

University of Georgia

Glyphosate-resistant Palmer amaranth response to Valor and Cobra programs.

Prot (67.01)

Trial ID: C4-08

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: 1.5 liters (min 1.1575)

Trt No.	Treatment Name	Form Conc	Form Unit	Form Type	Rate Rate	Grow Unit	Stg	Appl Code	Amt Product to Measure	Plot No. By Rep		
										1	2	3
1	Non-treated									101	205	308
2	Valor	51		DG	2	OZ/A	preplant	A	1.518 g/mx	102	203	307
	Roundup PowerMax	5.5		L	22	OZ/A	preplant	A	17.42 ml/mx			
	Roundup PowerMax	5.5		L	22	OZ/A	POST	C	17.42 ml/mx			
	Dual Magnum	7.62		L	1	PT/A	POST	C	12.67 ml/mx			
	Valor	51		DG	2	OZ/A	Overtop	E	1.518 g/mx			
	Roundup PowerMax	5.5		L	22	OZ/A	Overtop	E	17.42 ml/mx			
	Direx	4		L	0.8	QT/A	Overtop	E	20.27 ml/mx			
3	Valor	51		DG	2	OZ/A	preplant	A	1.518 g/mx	103	208	306
	Roundup PowerMax	5.5		L	22	OZ/A	preplant	A	17.42 ml/mx			
	Roundup PowerMax	5.5		L	22	OZ/A	POST	C	17.42 ml/mx			
	Staple	3.2		L	1.7	OZ/A	POST	C	1.346 ml/mx			
	Valor	51		DG	2	OZ/A	Overtop	E	1.518 g/mx			
	Roundup PowerMax	5.5		L	22	OZ/A	Overtop	E	17.42 ml/mx			
	Direx	4		L	0.8	QT/A	Overtop	E	20.27 ml/mx			
4	Valor	51		DG	2	OZ/A	preplant	A	1.518 g/mx	104	206	303
	Roundup PowerMax	5.5		L	22	OZ/A	preplant	A	17.42 ml/mx			
	Roundup PowerMax	5.5		L	22	OZ/A	POST	C	17.42 ml/mx			
	Dual Magnum	7.62		L	1	PT/A	POST	C	12.67 ml/mx			
	Cobra	2		L	12.5	OZ/A	MPD	D	9.898 ml/mx			
	Roundup PowerMax	5.5		L	22	OZ/A	MPD	D	17.42 ml/mx			
	Dual Magnum	7.62		L	2	PT/A	MPD	D	25.34 ml/mx			
5	Valor	51		DG	2	OZ/A	preplant	A	1.518 g/mx	105	207	301
	Roundup PowerMax	5.5		L	22	OZ/A	preplant	A	17.42 ml/mx			
	Roundup PowerMax	5.5		L	22	OZ/A	POST	C	17.42 ml/mx			
	Dual Magnum	7.62		L	1	PT/A	POST	C	12.67 ml/mx			
	Cobra	2		L	12.5	OZ/A	MPD	D	9.898 ml/mx			
	Roundup PowerMax	5.5		L	22	OZ/A	MPD	D	17.42 ml/mx			
	Dual Magnum	7.62		L	2	PT/A	MPD	D	25.34 ml/mx			
	Direx	4		L	1	QT/A	Overtop	E	25.34 ml/mx			
	MSMA	6		L	2.5	PT/A	Overtop	E	31.67 ml/mx			
6	Valor	51		DG	2	OZ/A	preplant	A	1.518 g/mx	106	202	305
	Prowl H20	3.8		L	2	PT/A	preplant	A	25.34 ml/mx			
	Roundup PowerMax	5.5		L	22	OZ/A	preplant	A	17.42 ml/mx			
	Roundup PowerMax	5.5		L	22	OZ/A	POST	C	17.42 ml/mx			
	Dual Magnum	7.62		L	1	PT/A	POST	C	12.67 ml/mx			
	Valor	51		DG	2	OZ/A	Overtop	E	1.518 g/mx			
	Roundup PowerMax	5.5		L	22	OZ/A	Overtop	E	17.42 ml/mx			
	Direx	4		L	0.8	QT/A	Overtop	E	20.27 ml/mx			
7	Valor	51		DG	2	OZ/A	preplant	A	1.518 g/mx	107	204	302
	Roundup PowerMax	5.5		L	22	OZ/A	preplant	A	17.42 ml/mx			
	Prowl H20	3.8		L	2	PT/A	PRE	B	25.34 ml/mx			
	Roundup PowerMax	5.5		L	22	OZ/A	POST	C	17.42 ml/mx			
	Dual Magnum	7.62		L	1	PT/A	POST	C	12.67 ml/mx			
	Valor	51		DG	2	OZ/A	Overtop	E	1.518 g/mx			
	Roundup PowerMax	5.5		L	22	OZ/A	Overtop	E	17.42 ml/mx			
	Direx	4		L	0.8	QT/A	Overtop	E	20.27 ml/mx			

