

TREATMENT THRESHOLDS FOR BOLLWORM [*HELICOVERPA ZEA*] IN SECOND-GENERATION**BT COTTON****Kristen Carter****Jeremy Greene****Ginger Devinney****Dan Robinson****Clemson University Edisto Research****and Education Center****Blackville, SC****Francis Reay-Jones****Clemson University Pee Dee Research****and Education Center****Florence, SC****Abstract**

Dual-gene *Bt* cotton has reduced the need for supplemental insecticide treatments for bollworm, *Helicoverpa zea*, compared with original single-gene technology. Bollgard II® (Monsanto) and WideStrike® (Dow AgroSciences) have the Cry1Ac gene in common but have a different combination of either Cry2Ab or Cry1F, respectively. These second-generation technologies enhance control of lepidopteran pests but remain less than 100% effective against bollworm, particularly when population pressure is high. Treatment thresholds recommended for bollworm in South Carolina are 3 or more large larvae per 100 plants or 5% boll damage, and there is no difference in the recommendation for Bollgard II® and WideStrike®. Research conducted in 2010 and 2011 aimed to explore the quantifiable differences between technologies and develop the best possible thresholds for each. Test plots containing non-*Bt*, WideStrike®, and Bollgard II® varieties were scouted and treated weekly for one of the following: bollworm eggs, larvae in white blooms, or boll damage. Thresholds in each of the three categories were selected, and tests plots were sprayed accordingly. Although improvements in yield were often observed with insecticide applications, statistical differences in yield were not evident within the *Bt* technologies, indicating that insecticide applications exclusively targeting bollworm were not necessary in dual-gene cotton during this limited study. However, growing conditions conducive to growth and development of cotton were extended during both years, allowing yield compensation for bollworm damage sustained each season. Because conditions favorable for yield compensation do not occur perennially, such conditions should not be counted on when making insect control decisions. Also, significant differences in bollworm density and damage levels were observed between technologies, so it would be prudent if a more proactive approach was taken in protecting WideStrike® cotton than with Bollgard II®. This conservative approach could include an egg threshold where local norms for moderate egg pressure can be defined. For example, sustained egg pressure of 30-50 eggs per 100 plants for consecutive weeks and persistent observations of bollworm moths in the field might be an appropriate timing for initial treatment for bollworm on WideStrike® varieties in South Carolina. Boll damage levels of 5% or greater should remain as an additional threshold for both technologies. Finally, because stink bugs are regularly controlled with insecticides during periods of bollworm infestation, concomitant control of bollworm can be expected and might prove sufficient under most scenarios, thus negating dedicated applications solely for bollworm.

Acknowledgments

The South Carolina Cotton Board provided funding to support this research, and we thank all cotton producers in South Carolina for their support.