

**PERENNIAL WEED MANAGEMENT IN  
ROUNDUP READY (GLYPHOSATE-TOLERANT)  
AND BXN (BROMOXYNIL-TOLERANT)  
COTTON ON THE TEXAS SOUTHERN  
HIGH PLAINS**

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Transgenic crops provide producers with several new options to control perennial weeds. Producers on the Texas Southern High Plains use preplant incorporated and preemergence herbicides to control many annual weed species. However, these herbicides have little activity on perennial weeds such as silverleaf nightshade (*Solanum elaeagnifolium*), woollyleaf bursage (*Ambrosia grayi*), and field bindweed (*Convolvulus arvensis*). Traditional perennial weed management includes in-season spot-spraying, fall applications, or preplant applications. The use of Roundup Ultra (glyphosate) in Roundup Ready cotton and Buctril (bromoxynil) in BXN cotton provide new options to control many of these perennial weeds in-season. The objectives of this research are: 1) to evaluate Roundup Ultra and Buctril applied alone or in combination with cultivation for perennial weed control; 2) to determine effects of weed control systems on cotton yield and net economic returns; and 3) to evaluate perennial weed control after each season of treatments.

Field studies were established in 1998 and repeated in 1999 at the Texas Agricultural Experiment Stations in Lubbock and Halfway, TX and at the Texas Tech Research Station near New Deal, TX. The Lubbock location was heavily infested with silverleaf nightshade, and the Halfway and New Deal locations were heavily infested with woollyleaf bursage and field bindweed, respectively. The experimental design at each location was a complete randomized block with 3 replications. Plot sizes ranged from 13 by 30 feet to 13 by 100 feet depending on weed density. Roundup Ultra and Buctril were applied three times throughout the growing season. All herbicide treatments were used with and without cultivation. Roundup Ultra at 0.75 lb ae/A was applied postemergence topical (PT) and postemergence-directed (PD). Buctril at 0.5 lb ai/A was applied PT. These applications were made when the cotton had 1-2 leaves, 3-4 leaves, and at first bloom. Commercial standard weed control systems were used at each location and compared to the Roundup Ready and BXN systems. The commercial standard system for silverleaf nightshade was a post-harvest treatment of Roundup Ultra at 1.5 lb ae/A. This treatment was applied to silverleaf nightshade in the green berry stage. The commercial standard for woollyleaf bursage control was

MSMA at 1.5 lb ai/A applied to cotton at the 2-3 leaf stage followed by Banvel (dicamba) at 1.0 lb ai/A applied post-harvest. The commercial standard for field bindweed was a post-harvest treatment of Banvel at 1.0 lb ai/A. Weed control ratings were recorded in 1998, prior to treatments in 1999, and 14 days after all in-season applications in 1999. Prior to any herbicide treatment in 1999, weed densities were recorded to determine the effect of the 1998 treatments.

Late season silverleaf nightshade control by Roundup Ultra and Buctril was 88% and 68%, respectively. When cultivation was added, Roundup Ultra and Buctril controlled silverleaf nightshade 99% and 89%, respectively. Roundup Ultra controlled field bindweed 88%. Field bindweed control increased to 94% when cultivation was added. Buctril controlled field bindweed 62% without cultivation and 72% when cultivation was added. Roundup Ultra controlled woollyleaf bursage 92%, and control increased to 98% when cultivation was added. Buctril controlled woollyleaf bursage 50% without cultivation, and control increased to 78% with cultivation. Cultivation alone did not effectively control any of the three weed species.

Both Roundup Ready and BXN cotton perennial weed control systems increased yields and net returns over weed control costs compared to cultivation alone for all weed species. Long-term weed control will be evaluated to determine which system provides the greatest reduction in weed populations over time.