SPECIES COMPOSITION AND POPULATION INCREASE OF EARLY SEASON THRIPS ON COTTON

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Abstract

To determine species composition, thrips were collected from cultivar resistance tests from 1998 to 2000 and identified. In 1998, thrips species composition at Lonoke, Arkansas consisted of > 99% *Frankliniella fusca*. During 1999 and 2000, the composition at this location has changed to include more *Frankliniella occidentalis*. Also at Lonoke, population increase was evaluated by sampling thrips on a daily basis to determine the number of adult and larval thrips present on cotton. A zero baseline could not be established due to thrips being present before the cotton had fully emerged from the ground. Heavy rainfall had a detrimental effect on adult and larval thrips populations often reducing their numbers dramatically.

Introduction

Thrips are considered important economic pests in seedling cotton, *Gossypium hirsutum* L. (Johnson et al. 1989) and are commonly found on cotton throughout the season. Early infestations of thrips can cause pre-bloom square loss, reduce leaf area, root development and yield, and delay crop maturity.

There are as many as 13 species of thrips that are known to feed on cotton (Watts 1937). Johnson et al. (1989) found that the most common thrips species in Arkansas seedling cotton are *Frankliniella fusca, F. tritici* and *Thrips tabaci*. Stanton et al. (1992) identified *F. fusca* as being the most abundant species of thrips inhabiting Arkansas cotton, comprising 92% of the composition.

Objectives

1. Determine the increase in adult and larval thrips population on seedling cotton.
2. Examine thrips species composition in eastern Arkansas.

Methods and Materials

To determine species composition, thrips were collected from cotton cultivar resistance tests. In all tests, thrips were collected by using a whole-plant sampling technique (Burris et al. 1990).

Species Composition

Thrips from 1998 Lonoke and 2000 Rohwer and Keiser locations were sampled from a number of cotton cultivars. Adult thrips were collected, pooled and a subsample was permanently mounted and identified.

Population Increase

The 1999 and 2000 Lonoke tests were collected from a BXN 47 sequential planting test (results not presented herein). Adult and larval thrips were sampled daily from seedling emergence until plant size made it difficult to sample whole plants (ca. 28 days).

Results and Discussion

Species Composition

The species composition of thrips inhabiting cotton in Lonoke, Arkansas during 1998 (Figure 1) was 98% *Frankliniella fusca*, 1% *Frankliniella occidentalis*, and 1% *Neohydatothrips variabilis*. In 1999, *F. fusca* made up 100% of the composition in late May and again in late June. By 7 June, *F. occidentalis* represented 18.2% of the species found in Lonoke and only 6.3% by 22 June (Figure 2). However, in the 2000 Lonoke test, *F. occidentalis* was present during the entire sample period (Figure 3). Not only was *F. occidentalis* consistently found in 2000, it made up a larger percentage of the overall composition with its lowest percentage 18.7% on 19 July and its highest at 5 July at 40%. Also, *F. occidentalis* made up similar percentages in Rohwer and Keiser, Arkansas with 32 and 21.5%, respectively.

Population Increase

The 1999 daily sample test showed that thrips are present on cotton seedlings as soon as they emerge from the ground (Figure 4). Adult thrips comprise most of the population for the first four days and larvae predominate thereafter. Also, heavy rainfall had a deleterious effect on the total thrips population, reducing thrips numbers to below two thrips per plant. In 2000, Lonoke thrips populations were lower than in 1999. This difference might be due to lower temperatures and increased rainfall during the early part of summer 2000 (Figure 5).

Conclusions

The thrips species composition appears to be changing, at least in central Arkansas, in favor of more *F. occidentalis*. The exact reason for this change is not known. It is possible that the last three relatively mild winters may have allowed this species to migrate farther across the state. The recent increase of *F. occidentalis* in Arkansas has provoked some discussion about the efficacy of current pesticides used for thrips control and weather or not *F. occidentalis* is harder to control than other thrips species. If this is in fact true, then the importance of thrips as cotton pests might increase in the northern part of the Cotton Belt.

