

COMPOUNDING EFFECTS OF THRIPS AND TARNISHED PLANT BUG ON COTTON MATURITY AND YIELD

J. Moor

J. Gore

D. Cook

A. Catchot

D. Dodds

Mississippi State University
Starkville, MS

Abstract

A field experiment was conducted in Stoneville, MS to determine the effects of tobacco thrips, *Frankliniella fusca* (Hinds), and tarnished plant bug, *Lygus lineolaris* (Palisot de Beauvois), on the maturity and yield of cotton. Plots were either managed for thrips, managed for tarnished plant bugs, or managed for both, along with an untreated control. Thrips ratings, plant heights, square retention, nodes above white flower, numbers of white flowers within 10 feet, and nodes above cracked boll were measured throughout the growing season. Plots were harvested at the end of the season. Maturity of plots with no tarnished plant bug management was delayed three days compared to those with tarnished plant bug management. This was likely impacted by warmer than usual air temperatures during September and October that allowed cotton plants to compensate for injury and mature at a normal rate. Plots with tarnished plant bug management yielded higher than those without.

Introduction

Tobacco thrips, *Frankliniella fusca* (Hinds), and tarnished plant bugs, *Lygus lineolaris* (Palisot de Beauvois), are two primary pests of cotton in Mississippi. Generally, thrips management includes seed treatments followed by foliar treatments if necessary. Historically, thrips have been known to delay fruiting, maturity, and harvest (Rummel and Quisenberry 1979, Hawkins et al. 1966) if not properly managed. For the 2016 growing season in Mississippi, thrips infested 425,000 acres (100%) of cotton planted. Approximately 87.9% of those acres were treated with a foliar spray to manage thrips. An estimated 16,575 bales (1% loss per acre) were lost due to thrips injury. This loss could be the result of poor control with neonicotinoid seed treatments. Also, growers have very few alternatives to these neonicotinoid seed treatments except for foliar applications (Cook et al. 2016). Another important pest of cotton in Mississippi is the tarnished plant bug. The tarnished plant bug feeds on the squares, flowers, and small bolls of cotton. Feeding on these smaller squares can cause abscission and result in direct yield losses (Gore et al. 2014, Layton 2000). In 2016, tarnished plant bug infested all of the cotton acres in Mississippi. Of these acres, 91.4% were treated for tarnished plant bug. A total of 83,827 bales (5% loss per acre) were lost due to tarnished plant bug damage in 2016. The objective of this study was to determine the combined effect of these two pests on cotton yield and maturity.

Materials and Methods

To determine the compounding effects of thrips and tarnished plant bugs on maturity and yield of cotton, an experiment was conducted at the Delta Research and Extension Center in Stoneville, MS in 2016. The experiment was a split-split plot within a randomized complete block design with four replications. The main-plot factor was thrips management at 2 levels, thrips protected and thrips unprotected. Thrips protected plots had a seed treatment of Avicta Duo (Syngenta), in-furrow application of AgLogic™ Aldicarb, (AgLogic Chemical), and automatic weekly sprays of acephate. The sub-plot factor was tarnished plant bug management at 2 levels, plant bug protected and plant bug unprotected. Plant bug protected plots received automatic weekly insecticide applications until first flower. Square retention for all plots remained above 80% for the first three weeks of June. Because of this, squares were manually removed until square retention reached 50% to simulate damage in plant bug unprotected plots. After first flower, all plots were managed for tarnished plant bug weekly. There were also plots with a treatment combination of thrips and tarnished plant bug protected. The sub-sub-plot factor was defoliation timing at 3 levels, defoliate thrips protected, defoliate plant bug protected, and defoliate both protected. Plots were defoliated when average nodes above cracked boll reached 4. Thrips damage ratings on a scale of 1-5 were measured in the

beginning of the season. Plant heights, square retention, nodes above white flower, white flowers per 10 feet, and nodes above cracked boll were measured throughout various times of the growing season. Yields were measured and recorded as lint pounds per acre.

Results

No significant differences among treatments were observed for nodes above white flower. Significantly higher numbers of white flowers per 10 feet were observed in plots where tarnished plant bugs were managed compared to unprotected plots. Number of nodes above cracked boll were significantly lower in plots where tarnished plant bugs were managed. Based on nodes above cracked boll counts, a 3 day difference in maturity was observed between plots with tarnished plant bug management opposed to plant bug unprotected plots. Plots that were managed for thrips and tarnished plant bug as well as plant bug management alone matured on Julian date 285; while, in plots with only thrips management and the untreated control matured on Julian date 288. The small difference in maturity date could be due to the unusually warmer air temperatures during September and October when the cotton was reaching full maturity. Significantly higher yields were observed in plots where both thrips and tarnished plant bugs were managed and plant bugs alone when compared to thrips management only and the untreated control. In conclusion, tarnished plant bug have more effect on the maturity and yield of cotton than injury from thrips.

Acknowledgments

The authors wish to thank the technicians and summer employees at the Delta Research and Extension Center in Stoneville, MS for their assistance with this study, and Cotton Incorporated for financial support.

References

- Cook, D.R., J. Gore, S.D. Stewart, D.L. Kerns, G.M. Lorenz, A.L. Catchot, F.R. Musser, G. Studebaker, N. Seiter, S. Brown. 2016. At-planting management of thrips in Mid-South cotton. Proc. 2016 Beltwide Cotton Conference, New Orleans, LA. 526-530.
- J. Gore, A. Catchot, F. Musser, J. Greene, B. R. Leonard, D. R. Cook, G. L. Snodgrass, R. Jackson; Development of a Plant-Based Threshold for Tarnished Plant Bug (Hemiptera: Miridae) in Cotton. J Econ Entomol 2014; 105.
- Rummel, D. R. and J. E. Quisenberry. 1979. Influence of thrips injury on leaf development and yield of various cotton genotypes. J. Econ. Entomol. 72: 706-709.