

# ENTOMOLOGY

## EVALUATION OF FOLIAR INSECTICIDE SPRAYS IN CURRENT BT COTTON TECHNOLOGIES

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**BT COTTONS ARE AN IMPORTANT COMPONENT OF IPM IN COTTON AND PRESERVATION OF THIS TECHNOLOGY IS VITAL TO THE ECONOMIC VIABILITY OF COTTON PRODUCTION IN MISSISSIPPI.**

Current Bt varieties have changed the dynamic of insect pest management in cotton across the U.S. Current commercial technologies include Bollgard II® (Monsanto Company), Widestrike™ (Dow AgroSciences), TwinLink® (Bayer CropScience), and Widestrike 3™ (Dow AgroSciences). All of these cotton technologies provide excellent control of tobacco budworm and no supplemental sprays have been needed for this pest in any of the technologies. In contrast, bollworms are much less susceptible to the proteins in Bt cotton and they can cause significant injury at moderate to high population densities. As a result, growers in Mississippi generally make 1 to 3 foliar insecticide applications to manage bollworms in Bt cottons. Research is needed to determine if these applications are economically justified in Mississippi.

An experiment was conducted at the DREC to evaluate the impact of foliar insecticide sprays for bollworm management in Bt cotton. Plots were planted as a split-plot in a randomized complete block design with 4 replications. The main-plot factor was insecticide spray and included sprayed and unsprayed. The sprayed treatments were sprayed with chlorantraniliprole (Prevathon, DuPont) at first flower at a

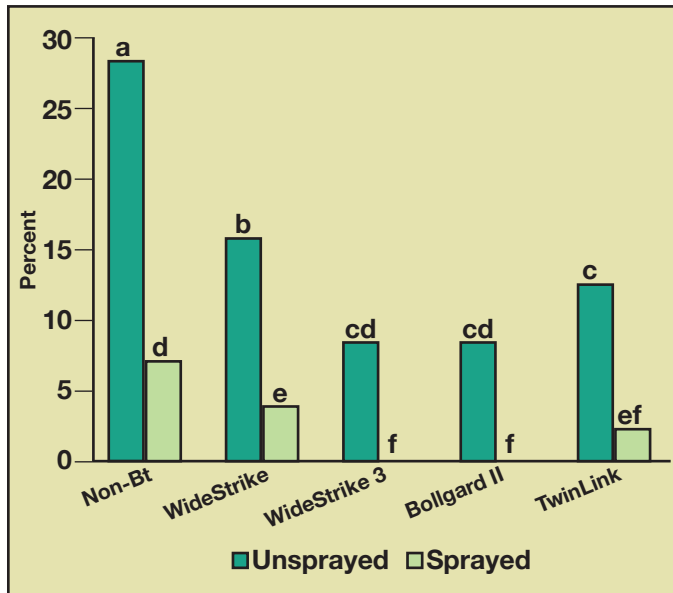
rate of 14 fluid ounces per acre. A second application was made approximately 2 weeks later. The sub-plot factor included the Bt cotton technologies mentioned previously and a non-Bt variety. Plots were evaluated weekly beginning at first flower by counting the number of damaged terminals, squares, and bolls on 20 plants in each plot. Additionally, the numbers of live larvae were counted on each of those structures. At the end of the season, plots were harvested and lint yields were determined.

Significant injury was observed in all of the Bt technologies on multiple evaluation dates. The greatest level of injury was observed approximately the third week of flowering (July 27, 2015) in this experiment (Figure 1). For all Bt technologies and the non-Bt variety, insecticide sprays significantly reduced the percentage of damaged bolls. Additionally, all Bt technologies reduced the percentage of damaged bolls compared to the non-Bt cotton. In terms of yield, insecticide sprays preserved yield in Widestrike, Bollgard II, TwinLink, and the non-Bt cottons. No differences in yield were observed between the sprayed and unsprayed treatments for Widestrike 3.

These data demonstrate the importance of man-

aging bollworms in Bt cottons. In general, all of the Bt technologies provide good control of bollworm in Mississippi, but control is not absolute. In many cases, supplemental control with foliar insecticides may be

**Figure 1:** Boll injury as a result of bollworm feeding and the impact of insecticide sprays on commercial Bt cotton technologies at Stoneville, MS on July 27, 2015



needed to prevent yield and economic losses, especially when heavy populations persist for multiple weeks.

**Figure 2:** Impact of insecticide sprays on lint yields of current commercial Bt cotton technologies at Stoneville, MS. Sprayed bars with an asterisk denote a significant difference compared to the unsprayed bar within a technology

