

**POSTEMERGENCE WEED CONTROL AND TOLERANCE IN
GLYPHOSATE TOLERANT COTTON**

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Abstract

Syngenta Ag Products will introduce Touchdown with IQ Technology, a new glyphosate formulation, for broad spectrum weed control in glyphosate tolerant cotton, corn, and soybean in 2001. This novel formulation has been researched to determine the attributes of the composition. Attributes, such as the speed of cuticle penetration, translocation throughout a plants vascular system, and the percentage of glyphosate penetration into a target plant. Extensive University and in-house studies were established in 2000 including over 50 trials conducted in glyphosate tolerant cotton throughout the cotton growing regions of the United States.

Sixteen trials were conducted evaluating cotton crop tolerance and yield performance following applications of Touchdown in nine states in 2000. Both spinner and stripper cotton varieties were use in these studies. Standard pre and post-emergence herbicides were used throughout the trial areas to maintain weed-free environments. Glyphosate treatments included Touchdown and Roundup Ultra applied at 0.75 lb ae/A as single and split applications made to cotton in the 1 and 4 leaf stage of growth. When cotton crop response was observed, it was expressed as chlorosis or stunting and was identical between Touchdown and Roundup Ultra. This crop response was expressed under cool, damp, and cloudy environmental conditions. There were no differences in cotton yield in any of the trials between the Touchdown or Roundup Ultra treatments, or compared to the glyphosate-free herbicide programs.

Twenty-one trials were conducted evaluating weed efficacy in glyphosate tolerant cotton following applications of Touchdown in twelve states in 2000. Both spinner and stripper cotton varieties were use in these studies. Post-emergence herbicide treatments included Touchdown or Roundup Ultra at 0.75 lb ae/A applied as single applications made to cotton in the 1 and 4 leaf stage of growth and split applications of Touchdown and Roundup Ultra at 0.75 lb ae/A followed by (fb.) Touchdown or Roundup Ultra at 0.56 or 0.75 lb ae/A to cotton in the 1 fb. 4 leaf stage of growth. Additional treatments included Prowl at 0.83 lb ai/A + Cotoran at 1.0 lb ai/A applied pre-emergence fb. post emergence treatments of Touchdown or Roundup Ultra at 0.75 lb ae/A fb. Touchdown or Roundup Ultra at 0.75 lb ae/A at the 1 and 4 leaf stage of cotton growth. Weed control from 24 different weed species were reported in these trials.

Results from these weed efficacy trials indicated that there were no differences between Touchdown and Roundup Ultra for 21 of the 24 species evaluated. Differences in performance of Touchdown and Roundup Ultra were reported in five of seven trials evaluating pitted morningglory (*Ipomoea lacunosa*). Two trials reported significantly better pitted morningglory control when Touchdown was applied as a single application to 2 leaf cotton compared to Roundup Ultra, and two trials reported significantly better control from Touchdown when it was applied as a single application to 4 leaf cotton compared to Roundup Ultra. One trial reported significantly better pitted morningglory control when Roundup Ultra was applied as a single application to 4 leaf cotton compared to Touchdown. For split application treatments, two trials reported significantly better pitted morningglory control when Touchdown was applied compared to Roundup Ultra. Differences in performance of Touchdown and Roundup

Ultra were reported in one trial each for velvetleaf (*Abutilon theophrasti*) and prickly sida (*Sida spinosa*). In both cases, Touchdown provided significantly better control of these species when it was applied as a single application at the 4 leaf cotton stage compared to Roundup Ultra.

Yield results from the efficacy trials indicated cotton yield from Touchdown and Roundup Ultra treatments were similar when applied at equivalent rates and timings. Results showed that cotton yield was generally higher when Touchdown and Roundup Ultra were applied following pre-emergence treatments. This would indicate that Touchdown and Roundup Ultra should only be utilized a part of the total weed control program in glyphosate tolerant cotton. Results also indicated that for weed species that are difficult to control with glyphosate herbicides such as *Ipomoea morningglories* spp., prickly sida, hemp sesbania (*Sesbania exaltata*), sicklepod (*Cassia obtusifolia*), and smallflower morningglory (*Jacquemontia tamnifolia*), sequential applications or pre-emergence herbicides will be necessary to provide consistently effective weed control.