

A META-ANALYSIS OF TRANSGENIC BT COTTON EFFICACY: 1996-2015, PRELIMINARY DATA**D. Fleming****F. Musser****Mississippi State University****Mississippi State, MS****N. Little****USDA-ARS****Stoneville, MS****Abstract**

Transgenic *Bt* cotton resistant to lepidopteran pests was released for commercial production in 1996. Since that time, there have been five commercialized technologies (Bollgard, Bollgard 2, Widestrike, Twinlink, and Widestrike 3) available for planting in the United States, and reports of field-evolved resistance now exist for several of the genes in these technologies. A systematic review and meta-analysis was conducted to evaluate changes in the efficacy of Bollgard, Bollgard 2 and WideStrike technologies against Heliothine pests and changes in yield across the eastern cotton belt over time. These data revealed no significant changes in regards to damage of fruiting structures of Bollgard or Bollgard 2; however, fruiting structure damage of WideStrike has significantly increased at a rate of approximately 2 percent per year. These data show there is a widespread decrease in WideStrike efficacy and demonstrate the importance of moving toward technologies with a third *Bt* gene. The yield of Bt varieties, including Widestrike, in comparison to non-Bt varieties has remained largely constant, suggesting that current improvements in germplasm available only in Bt varieties is masking losses in Bt efficacy.