WEED MANAGEMENT IN ROUNDUP READY® COTTON CROPPING SYSTEMS

A. L. Helm, J. W. Keeling, P. A. Dotray and D. T. Carmichael
Texas Agricultural Extension Service
Texas Agricultural Experiment Station
Lubbock, TX

Abstract

Conservation tillage cotton cropping systems using a winter cover crop have increased the need for better weed management practices without the use of cultivation. Two conservation tillage-cropping systems were compared to conventional tillage at the AG-CARES research farm near Lamesa, TX, in 1999 and 2000 to evaluate the use of glyphosate applied postemergence-topical (PT) and postemergence-directed (PD) in Roundup Ready® cotton. The two conservation tillage systems consisted of cotton planted in 40-inch rows planted in terminated rye and a rotational system consisting rye and sorghum followed by cotton (R-S-C). Rye was planted as a winter cover crop on November 10, 1999 and November 15, 2000 in the conservation tillage 40-inch rows and terminated on March 26, 1999 and March 14, 2000. All weed management systems consisted of the same treatments 1) pendimethalin preplant at 0.75 lb ai/A and mechanically incorporated in the conventional tillage system. Pendimethalin 1.2 lb ai/A was applied to the conservation tillage systems and incorporated with 0.75 inches of irrigation fb prometryn PRE at 0.75 lb ai/A and incorporated with 0.5 inches of irrigation + cultivation (2X) + spot spray (glyphosate at 2%) + hand hoe; 2) pendimethalin fb glyphosate PT fb PD at a rate of 0.75 lb ae/A; 3) glyphosate PT fb PD. Each plot was 26 feet by 300 feet with three replications and received 13 inches of irrigation in 1999 and 17 inches of irrigation in 2000 through a LEPA irrigation system. Two Paymaster varieties (HS26 and PM 2326RR) were planted on May 12, 1999 and May 10, 2000. The variety HS26 was planted in the treatments that did not receive any glyphosate applications.

Prior to any of the glyphosate applications, treatments 1 and 2 both provided 90-100% control of both Palmer amaranth (*Amaranthus palmeri*) and 60-100% control of Russian thistle (*Salsola iberica*). Fall applications of glyphosate provided 60-95% control of silverleaf nightshade (*Solanum elaeagnifolium*) in the treatments that did not include glyphosate as an in-season application. Glyphosate applications made in-season in 1998 and 1999 provided good long-term control of silverleaf nightshade. In all systems, residual herbicides followed by two applications of glyphosate provided at least the same level of control as the residual herbicides + cultivation. Glyphosate PT fb PD controlled silverleaf nightshade and Russian thistle, but Palmer amaranth control was less effective. Season-long Palmer amaranth control with the residual herbicides + glyphosate PT fb PD gave similar control when compared to the residual herbicides + cultivation + spot spray + hand hoe treatment. However, glyphosate alone did not provide the same level of Palmer amaranth control. In the conventional tillage system, residual herbicides + glyphosate provided higher net returns in 1999, while glyphosate alone provided higher net returns in 2000. Glyphosate alone gave higher net returns in the conservation tillage 40-inch rows and the rotation systems in 1999. Residual herbicides + glyphosate PT fb PD provided higher net returns in the rotation systems in 2000.

Reprinted from the *Proceedings of the Beltwide Cotton Conference*
Volume 2:1228-1228 (2001)
National Cotton Council, Memphis TN