

EFFICACY OF TOTAL POSTEMERGENCE WEED CONTROL PROGRAMS FOR TRANSGENIC COTTON

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Abstract

Herbicide-resistant cotton gives producers the option to omit the use of a soil-applied herbicide and of using ultra-narrow row spacing as a production option. This study was conducted to compare the yield of transgenic cotton under conventional and ultra-narrow row spacing and to determine if preemergence herbicides are necessary for acceptable weed control in these systems. Experiments were conducted in 1999 at Little Rock and Fayetteville, AR, then repeated in 2000 at Marianna and Fayetteville, AR. Fayetteville was the only location that was irrigated.

Narrow rows were spaced 7.5 or 10 inches apart, and conventional rows were 30 or 40 inches apart. Roundup Ready (glyphosate-tolerant) cultivars used were PM1220 in 1999 and PM1218 in 2000. Herbicide treatments consisted of a total postemergence (POST) program of Roundup Ultra (1 to 3 and 6 to 8 leaves) or a herbicide program with Cotoran + Dual Magnum preemergence (PRE) followed by Roundup Ultra at 1 to 3 leaves, followed by Staple and Select, as needed. Glyphosate was applied over-the-top at all cotton stages in both row spacings, so that the effect of spacing on cotton development could be more accurately compared. BXN47, a bromoxynil-tolerant cultivar, was included both years. Herbicide treatments for BXN cotton consisted of a total POST program of Bucril and Staple (1 to 3 leaves) followed by Select as needed or a herbicide program with Cotoran + Dual Magnum PRE followed by Bucril and Staple (1 to 3 leaves) and Select applied as needed. In 2000, a non-transgenic cultivar, ST474, was added. The treatment for ST474 in narrow rows was a PRE application of Cotoran + Dual Magnum followed by Staple and Select as needed. For conventional row spacings Cotoran + Dual Magnum was applied PRE followed by Cotoran + Direx early directed, Direx + MSMA late directed, and Direx layby.

Weed control ratings were taken before the first POST application and at 2, 4, and 6 to 8 wk after the last POST application. In Little Rock, Palmer amaranth and prickly sida were controlled better in treatments containing a soil-applied herbicide for BXN47 late in the season. The total POST program for BXN47 did not control Palmer amaranth ($\leq 28\%$) in either row spacing. Palmer amaranth weed pressure was high (22/ft²). The glyphosate program with a soil-applied herbicide did not increase control when compared to the total POST program for Palmer amaranth and prickly sida.

At Marianna in 2000, Palmer amaranth control was $\geq 95\%$ except for the bromoxynil total POST program in conventional row spacing, which gave only 26% control. This could be due to Staple-resistant Palmer amaranth. Possible resistance will be evaluated in the greenhouse. Prickly sida control was excellent for all treatments ($\geq 96\%$). The bromoxynil total POST program POST in ultra-narrow rows gave lower pitted morningglory control (84%) than the other treatments, which gave $\geq 91\%$ control.

Throughout the 1999 season in Fayetteville, Palmer amaranth control was similar in all treatments (92 to 100%). Soil-applied herbicides improved season-long control of prickly sida. In 2000, good weed control was obtained from all treatments. For Palmer amaranth, all programs had $\geq 98\%$ control except the bromoxynil total POST program in ultra narrow rows, which gave 80% control. Treatments affected yield differently at the three locations. At Little Rock and Marianna, yield was increased when a PRE herbicide was applied. At Fayetteville, however, yield was not

increased with PRE applications. In 1999 at Fayetteville, PM1220 in both row spacings produced higher yields than BXN47. In 2000 at Fayetteville and Marianna, PM1218 with a PRE produced higher yields than all treatments in both row spacings. In Little Rock, yield did not differ between row spacings. In Fayetteville both years, cotton in conventional row spacing had higher yields than ultra-narrow rows. However, at Marianna ultra-narrow row cotton produced higher yields than conventional-row cotton.