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Glyphosate-resistant Palmer amaranth control by residual herbicides applied preemergence

Trial ID: C5-07

Protocol ID:

Location: Macon County

Study Director: Kichler, Culpepper

Investigator: Stanley Culpepper

Reps: 3

Plots: 6 by 23 feet

Spray vol: 14.8 gal/ac

Mix size: 1 liters (min .53246)

Trt No.	Treatment Name	Form Conc	Form Unit	Form Type	Rate Rate	Growth Stage	Appl Code	Amt to Measure	Plot No. By Rep		
									1	2	3
1	1X Rate Caparol	4.0 lba/gal	L		2 PT/A	PRE	A	16.89 ml/mx	119	207	326
2	1X Rate Cotoran	4.0 lba/gal	L		2 PT/A	PRE	A	16.89 ml/mx	125	205	318
3	1X Rate Direx	4.0 lba/gal	L		2 PT/A	PRE	A	16.89 ml/mx	114	208	324
4	1X Rate Dual Magnum	7.62 lba/gal	L		1 PT/A	PRE	A	8.445 ml/mx	123	213	314
5	1X Rate Envoke	75 %	WG		0.1 OZ/A	PRE	A	.0506 g/mx	117	206	325
6	1X Rate Layby Pro	4.0 lba/gal	L		2 PT/A	PRE	A	16.89 ml/mx	121	210	321
7	1X Rate Linex	4.0 lba/gal	L		2 PT/A	PRE	A	16.89 ml/mx	120	201	317
8	1X Rate Prowl H2O	3.8 lba/gal	L		2 PT/A	PRE	A	16.89 ml/mx	126	204	316
9	1X Rate Reflex	2.0 lba/gal	L		1 PT/A	PRE	A	8.445 ml/mx	115	202	319
10	1X Rate Stalwart	8.0 lba/gal	L		1 PT/A	PRE	A	8.445 ml/mx	118	211	322
11	1X Rate Staple LX	3.2 lba/gal	L		1.7 FL OZ/A	PRE	A	0.8974 ml/mx	124	212	315
12	1X Rate Suprend	80 %	WG		1 LB/A	PRE	A	8.096 g/mx	116	203	320
13	1X Rate Valor SX	51 %	WG		1.5 OZ/A	PRE	A	0.759 g/mx	122	209	323
14	1.5X Rate Caparol	4.0 lba/gal	L		3 PT/A	PRE	A	25.34 ml/mx	103	223	312
15	1.5X Rate Cotoran	4.0 lba/gal	L		3 PT/A	PRE	A	25.34 ml/mx	111	221	304
16	1.5X Rate Direx	4.0 lba/gal	L		3 PT/A	PRE	A	25.34 ml/mx	107	225	308
17	1.5X Rate Dual Magnum	7.62 lba/gal	L		1.5 PT/A	PRE	A	12.67 ml/mx	109	219	301
18	1.5X Rate Envoke	75 %	WG		0.15 OZ/A	PRE	A	.0759 g/mx	112	215	307
19	1.5X Rate Layby Pro	4.0 lba/gal	L		3 PT/A	PRE	A	25.34 ml/mx	113	222	309
20	1.5X Rate Linex	4.0 lba/gal	L		3 PT/A	PRE	A	25.34 ml/mx	106	218	311
21	1.5X Rate Prowl H2O	3.8 lba/gal	L		3 PT/A	PRE	A	25.34 ml/mx	102	214	302
22	1.5X Rate Reflex	2.0 lba/gal	L		1.5 PT/A	PRE	A	12.67 ml/mx	108	217	305
23	1.5X Rate Stalwart	8.0 lba/gal	L		1.5 PT/A	PRE	A	12.67 ml/mx	101	216	306

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Reps: 3 Plots: 6 by 23 feet
 Spray vol: 14.8 gal/ac Mix size: 1 liters (min .53246)

