

NEW WEED MANAGEMENT PROGRAMS FOR WEED CONTROL IN NO-TILL COTTON

J. W. Wilcut, R. Hayes and S. D. Askew

North Carolina State University

Raleigh, NC

University of Tennessee

Jackson, TN

Abstract

Experiments were conducted at Goldsboro, NC and Milan, TN to investigate weed control, cotton tolerance, and yield of new transgenic cotton varieties (Gossypium hirsutum) with a standard non-transgenic variety, Stoneville 474. The BXN variety used in the study was BXN 47 and the Roundup Ready varieties were Paymaster 1220RR and 1330RR in Tennessee and North Carolina, respectively. There were weed-free checks for the non-transgenic variety, the BXN variety, and the Roundup Ready variety at each location which allowed for direct comparisons of the yield potential. These weed-free plots were treated with Prowl at 39 fl. oz/ac plus Gramoxone at 24 fl. oz. product/ac plus Cotoran at 1.0 quart/ac applied preemergence (PRE). Plots were maintained weed free with additional hand weedings and hand hoeings as needed.

Herbicide systems evaluated for the non-transgenic cotton variety included Gramoxone Extra at 24 fl. oz. product/ac plus Prowl at 39 fl oz/ac plus Cotoran at 1.0 quart/ac PRE followed by (fb) either 1) Cotoran at 1.0 quart/ac plus MSMA at 2.0 lb ai/ac early post-directed (EPDS) fb Bladex at 26 fl. oz/ac plus MSMA at 2.0 lb ai/ac at LAYBY post-directed, or 2) Staple at 1.2 oz product/ac early postemergence over-the-top (EPOST) followed by Bladex plus MSMA at LAYBY. The BXN system used Gramoxone Extra plus Prowl plus Cotoran PRE fb Buctril at 0.5 lb ai/ac EPOST over-the-top fb Bladex plus MSMA at LAYBY. The Roundup Ready systems included 1) Gramoxone Extra plus Prowl plus Cotoran PRE fb Roundup at 1.0 pint/ac EPOST over-the-top fb Bladex plus MSMA at LAYBY, 2) Prowl plus Gramoxone Extra PRE fb Roundup on an as-needed basis (ASN), 3) Roundup ASN fb a LAYBY of Bladex plus MSMA, and 4) Roundup on an as-needed basis with no other herbicides. Roundup Ultra was the formulation of Roundup used and it was applied postemergence over-the-top on 4L cotton or smaller. All applications made after the 4L stage were post-directed or applied under a spray hood to minimize contact with cotton foliage. Buctril and Roundup were not applied with any spray adjuvants while a non-ionic surfactant at 0.25% (v/v) was applied with Staple EPDS and LAYBY treatments.

Sicklepod (Senna obtusifolia) control was at least 94% with all Roundup-containing systems and was better than all

other systems in North Carolina. In Tennessee, sicklepod control was numerically better (at least 90% control) with all Roundup systems except the Roundup ASN plus LAYBY treatment of Bladex plus MSMA. Smooth pigweed (Amaranthus hybridus) control in Tennessee was at least 90% with the Staple system and with all Roundup systems except Roundup ASN plus LAYBY herbicides. Entireleaf (Ipomoea hederacea var. integriuscula) and pitted morningglory (Ipomoea lacunosa) control was at least 90% with all systems in North Carolina. Good control of common cocklebur (Xanthium strumarium) was obtained in Tennessee with the BXN system and with all Roundup systems except the Roundup ASN plus LAYBY herbicide system. Good johnsongrass (Sorghum halepense) control was obtained with all Roundup systems and with the Staple system at the Tennessee location.

In North Carolina, Stoneville 474 was the highest yielding variety in the weed-free part of the study. Equivalent weed-free yield was also obtained with BXN 47. All three varieties (Stoneville 474, BXN 47, and Paymaster 1220RR) yielded similarly in the weed-free study in Tennessee. The highest yielding management system in North Carolina was the standard PDS plus LAYBY system and with all Roundup systems except Roundup ASN with no other herbicides. In Tennessee, the highest yielding systems were Roundup systems that used soil-applied and LAYBY herbicides and Roundup ASN with no other herbicides.