 1998.

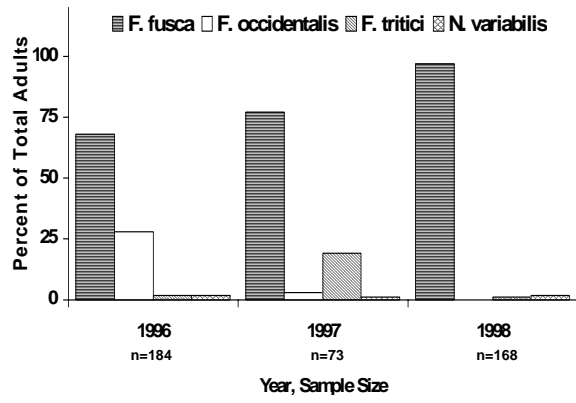


Figure 5. Thrips species composition at the Red River Research Station during 1996 to 1998.