

**TRANSGENIC VS. CONVENTIONAL VARIETIES
IN ARKANSAS COTTON VARIETY TESTS, 1996-2002**

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Abstract

Transgenic cotton varieties were first entered into the Arkansas Cotton Variety Test in 1996. From 1997-2002, ca. one-half of the varieties tested have been transgenic. Comparison of conventional and transgenic varieties in these variety tests provides information on the effects of the shift to over 90% transgenic cotton in Arkansas. The objective of this study was to compare average yield and fiber data of conventional and transgenic varieties in the Arkansas Cotton Variety Tests from 1996 through 2002. This analysis provides information on the relative performance of transgenic and conventional product groups rather than the effects of specific transgenes. For each year, the test was grown at six locations (four irrigated and two non-irrigated). Each test site used four replications for yield and two for fiber quality. Means for each variety type [conventional, RR (Round-up Ready), Bt, stacked genes (BR) and BXN] were determined and weighted means were determined across years. Compared to conventional, transgenic varieties had less lint yield (-6 lb/a), slightly greater plant height (+0.5 cm), less lint fraction (-0.2%), higher micronaire (+0.08 units), shorter fiber (-0.02 inches), and weaker fiber strength (-0.9 g/tex). Although the direction of influence on each parameter has negative effects on cotton production in Arkansas, primary concern is over the effects on yield, micronaire and strength. The decline in yield was due to the performance of RR varieties since Bt, BR and BXN varieties have yielded more than conventional varieties. The direction of influence on fiber quality traits was similar for each transgenic type. Lower micronaire of transgenic varieties in 2001 and 2002 suggests that improvement is being made. However, the negative effect on fiber strength of transgenic compared to conventional varieties continued through 2002. Lower fiber quality of transgenic varieties may be due to backcross breeding with emphasis on expression of the transgene and on yield. Since variation among transgenic varieties is great, the merits of individual transgenic varieties must be considered.