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Reps: 3 Plots: 12 by 25 feet
 Spray vol: 14.8 gal/ac Mix size: 1.5 liters (min 1.1575)

Trt No.	Treatment Name	Form Conc	Form Unit	Form Type	Rate	Grow Unit	Stg	Appl Code	Amt to Measure	Product	Plot No. By Rep		
											1	2	3
8	Valor	51		DG	2	OZ/A	preplant	A	1.518	g/mx	108	201	304
	Roundup PowerMax	5.5		L	22	OZ/A	preplant	A	17.42	ml/mx			
	Staple	3.2		L	1.7	OZ/A	PRE	B	1.346	ml/mx			
	Cotoran	4		L	1	QT/A	PRE	B	25.34	ml/mx			
	Roundup PowerMax	5.5		L	22	OZ/A	POST	C	17.42	ml/mx			
	Dual Magnum	7.62		L	1	PT/A	POST	C	12.67	ml/mx			
	Valor	51		DG	2	OZ/A	Overtop	E	1.518	g/mx			
	Roundup PowerMax	5.5		L	22	OZ/A	Overtop	E	17.42	ml/mx			
	Direx	4		L	0.8	QT/A	Overtop	E	20.27	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
22.771	g	Valor	51	DG	
457.270	ml	Roundup PowerMax	5.5	L	
158.345	ml	Dual Magnum	7.62	L	
158.345	ml	Direx	4	L	
3.365	ml	Staple	3.2	L	
24.744	ml	Cobra	2	L	
39.586	ml	MSMA	6	L	
63.338	ml	Prowl H20	3.8	L	
31.669	ml	Cotoran	4	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: Determine Palmer response to various Valor and Cobra systems.

Palmer response:

1. Valor applied preplant provided excellent residual control; however, the strip tillage process destroyed the weed control by Valor in the row.
2. Just before POST treatments were applied the most effective program included a PRE application of Staple + Cotoran which provided control in the strip following the strip tillage operation.
3. At 17 d after the POST treatment, control was greater than 80% only with the system including Staple + Cotoran PRE.
4. MPD treatments had little impact because the pigweed was too large to control.
5. Layby options actually had to be applied topically because the Palmer was too large to direct. Even with topical applications, control was poor with layby treatments.

Cotton Response:

1. A one inch rainfall occurred after the PRE application; thus, Staple + Cotoran PRE stunted early season growth by 20%.
2. Topical application of Roundup + Dual Magnum caused 13 to 15% necrotic spotting.
3. Directed Cobra treatments caused little injury.
4. Topical applications of Valor + Direx + Roundup caused severe cotton injury on those plants that the spray actually contacted.

CONCLUSIONS:

1. Although Valor is extremely effective applied preplant, the strip tillage operation destroys herbicide control in the drill.
2. Valor needs to be applied after running the strip till or a PRE herbicide must be applied.

GENERAL COMMENTS:

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1. Wheat was used for a cover crop. Roundup was applied on March 26 to kill 15 in tall wheat. Valor was applied preplant on April 11. Strip tillage operation and planting occurred on April 24. Paraquat was applied PRE over trial area.
2. April 11, 2008 - No weeds emerged.
3. June 20, 2008 - Layby applied to topically because pigweed larger than cotton.
4. Preplant treatments received rainfall within 5 days. Additional rainfall during times when herbicides were applied after planting.:

Apr 28	1 in
May 9	0.4 in
May 11	2.7 in
May 20	0.2 in
May 24	0.3 in
Jun 11	0.9 in
Jun 17	0.6 in
Jun 22	1 in
Jul 5	0.5 in
Jul 21	1 in

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Glyphosate-resistant Palmer amaranth response to Valor and Cobra programs.