Trt No.	Treatment Name	Form Conc	Form Unit	Form Type	Rate Rate	Rate Unit	Growth Stage	Appl Code	Amt Product to Measure	Plot No. By Rep		
										1	2	3
24	1.5X Rate Staple LX	3.2	lba/gal	L	2.55	FL OZ/A	PRE	A	1.346 ml/mx	105	224	310
25	1.5X Rate Suprend	80	%	WG	1.5	LB/A	PRE	A	12.14 g/mx	104	226	303
26	1.5X Rate Valor SX	51	%	WG	2.25	OZ/A	PRE	A	1.139 g/mx	110	220	313
27	Untreated									128	227	327
28	Untreated									127	228	328
29	V-10204	60		WG	0.053	LB A/A	PRE	A	0.7152 g/mx	129	229	329
30	V-10204	60		WG	0.106	LB A/A	PRE	A	1.43 g/mx	130	230	330
31	V-10204	60		WG	0.159	LB A/A	PRE	A	2.146 g/mx	131	231	331
32	V-10204	60		WG	0.213	LB A/A	PRE	A	2.874 g/mx	132	232	332

Sort Order: Treatment

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

Amount*	Unit	Treatment Name	Form Conc	Form Type	Lot Code
52.782	ml	Caparol	4.0	L	
52.782	ml	Cotoran	4.0	L	
52.782	ml	Direx	4.0	L	
26.391	ml	Dual Magnum	7.62	L	
0.158	g	Envoke	75	WG	
52.782	ml	Layby Pro	4.0	L	
52.782	ml	Linex	4.0	L	
52.782	ml	Prowl H2O	3.8	L	
26.391	ml	Reflex	2.0	L	
26.391	ml	Stalwart	8.0	L	
2.804	ml	Staple LX	3.2	L	
25.301	g	Suprend	80	WG	
2.372	g	Valor SX	51	WG	
8.957	g	V-10204	60	WG	

* 'Per area' calculations based on spray volume= 14.8 gal/ac, mix size= 1 liters (mix size basis).
 * Product amount calculations increased 25 % for overage adjustment.

Trial Comments

OBJECTIVE: Determine the most effective residual herbicide for glyphosate-resistant Palmer amaranth throughout the cotton crop.

Note: The first rainfall after applications did not occur for 17 days. By 17 days, the initial pigweed flush that occurred was not controlled by any herbicide treatment as the products were not activated by any rainfall. Ratings in this study began after the 1st rainfall and evaluations only occurred on the second and third pigweed flush not taking into account the plants present from the initial flush.

Palmer amaranth Control:

1. Valor, Staple, and Reflex provided consistently the best control.
2. Linex and Layby Pro were as effective as Valor, Staple and Reflex during early season but were generally less effective later in the crop.
3. Cotoran, Diuron, and Dual Magnum generally provided about 20% less control than the more effective products.
4. Control by V-10204 ranged from little control (0.053) to control being as effective (0.213 lb) as any product at 27 and 41 DAT.
5. Caparol was the least effective product.

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6. Little differences were noted with Cotoran and Diuron.

CONCLUSIONS:

1. In dry land conditions, Staple, Valor, and Reflex should be included in a programs approach to control glyphosate-resistant Palmer amaranth even if rainfall does not occur for 17 days after application because the products will provide control through the season.

GENERAL COMMENTS:

May 5: The initial Palmer flush included on 5 plants per square yard.

May 15: WeatherMax at 22 oz/A applied topically over trial area.

May 27: The second Palmer flush included 40 to 60 plants per square yard.

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Glyphosate-resistant Palmer amaranth control by residual herbicides applied preemergence

Trial ID: C5-07

Protocol ID:

Location: Macon County

Study Director: Kichler, Culpepper

Investigator: Stanley Culpepper

Pest Type	W Weed	W Weed	W Weed
Pest Code	AMAPA	AMAPA	AMAPA
Rating Date	May-15-07	May-29-07	Jul-11-07
Rating Data Type	% control	% control	% control
Rating Unit	flush 2	flush 2	flush 2
Assessed By	SC		
Days After First/Last Applic.	27	41	84
Trt-Eval Interval	27 DA-A	41 DA-A	84 DA-A
Trt No.	Treatment Name	Rate	Unit
1	1X Rate Caparol	2	PT/A
		13	jk
		20	n
		7	jk
2	1X Rate Cotoran	2	PT/A
		62	b-f
		65	b-i
		45	c-f
3	1X Rate Direx	2	PT/A
		45	e-i
		68	a-h
		47	b-f
4	1X Rate Dual Magnum	1	PT/A
		52	e-h
		57	f-k
		43	d-g
5	1X Rate Envoke	0.1	OZ/A
		52	e-h
		58	e-k
		17	h-k
6	1X Rate Layby Pro	2	PT/A
		62	b-f
		68	a-h
		30	e-i
7	1X Rate Linex	2	PT/A
		75	a-d
		78	a-d
		15	h-k
8	1X Rate Prowl H2O	2	PT/A
		42	f-i
		45	jkl
		35	e-h
9	1X Rate Reflex	1	PT/A
		75	a-d
		67	b-h
		70	ab
10	1X Rate Stalwart	1	PT/A
		27	ij
		33	lmn
		30	e-i
11	1X Rate Staple LX	1.7	FL OZ/A
		76	a-d
		72	a-g
		67	a-d
12	1X Rate Suprend	1	LB/A
		43	e-i
		53	g-k
		27	f-j
13	1X Rate Valor SX	1.5	OZ/A
		78	abc
		83	ab
		80	a
14	1.5X Rate Caparol	3	PT/A
		47	e-i
		33	lmn
		10	ijk
15	1.5X Rate Cotoran	3	PT/A
		60	c-f
		57	f-k
		47	b-f
16	1.5X Rate Direx	3	PT/A
		65	a-e
		60	d-j
		63	a-d
17	1.5X Rate Dual Magnum	1.5	PT/A
		62	b-f
		63	c-j
		48	b-f
18	1.5X Rate Envoke	0.15	OZ/A
		62	b-f
		58	e-k
		22	g-k
19	1.5X Rate Layby Pro	3	PT/A
		80	abc
		77	a-e
		48	b-f
20	1.5X Rate Linex	3	PT/A
		87	a
		82	abc
		62	a-d
21	1.5X Rate Prowl H2O	3	PT/A
		47	e-i
		47	i-l
		47	b-f

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Pest Type	W Weed	W Weed	W Weed
Pest Code	AMAPA	AMAPA	AMAPA
Rating Date	May-15-07	May-29-07	Jul-11-07
Rating Data Type	% control	% control	% control
Rating Unit	flush 2	flush 2	flush 2
Assessed By	SC		
Days After First/Last Applic.	27	41	84
Trt-Eval Interval	27 DA-A	41 DA-A	84 DA-A
Trt No.	Treatment Name	Rate	Rate Unit
22	1.5X Rate Reflex	1.5	PT/A
23	1.5X Rate Stalwart	1.5	PT/A
24	1.5X Rate Staple LX	2.55	FL OZ/A
25	1.5X Rate Suprend	1.5	LB/A
26	1.5X Rate Valor SX	2.25	OZ/A
27	Untreated		
28	Untreated		
29	V-10204	0.053	LB A/A
30	V-10204	0.106	LB A/A
31	V-10204	0.159	LB A/A
32	V-10204	0.213	LB A/A
	LSD (P=.05)	19.2	16.5
	Standard Deviation	11.7	10.1
	CV	21.5	18.03
	Bartlett's X2	40.905	23.411
	P(Bartlett's X2)	0.055	0.554

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

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Trial ID: C5-07

Protocol ID: _____

Location: Macon County

Study Director: Kichler, Culpepper

Investigator: Stanley Culpepper

General Trial Information

Study Director: Stanley Culpepper

Title: Ext. Weed Science

Affiliation: University of Georgia

Postal Code: 31794

E-mail: _____

Investigator: Jeremy Kickler

Title: Macon. Co. Extension

Affiliation: University of Georgia

Postal Code: _____

E-mail: _____

Keywords: _____

Trial Location

City: Macon Co

Trial Status: completed

State/Prov.: GA

Trial Reliability: _____

Postal Code: USA

Initiation Date: Apr-18-07

Country: Macon

Planned Completion Date: _____

-Latitude of LL Corner °: _____

-Longitude of LL Corner °: _____

Altitude of LL Corner: _____ Unit: _____ Angle y-axis to North °: _____

Map Reference: _____

Directions: _____

Conducted Under GLP:

Official Trial Code: _____

Conducted Under GEP:

Other Trial Code: _____

Guideline	Description
1.	

