GLYPHOSATE-RESISTANT PALMER AMARANTH RESPONSE TO WEED MANAGEMENT PROGRAMS IN ROUNDUP READY AND LIBERTY LINK COTTON

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Abstract

Glyphosate-resistant Palmer amaranth is spreading rapidly throughout Georgia and the Southeast. A grower's ability to manage this pest in Roundup Ready cotton is heavily dependent on residual herbicides. When timely rainfalls do not activate these residual herbicides, cotton yield can be eliminated by this resistant pest. The objective of this trial was to determine if glyphosate-resistant Palmer amaranth could be controlled more effectively with Ignite-based programs in dryland cotton production in Georgia.

The randomized split-plot design experiment was conducted in Georgia during 2007 in a field with a heavy population of glyphosate-resistant Palmer amaranth. Treatments included two cultivars (Liberty Link FM 1735 LLB2 or DP 555 BRR) and six herbicide systems (Table 1) as whole plots. Whole plots were then split into subplots being cultivated (10 day after POST 1 and 10 day after POST 2) or not cultivated.

Table 1. Herbicide treatment options in Liberty Link and Roundup Ready cotton.*

PRE Application	POST 1 Application*	POST 2 Application	Layby
Prowl	Ignite or WeatherMax	Ignite or WeatherMax	Direx + MSMA
Prowl	Ignite or WeatherMax + Staple	Ignite or WeatherMax	Direx + MSMA
Prowl	Ignite or WeatherMax + Dual Magnum	Ignite or WeatherMax	Direx + MSMA
Prowl + Reflex	Ignite or WeatherMax	Ignite or WeatherMax	Direx + MSMA
Prowl + Reflex	Ignite or WeatherMax + Staple	Ignite or WeatherMax	Direx + MSMA
Prowl + Reflex	Ignite or WeatherMax + Dual Magnum	Ignite or WeatherMax	Direx + MSMA

*Ignite was applied in Liberty Link cotton and Roundup WeatherMax was applied in Roundup Ready cotton. Herbicide rates included Direx 2 pt/A; Dual Magnum 1 pt/A; Ignite 23 oz/A; MSMA 2.5 pt/A; Prowl 2.1 pt/A, Reflex 1 pt/A; Roundup WeatherMax 23 oz/A; and Staple LX 1.7 fl oz/A.

POST 1 applications were made to cotton in the 1- to 3-leaf stage infested with 2- to 3-inch Palmer amaranth and POST 2 applications were made to cotton in the 5- to 6-leaf stage. Palmer amaranth size at the POST 2 application ranged from 2 to 10 inches with 10 inch plants emerging at planting and escaping PRE and POST 1 treatments while 2 inch plants were present in plots where POST 1 treatments controlled early season emerged Palmer amaranth.

Although rainfall did not occur until 17 days after planting, cotton and Palmer amaranth emerged within 6 days of planting. Prowl and Prowl plus Reflex provided less than 35% control of the Palmer amaranth that emerged at planting.

At harvest, Palmer amaranth was controlled less than 30% in all Roundup Ready programs not receiving cultivation primarily due to the residual herbicides not being activated with a timely rainfall. Similar treatments in Liberty Link cotton using Ignite provided 70 to 88% control. In the Roundup Ready programs using Staple and cultivation, Palmer amaranth was controlled only 70%. Cultivation did not impact control of the other Roundup Ready programs. Cultivation in all Ignite-based programs improved control to at least 94%.

Roundup Ready programs without cultivation could not be harvested. Ignite-based programs without cultivation produced 1010 to 1135 lb/A of seed cotton. Cultivating did allow harvest of the Roundup Ready program including Staple, with yields of 830 lb/A. Including cultivation in the Ignite-based programs increased yields 400 to 555 lb/A.

In dryland cotton production when residual herbicides can not be activated by rainfall or irrigation in a timely manner, Ignite-based programs were more effective than Roundup Ready programs in controlling glyphosate-resistant Palmer amaranth. Only Liberty Link programs with timely applications of Ignite in combination with cultivation provided adequate control of glyphosate-resistant Palmer amaranth.