VARIETAL RESPONSE OF COTTON TO THRIPS INJURY

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Abstract

Identical experiments were done in Tennessee and Virginia to evaluate how different cotton varieties responded to thrips injury. Three commonly grown varieties were selected (ST4554 B2RF, PHY370 WR, PHY375 WRF). The same insecticide treatments were applied to each variety (untreated, Temik @ 5 lb/acre, Gaucho @ 0.375 mg ai/seed). Thrips numbers and injury, various plant growth and maturity parameters, and yield data were collected. Both Temik and Gaucho treatments significantly reduced thrips numbers and injury. Consequently, plants grew and matured more quickly in treated plots, and yields were also higher. In Tennessee, Temik generally did not provide the same level of plant protection as Gaucho, presumably because of excessive rainfall in the few weeks after planting. Temik tended to perform slightly better than Gaucho at the Virginia location. Second-pick yield data indicated that all varieties partially compensated for thrips injury, and the response to thrips injury was similar across varieties.

Introduction

Without the use of at-planting insecticides of seed treatments, thrips would be the most damaging insect pest of cotton in the northern Cotton Belt. A number of factors including thrips density, environmental conditions and perhaps varietal sensitivity can affect how cotton responds to injury. The objective of this study was to evaluate if selected varieties responded similarly to thrips injury. Stewart et al. (2007) reported an interaction between variety and thrips treatment. In this study, the lack of a thrips treatment negatively affected the growth and maturity of all varieties. However, in terms of final yield, PHY370 WR completely compensated for thrips injury in untreated plots; whereas ST4554 B2RF did not. DP444 BR was intermediate in its response. Thus, similar tests were done in 2008, and expanded to include a location in Virginia, to see if this response could be duplicated.

Materials and Methods

Identical experiments were done in Tennessee at the West Tennessee Research and Education Center and in Virginia at the Tidewater AREC. Each study was a factorial of three varieties and three at-planting treatment options arranged in a randomized complete block with four replicates. Varieties were ST4554 B2RF, PHY370 WR and PHY375 WRF. Insecticide treatments were untreated, Temik in-furrow (5 lb/acre) and Gaucho 600F (0.375 mg ai/seed). All seed had the same base fungicide seed treatment. Planting dates in Tennessee and Virginia were 4/23/08 and 5/2/08, respectively. Individual plot size was 4 rows (38 in) by 35 feet. Data collected included thrips numbers per 5 plants; thrips injury ratings (0-5 scale); plant height, nodes, total nodes above white flower, nodes above cracked boll (10 plants per plot); squares/m row; and lint yield. Plots were harvested on two dates to determine relative levels of yield compensation among treatments. Harvest dates were 9/26 and 10/14 in Tennessee and 10/14 and 10/30 in Virginia. Data were analyzed as a factorial with main effects of variety and insecticide treatment. LSD (protected, 0.05) was used for mean separation. Selected, representative data are presented.

Results and Discussion

Thrips numbers and injury were greatly reduced by the use of Temik or Gaucho (Figures 1 and 2). In Virginia, Temik provided numerically better control than Gaucho. However, Gaucho provided better control of thrips than Temik at the Tennessee location where excessive rainfall for two weeks after planting apparently leached Temik away from plants. Thrips treatment positively influenced plant development and maturity (Figures 3-6). Plants in treated plots were taller, had more nodes and squares, and had fewer nodes above cracked boll compared with untreated plots. Thrips treatment also significantly improved first pick and overall yield (Figure 7). Untreated plots only partially compensated for injury by having higher second-pick yields than insecticide treated plots. Although there was a significant variety effect on yield at the Virginia location, there were few meaningful interactions in the response of varieties to insecticide treatment.

Conclusions

Compared with plots receiving a Temik or Gaucho treatment, thrips in untreated plots caused significant injury and negatively influenced plant growth, maturity and yield. All three varieties responded similarly, unlike a previous study, indicating they were equally sensitive to thrips injury.

