Field Performance of Transgenic Cottons Expressing One or Two *Bacillus thuringiensis* Endotoxins Against Bollworm, *Helicoverpa zea* (Boddie)

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Bollworm, *Helicoverpa zea* (Boddie), survival on Bollgard cottons is an economic problem and also a concern for dealing with the development of bollworm resistance. Bollgard II cottons that produce two Bt proteins have been developed to provide increased bollworm control. Bollgard and Bollgard II cottons were evaluated along with their conventional sister line for susceptibility against bollworm in North Carolina field studies from 1999-2002. The impact of supplemental pyrethroid oversprays on bollworm control and yields was also evaluated. Comparisons of untreated genotypes averaged across four years demonstrated that both Bt genotypes reduced infestation rates by larvae and damage to squares and bolls compared with the conventional cultivar. Bollgard II had fewer squares and bolls infested with larvae and less square and boll damage compared with Bollgard. Larval infestations and damage levels were also lower in pyrethroid-treated conventional cotton, and both pyrethroid-treated and untreated Bt genotypes, compared with the untreated conventional cultivar. A reduction in larval numbers and square and boll damage was achieved with pyrethroid oversprays in both conventional and Bollgard cultivars, but not in Bollgard II. Except for square damage, larval numbers and damage were comparable among pyrethroid-treated conventional and untreated Bollgard cottons. Pyrethroid-treated Bollgard contained numbers of larvae and damage comparable to that of untreated Bollgard II. Pyrethroid-treated and untreated Bollgard and Bollgard II cottons on average produced similar yields. Only pyrethroid-treated and untreated Bollgard II cottons produced significantly higher yields compared with the pyrethroid-treated conventional cultivar.