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Glyphosate-resistant Palmer amaranth response to Parallel & Dual Magnum systems.

Trial ID: C20-06

Study Dir.: Stanley Culpepper

Location: Macon Co. (paved rd)

Investigator: Stanley Culpepper

Reps: 3

Plots: 12 by 22 feet

Spray vol: 14.8 gal/ac

Mix size: 1.5 liters (min 1.0186)

Trt No.	Treatment Name	Form Conc	Form Unit	Form Type	Rate Rate	Grow Stg	Appl Code	Amt Product to Measure	Plot No. By Rep			
									1	2	3	
1	Prowl H20	3.8	L		1	QT/A	PRE	A	25.34 ml/mx	101	213	308
	Roundup WeatherMax	4.5	L		22	OZ/A	POST	B	17.42 ml/mx			
	Parallel	8	L		1	PT/A	POST	B	12.67 ml/mx			
	WeatherMax	4.5	L		22	OZ/A	PD	C	17.42 ml/mx			
	Direx	4	L		1	PT/A	PD	C	12.67 ml/mx			
2	Prowl H20	3.8	L		1	QT/A	PRE	A	25.34 ml/mx	102	210	301
	Roundup WeatherMax	4.5	L		22	OZ/A	POST	B	17.42 ml/mx			
	Parallel	8	L		1.3	PT/A	POST	B	16.47 ml/mx			
	WeatherMax	4.5	L		22	OZ/A	PD	C	17.42 ml/mx			
	Direx	4	L		1	PT/A	PD	C	12.67 ml/mx			
3	Prowl H20	3.8	L		1	QT/A	PRE	A	25.34 ml/mx	103	201	315
	Roundup WeatherMax	4.5	L		22	OZ/A	POST	B	17.42 ml/mx			
	Dual Magnum	7.62	L		1	PT/A	POST	B	12.67 ml/mx			
	WeatherMax	4.5	L		22	OZ/A	PD	C	17.42 ml/mx			
	Direx	4	L		1	PT/A	PD	C	12.67 ml/mx			
4	Prowl H20	3.8	L		1	QT/A	PRE	A	25.34 ml/mx	104	212	316
	Roundup WeatherMax	4.5	L		22	OZ/A	POST	B	17.42 ml/mx			
	Dual Magnum	7.62	L		1.3	PT/A	POST	B	16.47 ml/mx			
	WeatherMax	4.5	L		22	OZ/A	PD	C	17.42 ml/mx			
	Direx	4	L		1	PT/A	PD	C	12.67 ml/mx			
5	Prowl H20	3.8	L		1	QT/A	PRE	A	25.34 ml/mx	105	206	307
	Roundup WeatherMax	4.5	L		22	OZ/A	POST	B	17.42 ml/mx			
	Parallel	8	L		1.3	PT/A	POST	B	16.47 ml/mx			
	Diuron	4	L		1	PT/A	POST	B	12.67 ml/mx			
	WeatherMax	4.5	L		22	OZ/A	PD	C	17.42 ml/mx			
Direx	4	L		1	PT/A	PD	C	12.67 ml/mx				
6	Prowl H20	3.8	L		1	QT/A	PRE	A	25.34 ml/mx	106	209	303
	Roundup WeatherMax	4.5	L		22	OZ/A	POST	B	17.42 ml/mx			
	Dual Magnum	7.62	L		1.3	PT/A	POST	B	16.47 ml/mx			
	Diuron	4	L		1	PT/A	POST	B	12.67 ml/mx			
	WeatherMax	4.5	L		22	OZ/A	PD	C	17.42 ml/mx			
Direx	4	L		1	PT/A	PD	C	12.67 ml/mx				
7	Prowl H20	3.8	L		1	QT/A	PRE	A	25.34 ml/mx	107	208	310
	Roundup WeatherMax	4.5	L		22	OZ/A	POST	B	17.42 ml/mx			
	Parallel	8	L		1.3	PT/A	POST	B	16.47 ml/mx			
	Diuron	4	L		2	PT/A	POST	B	25.34 ml/mx			
	WeatherMax	4.5	L		22	OZ/A	PD	C	17.42 ml/mx			
Direx	4	L		1	PT/A	PD	C	12.67 ml/mx				
8	Prowl H20	3.8	L		1	QT/A	PRE	A	25.34 ml/mx	108	205	304
	Roundup WeatherMax	4.5	L		22	OZ/A	POST	B	17.42 ml/mx			
	Dual Magnum	7.62	L		1.3	PT/A	POST	B	16.47 ml/mx			
	Diuron	4	L		2	PT/A	POST	B	25.34 ml/mx			
	WeatherMax	4.5	L		22	OZ/A	PD	C	17.42 ml/mx			
Direx	4	L		1	PT/A	PD	C	12.67 ml/mx				
9	Prowl H20	3.8	L		1	QT/A	PRE	A	25.34 ml/mx	109	207	313
	Dual Magnum	7.62	L		1.33	PT/A	POST	B	16.85 ml/mx			
	Cotoran	4	L		1	PT/A	POST	B	12.67 ml/mx			
10	Prowl H20	3.8	L		1	QT/A	PRE	A	25.34 ml/mx	110	216	306
	Parallel	8	L		1.33	PT/A	POST	B	16.85 ml/mx			
	Cotoran	4	L		1	PT/A	POST	B	12.67 ml/mx			

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Reps: 3

Plots: 12 by 22 feet

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Mix size: 1.5 liters (min 1.0186)

Trt No.	Treatment Name	Form Conc	Form Unit	Form Type	Rate	Grow Unit	Appl Stg	Appl Code	Amt Product to Measure	Plot No. By Rep		
										1	2	3
11	Prowl H20	3.8	L		1	QT/A	PRE	A	25.34 ml/mx	111	214	305
	Dual Magnum	7.62	L		1.33	PT/A	POST	B	16.85 ml/mx			
	Cotoran	4	L		2	PT/A	POST	B	25.34 ml/mx			
12	Prowl H20	3.8	L		1	QT/A	PRE	A	25.34 ml/mx	112	211	312
	Parallel	8	L		1.33	PT/A	POST	B	16.85 ml/mx			
	Cotoran	4	L		2	PT/A	POST	B	25.34 ml/mx			
13	Prowl H20	3.8	L		1	QT/A	PRE	A	25.34 ml/mx	113	202	311
	Dual Magnum	7.62	L		1.33	PT/A	POST	B	16.85 ml/mx			
	Diuron	4	L		1	PT/A	POST	B	12.67 ml/mx			
	Staple	3.2	L		1.7	OZ/A	POST	B	1.346 ml/mx			
14	Prowl H20	3.8	L		1	QT/A	PRE	A	25.34 ml/mx	114	215	302
	Parallel	8	L		1.33	PT/A	POST	B	16.85 ml/mx			
	Diuron	4	L		1	PT/A	POST	B	12.67 ml/mx			
	Staple	3.2	L		1.7	OZ/A	POST	B	1.346 ml/mx			
15	Prowl H20	3.8	L		1	QT/A	PRE	A	25.34 ml/mx	115	203	309
	Parallel	8	L		1.33	PT/A	POST	B	16.85 ml/mx			
	Diuron	4	L		1	PT/A	POST	B	12.67 ml/mx			
	Staple	3.2	L		1.7	OZ/A	POST	B	1.346 ml/mx			
16	Non-treated									116	204	314

Sort Order: Treatment

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

Amount*	Unit	Treatment Name	Form Conc	Form Type	Lot Code
475.034	ml	Prowl H20	3.8	L	
174.198	ml	Roundup WeatherMax	4.5	L	
161.828	ml	Parallel	8	L	
174.198	ml	WeatherMax	4.5	L	
126.676	ml	Direx	4	L	
140.769	ml	Dual Magnum	7.62	L	
142.510	ml	Diuron	4	L	
95.007	ml	Cotoran	4	L	
5.048	ml	Staple	3.2	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.

Trial Comments

OBJECTIVE: Compare metolachlor mixtures for the control of glyphosate-resistant Palmer amaranth.

Cotton Response:

1. It was extremely hot and humid at time of application.
2. All POST treatments were made topically.
3. Mixtures of metolachlor plus glyphosate caused at least 16% spotting/speckling injury at 4 DAT. This injury was not noted by 11 DAT. No difference in metolachlor products was noted.
4. Mixtures of metolachlor plus diuron plus glyphosate caused severe injury (>85% 4 DAT) with no differences noted when comparing metolachlor products. Diuron rate impacted cotton recovery.
5. Mixtures of metolachlor plus Cotoran also caused severe injury (>50% 4 DAT). In contrast to diuron mixtures, Cotoran mixtures did eventually visually recover although maturity was delayed. Cotoran rate impacted initial control but did not impact cotton recovery.

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6. Mixtures of metolachlor/diuron/staple caused at least 75% injury 4 DAT but injury was less than that noted with glyphosate/metolachlor/diuron mixtures.

Glyphosate-resistant Palmer amaranth response:

1. Prowl was applied over the trial area except in the non-treated. Prowl provided poor control.
2. Glyphosate plus metolachlor mixtures did not control emerged pigweed escaping the Prowl application, thus control was poor throughout the season. No differences in control by metolachlor products was noted with these mixtures.
3. Diuron mixtures provided good control of emerged Palmer amaranth. Cotoran was less effective than diuron. Mixing Staple with diuron did not improve control compared to diuron alone (very possible this pigweed population is resistant to both glyphosate and ALS chemistry).
4. There were no differences when comparing Parallel to Dual Magnum in the Cotoran or Diuron/Staple systems. However in the diuron (1 pt/A) plus glyphosate systems, 1.3 pt/A of Dual Magnum was more effective than 1.3 pt/A of Parallel at 23 and 42 days after application.
5. Control by most systems was non-existent by 50 DAT and the study had to be destroyed to reduce pollen and seed production.

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Glyphosate-resistant Palmer amaranth response to Parallel & Dual Magnum systems.

Trial ID: C20-06

Study Dir.: Stanley Culpepper

Location: Macon Co. (paved rd)

Investigator: Stanley Culpepper

Weed Code		GOSHI	GOSHI	GOSHI	AMAPA	AMAPA	AMAPA	AMAPA		
Crop Code		injury	injury	injury	control	control	control	control		
Rating Data Type		percent	percent	percent	percent	percent	percent	percent		
Rating Unit										
Rating Date		Jun-01-06	Jun-08-06	Jun-20-06	Jun-01-06	Jun-08-06	Jun-20-06	Jul-09-06		
Assessed By		AD	SC	SC	AD	SC	SC	SC		
Trt-Eval Interval		4 DA-B	11 DA-B	23 DA-B	4 DA-B	11 DA-B	23 DA-B	42 DA-B		
Trt No.	Treatment Name	Rate	Unit	1	2	3	4	5	6	7
1	Prowl H20	1	QT/A	20 g	0 e	3 d	53 cd	30 cde	23 c	13 de
	Roundup WeatherMax	22	OZ/A							
	Parallel	1	PT/A							
	WeatherMax	22	OZ/A							
	Direx	1	PT/A							
2	Prowl H20	1	QT/A	17 g	0 e	0 d	50 d	30 cde	20 c	12 de
	Roundup WeatherMax	22	OZ/A							
	Parallel	1.3	PT/A							
	WeatherMax	22	OZ/A							
	Direx	1	PT/A							
3	Prowl H20	1	QT/A	23 g	0 e	0 d	73 b	35 cd	23 c	12 de
	Roundup WeatherMax	22	OZ/A							
	Dual Magnum	1	PT/A							
	WeatherMax	22	OZ/A							
	Direx	1	PT/A							
4	Prowl H20	1	QT/A	20 g	0 e	0 d	65 bc	38 c	23 c	18 d
	Roundup WeatherMax	22	OZ/A							
	Dual Magnum	1.3	PT/A							
	WeatherMax	22	OZ/A							
	Direx	1	PT/A							
5	Prowl H20	1	QT/A	92 a	60 bc	17 c	93 a	83 b	52 b	47 c
	Roundup WeatherMax	22	OZ/A							
	Parallel	1.3	PT/A							
	Diuron	1	PT/A							
	WeatherMax	22	OZ/A							
	Direx	1	PT/A							
6	Prowl H20	1	QT/A	88 ab	68 b	27 b	90 a	91 ab	65 b	63 b
	Roundup WeatherMax	22	OZ/A							
	Dual Magnum	1.3	PT/A							
	Diuron	1	PT/A							
	WeatherMax	22	OZ/A							
	Direx	1	PT/A							
7	Prowl H20	1	QT/A	97 a	88 a	63 a	97 a	98 a	92 a	93 a
	Roundup WeatherMax	22	OZ/A							
	Parallel	1.3	PT/A							
	Diuron	2	PT/A							
	WeatherMax	22	OZ/A							
	Direx	1	PT/A							
8	Prowl H20	1	QT/A	93 a	86 a	60 a	95 a	97 a	84 a	87 a
	Roundup WeatherMax	22	OZ/A							
	Dual Magnum	1.3	PT/A							
	Diuron	2	PT/A							
	WeatherMax	22	OZ/A							
	Direx	1	PT/A							
9	Prowl H20	1	QT/A	52 f	27 d	0 d	70 b	27 de	15 c	7 de
	Dual Magnum	1.33	PT/A							
	Cotoran	1	PT/A							

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Weed Code		GOSHI	GOSHI	GOSHI	AMAPA	AMAPA	AMAPA	AMAPA		
Crop Code		injury	injury	injury	control	control	control	control		
Rating Data Type		percent	percent	percent	percent	percent	percent	percent		
Rating Unit										
Rating Date		Jun-01-06	Jun-08-06	Jun-20-06	Jun-01-06	Jun-08-06	Jun-20-06	Jul-09-06		
Assessed By		AD	SC	SC	AD	SC	SC	SC		
Trt-Eval Interval		4 DA-B	11 DA-B	23 DA-B	4 DA-B	11 DA-B	23 DA-B	42 DA-B		
Trt No.	Treatment Name	Rate	Unit	1	2	3	4	5	6	7
10	Prowl H20 Parallel Cotoran	1 1.33 1	QT/A PT/A PT/A	60 ef	30 d	0 d	60 bcd	25 e	18 c	7 de
11	Prowl H20 Dual Magnum Cotoran	1 1.33 2	QT/A PT/A PT/A	77 cd	30 d	0 d	67 bc	32 cde	15 c	10 de
12	Prowl H20 Parallel Cotoran	1 1.33 2	QT/A PT/A PT/A	68 de	30 d	0 d	72 b	38 c	17 c	13 de
13	Prowl H20 Dual Magnum Diuron Staple	1 1.33 1 1.7	QT/A PT/A PT/A OZ/A	78 c	51 c	12 c	87 a	86 b	58 b	57 bc
14	Prowl H20 Parallel Diuron Staple	1 1.33 1 1.7	QT/A PT/A PT/A OZ/A	80 bc	57 bc	13 c	88 a	86 b	62 b	69 b
15	Prowl H20 Parallel Diuron Staple	1 1.33 1 1.7	QT/A PT/A PT/A OZ/A	75 cd	61 bc	13 c	90 a	84 b	63 b	65 b
16	Non-treated			0 h	0 e	0 d	0 e	0 f	0 d	0 e
LSD (P=.05)				8.7	11.2	6.9	12.4	7.5	12.4	13.5
Standard Deviation				5.2	6.7	4.1	7.4	4.5	7.4	8.1
CV				8.93	18.4	31.65	10.35	8.23	18.82	22.58
Bartlett's X2				9.631	5.525	5.187	23.438	18.009	10.857	19.747
P(Bartlett's X2)				0.473	0.596	0.637	0.037*	0.115	0.697	0.102

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

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

SOIL DESCRIPTION

% Sand: 82 % OM: 6.3 Texture: loamy sand
 % Silt: 14 pH: 2 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: dryland

Closest Weather Station: _____ Distance: _____ Unit: ____

APPLICATION DESCRIPTION

	A	B	C
Application Date:	May-02-06	May-28-06	Jun-21-06
Time of Day:	9 am	12 pm	12 pm
Application Method:	broadcast	broadcast	broadcast
Application Timing:	PRE	POST	PD
Applic. Placement:	on soil	overtop	directed
Air Temp., Unit:	74 F	94 F	94 F
% Relative Humidity:	42	59	49
Wind Velocity, Unit:	2 mph	1 mph	3 mph
Dew Presence (Y/N):	n	n	n
Water Hardness:			
Soil Temp., Unit:	79 F	105 F	100 F
Soil Moisture:	moist	fair	fair
% Cloud Cover:	25	5	15

CROP STAGE AT EACH APPLICATION

	A	B	C
Crop 1 Code, Stage:	GOSHI PRE	GOSHI POST	GOSHI PD
Stage Scale:	not up	3 leaf	10 lf
Height, Unit:	0 inch	3 inch	11 inch

WEED STAGE AT EACH APPLICATION

	A	B	C
Weed 1 Code, Stage:	AMAPA PRE	AMAPA POST	AMAPA PD
Stage Scale:	not up	3 inch	up to 15"
Density, Unit:	0 ydsq	50 ydsq	64 ydsq

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APPLICATION EQUIPMENT

	A	B	C
Appl. Equipment:	backpack	backpack	backpack
Operating Pressure:	23	23	18
Nozzle Type:	flat fan	flat fan	floodjet
Nozzle Size:	11002	11002	TK2
Nozzle Spacing, Unit:	18 inch	18 inch	36 inch
Nozzles/Row:	2	2	1
Band Width, Unit:			
Boom Length, Unit:	4.5 feet	4.5 feet	
Boom Height, Unit:	15 inch	15 inch	15 inch
Ground Speed, Unit:	3 mph	3 mph	3 mph
Incorporation Equip.:			
Hours to Incorp.:			
Incorp. Depth, Unit:			
Carrier:	water	water	water
Spray Volume, Unit:	14.8 GPA	14.8 GPA	14.8 GPA
Spray pH:			
Propellant:	CO2	CO2	CO2
Tank Mix (Y/N):	Y	Y	Y

Trt No	Treatment Application Comment