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ALS-resistant Palmer amaranth response to residual based cotton programs.

Trial ID: C33-07

Study Dir.: Scott Brown

Location: Colquit County

Investigator: Stanley Culpepper

Reps: 4

Plots: 12 by 20 feet

Spray vol: 14.8 gal/ac

Mix size: 1.5 liters (min 1.2347)

Trt No.	Treatment Name	Form Conc	Form Unit	Form Type	Form Rate	Rate Unit	Grow Stg	Appl Code	Amt Product to Measure	Plot No. By Rep			
										1	2	3	4
1	No PRE									101	203	301	407
	Staple	3.2		L	2.55	OZ/A	POST	B	2.019 ml/mx				
	NIS			L	0.25	% V/V	POST	B	3.75 ml/mx				
	WeatherMax	4.5		L	22	OZ/A	PD	C	17.42 ml/mx				
	Valor	51		DG	1.5	OZ/A	PD	C	1.139 g/mx				
2	Prowl	3.8		L	2.1	PT/A	PRE	A	26.6 ml/mx	102	201	310	402
	Reflex	2		L	1	PT/A	PRE	A	12.67 ml/mx				
	Staple	3.2		L	2.55	OZ/A	POST	B	2.019 ml/mx				
	NIS			L	0.25	% V/V	POST	B	3.75 ml/mx				
	WeatherMax	4.5		L	22	OZ/A	PD	C	17.42 ml/mx				
	Valor	51		DG	1.5	OZ/A	PD	C	1.139 g/mx				
3	Prowl	3.8		L	2.1	PT/A	PRE	A	26.6 ml/mx	103	214	306	403
	Diuron	4		L	1	QT/A	PRE	A	25.34 ml/mx				
	Staple	3.2		L	2.55	OZ/A	POST	B	2.019 ml/mx				
	NIS			L	0.25	% V/V	POST	B	3.75 ml/mx				
	WeatherMax	4.5		L	22	OZ/A	PD	C	17.42 ml/mx				
	Valor	51		DG	1.5	OZ/A	PD	C	1.139 g/mx				
4	Prowl	3.8		L	2.1	PT/A	PRE	A	26.6 ml/mx	104	210	311	404
	Cotoran	4		L	1	QT/A	PRE	A	25.34 ml/mx				
	Staple	3.2		L	2.55	OZ/A	POST	B	2.019 ml/mx				
	NIS			L	0.25	% V/V	POST	B	3.75 ml/mx				
	WeatherMax	4.5		L	22	OZ/A	PD	C	17.42 ml/mx				
	Valor	51		DG	1.5	OZ/A	PD	C	1.139 g/mx				
5	Prowl	3.8		L	2.1	PT/A	PRE	A	26.6 ml/mx	105	204	314	413
	Staple	3.2		L	1.7	OZ/A	PRE	A	1.346 ml/mx				
	Staple	3.2		L	2.55	OZ/A	POST	B	2.019 ml/mx				
	NIS			L	0.25	% V/V	POST	B	3.75 ml/mx				
	WeatherMax	4.5		L	22	OZ/A	PD	C	17.42 ml/mx				
	Valor	51		DG	1.5	OZ/A	PD	C	1.139 g/mx				
6	Diuron	4		L	1	QT/A	PRE	A	25.34 ml/mx	106	205	308	410
	Reflex	2		L	16	OZ/A	PRE	A	12.67 ml/mx				
	Staple	3.2		L	2.55	OZ/A	POST	B	2.019 ml/mx				
	NIS			L	0.25	% V/V	POST	B	3.75 ml/mx				
	WeatherMax	4.5		L	22	OZ/A	PD	C	17.42 ml/mx				
	Valor	51		DG	1.5	OZ/A	PD	C	1.139 g/mx				
7	No PRE									107	208	307	411
	WeatherMax	4.5		L	22	OZ/A	POST	B	17.42 ml/mx				
	WeatherMax	4.5		L	22	OZ/A	PD	C	17.42 ml/mx				
	Valor	51		DG	1.5	OZ/A	PD	C	1.139 g/mx				
8	Prowl	3.8		L	2.1	PT/A	PRE	A	26.6 ml/mx	108	213	304	409
	Reflex	2		L	1	PT/A	PRE	A	12.67 ml/mx				
	WeatherMax	4.5		L	22	OZ/A	POST	B	17.42 ml/mx				
	WeatherMax	4.5		L	22	OZ/A	PD	C	17.42 ml/mx				
	Valor	51		DG	1.5	OZ/A	PD	C	1.139 g/mx				
9	Prowl	3.8		L	2.1	PT/A	PRE	A	26.6 ml/mx	109	212	309	414
	Diuron	4		L	1	QT/A	PRE	A	25.34 ml/mx				
	WeatherMax	4.5		L	22	OZ/A	POST	B	17.42 ml/mx				
	WeatherMax	4.5		L	22	OZ/A	PD	C	17.42 ml/mx				
	Valor	51		DG	1.5	OZ/A	PD	C	1.139 g/mx				

