

**WEED MANAGEMENT IN CONSERVATION
TILLAGE SYSTEMS USING ROUNDUP IN
ROUNDUP READY COTTON**
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Abstract

Conservation tillage production systems using a wheat or rye cover crop have gained acceptance on the Texas High Plains but effective weed control is often more difficult to achieve than in conventional tillage systems. Field studies were conducted at two locations on the Texas High Plains in 1996 to evaluate weed management in conservation tillage systems with postemergence topical (PT) glyphosate (Roundup Ultra) applications in Roundup Ready® Cotton. At each site, rye was planted as a winter cover crop and terminated 2-3 weeks prior to cotton planting. Roundup Ready cotton (PM 2326RR) was planted on May 21 without tillage. Conservation tillage herbicide systems at each location included 1) glyphosate only; 2) glyphosate and prometryn post-directed (PD) layby; 3) trifluralin incorporated by chemigation (PPI) and prometryn PE and glyphosate; and 4) trifluralin PPI and prometryn PE. Trifluralin PPI and prometryn PE were used in the conventional tillage system. Conservation tillage treatments were cultivated once during the growing season while conventional tillage plants were cultivated three times. Both conventional and conservation tillage treatments not treated with glyphosate were hand-hoed. Plots at Location I were 8 rows by 300 ft with three replications and plots at Location II were 24 rows by 300 ft with 3 replications. Both locations were irrigated as needed throughout the growing season.

At Location I, weed species included Palmer amaranth (Amaranthus palmeri), Russian thistle (Salsola iberica), lanceleaf sage (Salvia reflexa), devil's-claw (Proboscidea louisianica), and silverleaf nightshade (Solanum elaeagnifolium). The addition of glyphosate to the standard soil-applied herbicides improved control for all species, especially silverleaf nightshade. When glyphosate was used alone or in conjunction with a lay-by residual herbicide, less effective Palmer amaranth, devil's-claw, and lanceleaf sage control was achieved compared to the glyphosate treatment plus a PPI and PE herbicide. Russian thistle control was reduced with the elimination of soil applied herbicides. The most effective season-long control of all species was achieved with the PPI plus PE herbicide followed by glyphosate PT.

At Location II, Palmer amaranth, Russian thistle, kochia (Kochia scoparia), puncturevine, (Tribulus terrestris) and

morningglory (Ipomoea spp.) species were the predominant weed species. The addition of glyphosate to the standard soil herbicides improved morningglory and puncturevine control. When glyphosate was used without a PPI or PE herbicide, morningglory and Russian thistle control declined significantly. Similar to Location I, the most effective season-long control of all weed species was achieved with the addition of glyphosate to standard soil-applied herbicide treatments. This system produced the highest yield at each location.