Prot (67.01)

Trial ID: C4-08

Study Dir.: Stanley Culpepper

Location: Macon County

Investigator: Stanley Culpepper

Weed Code	AMAPA	AMAPA	AMAPA	AMAPA	AMAPA	AMAPA	GOSHI	GOSHI	
Crop Code	GOSHI	GOSHI	GOSHI	GOSHI	GOSHI	GOSHI	GOSHI	GOSHI	
Rating Data Type	control	control	control	control	control	control	injury	injury	
Rating Unit	%	%	%	%	%	%	%	%	
Rating Date	May-13-08	May-23-08	May-30-08	Jun-11-08	Jun-19-08	Jun-26-08	May-13-08	May-23-08	
Trt-Eval Interval	0 DA-C	10 DA-C	17 DA-C	12 DA-D	20 DA-D	6 DA-E	0 DA-C	10 DA-C	
Trt No.	Treatment Name	Rate	Rate	Rate	Rate	Rate	Rate	Rate	
		Unit	1	2	3	4	5	6	
1	Non-treated		0 d	0 c	0 e	0 d	0 b	0 e	0 c
2	Valor	2 OZ/A	70 bc	83 b	65 bcd	40 bc	47 a	53 cd	0 b
	Roundup PowerMax	22 OZ/A							13 b
	Roundup PowerMax	22 OZ/A							
	Dual Magnum	1 PT/A							
	Valor	2 OZ/A							
	Roundup PowerMax	22 OZ/A							
	Direx	0.8 QT/A							
3	Valor	2 OZ/A	65 c	94 a	75 ab	62 ab	60 a	70 ab	0 b
	Roundup PowerMax	22 OZ/A							14 b
	Roundup PowerMax	22 OZ/A							
	Staple	1.7 OZ/A							
	Valor	2 OZ/A							
	Roundup PowerMax	22 OZ/A							
	Direx	0.8 QT/A							
4	Valor	2 OZ/A	68 bc	85 b	72 abc	58 abc	57 a	38 d	0 b
	Roundup PowerMax	22 OZ/A							14 b
	Roundup PowerMax	22 OZ/A							
	Dual Magnum	1 PT/A							
	Cobra	12.5 OZ/A							
	Roundup PowerMax	22 OZ/A							
	Dual Magnum	2 PT/A							
5	Valor	2 OZ/A	63 c	80 b	57 cd	50 abc	57 a	55 bc	0 b
	Roundup PowerMax	22 OZ/A							15 b
	Roundup PowerMax	22 OZ/A							
	Dual Magnum	1 PT/A							
	Cobra	12.5 OZ/A							
	Roundup PowerMax	22 OZ/A							
	Dual Magnum	2 PT/A							
	Direx	1 QT/A							
	MSMA	2.5 PT/A							
6	Valor	2 OZ/A	85 ab	78 b	55 d	30 c	47 a	52 cd	0 b
	Prowl H20	2 PT/A							13 b
	Roundup PowerMax	22 OZ/A							
	Roundup PowerMax	22 OZ/A							
	Dual Magnum	1 PT/A							
	Valor	2 OZ/A							
	Roundup PowerMax	22 OZ/A							
	Direx	0.8 QT/A							
7	Valor	2 OZ/A	73 abc	85 b	67 bcd	65 ab	53 a	60 bc	0 b
	Roundup PowerMax	22 OZ/A							14 b
	Prowl H20	2 PT/A							
	Roundup PowerMax	22 OZ/A							
	Dual Magnum	1 PT/A							
	Valor	2 OZ/A							
	Roundup PowerMax	22 OZ/A							
	Direx	0.8 QT/A							

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Weed Code	AMAPA	AMAPA	AMAPA	AMAPA	AMAPA	AMAPA	AMAPA	GOSHI	GOSHI		
Crop Code	GOSHI	GOSHI	GOSHI	GOSHI	GOSHI	GOSHI	GOSHI	GOSHI	GOSHI		
Rating Data Type	control	control	control	control	control	control	injury	injury	injury		
Rating Unit	%	%	%	%	%	%	%	%	%		
Rating Date	May-13-08	May-23-08	May-30-08	Jun-11-08	Jun-19-08	Jun-26-08	May-13-08	May-23-08	May-23-08		
Trt-Eval Interval	0 DA-C	10 DA-C	17 DA-C	12 DA-D	20 DA-D	6 DA-E	0 DA-C	10 DA-C	10 DA-C		
Trt No.	Treatment Name	Rate	Unit	1	2	3	4	5	6	7	8
8	Valor	2	OZ/A	88 a	99 a	85 a	75 a	63 a	76 a	20 a	18 a
	Roundup PowerMax	22	OZ/A								
	Staple	1.7	OZ/A								
	Cotoran	1	QT/A								
	Roundup PowerMax	22	OZ/A								
	Dual Magnum	1	PT/A								
	Valor	2	OZ/A								
	Roundup PowerMax	22	OZ/A								
	Direx	0.8	QT/A								
LSD (P=.05)				16.1	7.2	13.9	28.0	20.9	15.1	0.0	2.5
Standard Deviation				9.2	4.1	8.0	16.0	11.9	8.6	0.0	1.4
CV				14.39	5.4	13.39	33.65	24.89	17.11	0.0	11.45
Bartlett's X2				11.295	7.557	1.731	5.605	4.745	2.189	0.0	1.119
P(Bartlett's X2)				0.08	0.109	0.943	0.347	0.577	0.901	.	0.952