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Reps: 4

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Mix size: 1.5 liters (min 1.2347)

Ttr No.	Treatment Name	Form Conc	Form Unit	Form Rate	Form Type	Rate Unit	Grow Stg	Appl Code	Amt Product to Measure	Plot No. By Rep			
										1	2	3	4
10	Prowl	3.8	L	2.1	PT/A	PRE	A	26.6 ml/mx	110	206	312	405	
	Cotoran	4	L	1	QT/A	PRE	A	25.34 ml/mx					
	WeatherMax	4.5	L	22	OZ/A	POST	B	17.42 ml/mx					
	WeatherMax	4.5	L	22	OZ/A	PD	C	17.42 ml/mx					
	Valor	51	DG	1.5	OZ/A	PD	C	1.139 g/mx					
11	Prowl	3.8	L	2.1	PT/A	PRE	A	26.6 ml/mx	111	202	313	406	
	Staple	3.2	L	1.7	OZ/A	PRE	A	1.346 ml/mx					
	WeatherMax	4.5	L	22	OZ/A	POST	B	17.42 ml/mx					
	WeatherMax	4.5	L	22	OZ/A	PD	C	17.42 ml/mx					
	Valor	51	DG	1.5	OZ/A	PD	C	1.139 g/mx					
12	Diuron	4	L	1	QT/A	PRE	A	25.34 ml/mx	112	211	302	412	
	Reflex	2	L	1	PT/A	PRE	A	12.67 ml/mx					
	WeatherMax	4.5	L	22	OZ/A	POST	B	17.42 ml/mx					
	WeatherMax	4.5	L	22	OZ/A	PD	C	17.42 ml/mx					
	Valor	51	DG	1.5	OZ/A	PD	C	1.139 g/mx					
13	Prowl	3.8	L	2.1	PT/A	PRE	A	26.6 ml/mx	113	209	305	408	
	Reflex	2	L	1	PT/A	PRE	A	12.67 ml/mx					
	WeatherMax	4.5	L	22	OZ/A	POST	B	17.42 ml/mx					
	Dual Magnum	7.62	L	16	OZ/A	POST	B	12.67 ml/mx					
	WeatherMax	4.5	L	22	OZ/A	PD	C	17.42 ml/mx					
	Valor	51	DG	1.5	OZ/A	PD	C	1.139 g/mx					
14	Non-treated								114	207	303	401	

Sort Order: Treatment

Product quantities required for listed treatments and applications in one trial:

Amount*	Unit	Treatment Name	Form Conc	Form Type	Lot Code
18.509	ml	Staple	3.2	L	
28.122	ml	NIS		L	
435.495	ml	WeatherMax	4.5	L	
18.502	g	Valor	51	DG	
299.272	ml	Prowl	3.8	L	
79.174	ml	Reflex	2	L	
126.676	ml	Diuron	4	L	
63.338	ml	Cotoran	4	L	
15.836	ml	Dual Magnum	7.62	L	

- * 'Per area' calculations based on spray volume= 14.8 gal/ac, mix size= 1.5 liters (mix size basis).
- * Product amount calculations increased 25 % for overage adjustment.
- * 'Per volume' calculations use spray volume= 14.8 gal/ac, mix size= 1.5 liters.

Trial Comments

OBJECTIVE: Determine the most effective program to manage ALS-resistant Palmer amaranth.

