PALMER AMARANTH CONTROL IN COTTON, 1994-1996 H. R. Hurst Delta Research and Extension Center Stoneville, MS

<u>Abstract</u>

Cotton ('DES 119' in 1994 and 1995 or 'SG 125' in 1996) was planted on a silt loam soil site on May 16, 1994; May 2, 1995; and May 6, 1996. The area was naturally infested with pigweeds. The predominate species was Palmer amaranth (Amaranthus palmeri S. Wats.) with some smooth pigweed (A. hybridus L.). In mid-April 1994, the entire area was disk-harrowed two times at an angle to the row direction, and a finishing harrow was used prior to planting. All treatments in 1995 and 1996 were applied to killed standing wheat stubble previously treated with Gramoxone Extra ® 0.75 lb + Karmex ® 0.25 lb in March 1995 and with Roundup D-Pak® 0.75 lb + Goal® 0.2 lb in March 1996. Gramoxone Extra 0.94 lb was applied at planting in 1995 and 1996. Preplant incorporated treatments were soil incorporated with a 4-row tandem disk harrow in the row direction one time in 1995 and two times in 1996 without prior land preparation. Sixteen treatment combinations of preplant incorporated (PPI), preemergence (PRE), and postemergence (over-the-top PO-OT or directed PO-DIR) herbicides were used in a randomized complete block design with 4 replications. Individual plots were four, 40inch rows 40 feet long. All data were obtained from the two center rows of each plot. Evaluations were made from crop/weed counts, estimated visual weed control/crop injury (0 = no control/injury, 100 = complete control/injury), and seed cotton yield. Weed counts on June 7, 1994 resulted in Palmer amaranth reductions of 12 to 99% below the noherbicide check. In mid-July 1994, treatments with 90% or greater pigweed control were Treflan® 0.5 lb PPI followed by (fb) Staple® 0.063 lb PO-OT 27 days after planting (DAP) fb Accent® 0.038 lb + Staple 0.032 lb PO-OT 54 DAP (90%), Treflan 0.75 lb PPI fb Staple 0.032 lb PO-OT 27 DAP fb Accent 0.0025 lb + Staple 0.032 lb PO-OT 54 DAP (91%), Prowl® 1.25 lb + Cotoran® 1.25 lb PRE fb Beacon[®] 0.021 lb PO-DIR 30 DAP (90%), and Bladex[®] 0.5 lb + Command® 0.75 lb PRE fb Beacon 0.021 lb PO-DIR 30 DAP fb Accent 0.008 lb + Staple 0.032 lb PO-OT 41 DAP (95%). Most of the herbicide treatments were repeated on the same plots in 1995. Treatments with >90% control in late-July were Prowl 1.25 lb + Cotoran 1.25 lb PRE fb Beacon 0.021 lb PO-DIR 43 DAP (91%). Bladex 0.5 lb + Staple 0.063 lb PRE (97%), Prowl 1.0 lb PPI fb Staple 0.047 lb PRE fb Staple 0.063 lb PO-OT 58 DAP (100%), and cultivate + hand hoe weed-free check (100%). All treatments except the no-herbicide checks in 1995 were

Reprinted from the *Proceedings of the Beltwide Cotton Conference* Volume 1:804-805 (1997) National Cotton Council, Memphis TN cultivated as needed, leaving an undisturbed band of 12 inches centered on the row.

In mid-June 1996, treatments with >90% control were Bladex 0.5 lb + Staple 0.063 lb PRE (91%), Prowl 1.25 lb PRE fb Staple 0.063 PO-OT (all Post treatments were OT in 1996) 16 DAP (97%), Prowl 1.0 lb PPI fb Staple 0.047 lb PRE (95%), Treflan 0.75 lb PPI fb Staple 0.032 lb PO-OT 16 and 35 DAP (91%), Command 0.75 lb PRE fb Staple 0.032 lb PO-OT 16 and 35 DAP (92%), and cultivate/hoe check (99%). All treatments in 1996 were cultivated, leaving an undisturbed band of 12 inches centered on the row. By harvest only the cultivate/hoe check (99%) and Treflan 0.75 lb PPI fb Command 0.75 lb + Staple 0.047 lb PRE (91%) gave >90% control. Treatments with Bladex 0.5 lb + Staple 0.063 lb PRE had 88% and Prowl 1.0 lb PPI fb Staple 0.047 lb PRE had 89% Palmer amaranth control at harvest.

Cotton stand was not affected by any treatment in either year, averaging 37,600 plants/A in 1994, 39,100 plants/A in 1995, and 42,900 plants/A in 1996. Seed cotton yield in 1994 was very low due to late-planting and excessive rainfall during July and August. This resulted in excessive vegetative plant growth. The seed cotton yield ranged from 716 to 1164 lb/A in 1994. The no-herbicide check yield was 0 while the cultivate /hand hoe check treatment yielded 756 lb/A. Yield from the treatment with Treflan 0.75 lb PPI fb Command 0.75 lb PRE fb Buctril® 0.375 lb PO-DIR 30 DAP fb Staple 0.032 lb PO-OT 41 DAP (1164 lb/A) and the treatment with Treflan 0.75 lb PPI fb Staple 0.032 lb PO-OT 27 and 37 DAP (1137 lb/A) produced higher yields than the treatment with Bladex 0.5 lb + Command 0.75 lb PRE fb Beacon 0.021 lb PO-DIR 30 DAP fb Accent 0.008 lb + Staple 0.032 lb PO-OT 41 DAP (716 lb/A). All herbicide treatments were greater than the no-herbicide check. In 1995, the 1994 treatment with Prowl 1.0 lb PPI fb Staple 0.063 lb PO-OT 27 DAP was left untreated. Both this treatment and the no-herbicide check did not yield any seed cotton (neither was cultivated) and were lower than all other treatments. The greatest 1995 yield (2521 lb/A) was from the treatment with Prowl 1.0 lb PPI fb Staple 0.047 lb PRE fb Staple 0.063 lb PO-OT 58 DAP which was greater than all other treatments. The least yield from any herbicide treatment was with Bladex 0.5 lb + Zorial® 1.5 lb PRE fb Buctril 0.375 lb PO-DIR 43 DAP (1631 lb/A). Generally PO-DIR applications did not provide sufficient spray coverage on weed plants for effective control.

In 1996, seed cotton yields generally were similar to 1995. They ranged from a low of 329 lb/A for the no-herbicide check (this treatment was cultivated in 1996) to a high of 2625 lb/A with the treatment of Prowl 1.0 lb PPI fb Staple 0.047 lb PRE. Treatments with seed cotton yields which were not different from the greatest yielding treatment included all those listed above giving >90% Palmer amaranth control in June and /or at harvest and Treflan 0.75 lb PPI fb Staple 0.032 lb PO-OT 16 and 35 DAP, Treflan 0.5 lb + Zorial 0.63 lb PPI fb Zorial 0.63 lb PRE fb Staple 0.032 lb PO-OT 35 DAP, Bladex 0.5 lb + Zorial 1.5 lb PRE fb Staple 0.032 lb PO-OT 16 DAP, and Bladex 0.5 lb + Command 0.75 PRE fb Staple 0.032 PO-OT at 16 DAP.