

A BELTWIDE PERSPECTIVE ON NEW WEED MANAGEMENT TECHNOLOGIES IN COTTON

J. W. Wilcut

North Carolina State University

Raleigh, NC

B. J. Brecke

University of Florida

Jay, FL

D. C. Bridges

University of Georgia

Griffin, GA

J. M. Chandler

Texas A&M University

College Station, TX

R. Hayes

University of Tennessee

Jackson, TN

R. L. Nichols

Cotton Incorporated

Raleigh, NC

C. E. Snipes

Mississippi State University

Stoneville, MS

Abstract

Experiments were conducted at seven locations in Florida, Georgia, North Carolina, Mississippi, Tennessee, and Texas to investigate weed control, cotton tolerance, and yield of new transgenic herbicide resistant varieties (Gossypium hirsutum) with standard non-transgenic varieties. The non-transgenic cotton varieties planted included Stoneville 474 in Florida, Georgia, North Carolina, Mississippi, and Tennessee and DPL 50 in Texas. The BXN varieties planted were BXN 47 in all states except Florida (BXN 57). The Roundup Ready varieties included DPL 5690RR in Texas, DPL 5415RR in Georgia and Florida, Paymaster 1220RR in Tennessee, and Paymaster 1330RR in North Carolina. There were weed-free checks for the non-transgenic variety, the BXN variety, and the Roundup Ready variety in each location which allowed for direct comparison of the yield potential. These weed-free plots were treated with Treflan at 1.0 to 1.5 pints/ac preplant incorporated (PPI) plus Cotoran preemergence (PRE) at 2 to 3 pints/acre. Plots were maintained weed free with additional hand weedings.

Herbicide systems evaluated for the non-transgenic cotton varieties included Treflan PPI plus Cotoran PRE fb either 1) Cotoran at 2.0 pints/ac plus MSMA at 2.0 lb ai/ac early post-directed (EPDS) fb Bladex at 26 fl. oz./ac plus MSMA at LAYBY or 2) Staple at 1.2 oz product/ac early postemergence (EPOST) over-the-top fb a LAYBY of Bladex plus MSMA. The BXN system utilized Treflan PPI

fb Cotoran PRE fb Buctril at 0.5 lb ai/ac EPOST by a LAYBY of Bladex plus MSMA. The Roundup systems included 1) Treflan PPI fb Cotoran PRE fb Roundup at 1 to 2 pints/ac EPOST by a LAYBY of Bladex plus MSMA, 2) Treflan PPI fb Roundup as needed (ASN), 3) Roundup ASN fb a LAYBY of Bladex plus MSMA, and 4) Roundup ASN alone 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 on applied under a spray hood to minimize contact with cotton foliage. Buctril and Roundup Ultra were not applied with any spray adjuvants while a non-ionic surfactant at 0.25% was applied with Staple, EPDS, and LAYBY treatments.

Sicklepod control in North Carolina was better with the Roundup systems than with the traditional EPDS plus LAYBY system, the Staple system, or the BXN system. However in Florida and Georgia, sicklepod control was comparable with all systems and technologies. Entireleaf morningglory control was excellent with all herbicide systems in North Carolina and Tennessee and the same results were seen for ivyleaf morningglory control in Texas. In North Carolina, pitted morningglory control was better for systems that used EPOST over-the-top herbicides. Common cocklebur control in Tennessee, common lambsquarters control in North Carolina, velvetleaf control in Texas, and prickly sida control in Tennessee, Georgia, and North Carolina was good to excellent with all systems.

Yields of cotton kept weed-free were comparable for all varieties with only minor and inconsistent differences seen across all locations. All weed management systems except the BXN system conserved at least 90% of the weed-free yields when averaged over all locations. Performance of the Buctril and Staple systems on conserving yield potential suffered in locations infested with sicklepod. This performance would likely be improved by the addition of a low rate of MSMA to Buctril or Staple applied EPOST. Averaged across seven locations, the standard EPDS and LAYBY system yielded 94% of the weed free, the standard plus Staple EPOST yielded 95% of the weed free, the standard BXN system yielded 82% of the weed free, and the standard of Treflan PPI, Cotoran PRE, Roundup EPOST, and a LAYBY yielded 97% of the weed free.

With the Roundup technology, many producers are looking at reducing inputs of other herbicides. Averaged across all locations, Roundup alone ASN systems yielded 98% of the weed free, Roundup plus LAYBY herbicides yielded 91% of the weed free, Treflan plus Roundup yielded 99% of the weed free, and residuals at planting plus at LAYBY plus Roundup EPOST yielded 97% of the weed free. The best weed control, highest yields, and greatest net returns to weed management systems will be consistently provided year after year with management systems that are flexible, adaptive, and consistent over a wide variety of

environmental conditions, weed populations, and densities. Cotton producers now have the luxury of adapting these new technologies to their weed management programs on a field by field basis.