

Field Performance of Cotton Genetically Modified to Express Insecticidal Protein from *Bacillus thuringiensis*

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Abstract

Five transgenic lines of cotton, *Gossypium hirsutum* L., carrying the delta-endotoxin gene from *Bacillus thuringiensis* Berl., and two control cultivars, Coker 312 (the parent stock) and MD51N (an adapted nectariless line) were evaluated at the Maricopa Agricultural Center for resistance to attack by several insect pests and for agronomic properties. The transgenic lines were highly resistant to pink bollworm (PBW), *Pectinophora gossypiella* (Saunders), as shown by 90% fewer rosetted blooms, 96% fewer PBW recovered from incubated bolls, and 92% less seed damage than in the control cultivars. The transgenic lines were highly resistant to saltmarsh caterpillar, *Estigmene acrea* (Drury), and beet armyworm, *Spodoptera exigua* (Hbn.), as shown by minimal damage to transgenic leaves and almost complete defoliation of control leaves. The transgenic lines were virtually immune to cotton leafperforator, *Bucculatrix thurberiella* Busck, as shown by no apparent damage to transgenic leaves, and many mines, "horseshoes", and feeding areas on the control leaves. Compared to Coker 312, one transgenic line yielded more lint, and one yielded less. Four transgenic lines had higher lint percentages and all five had smaller bolls and were later maturing than Coker 312. Compared to MD51N, no transgenic line yielded more lint and one yielded less. All five transgenic lines had lower lint percentages, three had smaller bolls, and three were earlier maturing than MD51N (USDA, ARS, Western Cotton Research Laboratory in cooperation with Monsanto Co. and Arizona Agricultural Experiment Station).