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**GR Palmer amaranth response to Staple, Direx, and Reflex programs.
Prot (USA-900 SE)**

Trial ID: C9-08

Study Dir.: Stanley Culpepper

Location: Macon County

Investigator: Stanley Culpepper

Reps: 3

Plots: 6 by 25 feet

Spray vol: 14.8 gal/ac

Mix size: 1 liters (min .57876)

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	Staple LX	3.2	L		2	OZ/A	PRE	A	1.056 ml/mx	101	206	315
	Direx	4	L		1.8	PT/A	PRE	A	15.2 ml/mx			
2	Staple LX	3.2	L		2	OZ/A	PRE	A	1.056 ml/mx	102	205	309
	Direx	4	L		1.8	PT/A	PRE	A	15.2 ml/mx			
	Roundup PowerMax	5.5	L		22	OZ/A	1"AMA	C	11.61 ml/mx			
	Staple LX	3.2	L		2.7	OZ/A	1"AMA	C	1.425 ml/mx			
3	Staple LX	3.2	L		2	OZ/A	PRE	A	1.056 ml/mx	103	214	316
	Direx	4	L		1.8	PT/A	PRE	A	15.2 ml/mx			
	Dual Magnum	7.64	L		1.33	PT/A	0"AMA	B	11.23 ml/mx			
	Roundup PowerMax	5.5	L		22	OZ/A	1"AMA	C	11.61 ml/mx			
	Staple LX	3.2	L		2.7	OZ/A	1"AMA	C	1.425 ml/mx			
4	Staple LX	3.2	L		2	OZ/A	PRE	A	1.056 ml/mx	104	213	306
	Direx	4	L		1.8	PT/A	PRE	A	15.2 ml/mx			
	Dual Magnum	7.64	L		1.33	PT/A	0"AMA	B	11.23 ml/mx			
5	Non-treated								105	216	312	
6	Staple LX	3.2	L		2	OZ/A	PRE	A	1.056 ml/mx	106	212	301
	Reflex	2	L		1	PT/A	PRE	A	8.445 ml/mx			
	Dual Magnum	7.64	L		1.33	PT/A	0"AMA	B	11.23 ml/mx			
7	Staple LX	3.2	L		2	OZ/A	PRE	A	1.056 ml/mx	107	208	310
	Reflex	2	L		1	PT/A	PRE	A	8.445 ml/mx			
	Dual Magnum	7.64	L		1.33	PT/A	0"AMA	B	11.23 ml/mx			
	Roundup PowerMax	5.5	L		22	OZ/A	1"AMA	C	11.61 ml/mx			
	Staple LX	3.2	L		2.7	OZ/A	1"AMA	C	1.425 ml/mx			
8	Direx	4	L		1.8	PT/A	PRE	A	15.2 ml/mx	108	210	307
	Reflex	2	L		1	PT/A	PRE	A	8.445 ml/mx			
	Dual Magnum	7.64	L		1.33	PT/A	0"AMA	B	11.23 ml/mx			
9	Direx	4	L		1.8	PT/A	PRE	A	15.2 ml/mx	109	201	302
	Reflex	2	L		1	PT/A	PRE	A	8.445 ml/mx			
	Staple LX	3.2	L		2	OZ/A	PRE	A	1.056 ml/mx			
10	Direx	4	L		1.8	PT/A	PRE	A	15.2 ml/mx	110	203	314
	Reflex	2	L		1	PT/A	PRE	A	8.445 ml/mx			
	Staple LX	3.2	L		2	OZ/A	1"AMA	C	1.056 ml/mx			
	NIS		L		0.25	% V/V	1"AMA	C	2.5 ml/mx			
11	Reflex	2	L		1	PT/A	PRE	A	8.445 ml/mx	111	202	303
	Dual Magnum	7.64	L		1.33	PT/A	0"AMA	B	11.23 ml/mx			
12	Reflex	2	L		1	PT/A	PRE	A	8.445 ml/mx	112	211	313
	Dual Magnum	7.64	L		1.33	PT/A	0"AMA	B	11.23 ml/mx			
	Staple LX	3.2	L		2	OZ/A	1"AMA	C	1.056 ml/mx			
	NIS		L		0.25	% V/V	1"AMA	C	2.5 ml/mx			
13	Non-treated								113	204	311	
14	Direx	4	L		1.8	PT/A	PRE	A	15.2 ml/mx	114	209	305
	Reflex	2	L		1	PT/A	PRE	A	8.445 ml/mx			
	Staple LX	3.2	L		2	OZ/A	1"AMA	C	1.056 ml/mx			
	NIS		L		0.25	% V/V	1"AMA	C	2.5 ml/mx			
	Dual Magnum	7.64	L		1.33	PT/A	1"AMA	C	11.23 ml/mx			
15	Direx	4	L		1.8	PT/A	PRE	A	15.2 ml/mx	115	207	304
	Reflex	2	L		1	PT/A	PRE	A	8.445 ml/mx			
	Roundup PowerMax	5.5	L		22	OZ/A	1"AMA	C	11.61 ml/mx			
	Staple LX	3.2	L		2	OZ/A	1"AMA	C	1.056 ml/mx			
	Dual Magnum	7.64	L		1.33	PT/A	1"AMA	C	11.23 ml/mx			

