

COTTON HADSS: A TWO-YEAR VALIDATION ON THE TEXAS SOUTHERN HIGH PLAINS. L.L. Lyon, J.W. Keeling, and P.A. Dotray, Texas Agricultural Experiment Station, Lubbock, TX 79403 and Texas Tech University, Lubbock, TX 79409.

ABSTRACT

Field experiments were initiated in 1999 and continued in 2000 at the Texas Agricultural Experiment Station (TAES) near Lubbock to evaluate the Cotton HADSS program in Texas Southern High Plains cotton production. This region differs from other areas that have adopted the Herbicide Application Decision Support System (HADSS) because of its unique growing conditions, cultural practices, weed species, and weed control programs. The experimental design was a randomized block with a split-plot arrangement and four replications. Plot size was 27 by 50 feet. Treatments were evaluated in a natural infestation of Palmer amaranth (*Amaranthus palmeri* S. Wats) and devil's-claw [*Proboscidea louisianica* (Mill.) Thellung]. Treatments included: 1) Treflan preplant incorporated (PPI) at 0.75 lb ai/A followed by (fb) postemergence HADSS recommendations (PPI fb POST HADSS); 2) postemergence HADSS recommendations alone (POST HADSS); 3) TAES recommendations for the Texas Southern High Plains; 4) weed-free check; and 5) untreated check. All treatments were evaluated in Roundup Ready, BXN, and conventional cotton varieties. Weed density was determined and applications were made at the 2- to 3-leaf, 6- to 8-leaf, and 10- to 12-leaf cotton growth stages. Weed control was evaluated 14 days after each treatment and at harvest. Cotton lint yields and net returns over weed control costs were determined for each treatment.

HADSS recommendations paralleled TAES recommendations in the Roundup Ready system in both years. In the Roundup Ready system, Palmer amaranth was controlled >98% in the PPI fb POST HADSS treatments and the TAES recommended treatments, whereas control with POST HADSS was \leq 85%. Season-long devil's-claw control was >95% for all three treatments in both years. Palmer amaranth control in the BXN system with PPI fb POST HADSS and the TAES recommendations was >88%, which was more effective than POST HADSS (55% in 1999 and 5% in 2000). Devil's-claw was controlled at least 95% with PPI fb POST HADSS recommendations and the TAES treatments. POST HADSS controlled devil's-claw 88% in 1999, but was not effective in 2000. In the conventional system, late-season Palmer amaranth was controlled 98% with the TAES recommendations. This control was superior to the PPI fb POST HADSS recommendations (92%) and POST HADSS recommendations (65%). However, in 2000, both PPI fb POST HADSS and TAES recommendations controlled Palmer amaranth >95%. Devil's-claw was controlled 95% with the TAES recommendations and PPI fb POST HADSS, which was superior to POST HADSS (88%). HADSS recommendations differed from TAES recommendations in the BXN and conventional systems both years.

In 1999, the three herbicide treatments produced similar yields within each variety. Net returns over weed control costs increased compared to hand-hoeing and cultivation alone in the Roundup Ready and conventional systems. No differences were seen in net returns between the three treatments in either the Roundup Ready or the conventional systems. In the BXN system, higher net returns were produced with the TAES recommendations compared to the two HADSS recommendation treatments and hand-hoeing and cultivation.

In 2000, the TAES recommendations produced yields equal to the weed-free check and greater than both HADSS treatments in the Roundup Ready system. In the BXN system, the TAES recommendations produced yields greater than the PPI fb POST HADSS recommendations, which were higher than the POST HADSS. The TAES recommendations produced yields similar to the weed-free check. In the conventional system, no differences in yield were seen between the PPI fb POST HADSS, TAES recommendations, and the weed-free check, which were all greater than the POST HADSS. The TAES recommendation produced higher net returns over weed control costs in the Roundup Ready system than either HADSS treatment. The TAES recommendations in the BXN system produced the only positive net returns. In the conventional system, net returns for the PPI fb POST HADSS and TAES recommendations were similar, and the POST HADSS program produced negative net returns over weed control costs. Additional information is needed on the competitiveness of weeds unique to the Texas Southern High Plains and on herbicide efficacy on those weeds for the HADSS program to be effective in all cotton varieties in the region.