References

Stewart, S. D., G. M. Lorenz, K. L. Willis, B. A. Hanks, S. J. Steckel and C. K. Colwell. 2007. Thrips control in seedling cotton. Pp.1654-1658, *In* Proceedings of the Beltwide Cotton Conferences.

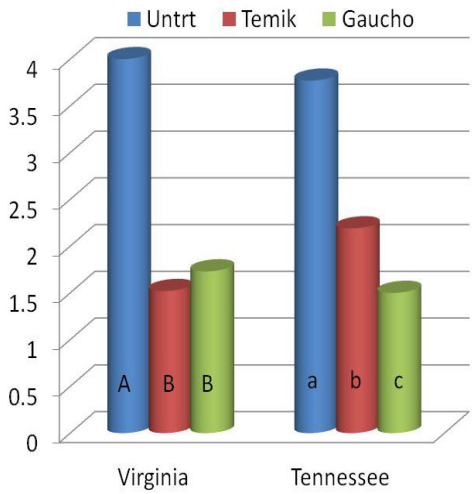

Figure 1. Thrips injury (0-5 scale) on 5/27 (VA) and 5/20 (TN) in each of three treatments: Untreated, Temik 15G (5 Lb/A) and Gaucho (0.375 MG AI/Seed)

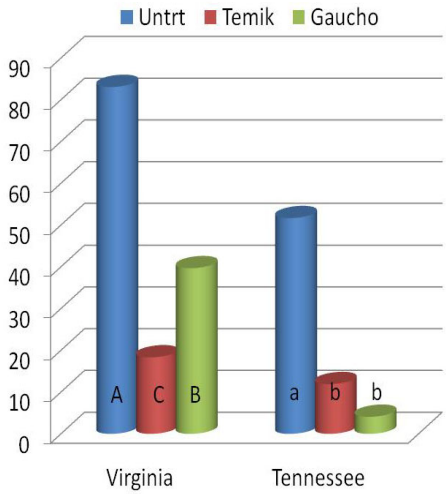

Figure 2. Numbers of thrips per five plants on 6/2(VA) and 5/20 (TN) in each of three treatments: Untreated, Temik 15G (5 Lb/A) and Gaucho (0.375 MG AI/Seed)

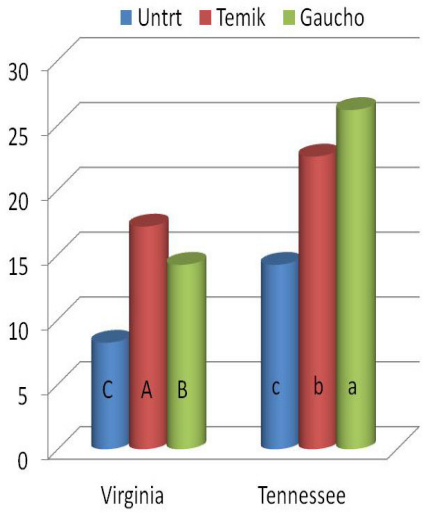

Figure 3. Plant height (cm) on 6/25 (VA) and 6/16 (TN) in each of three treatments: Untreated, Temik 15G (5 Lb/A) and Gaucho (0.375 MG AI/Seed)

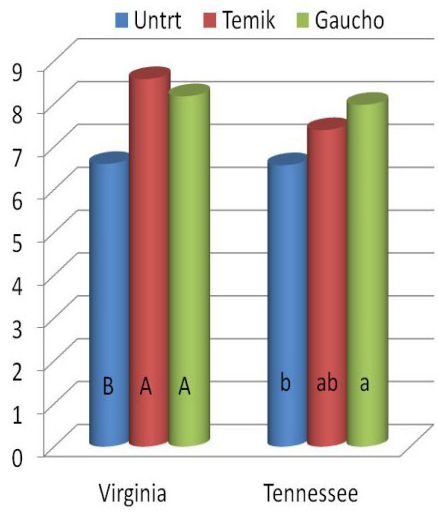

Figure 4. Numbers of plant nodes on 6/25 (VA) and 6/16 (TN) in each of three treatments: Untreated, Temik 15G (5 Lb/A) and Gaucho (0.375 MG AI/Seed)

