

FIRST-HAND EXPERIENCES WITH DUAL BT COTTONS IN THE SOUTHEAST**Jeremy K. Greene****Clemson University Edisto Research and Education Center
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The introduction, adoption, and evolution of Bt cotton technology has truly been remarkable to witness. Fifteen years ago, Monsanto introduced a technology (Bollgard®) that dramatically changed the way we managed insects in cotton then that continues on today. Because of resistance management concerns, the original single-Bt-gene technology (Bollgard®) is no longer available in the USA. Available now are varieties producing multiple Bt proteins toxic to a wide spectrum of caterpillar pests. Dual-Bt-gene technologies commercially available include Bollgard II® (Cry1Ac and Cry2Ab – Monsanto, 2003) and WideStrike® (Cry1Ac and Cry1F – Dow AgroSciences, 2005). New constructs of Bt genes, such as those in TwinLink™ technology (Cry1Ab and Cry2Ae – Bayer CropScience) will be available within a couple of years, pending registration and appropriate approvals. While cotton varieties with multiple-Bt-gene technology provide very good control of caterpillar pests, they do not offer 100% control of bollworm, *Helicoverpa zea*. Under extreme, natural pressure from bollworm, these technologies display variable control of bollworm and might require supplemental applications of insecticide to avoid yield losses due to injury from the species. During 2010, we experienced the highest recorded pressure from bollworm in field trials in SC in the last five seasons. Separate trials of existing and promising Bt cotton technologies were inundated by natural infestations of bollworm, and variable results were observed. In the same field-test area, peak boll damage levels approached 20, 60, and 30% in unprotected varieties with Bollgard II®, WideStrike®, and TwinLink™ traits, respectively. As a comparison, damage levels in original Bollgard® technology reached 60% at the peak of bollworm pressure and damage. In one trial comparing varieties of Bollgard II® and WideStrike®, damage levels in aggressively protected paired plots were significantly less than those in unprotected plots, and most yields were significantly more than those from untreated plots, indicating that bollworm was causing some yield loss at the level of pressure experienced. However, sufficient rainfall and optimal growing conditions late in the season, following the interval of heavy feeding injury from bollworm, allowed tremendous yield compensation in other trials. In particular, WideStrike® was able to compensate for much of the damage caused by bollworm, and yields in plots of unprotected TwinLink™ cotton were very similar to those in protected plots. Research is underway to develop treatment thresholds tailored for multiple-Bt-gene technologies as they become available. Educational challenges still exist about the varying expression of injury symptoms among these technologies and how to scout and manage for bollworm when encountered at high levels.