

**CONTROL OF PALMER AMARANTH IN GLYTOL™ + LIBERTYLINK® COTTON**

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**Abstract**

Palmer amaranth (*Amaranthus palmeri*) remains the most common weed in cotton fields on the Texas High Plains. Continuing use of glyphosate in this region has led to weed population shifts such that weeds that are difficult to control with glyphosate are becoming more common in fields. Cotton varieties containing both GlyTol® and LibertyLink® traits will be commercialized as GlyTol® + LibertyLink® (GL) cotton in 2011. GL technology offers producers the potential to manage weeds in cotton with over-the-top applications of two herbicides with two different mechanisms of action.

Field trials were conducted in Lubbock, TX in 2010 to determine optimum tank-mix and sequential applications of Roundup PowerMax (RUPM) and Ignite 280 in GL cotton to control Palmer amaranth. In order to determine optimum tank-mix applications, two trials were conducted. The first included RUPM and Ignite 280 applied at varying tank-mix rates (1X:1X, 1X:0.75X, 1X:0.5X, 1X:0.25X and 1X:0X for each herbicide). The second included RUPM and Ignite 280 applied at an overall 1X rate but varying proportions of each (1X:0X, 0.75X:0.25X, 0.5X:0.5X, 0.25X:0.75X, and 0X:1X). 1X rate of RUPM corresponded to 22 oz/A while 1X rate of Ignite 280 corresponded to 29 oz/A. All treatments were applied postemergence (POST) to 2-4 inch weeds and to 5-10 inch weeds.

A third trial evaluated sequential applications of RUPM and Ignite 280 in an overall weed management system. All treatments included a preplant incorporated (PPI) application of Prowl H<sub>2</sub>O at 1qt/A. Early-post (EPOST) and mid-post (MPOST) treatments of RUPM at 22 oz/A and Ignite 280 at 29 oz/A were applied in all possible sequential combinations. PPI and POST herbicide applications were made using a tractor-mounted compressed-air or a backpack CO<sub>2</sub>-presurized sprayer calibrated to deliver 10 gallons per acre. For all experiments, FM 9250GL was planted on May 19 on 30-inch rows and treated with Temik at 3.5 lb ai/A. Plots were 4 rows by 30 feet in length with three replications. Weed control was visually estimated based on a standard scale of 0 to 100% where 0 = no weed control and 100 = complete weed control. In the systems trial, the middle two rows of each plot were mechanically harvested with a John Deere 7445 two-row cotton stripper and cotton lint weights recorded.

Results indicated that tank-mixes of RUPM and Ignite 280 reduced control of Palmer amaranth compared to RUPM alone. When applied to 2-4 in weeds, tank-mix combinations of both herbicides were less effective controlling Palmer amaranth (85-92%) than RUPM (99%). Control of 5-10 in weeds declined with tank-mixes (57-72%) compared to RUPM (92%). Proportional tank-mix combinations on 2-4 in weeds provided less effective Palmer amaranth control (90-96%) than RUPM (100%) and control declined (55-63%) on 5-10 in weeds compared to RUPM (100%).

Sequential applications of RUPM and Ignite 280, regardless of the sequence, effectively controlled Palmer amaranth, although treatments with RUPM as part of the application sequence were more effective than treatments with only Ignite 280. End-of-season control across all systems ranged from 92-100%. Cotton lint yields were similar across treatments. These results indicate that tank-mixes of RUPM and Ignite 280 reduce Palmer amaranth control and that sequential applications of these two herbicides are a better option.