CROP RESPONSE:

1. Minor and insignificant crop injury was noted with all systems.

WEED RESPONSE

Palmer amaranth:

1. The least effective PRE treatment was Prowl + Staple. A trend was noted for diuron plus Reflex to be the most effective PRE treatment.

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2. Glyphosate POST completely killed Palmer amaranth. Staple provided poor control of this ALS-resistant weed.
3. Late in the year, all glyphosate programs provided excellent control with the least effective glyphosate system tending to be the program including Prowl + Staple PRE.
4. Late in the year, most Staple programs provided only fair control. The best control was noted in the Staple program with diuron + Reflex PRE.

Texas Panicum and Florida Beggarweed:

1. All programs with a PRE treatment or glyphosate provided excellent control

CONCLUSIONS:

1. Glyphosate is still the most effective management tool for non-glyphosate resistant Palmer amaranth.
2. Reflex, diuron, Cotoran, and Prowl can all be used to effectively manage ALS-resistant Palmer amaranth.

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Weed Code				AMAPA	AMAPA	AMAPA	AMAPA	PANTE		
Crop Code	cotton	cotton	cotton							
Rating Data Type	%	%	%	%	%	%	%	%		
Rating Unit	injury	injury	injury	control	control	control	control	control		
Rating Date	Jun-27-07	Jul-07-07	Jul-31-07	Jun-27-07	Jul-07-07	Jul-26-07	Sep-01-07	Jun-27-07		
Trt-Eval Interval	19 DA-A	10 DA-B	5 DA-C	19 DA-A	10 DA-B	29 DA-B	37 DA-C	19 DA-A		
Trt No.	Treatment Name	Rate								
		Rate Unit	1	2	3	4	5	6		
			7	8						
9	Prowl	2.1 PT/A	0 a	0 a	6 a	98 ab	97 a	94 ab	94 a	99 a
	Diuron	1 QT/A								
	WeatherMax	22 OZ/A								
	WeatherMax	22 OZ/A								
	Valor	1.5 OZ/A								
10	Prowl	2.1 PT/A	0 a	0 a	5 a	99 a	99 a	99 a	99 a	99 a
	Cotoran	1 QT/A								
	WeatherMax	22 OZ/A								
	WeatherMax	22 OZ/A								
	Valor	1.5 OZ/A								
11	Prowl	2.1 PT/A	0 a	0 a	6 a	87 de	99 a	98 a	89 ab	99 a
	Staple	1.7 OZ/A								
	WeatherMax	22 OZ/A								
	WeatherMax	22 OZ/A								
	Valor	1.5 OZ/A								
12	Diuron	1 QT/A	0 a	0 a	7 a	99 a	99 a	97 a	99 a	98 a
	Reflex	1 PT/A								
	WeatherMax	22 OZ/A								
	WeatherMax	22 OZ/A								
	Valor	1.5 OZ/A								
13	Prowl	2.1 PT/A	0 a	0 a	5 a	99 a	99 a	99 a	99 a	99 a
	Reflex	1 PT/A								
	WeatherMax	22 OZ/A								
	Dual Magnum	16 OZ/A								
	WeatherMax	22 OZ/A								
	Valor	1.5 OZ/A								
14	Non-treated		0 a	0 a	0 b	0 f	0 e	0 e	25 c	0 b
LSD (P=.05)			0.0	0.0	2.3	5.6	10.1	19.1	25.4	1.9
Standard Deviation			0.0	0.0	1.6	3.9	7.1	13.3	17.8	1.3
CV			0.0	0.0	30.79	5.29	8.67	17.01	22.03	1.72
Bartlett's X2			0.0	0.0	18.539	26.729	2.86	18.762	25.054	6.741
P(Bartlett's X2)			.	.	0.10	0.001*	0.722	0.005*	0.002*	0.15

Means followed by same letter do not significantly differ (P=.05, Duncan's New MRT)

