

**WEED MANAGEMENT IN STRIP- AND CONVENTIONAL-TILLAGE
TRANSGENIC AND NON-TRANSGENIC COTTON**

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Abstract

Studies were conducted to evaluate weed management systems in non-transgenic, transgenic Buctril-resistant (BXN), and transgenic Roundup-Ready (RR) cotton in strip- and conventional-tillage environments. Field studies were established at the Central Crops Research Station located near Clayton, NC in 1999; the Cherry Farm Unit near Goldsboro, NC in 1999 and 2000; the Peanut Belt Research Station near Lewiston-Woodville, NC in 1999; and the Upper Coastal Plain Research Station near Rocky Mount, NC in 1999 and 2000. Cotton cultivars, 'Paymaster 1220RR', 'Stoneville BXN 47', and 'Stoneville 474' (non-transgenic), were planted on May 13, 1999 at Clayton, May 17, 1999 and May 25, 2000 at Goldsboro; May 10, 1999 at Lewiston; and May 11, 1999 and May 9, 2000 at Rocky Mount. Cotton was seeded 4 seed per foot. Plots were 30 ft long and four 38 in rows wide at Clayton and Goldsboro and 30 ft long and four 36 in rows wide at Rocky Mount and Lewiston. The experimental design was a randomized complete block with treatments replicated three times. A split-plot treatment arrangement with main plot tillage and subplot herbicide system was utilized to facilitate tillage and planting. Fifteen herbicide systems were evaluated in each main plot and differed between the tillage regimes. The difference between the tillage regimes was due to the additional paraquat PRE treatment in strip-tilled cotton for control of emerged weed vegetation at planting.

Five herbicide systems were evaluated in each cotton cultivar and three cultivars were grown in each tillage regime for a total of 15 herbicide systems in each tillage regime. The five herbicide systems in non-transgenic cotton included: 1) no herbicide treatment, 2) Prowl at 1.8 pt/A PRE + Cotoran at 2.0 pt/A PRE fb Staple at 0.5 oz A/A plus Bueno 6 at 1.3 pt/A EPOST fb Caparol at 2.4 pt/A plus Bueno 6 at 2.6 pt/A at LAYBY, 3) the aforementioned system with hand weeding as needed (ASN) to keep plot weed-free, 4) Prowl at 1.8 pt/A PREBAN (18 in wide) on the seed drill fb Staple at 0.5 oz A/A plus Bueno 6 at 1.3 pt/A EPOST fb Staple at 0.5 oz A/A plus Select at 0.5 pt/A POST fb Caparol at 2.4 pt/A plus Bueno 6 at 2.6 pt/A at LAYBY, and 5) Staple at 0.5 oz A/A plus Bueno 6 at 1.3 pt/A EPOST fb Staple at 0.5 oz A/A plus Select at 0.5 pt/A POST fb Caparol at 2.4 pt/A plus Bueno 6 at 2.6 pt/A at LAYBY. Herbicide programs for Buctril-resistant cotton included: 1) no herbicide treatment, 2) Prowl at 1.8 pt/A PRE + Cotoran at 2 pt/A PRE fb Buctril at 0.75 pt/A plus Bueno 6 at 1.3 pt/A EPOST fb Caparol at 2.4 pt/A plus Bueno 6 at 2.6 pt/A at LAYBY, 3) the aforementioned system with hand weeding ASN to keep plots weed-free, 4) Prowl at 1.8 pt/A PREBAN fb Buctril at 0.75 pt/A plus Bueno 6 at 1.3 pt/A EPOST fb Buctril at 0.75 pt/A plus Select at 0.5 pt/A POST fb Caparol at 2.4 pt/A plus Bueno 6 at 2.6 pt/A at LAYBY, and 5) Buctril at 0.75 pt/A plus Bueno 6 at 1.3 pt/A EPOST fb Buctril at 0.75 pt/A plus Select at 0.5 pt/A POST fb Caparol at 2.4 pt/A plus Bueno 6 at 2.6 pt/A at LAYBY. Herbicide programs for Roundup-resistant cotton included: 1) no herbicide treatment, 2) Prowl at 1.8 pt/A PRE + Cotoran at 2 pt/A PRE fb Roundup at 2 pt/A EPOST fb Caparol at 2.4 pt/A plus Bueno 6 at 2.6 pt/A at LAYBY, 3) the aforementioned system with hand weeding ASN to keep plots weed-free, 4) Prowl at 1.8 pt/A PREBAN fb Roundup at 2 pt/A ANS fb Caparol at 2.4 pt/A plus Bueno 6 at 2.6 pt/A at LAYBY, and 5) Roundup at 2 pt/A ANS fb Caparol at 2.4 pt/A plus Bueno 6 at 2.6 pt/A at LAYBY.

Tillage did not affect the level of weed control provided by the herbicide systems evaluated. Early-season stunting in strip-tillage cotton was 5% or less, regardless of herbicide system or cultivar and was transient. Excellent (>90%) control of common lambsquarters, Ipomoea species including entireleaf, ivyleaf, pitted, and tall morningglories; jimsonweed, prickly sida, and velvetleaf was achieved with programs containing Buctril, Roundup, and Staple early postemergence (EPOST). Roundup systems provided better and more consistent control of fall panicum, goosegrass, and large crabgrass than Buctril and Staple systems. Buctril and Staple EPOST did not control sicklepod unless applied in mixture with Bueno 6 and followed by (fb) a late postemergence-directed (LAYBY) treatment of Caparol plus Bueno 6. Herbicide systems that included Roundup EPOST controlled sicklepod with or without a soil-applied herbicide treatment. The highest yielding systems included all the Roundup systems and Buctril systems that included a soil-applied herbicide treatment. Non-transgenic systems that included a soil-applied herbicide treatment yielded less than soil-applied treatment plus Roundup EPOST system. Net returns from Roundup systems were generally higher than net returns from Buctril or Staple systems.