

**PERENNIAL WEED CONTROL WITH
ROUNDUP READY AND BXN COTTON**

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Abstract

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 which provide effective control of many annual weed species. However, these herbicides have little activity on perennial weeds such as silverleaf nightshade (*Solanum eleagnifolium*), woollyleaf bursage (*Ambrosia grayi*), and field bindweed (*Convolvus arvensis*). These weeds are becoming a problem as they infest more acreage each year. The use of Roundup Ultra in Roundup Ready cotton and Buctril in BXN cotton provide new options to control many of these perennial problem weeds in-season. The objectives of this research are: 1) to evaluate Roundup Ultra and Buctril applications alone or in combination with cultivation for perennial weed control; 2) to determine effects of weed control systems on cotton yield and economic returns; and 3) to evaluate perennial weed control in the years following applications to determine the long-term control of these weeds.

Field studies were conducted at the Texas Agricultural Experiment Station 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 were 13.3 feet by 30 feet to 13.3 feet by 100 feet and varied with weed species. Roundup Ultra and Buctril were applied three times throughout the growing season. All of these herbicide treatments were used with and without cultivation. Roundup Ultra at time of 0.75 lb ae/A was applied postemergence topical (PT) and postemergence-directed (PD). Buctril was applied PT at 0.5 lb ai/A. These applications were made when the cotton had 1-2 leaves, 3-4 leaves, and when cotton was at first bloom. Commercial standard weed control systems were used at each location and compared to the Roundup Ready and

BXN systems. Weed control ratings were recorded 14 days after all applications at each location.

After the initial treatments, Roundup Ultra controlled silverleaf nightshade 79%, while Buctril provided 68% control. When cultivation was added to the herbicide treatments, Roundup Ultra and Buctril provided 99% and 96% silverleaf nightshade control respectively. Field bindweed was controlled 82% with Roundup Ultra and 48% with Buctril. Field bindweed control increased to 85% and 68% respectively when cultivation was added. Woollyleaf bursage was controlled 82% by Roundup Ultra and 65% with Buctril. When cultivation was added to these treatments control increased to 92% and 86% respectively.

The second treatment maintained control levels provided by the initial treatments. Roundup Ultra provided 78% control of silverleaf nightshade, while Buctril provided 62% control. Silverleaf nightshade control increased to 96% when cultivation was added to Roundup Ultra and 92% when added to Buctril. Field bindweed was controlled 79% with Roundup Ultra and 62% with Buctril. Added cultivation proved to have little effect on either system, providing 76% control for both Roundup Ultra and Buctril. Woollyleaf bursage was controlled 82% with Roundup Ultra and 62% with Buctril. When cultivation was added to these treatments control increased to 92% and 75% respectively.

Late season silverleaf nightshade control with Roundup Ultra averaged 72%, while Buctril provided 57% control. When cultivation was added to Roundup Ultra and Buctril systems, silverleaf nightshade control increased to 95% and 86% respectively. Roundup Ultra controlled field bindweed 82% and control increased to 89% when cultivation was added. Buctril controlled field bindweed 40% without cultivation and 72% when cultivation was added. Roundup Ultra controlled woollyleaf bursage 72%, and control increased to 89% when cultivation was added. Buctril controlled woollyleaf bursage 43% without cultivation, and control increased to 78% with cultivation. Cultivation alone did not control any of the three weed species.

Both Roundup Ready and BXN cotton weed control systems increased 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 greatest reduction in weed populations over time.