Literature Cited

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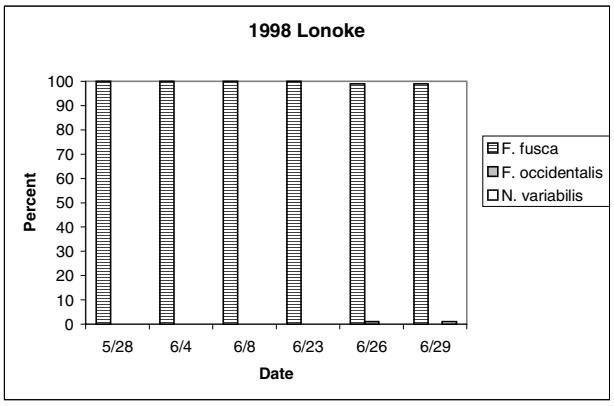

Figure 1. Thrips species composition in Lonoke, Ar 1998.

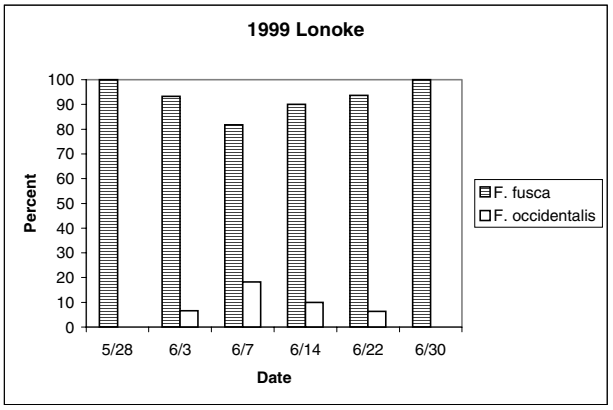

Figure 2. Thrips species composition in Lonoke, Ar 1999.

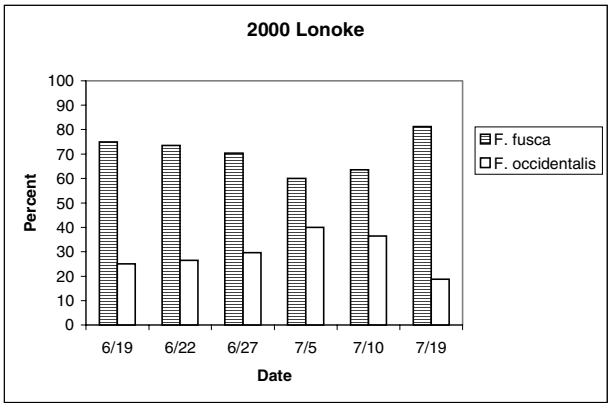

Figure 3. Thrips species composition in Lonoke, Ar. 2000.

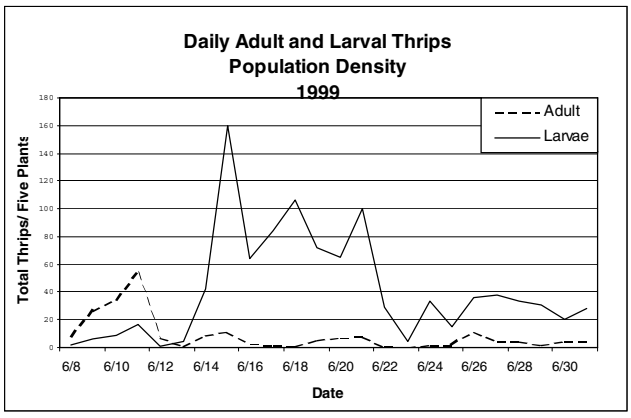

Figure 4. Thrips population density at Lonoke, Arkansas during 1999.

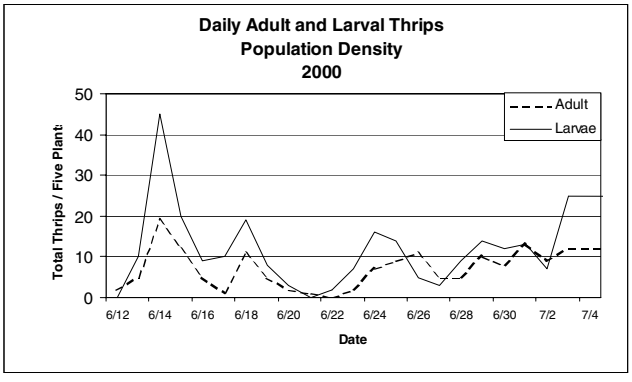

Figure 5. Thrips population density at Lonoke, Arkansas during 2000.