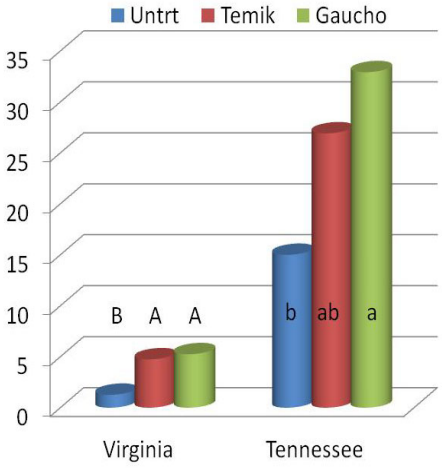

Figure 5. Numbers of squares per meter of row on 7/2 (VA) and 6/16 (TN) in each of three treatments: Untreated, Temik 15G (5 Lb/A) and Gaucho (0.375 MG AI/Seed)

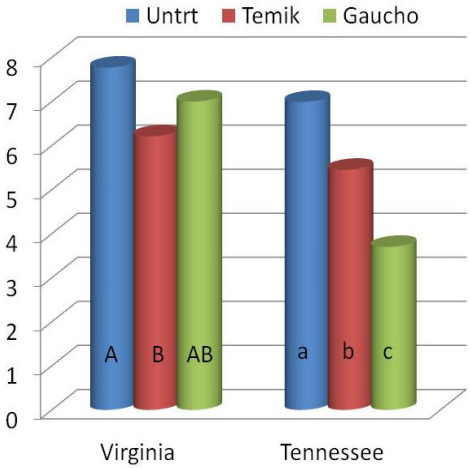

Figure 6. Nodes above cracked boll on 9/19 (VA) and 9/9 (TN) in each of three treatments: Untreated, Temik 15G (5 Lb/A) and Gaucho (0.375 MG AI/Seed)

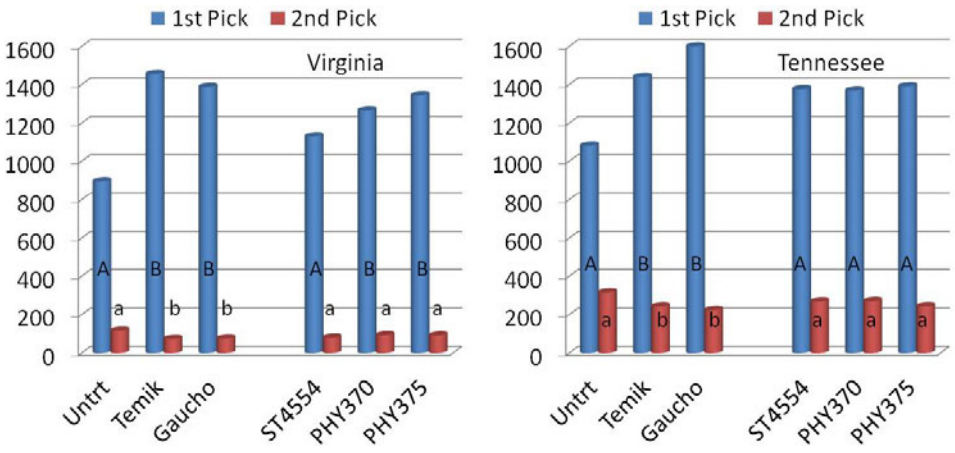

Figure 7. Lint yield from first and second pickings in each of three treatments: Untreated, Temik 15G (5 Lb/A) and Gaucho (0.375 MG AI/Seed)