Objectives: _____

Conclusions: _____

Cooperator/Landowner

Cooperator: _____

Country: _____

Organization: _____

Phone No: _____

Address 1: _____

Fax No: _____

Address 2: _____

City: _____

State/Prov: _____

Postal Code: _____ E-mail: _____

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Crop Description	
Crop 1: GOSHI <i>Gossypium hirsutum</i>	Cotton, American upland
Variety: DP 555 BRR	Description: _____
BBCH Scale: BCOT	Planting Date: May-01-06
Planting Method: seeded	Rate, Unit: 3 ft
Depth, Unit: 0.5 in	Perennial Age, Unit: _____
Row Spacing, Unit: 3 ft	Spacing Within Row, Unit: 4 in
Seed Bed: bedded	Soil Temperature, Unit: 79 F
Soil Moisture: moist	Emergence Date: May-06-06
Harvest Date: _____	Harvest Equipment: _____
Harvested Width, Unit: _____	Harvested Length, Unit: _____
% Standard Moisture: _____	Moisture Meter: _____
Weighing Equipment: _____	

Pest Description	
Pest 1 Type: W Code: AMAPA <i>Amaranth, Palmer</i>	
Common Name: <i>Amaranthus palmeri</i>	
Description: _____	

Site and Design			
Plot Width, Unit: 6	FT	Site Type:	Sutton farms
Plot Length, Unit: 23	FT	Tillage Type:	conventional
Replications: 3		Study Design:	Split-Plot
% Slope: _____		Soil Drainage:	_ _____

Trial Initiation Comments:

	Previous Crops	Previous Pesticides	Year
1.			

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

Comment:

Field Prep./Maintenance:

Soil Description			
Description Name: _____			
% Sand: 82	% OM: 6.3	Texture:	Loamy sand
% Silt: 14	pH: 2.0	Soil Name:	_____
% Clay: 4	CEC: _____	Fert. Level:	_____
Analyzed By:			

Additional Measured Elements		
Element	Quantity	Unit

Moisture Conditions		
Overall Moisture Conditions:	dry	
Closest Weather Station:	_____	Distance: _____ Unit: _____

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	Date	Time	Amount	Unit	Type	Interval	Unit
1.							

Application Description

	A
Application Date:	Apr-18-07
Time of Day:	9:00 pm
Application Method:	broadcast
Application Timing:	PRE
Application Placement:	on soil
Applied By:	
Air Temperature, Unit:	65 F
% Relative Humidity:	59
Wind Velocity, Unit:	0 mph
Wind Direction:	
Dew Presence (Y/N):	N
Water Hardness:	
Soil Temperature, Unit:	63 F
Soil Moisture:	moist
% Cloud Cover:	0
Next Rain Occurred On:	

Crop Stage At Each Application

	A
Crop 1 Code, BBCH Scale:	GOSHI BCOT
Stage Scale Used:	BBCH
Stage Majority, Percent:	not up 100
Stage Minimum, Percent:	not up 100
Stage Maximum, Percent:	not up 100
Diameter, Unit:	
Height, Unit:	
Height Minimum, Maximum:	

Pest Stage At Each Application

	A
Pest 1 Code, Disc., Scale:	AMAPA W PRE
Stage Majority, Percent:	not up 100
Stage Minimum, Percent:	not up 100
Stage Maximum, Percent:	not up 100
Diameter, Unit:	
Height, Unit:	
Height Minimum, Maximum:	
Density, Unit:	0. .
Coverage, Unit:	

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Application Equipment

	A
Appl. Equipment:	backpack
Operating Pressure, Unit:	24 PSI
Nozzle Type:	flat fan
Nozzle Size:	11002
Nozzle Spacing, Unit:	18 inch
Nozzles/Row:	2
Nozzle Calibration, Unit:	
Band Width, Unit:	
Boom ID:	
Boom Length, Unit:	4.5 feet
Boom Height, Unit:	15 inch
Ground Speed, Unit:	3 mph
Incorporation Equip.:	
Hours to Incorp.:	
Incorp. Depth, Unit:	
Carrier:	water
Spray Volume, Unit:	15 GAL/AC
Mix Size, Unit:	
Spray pH:	
Propellant:	CO2
Tank Mix (Y/N):	Y

Equipment Comment:

Trt No Treatment Application Comment

Date By Notes

Date By Deviations

Reasons: