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Glyphosate-resistant Palmer amaranth response to Staple systems.

Trial ID: C10-07

Study Dir.: Stanley Culpepper

Location: Macon County

Investigator: Stanley Culpepper

Reps: 3

Plots: 12 by 25 feet

Spray vol: 14.8 gal/ac

Mix size: 2 liters (min 1.1575)

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
1	Prowl H20	3.8	L	2.1	PT/A	PRE	A	35.47 ml/mx	101	212	302	
	Reflex	2	L	1	PT/A	PRE	A	16.89 ml/mx				
	Staple	3.2	L	2.5	OZ/A	POT	B	2.639 ml/mx				
	WeatherMax	4.5	L	15	OZ/A	POT	B	15.84 ml/mx				
	Layby Pro	4	L	2	PT/A	Layby	C	33.78 ml/mx				
	MSMA	6	L	24	OZ/A	Layby	C	25.34 ml/mx				
2	Prowl H20	3.8	L	2.1	PT/A	PRE	A	35.47 ml/mx	102	204	305	
	Direx	4	L	1	QT/A	PRE	A	33.78 ml/mx				
	Staple	3.2	L	2.5	OZ/A	POT	B	2.639 ml/mx				
	WeatherMax	4.5	L	15	OZ/A	POT	B	15.84 ml/mx				
	Layby Pro	4	L	2	PT/A	Layby	C	33.78 ml/mx				
	MSMA	6	L	24	OZ/A	Layby	C	25.34 ml/mx				
3	Prowl H20	3.8	L	2.1	PT/A	PRE	A	35.47 ml/mx	103	206	312	
	Staple	3.2	L	1.7	OZ/A	PRE	A	1.795 ml/mx				
	Cotoran	4	L	1.25	QT/A	PRE	A	42.23 ml/mx				
	Staple	3.2	L	2.5	OZ/A	POT	B	2.639 ml/mx				
	WeatherMax	4.5	L	15	OZ/A	POT	B	15.84 ml/mx				
	Layby Pro	4	L	2	PT/A	Layby	C	33.78 ml/mx				
4	Prowl H20	3.8	L	2.1	PT/A	PRE	A	35.47 ml/mx	104	209	303	
	Staple	3.2	L	1.7	OZ/A	PRE	A	1.795 ml/mx				
	Cotoran	4	L	1.25	QT/A	PRE	A	42.23 ml/mx				
	WeatherMax	4.5	L	15	OZ/A	POT	B	15.84 ml/mx				
	Layby Pro	4	L	2	PT/A	Layby	C	33.78 ml/mx				
	MSMA	6	L	24	OZ/A	Layby	C	25.34 ml/mx				
5	Prowl H20	3.8	L	2.1	PT/A	PRE	A	35.47 ml/mx	105	201	309	
	Reflex	2	L	1	PT/A	PRE	A	16.89 ml/mx				
	Cotoran	4	L	1.25	QT/A	PRE	A	42.23 ml/mx				
	Staple	3.2	L	2.5	OZ/A	POT	B	2.639 ml/mx				
	WeatherMax	4.5	L	15	OZ/A	POT	B	15.84 ml/mx				
	Layby Pro	4	L	2	PT/A	Layby	C	33.78 ml/mx				
6	Prowl H20	3.8	L	2.1	PT/A	PRE	A	35.47 ml/mx	106	207	311	
	Staple	3.2	L	2.5	OZ/A	POT	B	2.639 ml/mx				
	WeatherMax	4.5	L	15	OZ/A	POT	B	15.84 ml/mx				
	Layby Pro	4	L	2	PT/A	Layby	C	33.78 ml/mx				
	MSMA	6	L	24	OZ/A	Layby	C	25.34 ml/mx				
	7	Prowl H20	3.8	L	2.1	PT/A	PRE	A				35.47 ml/mx
Reflex		2	L	1	PT/A	PRE	A	16.89 ml/mx				
Dual Magnum		7.64	L	1	PT/A	POT	B	16.89 ml/mx				
WeatherMax		4.5	L	15	OZ/A	POT	B	15.84 ml/mx				
Layby Pro		4	L	2	PT/A	Layby	C	33.78 ml/mx				
MSMA		6	L	24	OZ/A	Layby	C	25.34 ml/mx				
8	Non-treated								108	205	304	
9	Prowl H20	3.8	L	2.1	PT/A	PRE	A	35.47 ml/mx	109	203	307	
	Staple	3.2	L	1.7	OZ/A	PRE	A	1.795 ml/mx				
	Direx	4	L	1.25	QT/A	PRE	A	42.23 ml/mx				
	WeatherMax	4.5	L	15	OZ/A	POT	B	15.84 ml/mx				
	Layby Pro	4	L	2	PT/A	Layby	C	33.78 ml/mx				
	MSMA	6	L	24	OZ/A	Layby	C	25.34 ml/mx				

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Reps: 3 Plots: 12 by 25 feet
 Spray vol: 14.8 gal/ac Mix size: 2 liters (min 1.1575)

Trt No.	Treatment Name	Form Conc	Form Unit	Form Type	Form Rate	Rate Unit	Grow Stg	Appl Code	Amt to Measure	Product	Plot No. By Rep		
											1	2	3
10	Prowl H20	3.8	L	L	2.1	PT/A	PRE	A	35.47 ml/mx		110	211	310
	Reflex	2	L	L	1	PT/A	PRE	A	16.89 ml/mx				
	Direx	4	L	L	1.25	QT/A	PRE	A	42.23 ml/mx				
	Staple	3.2	L	L	2.5	OZ/A	POT	B	2.639 ml/mx				
	WeatherMax	4.5	L	L	15	OZ/A	POT	B	15.84 ml/mx				
	Layby Pro	4	L	L	2	PT/A	Layby	C	33.78 ml/mx				
	MSMA	6	L	L	24	OZ/A	Layby	C	25.34 ml/mx				
11	Staple	3.2	L	L	1.7	OZ/A	PRE	A	1.795 ml/mx		111	208	301
	Direx	4	L	L	1.25	QT/A	PRE	A	42.23 ml/mx				
	WeatherMax	4.5	L	L	15	OZ/A	POT	B	15.84 ml/mx				
	Layby Pro	4	L	L	2	PT/A	Layby	C	33.78 ml/mx				
	MSMA	6	L	L	24	OZ/A	Layby	C	25.34 ml/mx				
12	Reflex	2	L	L	1	PT/A	PRE	A	16.89 ml/mx		112	210	306
	Direx	4	L	L	1.25	QT/A	PRE	A	42.23 ml/mx				
	Staple	3.2	L	L	2.5	OZ/A	POT	B	2.639 ml/mx				
	WeatherMax	4.5	L	L	15	OZ/A	POT	B	15.84 ml/mx				
	Layby Pro	4	L	L	2	PT/A	Layby	C	33.78 ml/mx				
	MSMA	6	L	L	24	OZ/A	Layby	C	25.34 ml/mx				

Sort Order: Treatment

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

Amount*	Unit	Treatment Name	Form Conc	Form Type	Lot Code
399.029	ml	Prowl H20	3.8	L	
105.563	ml	Reflex	2	L	
32.068	ml	Staple	3.2	L	
217.748	ml	WeatherMax	4.5	L	
464.478	ml	Layby Pro	4	L	
348.396	ml	MSMA	6	L	
253.352	ml	Direx	4	L	
158.345	ml	Cotoran	4	L	
21.113	ml	Dual Magnum	7.64	L	

* 'Per area' calculations based on spray volume= 14.8 gal/ac, mix size= 2 liters (mix size basis).
 * Product amount calculations increased 25 % for overage adjustment.

Trial Comments

OBJECTIVE: Determine the most effective herbicide program to control glyphosate-resistant Palmer amaranth.

Cotton Injury:

1. Rainfall did not occur until 17 d after planting; thus, soil applied herbicides did not injure the crop.
2. POST applications caused typical spotting and speckling as expected with Staple or Dual mixtures.
3. Cotton injury from layby treatments could not be determined because of the very poor weed control.

Pitted Morningglory:

1. All programs provided excellent control throughout the season.

Palmer Amaranth:

1. Because of the lack of rainfall until 17 d after planting, soil applied herbicides provided poor and generally similar control at 23 DAT. Prowl alone was generally less effective than any tank mix PRE option.

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2. POT treatments of glyphosate or glyphosate plus Dual Magnum did control emerged pigweed and essentially the crop was lost at this point with these programs. Staple mixed with glyphosate did provide some minor suppression but control was still poor likely in response to this population exhibiting resistance to both glyphosate and ALS chemistry.
3. Layby treatments were applied but because of the large weed size plus the lack of coverage, control was essentially non-existent.

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Glyphosate-resistant Palmer amaranth response to Staple systems.

Trial ID: C10-07

Study Dir.: Stanley Culpepper

Location: Macon County

Investigator: Stanley Culpepper

Weed Code	COTTON	COTTON	AMAPA	AMAPA	AMAPA	AMAPA	IPOLA	IPOLA			
Crop Code											
Rating Data Type	%	%	%	%	%	%	%	%			
Rating Unit	injury	injury	control	control	control	control	control	control			
Rating Date	May-11-07	May-15-07	May-11-07	May-22-07	Jun-21-07	Jul-10-07	Jun-21-07	Jul-10-07			
Trt-Eval Interval	23 DA-A	27 DA-A	23 DA-A	10 DA-B	6 DA-C	25 DA-C	6 DA-C	25 DA-C			
Trt No.	Treatment Name	Rate	Unit	1	2	3	4	5	6	7	8
1	Prowl H20	2.1	PT/A	0 a	7 ab	52 ab	66 a	55 ab	35 ab	96 a	100 a
	Reflex	1	PT/A								
	Staple	2.5	OZ/A								
	WeatherMax	15	OZ/A								
	Layby Pro	2	PT/A								
	MSMA	24	OZ/A								
2	Prowl H20	2.1	PT/A	0 a	9 a	58 ab	71 a	62 ab	45 a	96 a	100 a
	Direx	1	QT/A								
	Staple	2.5	OZ/A								
	WeatherMax	15	OZ/A								
	Layby Pro	2	PT/A								
	MSMA	24	OZ/A								
3	Prowl H20	2.1	PT/A	0 a	6 abc	58 ab	73 a	52 ab	40 ab	96 a	100 a
	Staple	1.7	OZ/A								
	Cotoran	1.25	QT/A								
	Staple	2.5	OZ/A								
	WeatherMax	15	OZ/A								
	Layby Pro	2	PT/A								
	MSMA	24	OZ/A								
4	Prowl H20	2.1	PT/A	0 a	3 abc	63 ab	40 b	32 c	17 bc	96 a	100 a
	Staple	1.7	OZ/A								
	Cotoran	1.25	QT/A								
	WeatherMax	15	OZ/A								
	Layby Pro	2	PT/A								
	MSMA	24	OZ/A								
5	Prowl H20	2.1	PT/A	0 a	7 abc	63 ab	65 a	64 a	52 a	93 a	100 a
	Reflex	1	PT/A								
	Cotoran	1.25	QT/A								
	Staple	2.5	OZ/A								
	WeatherMax	15	OZ/A								
	Layby Pro	2	PT/A								
	MSMA	24	OZ/A								
6	Prowl H20	2.1	PT/A	0 a	5 abc	43 b	66 a	50 b	33 ab	96 a	100 a
	Staple	2.5	OZ/A								
	WeatherMax	15	OZ/A								
	Layby Pro	2	PT/A								
	MSMA	24	OZ/A								
7	Prowl H20	2.1	PT/A	0 a	8 ab	60 ab	30 b	37 c	15 bc	96 a	100 a
	Reflex	1	PT/A								
	Dual Magnum	1	PT/A								
	WeatherMax	15	OZ/A								
	Layby Pro	2	PT/A								
	MSMA	24	OZ/A								
8	Non-treated			0 a	0 c	0 c	0 c	0 d	0 c	0 b	0 b

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Weed Code			AMAPA	AMAPA	AMAPA	AMAPA	IPOLA	IPOLA		
Crop Code	COTTON	COTTON	AMAPA	AMAPA	AMAPA	AMAPA	IPOLA	IPOLA		
Rating Data Type	%	%	%	%	%	%	%	%		
Rating Unit	injury	injury	control	control	control	control	control	control		
Rating Date	May-11-07	May-15-07	May-11-07	May-22-07	Jun-21-07	Jul-10-07	Jun-21-07	Jul-10-07		
Trt-Eval Interval	23 DA-A	27 DA-A	23 DA-A	10 DA-B	6 DA-C	25 DA-C	6 DA-C	25 DA-C		
Trt No.	Treatment Name	Rate	1	2	3	4	5	6	7	8
		Rate Unit								
9	Prowl H20	2.1 PT/A	0 a	2 bc	65 a	33 b	29 c	15 bc	96 a	100 a
	Staple	1.7 OZ/A								
	Direx	1.25 QT/A								
	WeatherMax	15 OZ/A								
	Layby Pro	2 PT/A								
	MSMA	24 OZ/A								
10	Prowl H20	2.1 PT/A	0 a	7 abc	60 ab	73 a	62 ab	43 a	96 a	100 a
	Reflex	1 PT/A								
	Direx	1.25 QT/A								
	Staple	2.5 OZ/A								
	WeatherMax	15 OZ/A								
	Layby Pro	2 PT/A								
	MSMA	24 OZ/A								
11	Staple	1.7 OZ/A	0 a	0 c	53 ab	32 b	27 c	17 bc	96 a	100 a
	Direx	1.25 QT/A								
	WeatherMax	15 OZ/A								
	Layby Pro	2 PT/A								
	MSMA	24 OZ/A								
12	Reflex	1 PT/A	0 a	4 abc	57 ab	67 a	63 ab	50 a	96 a	100 a
	Direx	1.25 QT/A								
	Staple	2.5 OZ/A								
	WeatherMax	15 OZ/A								
	Layby Pro	2 PT/A								
	MSMA	24 OZ/A								
LSD (P=.05)			0.0	5.9	18.3	16.5	12.4	22.5	3.2	0.0
Standard Deviation			0.0	3.5	10.8	9.7	7.3	13.3	1.9	0.0
CV			0.0	72.03	20.47	18.97	16.56	44.01	2.15	0.0
Bartlett's X2			0.0	2.152	11.387	19.565	9.285	21.249	1.339	0.0
P(Bartlett's X2)			.	0.976	0.328	0.021*	0.505	0.019*	0.999	.

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: 82	% OM: 2.0	Texture: loamy sand
% Silt: 14	pH: 6.3	Soil Name: _____
% Clay: 4	CEC: _____	Fert. Level: _____

ADDITIONAL MEASURED ELEMENTS

Element	Quantity	Unit

MOISTURE CONDITIONS

No.	Date	Time	Amount	Unit	Type	Interval	Unit
1.							

Overall Moisture Conditions: _____

Closest Weather Station: _____ Distance: _____ Unit: _____

APPLICATION DESCRIPTION

	A	B	C
Application Date:	Apr-18-07	May-12-07	Jun-15-07
Time of Day:	7:30 am	11:00 am	8:00 am
Application Method:	broadcast	broadcast	broadcast
Application Timing:	PRE	POT	layby
Applic. Placement:	on soil	overtop	directed
Air Temp., Unit:	64 F	87 F	80 F
% Relative Humidity:	56	40	59
Wind Velocity, Unit:	3 mph	0 mph	3 mph
Dew Presence (Y/N):	N	N	N
Water Hardness:			
Soil Temp., Unit:	57 F	83 F	84 F
Soil Moisture:	moist	fair	moist
% Cloud Cover:	100	100	0

CROP STAGE AT EACH APPLICATION

	A	B	C
Crop 1 Code, Stage:	GOSHI PRE	GOSHI PPOT	GOSHI Layby
Stage Scale:	not up	1.5 leaf	10 leaf
Height, Unit:	0 inch	2 inch	14 inch

WEED STAGE AT EACH APPLICATION

	A	B	C
Weed 1 Code, Stage:	AMAPA PRE	AMAPA POT	AMAPA Layby
Stage Scale:	not up	2-5 inch	4-14 inch
Density, Unit:	0 ydsq	5 ydsq	30 ydsq
Weed 2 Code, Stage:	IPOLA PRE	IPOLA POT	IPOLA Layby
Stage Scale:	not up	2-3 inch	2-6 inch
Density, Unit:	0 ydsq	3 ydsq	3 ydsq

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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	D2
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	14.8 GPA	15 GPA
Spray pH:			
Propellant:	CO2	CO2	CO2
Tank Mix (Y/N):			

Trt No	Treatment Application Comment