WEED CONTROL AND COTTON TOLERANCE TO TOPICAL AND POST-DIRECTED APPLICATIONS OF ROUNDUP ULTRA

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Abstract

Field studies were conducted in 1996 at the Black Belt Branch Experiment Station at Brooksville, MS, the Plant Science Research Center at Starkville, MS, and the Delta Research and Extension Center at Stoneville, MS to evaluate Roundup Ready cotton tolerance and weed control efficacy to postemergence over-the-top (POT) and post-directed (PD) applications of Roundup Ultra.

The tolerance trial included various application timings and spray heights for post-directing Roundup Ultra. All treatments were overlayed POT with 1.0 lb ai/A Roundup Ultra, when cotton was in the 3-4 leaf stage. Post directed applications were applied as basal treatments or directed upon the plant to a percentage of their average height. Post-directed applications of Roundup Ultra at 1.5 lb ai/A were made at the 6-leaf stage (base of plant and 25% of plant height); 10-leaf stage (base of plant and 25% of plant height); 14-leaf stage (base of plant, 25% and 33% of plant height). Two sequential post-directed applications were made, 10-leaf base followed by 14-leaf (25%), and 10-leaf (25%) followed by 14-lf (25%). Treatments were arranged in a randomized complete block design with six replications. Data taken during the growing season included visual crop injury and plant heights. Prior to harvest, plant heights and plant map data (total fruit on bottom 5 nodes, total first position fruit at harvest, and nodes per plant) were recorded. All data were subjected to analysis of variance and means were separated with Fishers's protected LSD.

No visual crop injury was observed from any herbicide application, regardless of application timing or spray height. Plant height data indicated no difference in plant height among treatments during the growing season and at harvest. Likewise, no differences were found in any of the plant mapping parameters recorded, and cotton lint yield per acre did not differ among treatments.

Efficacy trials were centered around the evaluation of two problem weeds of which there is some concern over the effectiveness of Roundup Ultra. Experiments were conducted at the Brooksville and Stoneville locations. Treatments were arranged factorially as a two factor factorial in a randomized complete block design . Fastor A consisted of the following soil applied residual herbicides: 1.0 lb ai/A Prowl; 1.0 lb ai/A Prowl plus 0.8 lb ai/A Cotoran; 1.0 lb ai/A Zorial; and a soil applied herbicide check. Factor B consisted of postemergence applications of: 1.0 oz ai/A Staple (2 leaf) followed by 1.0 oz ai/A Staple (4 leaf); 1.0 lb ai/A Roundup Ultra (2 leaf); 1.0 lb ai/A Roundup Ultra (2 leaf) followed by 0.75 lb ai/A Roundup Ultra (4 leaf); and a postemergence check. Weeds evaluated were hemp sesbania [*Sesbania exaltata* (Raf.) Rydb.], and pitted morningglory (*Ipomoea lacunosa* L.) Data were analyzed as a factorial by analysis of variance and means were separated with Fishers's protected LSD.

At both locations, across all rating dates, and regardless of PRE treatment, two applications of Staple controlled hemp sesbania 90% or greater. At the final rating date, averaging across locations, hemp sesbania control was 79% with a single application of Roundup Ultra (2 leaf) when a PRE of Prowl plus Cotoran was used. Control was significantly lower (56-66%) with the other PRE applications with a single application of Roundup Ultra. The use of two applications of Roundup Ultra (final rating date) increased control in all cases over a single application. Prowl plus Cotoran with two applications of Roundup Ultra controlled hemp sesbania 92%. Two applications of Staple, averaged across location at the first rating date, controlled pitted morningglory 85-93%, except for 77% control with the use of Zorial PRE. A single application of Roundup at the first rating date controlled pitted morningglory 71-84%.

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