

**PERFORMANCE OF LIBERTY-TOLERANT  
COTTON**

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conclude that the transformation events in Coker 312 were successful and the gene for Liberty tolerance was expressed. Although these seed lines were useful for initial field experiments, improved Liberty-tolerant cotton varieties are needed for the Texas Southern high Plains.

**Abstract**

A research project was initiated in 1995 to develop Liberty-tolerant cotton using genetic engineering techniques. A plant chimeric bar gene was introduced into Coker 312 using *Agrobacterium* infection of hypocotyls. PCR analysis and direct screening with Liberty were conducted on plantlets to determine if the bar gene was being expressed. Seeds were collected from tolerant plants. Field experiments were conducted in 1997 at the Texas Agricultural Experiment Station near Lubbock to evaluate the performance of Liberty-tolerant cotton. Tolerance was evaluated at various cotton growth stages, to various Liberty rates, and to repeated Liberty applications. Liberty treatments were applied using a tractor-mounted compressed-air sprayer or a CO<sub>2</sub> backpack sprayer that delivered 10 GPA. Plots were hand-weeded throughout the growing season.

Liberty at 0.54 pounds ai/A was applied to Liberty-tolerant cotton at the cotyledonary, 2-3 leaf, 4-5 leaf, first square, first bloom, peak bloom, cut-out, or 50% open boll stages of growth. In a second test, Liberty was applied to 2-3 leaf cotton at 0.36, 0.72, 1.44, or 2.88 lbs/A. In a third test, Liberty at 0.54 was applied to cotton in the 0-1, 3-4, 9-10, or 14-15 leaf stage in single and sequential applications. Visual injury and plant heights were recorded throughout the growing season and stand recorded 14 days after treatment. Plants were mapped at harvest and lint yield and fiber quality determined.

Only 9% of plants were observed to be non-transgenic. No visual crop injury was observed in these tests. No differences in plant height, nodes per plant, or first position bolls were observed following any Liberty application. No Liberty application adversely affected cotton yield. We