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

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Weed Code			GOSHI	GOSHI	
Crop Code			injury	injury	
Rating Data Type			%	%	
Rating Unit					
Rating Date			May-30-08	Jun-26-08	
Trt-Eval Interval			17 DA-C	6 DA-E	
Trt No.	Treatment Name	Rate	Rate Unit	9	10
1	Non-treated			0 b	0 d
2	Valor	2	OZ/A	0 b	43 ab
	Roundup PowerMax	22	OZ/A		
	Roundup PowerMax	22	OZ/A		
	Dual Magnum	1	PT/A		
	Valor	2	OZ/A		
	Roundup PowerMax	22	OZ/A		
	Direx	0.8	QT/A		
3	Valor	2	OZ/A	12 a	53 a
	Roundup PowerMax	22	OZ/A		
	Roundup PowerMax	22	OZ/A		
	Staple	1.7	OZ/A		
	Valor	2	OZ/A		
	Roundup PowerMax	22	OZ/A		
	Direx	0.8	QT/A		
4	Valor	2	OZ/A	0 b	0 d
	Roundup PowerMax	22	OZ/A		
	Roundup PowerMax	22	OZ/A		
	Dual Magnum	1	PT/A		
	Cobra	12.5	OZ/A		
	Roundup PowerMax	22	OZ/A		
	Dual Magnum	2	PT/A		
5	Valor	2	OZ/A	7 ab	28 c
	Roundup PowerMax	22	OZ/A		
	Roundup PowerMax	22	OZ/A		
	Dual Magnum	1	PT/A		
	Cobra	12.5	OZ/A		
	Roundup PowerMax	22	OZ/A		
	Dual Magnum	2	PT/A		
	Direx	1	QT/A		
	MSMA	2.5	PT/A		
6	Valor	2	OZ/A	7 ab	37 bc
	Prowl H20	2	PT/A		
	Roundup PowerMax	22	OZ/A		
	Roundup PowerMax	22	OZ/A		
	Dual Magnum	1	PT/A		
	Valor	2	OZ/A		
	Roundup PowerMax	22	OZ/A		
	Direx	0.8	QT/A		
7	Valor	2	OZ/A	10 a	40 bc
	Roundup PowerMax	22	OZ/A		
	Prowl H20	2	PT/A		
	Roundup PowerMax	22	OZ/A		
	Dual Magnum	1	PT/A		
	Valor	2	OZ/A		
	Roundup PowerMax	22	OZ/A		
	Direx	0.8	QT/A		

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Weed Code			
Crop Code		GOSHI	GOSHI
Rating Data Type		injury	injury
Rating Unit		%	%
Rating Date		May-30-08	Jun-26-08
Trt-Eval Interval		17 DA-C	6 DA-E
Trt No.	Treatment Name	Rate	Rate
		Unit	Unit
		9	10
8	Valor	2 OZ/A	5 ab
	Roundup PowerMax	22 OZ/A	40 bc
	Staple	1.7 OZ/A	
	Cotoran	1 QT/A	
	Roundup PowerMax	22 OZ/A	
	Dual Magnum	1 PT/A	
	Valor	2 OZ/A	
	Roundup PowerMax	22 OZ/A	
	Direx	0.8 QT/A	
LSD (P=.05)		8.5	11.7
Standard Deviation		4.9	6.7
CV		97.28	22.16
Bartlett's X2		1.588	1.485
P(Bartlett's X2)		0.662	0.829

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

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**Glyphosate-resistant Palmer amaranth response to Valor and Cobra programs.
Prot (67.01)**

Trial ID: C4-08
Location: Macon County

Study Dir.: Stanley Culpepper
Investigator: Stanley Culpepper

GENERAL TRIAL INFORMATION

Study Director: Stanley Culpepper	Title: Ext. Weed Science
Affiliation: Univ. of Georgia	
Postal Code: 31794	
Investigator: Stanley Culpepper	Title: Ext. Weed Science
Affiliation: Univ. of Georgia	
Postal Code: 31794	

TRIAL LOCATION

City: Macon Co.	Trial Status: completed
State/Prov.: GA	Trial Reliability: good
Postal Code: 31068	Initiation Date: Apr-11-08
Country: USA	Planned Completion Date: _____
E-Longitude of LL Corner °: _____	N-Latitude of LL Corner °: _____
Altitude of LL Corner: _____ Unit: _____	Angle y-axis to North °: _____

