

WEED COMPETITION AND MANAGEMENT IN ROUNDUP READY FLEX COTTON

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Abstract

The Texas High Plains continues to plant a large number of acres to Roundup Ready cotton varieties because effective control of a wide range of annual and perennial weeds is achieved with glyphosate. The current Roundup Ready technologies allow postemergence over-the-top (POST) applications up to the 5-leaf cotton growth stage. This application window is often narrow due to wet or windy conditions that make it difficult to treat large acreages. The development of Roundup Ready Flex varieties with increased tolerance will allow POST applications beyond the 5-leaf cotton growth stage with the additional benefit of higher glyphosate rates for improved control of more difficult-to-control weeds. Tolerance tests on Roundup Ready Flex lines continue to exhibit excellent tolerance to POST glyphosate applications up to the 14-leaf cotton growth stage at rates 2 to 3 times higher than the currently used rate in Roundup Ready cotton.

Field experiments were conducted in 2003 and 2004 at the Texas Agricultural Experiment Station near Lubbock to evaluate glyphosate rates and timings for optimum control of Palmer amaranth (*Amaranthus palmeri*), devil's-claw (*Proboscidea louisianica*), ivyleaf morningglory (*Ipomoea hederaceae*), and silverleaf nightshade (*Solanum elaeagnifolium*) in Roundup Ready Flex cotton. Glyphosate was applied at 0.75 and 1.5 lb ae/A. Treatments based on cotton growth stage were compared to as-needed treatments based on weed population and size. Trifluralin at 0.75 lb ai/A was applied preplant incorporated (PPI) to all test areas. Another experiment was conducted in 2004 to evaluate timing of residual herbicide use in conjunction with glyphosate to control Palmer amaranth and devil's-claw. Glyphosate was applied at 0.75 lb ae/A alone or following trifluralin PPI at 0.75lb ai/A, or in combination with metolachlor at 1.0 lb ai/A POST or pyrithiobac at 0.036 lb ai/A POST.

Excellent Palmer amaranth, devil's-claw, and silverleaf nightshade control (> 90%) was achieved with POST treatments based either on cotton growth stage or as needed applications in both years. For these weeds, effective control was achieved with 0.75 lb ae/A treatments, with no benefit from higher glyphosate rates. In both years ivyleaf morningglory control was improved with an increase in glyphosate rate to 1.5 lb ae/A. In 2003, effective ivyleaf morningglory control was achieved with four POST applications applied as needed beginning at the 2-leaf cotton growth stage, with the last treatment applied at the 20-leaf cotton growth stage. By delaying the first application, only three POST treatments were required when applied at the 1.5 lb ae/A rate to achieve similar control. In 2004 with increased rainfall and weed pressure, five applications of glyphosate at 1.5 lb ae/A were required for effective control (> 90%). In 2004 the addition of a soil residual herbicide (trifluralin PPI, metolachlor or pyrithiobac POST) reduced the number of in-season glyphosate applications by one (from three to two) for season-long Palmer amaranth and devil's-claw control.