



Weed Management Systems for Palmer Amaranth Control in Alabama Cotton

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INTRODUCTION

- Glyphosate-resistant palmer amaranth (*Amaranthus palmeri*) has spread across the Southeastern U.S. cotton growing areas within the past five years. Historically Palmer amaranth has not been a problem in Alabama cotton fields. Recently, glyphosate-resistant Palmer amaranth was documented on a farm in east central Alabama (Barbour county). Approximately 2000 acres are infested on this farm. Reports of additional fields containing escaped pigweed in Roundup Ready cotton indicates this problem will most certainly spread across south Alabama fields in the next few years. A field of soybeans infested with Palmer amaranth that was discovered in the Tennessee Valley region of north Alabama in 2009 where the weed was not controlled with glyphosate applications. Further investigation of this infestation will be conducted in 2010. A large, replicated weed control demonstration was conducted in one of the cotton fields on the Barbour county farm in 2009. This was done to demonstrate to local farmers and extension advisors what herbicide systems could be used to combat glyphosate-resistant palmer amaranth in an area already infested with this biotype.

Table 1. COTTON HERBICIDE SYSTEMS (12): Glyphosate-Resistant Pigweed 2009

SYSTEM NO.	PREEMERGENCE	EARLY POST	LAYBY
1.	Prowl H2O - 2 pts/A	Ignite 280 - 29 fl oz/A	Valor 51 DF - 2 oz + MSMA - 2 pts/A
2.	Prowl H2O - 2 pts/A	Rdup PMax - 32 fl oz + Dual Mag - 1 pt/A	Ignite 280 - 29 fl oz/A
3.	Prowl H2O - 2 pts/A	Rdup PMax - 32 fl oz + Staple LX - 2 fl oz/A	Rdup PMax - 32 fl oz + Envoke - 0.1 oz/A
4.	Prowl H2O - 2 pts + Staple LX - 2 fl oz/A	Ignite 280 - 29 fl oz/A	Valor 51 DF - 2 oz + MSMA - 2 Pts/A
5.	Prowl H2O - 2 pts + Staple LX - 2 fl oz/A	Ignite 280 - 29 fl oz + Dual Mag - 1 pt/A	Ignite 280 - 29 fl oz/A
6.	Prowl H2O - 2 pts + Staple LX - 2 fl oz/A	Rdup PMax - 32 fl oz + Dual Mag - 1 pt/A	Rdup PMax - 32 fl oz + Envoke - 0.1 oz/A
7.	Cotoran 4F- 3 pts + Solicam DF- 1.5 #/A	Ignite 280 - 29 fl oz/A	Valor 51 DF - 2 oz + MSMA - 2 pts/A
8.	Cotoran 4F- 3 pts + Solicam DF- 1.5 #/A	Ignite 280 - 29 fl oz + Dual Mag - 1pt/A	Ignite 280 - 29 fl oz/A
9.	Cotoran 4F- 3 pts + Solicam DF- 1.5 #/A	Rdup PMax - 32 fl oz + Staple LX - 2 fl oz/A	Rdup PMax - 32 fl oz + Envoke - 0.1 oz/A
10.	Prowl H2O - 2 pts + Reflex 2E - 1 pt/A	Ignite 280 - 29 fl oz/A	Valor 51 DF - 2 oz + MSMA - 2 pts/A
11.	Prowl H2O - 2 pts + Reflex 2E - 1 pt/A	Ignite 280 - 29 fl oz + Dual Mag - 1 pt/A	Ignite 280 - 29 fl oz/A
12.	Prowl H2O - 2 pts + Reflex 2E - 1 pt/A	Rdup PMax - 32 fl oz + Staple LX - 2 fl oz/A	Rdup PMax - 32 fl oz + Envoke 0.1 oz/A

Table 3. Crop Injury and Palmer Amaranth Control 12 d after Early Postemergence Treatments, * = LSD (.05)

SYSTEM NO.	CROP INJURY (%)	PALMER CONTROL (%)	SYSTEM NO.	CROP INJURY (%)	PALMER CONTROL (%)
One	8	87	Seven	12	93
Two	3	88	Eight	23	95
Three	5	85	Nine	5	93
Four	13	93	Ten	3	95
Five	15	93	Eleven	19	95
Six	5	93	Twelve	5	93
	8*	9*		8*	9*

MATERIALS AND METHODS

- A four acre site located on the farm where glyphosate-resistant palmer amaranth was first confirmed in Alabama was selected to demonstrate different management systems for this weed in cotton.
- Phytogen 375 WRF seed were planted on May 14, 2009 in reduced tillage stale seedbed culture. Preemergence herbicides listed in Table 1 were applied immediately after planting and good activating rainfall occurred within two days. Row spacing was 38 inches and seed were planted at the rate of two seed per foot of row. Early postemergence treatments were applied June 11 and layby treatments were applied July 14.
- Visual crop injury and palmer pigweed control was evaluated on June 11, July 23 and July 22. Ratings were made on a scale of 0 to 100 where 0 = not injury or control and 100 = cotton death or complete control. No yields were obtained due to excessive rainfall throughout the fall and winter.

Table 2. Crop Injury and Palmer Amaranth Control 28 d after Preemergence Treatments, * = LSD (.05)

SYSTEM NO.	CROP INJURY (%)	PALMER CONTROL (%)	SYSTEM NO.	CROP INJURY (%)	PALMER CONTROL (%)
One	0	68	Seven	7	90
Two	0	73	Eight	12	92
Three	0	77	Nine	3	82
Four	3	88	Ten	3	91
Five	3	82	Eleven	0	90
Six	3	83	Twelve	2	93
	7*	11*		7*	11*

Table 4. Crop Injury and Palmer Amaranth Control 8 d after Layby Treatments, * = LSD (.05)

SYSTEM NO.	CROP INJURY (%)	PALMER CONTROL (%)	SYSTEM NO.	CROP INJURY (%)	PALMER CONTROL (%)
One	5	93	Seven	8	93
Two	10	93	Eight	5	93
Three	5	93	Nine	2	90
Four	10	95	Ten	5	93
Five	2	93	Eleven	5	93
Six	0	93	Twelve	0	95
	8*	4*		8*	4*

RESULTS AND DISCUSSION

- Timely activating rainfall occurred within 2 days following planting and preemergence herbicide applications. Minimal crop injury was observed at 28 d following application (12 % or less). Control of palmer amaranth ranged from 68-77% (Prowl H2O alone) to 90-93% (Prowl + Reflex).
- Some early postemergence treatments resulted in significant crop injury, with Ignite 280 + Dual Magnum injuring cotton 15 to 23%. Palmer amaranth control for all systems 12 d following these treatment ranged from 85 to 95% with systems one-three having the lowest control (85-88%) and the remaining systems providing 93 to 95% control.
- Crop injury was less than 11% for all layby treatments 8 d following application. Palmer amaranth control ranged from 90 to 95% at this time, with most plots showing only 3 to 4 plants per plot (4 rows by 400 ft). The grower had his crew hand weed these plants following our rating.