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Weed Code		PANTE	PANTE	PANTE	DEDTO	DEDTO	DEDTO
Crop Code							
Rating Data Type		%	%	%	%	%	%
Rating Unit		control	control	control	control	control	control
Rating Date		Jul-07-07	Jul-26-07	Sep-01-07	Jul-07-07	Jul-26-07	Sep-01-07
Trt-Eval Interval		10 DA-B	29 DA-B	37 DA-C	10 DA-B	29 DA-B	37 DA-C
Trt No.	Treatment Name	Rate	Rate	Rate	Rate	Rate	Rate
		Unit	Unit	Unit	Unit	Unit	Unit
		9	10	11	12	13	14
1	No PRE						
	Staple	2.55 OZ/A	31 b	35 c	88 c	92 b	88 b
	NIS	0.25 % V/V					99 a
	WeatherMax	22 OZ/A					
	Valor	1.5 OZ/A					
2	Prowl	2.1 PT/A	97 a	98 a	99 a	99 a	99 a
	Reflex	1 PT/A					
	Staple	2.55 OZ/A					
	NIS	0.25 % V/V					
	WeatherMax	22 OZ/A					
	Valor	1.5 OZ/A					
3	Prowl	2.1 PT/A	99 a	99 a	99 a	99 a	99 a
	Diuron	1 QT/A					
	Staple	2.55 OZ/A					
	NIS	0.25 % V/V					
	WeatherMax	22 OZ/A					
	Valor	1.5 OZ/A					
4	Prowl	2.1 PT/A	99 a	97 ab	99 a	99 a	99 a
	Cotoran	1 QT/A					
	Staple	2.55 OZ/A					
	NIS	0.25 % V/V					
	WeatherMax	22 OZ/A					
	Valor	1.5 OZ/A					
5	Prowl	2.1 PT/A	99 a	99 a	96 b	99 a	99 a
	Staple	1.7 OZ/A					
	Staple	2.55 OZ/A					
	NIS	0.25 % V/V					
	WeatherMax	22 OZ/A					
	Valor	1.5 OZ/A					
6	Diuron	1 QT/A	98 a	95 b	99 a	99 a	99 a
	Reflex	16 OZ/A					
	Staple	2.55 OZ/A					
	NIS	0.25 % V/V					
	WeatherMax	22 OZ/A					
	Valor	1.5 OZ/A					
7	No PRE		99 a	97 ab	99 a	99 a	99 a
	WeatherMax	22 OZ/A					
	WeatherMax	22 OZ/A					
	Valor	1.5 OZ/A					
8	Prowl	2.1 PT/A	99 a	99 a	99 a	99 a	99 a
	Reflex	1 PT/A					
	WeatherMax	22 OZ/A					
	WeatherMax	22 OZ/A					
	Valor	1.5 OZ/A					
9	Prowl	2.1 PT/A	99 a	99 a	99 a	99 a	99 a
	Diuron	1 QT/A					
	WeatherMax	22 OZ/A					
	WeatherMax	22 OZ/A					
	Valor	1.5 OZ/A					

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Weed Code		PANTE	PANTE	PANTE	DEDTO	DEDTO	DEDTO		
Crop Code									
Rating Data Type		%	%	%	%	%	%		
Rating Unit		control	control	control	control	control	contro		
Rating Date		Jul-07-07	Jul-26-07	Sep-01-07	Jul-07-07	Jul-26-07	Sep-01-07		
Trt-Eval Interval		10 DA-B	29 DA-B	37 DA-C	10 DA-B	29 DA-B	37 DA-C		
Trt No.	Treatment Name	Rate	Unit	9	10	11	12	13	14
10	Prowl	2.1	PT/A	99 a	99 a	99 a	99 a	99 a	99 a
	Cotoran	1	QT/A						
	WeatherMax	22	OZ/A						
	WeatherMax	22	OZ/A						
	Valor	1.5	OZ/A						
11	Prowl	2.1	PT/A	99 a	99 a	99 a	99 a	99 a	99 a
	Staple	1.7	OZ/A						
	WeatherMax	22	OZ/A						
	WeatherMax	22	OZ/A						
	Valor	1.5	OZ/A						
12	Diuron	1	QT/A	99 a	96 ab	99 a	99 a	99 a	99 a
	Reflex	1	PT/A						
	WeatherMax	22	OZ/A						
	WeatherMax	22	OZ/A						
	Valor	1.5	OZ/A						
13	Prowl	2.1	PT/A	99 a	99 a	99 a	99 a	99 a	99 a
	Reflex	1	PT/A						
	WeatherMax	22	OZ/A						
	Dual Magnum	16	OZ/A						
	WeatherMax	22	OZ/A						
	Valor	1.5	OZ/A						
14	Non-treated			0 c	0 d	0 d	0 c	0 c	0 b
LSD (P=.05)				3.1	3.1	2.8	3.2	1.9	0.0
Standard Deviation				2.2	2.2	2.0	2.2	1.3	0.0
CV				2.5	2.55	2.19	2.45	1.47	0.0
Bartlett's X2				1.514	3.685	2.073	0.0	0.0	0.0
P(Bartlett's X2)				0.469	0.45	0.15	.	.	.

