

# NEW LAYBY HERBICIDES FOR GEORGIA COTTON

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## Abstract

Experiments were conducted at the Southwest Georgia Branch Experiment Station near Plains and the Plant Science Farm near Athens to evaluate new chemistries for post-directed weed control in conventional and Roundup Ready cotton. Glyphosate was applied broadcast to the test area at the 2-leaf stage and directed at the 6" stage of cotton. Flumioxazin, sulfosulfuron, diclosulam, halosulfuron, cloransulam, trifloxysulfuron (CGA 342622), rimsulfuron, flufenapyr, carfentrazone, mesotrione, and diuron were compared for cotton injury and weed control when applied to cotton at the 14-16" stage post-directed. Sulfosulfuron and rimsulfuron caused greater than 25% cotton injury so probably would not be suitable for post-directed weed control in cotton because of excessive crop injury. The other herbicides caused less than 15% cotton injury 14 days after treatment (DAT). All of the herbicides examined provided >95% Palmer amaranth (*Amaranthus palmeri*) control 30 DAT. Cloransulam, trifloxysulfuron, flufenapyr, flumioxazin, and diuron provided sicklepod (*Senna obtusifolia*) control were similar whereas halosulfuron and carfentrazone provided less weed control.

## Introduction

The loss of cyanazine has led to an increased interest in finding new herbicides for post-direct weed control options in cotton. Post-directed herbicides for cotton need to provide moderate residual weed control. In this research, we examined several herbicides to determine cotton safety, weed control, and seed cotton yield.

## 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 in 2000 and 2001. Roundup Ready cotton ('PM 1218 BG/RR') was planted in Athens and Plains in 2000 while 'Suregrow 501 BRR' was planted in Plains in 2001. Glyphosate was applied broadcast to the test area at the 2-leaf stage and directed at the 6" stage of cotton. Flumioxazin (Valor), sulfosulfuron, halosulfuron, cloransulam, diclosulam, mesotrione, trifloxysulfuron (CGA 342622), flufenapyr, carfentrazone, and diuron were compared to cyanazine for cotton injury and weed control when applied to cotton at the 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, common cocklebur, sicklepod, and tall morningglory were present in the plots.

All herbicide treatments were applied with a tractor-mounted or backpack CO<sub>2</sub>-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

Sulfosulfuron and rimsulfuron caused greater than 25% cotton injury so probably would not be suitable for post-directed weed control in cotton because of excessive crop injury. The other herbicides caused less than 15% cotton injury 14 days after treatment (DAT). All of the herbicides examined provided >95% Palmer amaranth (*Amaranthus palmeri*) control 30 DAT. Cloransulam, diclosulam, trifloxysulfuron, flufenapyr, mesotrione, flumioxazin, and diuron provided sicklepod (*Senna obtusifolia*) control similar to cyanazine whereas halosulfuron, pyriithiobac, and carfentrazone provided less control than cyanazine.

Flumioxazin (Valor), sulfosulfuron, halosulfuron, cloransulam, c, diclosulam, trifloxysulfuron (CGA 342622), flufenapyr, carfentrazone, mesotrione, and diuron were compared to cyanazine for cotton injury and weed control when applied to cotton

at the 14-16" stage post-directed. Treatments that caused the most injury produced the least yield. Of those treatments causing minimal injury to cotton, yields were similar to cotton treated with cyanazine.

Table 1. Cotton injury, weed control and seed cotton yield from several post-directed herbicides in cotton, 2001.

Herbicide	Rate Lb/A	Cotton Injury (30 DAT)		Weed Control (30 DAT) <sup>a</sup>		Seed Cotton Yield	
		Athens	Plains	Palmer		Athens	Plains
		-----%-----		Amaranth	Sicklepod	-----lb/A-----	
Carfentrazone	0.0036	0	0	99	88	2105	3395
Cloransulam	0.016	0	0	99	98	2178	3533
CGA362622	0.007	0	0	99	99	1742	3854
Diclosulam	0.025	0	5	99	99	1974	3477
Diuron	0.5	0	2	99	87	2453	3529
Flufenapyr (V-3153)	0.018	0	0	99	96	2105	3602
Flumioxazin	0.063	0	0	99	99	2207	3688
Halosulfuron	0.048	0	0	99	98	1713	3305
Mesotrione		0	8	99	68	2250	3146
Sulfosulfuron	0.016	0	17	99	98	914	3291
Untreated		0	0	0	0	2200	0
LSD (0.05)		-	5		4	740	533

<sup>a</sup> Weed control data pooled over location.