Directions:

COOPERATOR/LANDOWNER

Cooperator: _____	Country: _____
Org: _____	Phone No: _____
Address 1: _____	Fax No: _____
Address 2: _____	
City: _____	
State/Prov: _____	
Postal Code: _____	

Conducted Under GLP (Y/N): N **Conducted Under GEP (Y/N):** N
Guidelines: _____ **Guideline Description:** _____

Objective:

Conclusions:

CROP AND WEED DESCRIPTION

Weed	Code	Common Name	Scientific Name
1.	AMAPA	Amaranth, Palmer	Amaranthus palmeri

Crop 1: GOSHI COTTON, SHORT STAPLE **Variety:** WFR 485
Planting Date: Apr-24-08 **Planting Method:** hill dropped
Rate: 2 8 in **Depth:** 0.5 in **Perennial Age:** _____
Row Spacing: 36 in **Spacing Within Row:** 8.5 in **Seed Bed:** bedded
Soil Temperature: 85 F **Soil Moisture:** moist **Emergence Date:** Apr-30-08

SITE AND DESIGN

Plot Width, Unit: 12 FT **Plot Length, Unit:** 25 FT **Reps:** 3
Site Type: On farm
Tillage Type: Conservation tillage **Study Design:** RANDOMIZED COMPLETE BLOCK

Trial Initiation Comments:

	Previous Crops	Previous Pesticides	Year
1.			

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MAINTENANCE

Field Prep./Maintenance: Wheat was used for a cover crop. Roundup was applied on March 26 to kill 15 in tall wheat. Valor was applied preplant on April 11. Strip tillage operation and planting occurred on April 24. Paraquat was applied PRE over trial area.

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: 6.4	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	D	E
Application Date:	Apr-11-08	Apr-25-08	May-13-08	May-30-08	Jun-20-08
Time of Day:	6:30 am	2:00 pm	6:00 pm	10:00 am	9:00 am
Application Method:	broadcast	broadcast	broadcast	broadcast	broadcast
Application Timing:	preplant	PRE	POST	MPD	layby
Applic. Placement:	overtop	on soil	overtop	directed	overtop
Air Temp., Unit:	68 F	85 F	78 F	78 F	74 F
% Relative Humidity:	45	49	45	67	66
Wind Velocity, Unit:	0 mph	5 mph	0 mph	3 mph	2 mph
Dew Presence (Y/N):	Y	N	N	N	N
Water Hardness:					
Soil Temp., Unit:	64 F	77 F	82 F	84 F	78 F
Soil Moisture:	moist	moist	moist	fair	fair
% Cloud Cover:	20	30	100	0	0

CROP STAGE AT EACH APPLICATION

	A	B	C	D	E
Crop 1 Code, Stage:	GOSHI A	GOSHI B	GOSHI C	GOSHI D	GOSHI E
Stage Scale:	preplant	PRE	2 leaf	6.5 leaf	10 leaf
Height, Unit:	0 in	0 in	2.5 in	7 in	10 in

WEED STAGE AT EACH APPLICATION

	A	B	C	D	E
Weed 1 Code, Stage:	AMAPA A	AMAPA B	AMAPA C	AMAPA D	AMAPA E
Stage Scale:	preplant	0.5 in	2 in	3.5 in	21 in
Density, Unit:	0 ydsq	5 ydsq	17 ydsq	20 ydsq	20 ydsq

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APPLICATION EQUIPMENT

	A	B	C	D	E
Appl. Equipment:	backpack	backpack	backpack	backpack	backpack
Operating Pressure:	24	24	24	26	24
Nozzle Type:	flat fan	flat fan	flat fan	flood jet	flat fan
Nozzle Size:	11002	11002	11002	TK 2	11002
Nozzle Spacing, Unit:	18 in	18 in	18 in	36 in	18 in
Nozzles/Row:	2	2	2	1	2
Band Width, Unit:					
Boom Length, Unit:	4.5 ft	4.5 ft	4.5 ft		4.5 ft
Boom Height, Unit:	15 in	15 in	15 in	12 in	15 in
Ground Speed, Unit:	3 mph	3 mph	3 mph	3 mph	3 mph
Incorporation Equip.:					
Hours to Incorp.:					
Incorp. Depth, Unit:					
Carrier:	water	water	water	water	water
Spray Volume, Unit:	15 GPA	14.5 GPA	15 GPA	15 GPA	15 GPA
Spray pH:					
Propellant:	CO2	CO2	CO2	CO2	CO2
Tank Mix (Y/N):	y	y	y	y	y

Trt No	Treatment Application Comment