

**THE IMPACT OF WEED CONTROL PROGRAMS  
ON DEVELOPMENT OF TRANSGENIC COTTON**

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**Abstract**

Herbicide-resistant cotton provides growers the option to reduce herbicide applications in wide-row cotton production as well as an excellent tool for weed management in ultra-narrow row cotton. Field studies were conducted at Fayetteville, Little Rock, and Marianna, AR in 1999 and 2000 to compare the development of Roundup Ready cotton under conventional and narrow-row spacings, with or without preemergence herbicides. The Fayetteville location was irrigated while the Little Rock and Marianna locations were dryland. Some of the transgenic (glyphosate-tolerant) cultivars used were PM1220 and PM1218 in 1999 and 2000, respectively. A conventional variety, ST474, was also planted in 2000 and used as a standard for comparison with the herbicide-tolerant cultivar. A complete herbicide program for transgenic cotton included a preemergence (PRE) application of Dual Magnum, 0.75 lb ai/A plus Cotoran, 1 lb ai/A. This was followed by a postemergence (POST) application of Roundup Ultra, 1 lb ai/A to 4-lf cotton. The total POST herbicide program consisted of a sequential application of Roundup Ultra at 2-lf and then at 6-lf cotton. The standard herbicide program for ST474 under ultra-narrow rows included a preemergence application of Dual Magnum plus Cotoran, followed by Staple, 0.062 lb ai/A or Select, 0.25 lb ai/A, POST as needed. The conventional herbicide program under wide row spacing consisted of four herbicide applications including Dual Magnum plus Cotoran PRE, Cotoran plus Karmex early directed, Direx plus MSMA late directed, and Direx at layby. Among the parameters measured were the nodes above first square or nodes above white flower (NAWF) and square shed, using COTMAN.

The use of preemergence herbicides generally reduced cotton stand but did not affect seed cotton yield. Ultra-narrow row cotton had less NAWF than cotton grown in conventional row. Under irrigated conditions, cotton in ultra-narrow rows cutout 7 to 14 days earlier than cotton grown in wide rows. Under dryland conditions, crop cutout earlier than expected based on the target development curve regardless of row spacing. The herbicide programs generally did not affect square shed except in Marianna where the total POST program increased square shed in ultra-narrow spacing, but this did not correlate with yield. In Fayetteville, there was no difference in yield between herbicide programs with PRE or total POST in ultra-narrow rows or conventional spacings in both years. In Little Rock and Marianna, where weed pressure was heavy, the application of preemergence herbicides resulted in higher yield than the total POST program. The Roundup Ready cultivar yielded better than the standard ST474. A different target development curve needs to be developed for COTMAN to monitor cotton development in ultra-narrow rows because cotton development will always be more limited under close spacing than under wide spacing, even when growing conditions are optimal. Planting density and fertility issues need to be resolved for ultra-narrow row spacing.