

GLYPHOSATE COMBINATIONS FOR LAYBY WEED CONTROL IN COTTON

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Abstract

Field studies were conducted to examine several glyphosate tank mix combinations to broaden the weed control spectrum and provide better residual weed control. Studies were established in Athens and Plains, GA in 2002 using standard small-plot technique examine the following tank-mix combinations with glyphosate (840 g ai/ha) applied at layby application: diuron (600 & 840 g ai/ha); carfentrazone (4 g ai/ha); diclosulam (24 g ai/ha); cloransulam (18 g ai/ha); CGA 362622 (6-11 g ai/ha); halosulfuron (18 g ai/ha); flumioxazin (35 & 70 g ai/ha); flufenapyr (18 g ai/ha); amicarbazone (100 g ai/ha) and oxyfluorfen (140 g ai/ha). None of the tank-mixes caused more than 15% cotton injury 7 or 30 days after treatment. All treatments provided >95% Texas panicum, Palmer amaranth, and sicklepod control 7 and 30 DAT. All treatments provided >95% tall morningglory control 7 DAT, but by 30 DAT, flufenapyr and diuron were 85 and 88%, respectively. All treatments except diuron and glyphosate alone provided >90% yellow nutsedge control. Seed cotton yields did not significantly differ at either location.

Introduction

Glyphosate-resistant cotton is planted on approximately 85% of all cotton acres in Georgia. Standard practices in glyphosate-resistant cotton weed control consist of an preplant incorporated dinitroaniline followed by an early (2-leaf-stage) application of glyphosate followed by a layby (late post-directed) application of herbicide to provide control of late-emerging weeds and some residual weed control through the latter part of the season. To broaden the weed control spectrum and provide residual weed control, a tank-mix with glyphosate is needed. These tank-mixes also provide the added benefit of a herbicide-resistance management program. The objective of this study was to examine the cotton safety and weed control of some newer herbicides in combination with glyphosate.

Materials and Methods

Field experiments were conducted at the Southwest Georgia Branch Experiment Station near Plains on a Greenville sandy clay loam (Rhodic Paleudult) with a pH of 6.5 and 1.0% organic matter and the Plant Science Farm near Athens on a Cecil sandy loam (clayey, kaolinitic, thermic, Typic Hapludults) with 76% sand, 16% silt, 8% clay, 0.9% organic matter, and pH 5.9. Roundup Ready cotton ('Suregrow 501 BRR') was planted in Athens and Plains in 2002. Glyphosate was applied broadcast to the test area at the 2-leaf stage and directed at the 6" stage of cotton. The following treatments were tank-mixed with glyphosate (840 g ai/ha) at layby: diuron (600 & 840 g ai/ha); carfentrazone (4 g ai/ha); diclosulam (24 g ai/ha); cloransulam (18 g ai/ha); CGA 362622 (6-11 g ai/ha); halosulfuron (18 g ai/ha); flumioxazin (35 & 70 g ai/ha); flufenapyr (18 g ai/ha); amicarbazone (100 g ai/ha) and oxyfluorfen (140 g ai/ha) for cotton injury and weed control when applied to cotton at the 35-40-cm (14-16") stage post-directed.

The experimental design was a randomized complete block with three replications. Individual plots consisted of four rows, spaced 91-cm apart, 6.1 m long. In Plains, sicklepod, Texas panicum, and wild poinsettia were present. In Athens, Palmer amaranth, common cocklebur, sicklepod, and tall morningglory were present in the plots.

All herbicide treatments were applied with a tractor-mounted or backpack CO₂-pressurized sprayer, calibrated to deliver 170 L/ha at 220 kPa. Weed control was visually estimated on a 0 to 100% scale where 0 = no control and 100 = complete control. Cotton injury was visually estimated on a 0 to 100% scale where 0 = no injury and 100 = complete kill. Visual estimates of weed control and cotton injury was taken 21, 42, and 84 DAP and 10 wk after planting. All weed control data were subjected to arcsine transformations before analysis. Significance of differences in treatment means for weed control ratings, cotton yield were determined with Fisher's Protected Least Significance Difference Test at the 5% level of probability. Visual estimates of weed control are expressed as untransformed data for reader clarity.

Layby Herbicide Cotton Injury and Weed Control

None of the tank-mixes caused more than 15% cotton injury 7 or 30 days after treatment. All treatments provided >95% Texas panicum, Palmer amaranth, and sicklepod control 7 and 30 DAT. All treatments provided >95% tall morningglory control 7 DAT, but by 30 DAT, flufenapyr and diuron were 85 and 88%, respectively. All treatments except diuron and glyphosate alone provided >90% yellow nutsedge control. Seed cotton yields did not significantly differ at either location.