

**WEED MANAGEMENT IN NO-TILL COTTON  
IN NORTH CAROLINA AND TENNESSEE**

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**Abstract**

Experiments were conducted in Clayton and Goldsboro, NC and Jackson and Milan, TN in 1997 and 1998 to evaluate weed control, cotton tolerance, and lint yield of new transgenic cotton (*Gossypium hirsutum*) varieties (BXN and Roundup-Ready) and a standard non-transgenic variety, Stoneville 474. The BXN variety used in all locations was BXN 47, while the Roundup-Ready varieties were Paymaster 1220RR, Paymaster 1330RR, and Deltapine 5415RR. Weed-free checks were included for the non-transgenic variety, the BXN variety, and the Roundup-Ready variety at each location to allow direct comparison of the yield potential for each variety. These weed-free plots received a preemergence (PRE) application of Prowl at 39 fl. oz./A plus Cotoran at 1 qt/A in NC and 2.4 pt/A in TN. These plots were maintained weed free by additional hand weedings and hand hoeings as needed.

A burndown treatment of Roundup at 1.5 pt/A in TN and 1.0 qt/A in NC was applied approximately 30 days prior to planting. In NC, all systems except for Roundup systems were oversprayed with Select at 8 fl. oz./A plus Agridex for rhizome johnsongrass (*Sorghum halepense*) control. Herbicide systems that were evaluated for the non-transgenic cotton variety included Prowl at 39 fl. oz./A plus Cotoran PRE followed by (fb) either 1) Cotoran plus MSMA at 2.67 pt/A early post-directed (EPD) fb Bladex at 26 fl. oz./A plus MSMA at 2.67 pt/A at LAYBY, or 2) Staple at 1.2 oz. product/A early postemergence over-the-top (EPOST) fb Bladex plus MSMA at LAYBY. The BXN system used Prowl plus Cotoran PRE fb Buctril at 1 pt/A EPOST fb Bladex plus MSMA at LAYBY. The Roundup-Ready systems included: 1) Prowl plus Cotoran PRE fb Roundup at 1 pt/A EPOST fb Bladex plus MSMA at LAYBY, 2) Prowl PRE fb Roundup on an as-needed basis (ASN), 3) Roundup ASN fb Bladex plus MSMA at LAYBY, and 4) Roundup ASN with no other herbicides. The formulation of Roundup used in all Roundup applications was Roundup Ultra and it was applied postemergence over-the-top on 4-leaf cotton or smaller. All Roundup applications made after the 4-leaf stage were either post-directed (TN) or applied under a hooded sprayer (NC) to minimize Roundup contact with the cotton foliage.

No spray adjuvants were used with Roundup or Buctril applications while a non-ionic surfactant at 0.25% (v/v) was applied with Staple EPOST and LAYBY treatments.

Johnsongrass was controlled at least 97% with all herbicide and cultivar systems in NC. Sicklepod (*Senna obtusifolia*) control was at least 94% with Roundup-containing systems compared to 72 to 78% control with other systems. Entireleaf morningglory (*Ipomoea hederacea* var. *integriuscula*) and ivyleaf morningglory (*Ipomoea hederacea*) was controlled at least 92% with all herbicide and cultivar systems. Large crabgrass (*Digitaria sanguinalis*) control was at least 90% with all herbicide and cultivar systems. Smooth pigweed (*Amaranthus hybridus*) was controlled at least 89% with all systems except for Roundup ASN alone. Smooth pigweed control with Roundup ASN alone was 82%. Common cocklebur (*Xanthium strumarium*) control was at least 87% with all herbicide and cultivar systems. Prickly sida (*Sida spinosa*) was controlled at least 84% with all herbicide and cultivar systems.

In NC in 1997, Stoneville 474 had the highest weed-free lint yield with equivalent weed-free yields obtained with BXN 47, while the highest weed-free lint yield in 1998 was Deltapine 5415RR with equivalent yields obtained with Stoneville 474. In TN in 1997, all three varieties (Stoneville 474, BXN 47, and Paymaster 1220RR) had similar weed-free yields while in 1998, Stoneville 474 had the highest weed-free yield with equivalent yields obtained from BXN 47. The highest yielding management system in NC in both years of the study was the standard EPD system. In 1998, all systems except for the standard plus Buctril and the Roundup ASN alone system yielded equivalently to the standard EPD system. All herbicide and cultivar systems yielded at least 88% of the weed-free yield from respective varieties in 1998. In TN, the highest-yielding weed management systems in both years of the study were Roundup systems that used soil-applied and LAYBY herbicides. Decreased lint yields from Roundup ASN fb LAYBY and Roundup ASN alone systems in TN and Roundup ASN alone in NC may be due to early-season weed interference due to the lack of a residual soil-applied herbicide in these systems.