

**CONTROL OF GLYPHOSATE TOLERANT SOYBEANS (*Glycine max*)
IN NO-TILL ROUNDUP READY™ COTTON (*Gossypium hirsutum L.*)**

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Abstract

Glyphosate tolerant soybean can infest cotton grown in rotation with Roundup Ready™ soybeans. Volunteer soybeans are most commonly observed in fields under no-till production. Two experiments were conducted in 2001 to determine preemergence burndown (PRE), post-emergence (POST) and post-directed (PD) herbicides and treatment methods that most effectively control glyphosate tolerant soybean in Roundup Ready Cotton. These two experiments were conducted at six locations. One study was conducted at two and the other at four locations. The studies were conducted in the northern cotton belt of Arkansas, Missouri and Tennessee.

Herbicides were preliminarily screened for soybean activity in 2000. PRE herbicide treatments selected for experiments conducted in 2001 included: Gramoxone Extra (paraquat) 0.313 lb ai/A alone, Roundup UltraMAX (glyphosate) at 0.75 lb ae/A tankmixed with Gramoxone Extra at 0.235 lb ai/A, 0.118 lb ai/A or 0.06 lb ai/A. PRE treatments of Valor (flumioxazin) at 0.078 lb ai/A, Direx (diuron) at 0.5 lb ai/A, Caparol (prometryn) 0.8 lb ai/A, 2,4-D ester at 0.8 lb ai/A or Clarity (dicamba) 0.25 lb ai/A in tankmix with Roundup UltraMAX at 0.75 lb ae/A were included for control of soybeans in this experiment.

The same tankmix treatments of Gramoxone Extra in combination with Roundup UltraMAX were applied PD in a separate experiment using 32% UAN as a carrier spray solution. Gramoxone Extra at 0.235 lb ai/A plus Roundup UltraMAX at 0.75 lb ae/A was also applied using water plus nonionic surfactant at 0.25% v/v as a carrier. Other PD treatments examined in this study included: Roundup UltraMAX at 0.75 lb ae/A plus Caparol at 0.8 lb ai/A, Cotoran (fluometuron) at 0.5 lb ai/A or Direx at 0.5 lb ai/A. Staple (pyrithiobac-sodium) at 0.6 oz/A was applied POST in combination with Roundup at .56 lb ae/A at the 2 or 4 leaf cotton growth stage.

PRE applied Gramoxone Extra 0.313 lb ai/A and Roundup UltraMAX at 0.75 lb ae/A tankmixed with Gramoxone Extra 0.235 lb ai/A provided acceptable control of volunteer soybean. PRE treatments with lower rates of Gramoxone tankmixed with Roundup UltraMax failed. Direx at 0.5 lb ai/A, Caparol 0.8 lb ai/A, 2,4-D ester at 0.8 lb ai/A and Clarity 0.25 lb ai/A controlled volunteer soybean when applied in combination with Roundup UltraMAX at 0.75 lb ae/A as a PRE. Roundup UltraMAX at 0.75 lb ae/A tankmixed with Valor at 0.078 lb ai/A did not control soybean. An unacceptable level of cotton injury was observed from the 2,4-D treatment. Cotton was planted within 7 days after PRE burndown herbicide application.

Soybean control with PD and POST treatments was more variable than with PRE treatments. PD treatments that performed well across locations were: 0.235 lb ai/A of Gramoxone Extra plus Roundup UltraMAX at 0.75 lb ae/A applied in water or 32-0-0. Roundup UltraMAX at 0.75 lb ae/A in combinations with Caparol at 0.8 lb ai/A, Cotoran at 0.5 lb ai/A or Direx at 0.5 lb ai/A provided relatively high levels of soybean control when applied PD. Control of soybean was highly variable across locations with Staple at 0.6 oz/A applied POST at both the 2 and 4 leaf cotton growth stage.

Yield was measured in four studies. Treatments of Roundup UltraMAX plus Direx or Staple preserved yield best in comparison to other treatments at Keiser, AR. Soybeans did affect cotton yield in three experiments at Jackson and Union City, TN.