Means followed by same letter do not significantly differ (P=.05, Duncan's New MRT)

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MAINTENANCE

Field Prep./Maintenance:

No.	Date	Maintenance Treatment Name	Form Conc	Form Unit	Form Type	Rate	Rate Unit
1.							

SOIL DESCRIPTION

% Sand: 0.	% OM: 0.	Texture: .
% Silt: 0.	pH: 0.	Soil Name: _____
% Clay: 0.	CEC: 0.	Fert. Level: _____

ADDITIONAL MEASURED ELEMENTS

Element	Quantity	Unit

MOISTURE CONDITIONS

No.	Date	Time	Amount	Unit	Type	Interval	Unit
1.							

Overall Moisture Conditions: adequate moisture to activate all herbicides after

Closest Weather Station: _____ Distance: _____ Unit: _____

APPLICATION DESCRIPTION

	A	B	C
Application Date:	Jun-08-07	Jun-27-07	Jul-26-07
Time of Day:	8:00 am	8:00 am	8:30 am
Application Method:	broadcast	broadcast	broadcast
Application Timing:	PRE	POST	PD
Applic. Placement:	on soil	overtop	directed
Air Temp., Unit:	77 F	75 F	84 F
% Relative Humidity:	67	82	76
Wind Velocity, Unit:	0 mph	2 mph	0 mph
Dew Presence (Y/N):	N	Y	Y
Water Hardness:			
Soil Temp., Unit:	78 F	80 F	81 F
Soil Moisture:	moist	moist	moist
% Cloud Cover:	100	40	40

CROP STAGE AT EACH APPLICATION

	A	B	C
Crop 1 Code, Stage:	GOSHI PRE	GOSHI POST	GOSHI PD
Stage Scale:	not up	4 leaf	12 leaf
Height, Unit:	0 inch	6 in	22 in

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WEED STAGE AT EACH APPLICATION

	A	B	C
Weed 1 Code, Stage:	DEDTO PRE	DEDTO POST	DEDTO PD
Stage Scale:	not up	< 3 in	< 3 in
Density, Unit:	0 ydsq	1 ydsq	1 ydsq
Weed 2 Code, Stage:	AMAPA PRE	AMAPA POST	AMAPA PD
Stage Scale:	not up	< 6 in	4 - 12 in
Density, Unit:	0 ydsq	7 ydsq	10 ydsq
Weed 3 Code, Stage:	PANTE PRE	PANTE POST	PANTE PD
Stage Scale:	not up	< 4 in	3 - 8 in
Density, Unit:	0 ydsq	6 ydsq	7 ydsq

APPLICATION EQUIPMENT

	A	B	C
Appl. Equipment:	backpack	backpack	backpack
Operating Pressure:	24	24	26
Nozzle Type:	flat fan	flat fan	floodjet
Nozzle Size:	11002	11002	TK 2
Nozzle Spacing, Unit:	18 in	18 in	36 in
Nozzles/Row:	2	2	1
Band Width, Unit:			
Boom Length, Unit:	4.5 ft	4.5 ft	
Boom Height, Unit:	15 in	15 in	12 in
Ground Speed, Unit:	3 mph	3 mph	3 mph
Incorporation Equip.:			
Hours to Incorp.:			
Incorp. Depth, Unit:			
Carrier:	water	water	water
Spray Volume, Unit:	15 GPA	15 GPA	15 GPA
Spray pH:			
Propellant:	CO2	CO2	CO2
Tank Mix (Y/N):			

Trt No	Treatment Application Comment