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Reps: 3 Plots: 6 by 25 feet
 Spray vol: 14.8 gal/ac Mix size: 1 liters (min .57876)

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
16	Direx	4	L	L	1.8	PT/A	PRE	A	15.2 ml/mx	116	215	308
	Reflex	2	L	L	1	PT/A	PRE	A	8.445 ml/mx			
	Roundup PowerMax	5.5	L	L	22	OZ/A	1"AMA	C	11.61 ml/mx			
	Staple LX	3.2	L	L	2	OZ/A	1"AMA	C	1.056 ml/mx			
	Direx	4	L	L	8	OZ/A	1"AMA	C	4.223 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
21.181	ml	Staple LX	3.2	L	
195.292	ml	Direx	4	L	
72.583	ml	Roundup PowerMax	5.5	L	
126.359	ml	Dual Magnum	7.64	L	
105.563	ml	Reflex	2	L	
9.374	ml	NIS		L	

- * '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.
- * 'Per volume' calculations use spray volume= 14.8 gal/ac, mix size= 1 liters.

Trial Comments

OBJECTIVE: Determine early season Palmer amaranth response to residual cotton herbicide programs.

Palmer Response (Palmer was not resistant to ALS chemistry, only glyphosate):

1. At 3 wk after PRE treatments, control was complete with all residual programs. Rainfall occurred 5 days after planting and treatment.
2. Mixing Reflex with Direx + Staple improved Palmer control 0, 4, 12, 13, and 35% at 21, 30, 37, 49, and 64 DAT, respectively.
3. At 30 days after the final application, the most effective programs consisted of Direx plus Reflex PRE followed by Roundup plus Staple plus Dual Magnum, Roundup plus Staple plus Direx or Staple plus Dual when Palmer was 2 inches in height.
4. Other programs that provided good control at 30 days after the final application included at least three and often four residual herbicides.

Cotton Injury:

1. A one inch rain occurred 5 d after planting.
2. Injury from PRE applications was minimal.
3. Topical applications of Dual caused less than 7% cotton leaf speckling.
4. Topical applications of Staple caused less than 10% chlorosis; however, Roundup plus Staple applications caused severe (33 to 35%) injury at 4 DAT. Cotton did recover by 16 DAT.
5. Mixing Dual with Staple and applying topically increased cotton injury at least 20% at 4 DAT and 6% at 16 DAT.
6. Mixing Direx at 8 oz with Staple plus Roundup did not increase injury at 4 DAT, but did nearly triple injury noted at 16 DAT with 20% injury still noted at 30 DAT.

CONCLUSIONS:

1. Reflex plus Staple plus Direx or Prowl will likely be the most effective residual at plant option for growers.
2. Growers could use Reflex plus Direx or Prowl PRE followed by sequential applications of Dual and Staple. It would be critical that no pigweed is emerged when applying the Dual OR the Staple.
3. Research needs to be conducted to determine how Staple and Dual mixtures could be applied topically to cotton without causing severe cotton injury.

GENERAL COMMENTS:

1. Firestorm @ 1 qt/A + 1 qt/A Crop Oil was applied over the trial area at planting.

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2. Rainfall occurring during times of herbicide applications in crop included the following:

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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Trial ID: C9-08

Study Dir.: Stanley Culpepper

Location: Macon County

Investigator: Stanley Culpepper

Weed Code		AMAPA	AMAPA	AMAPA	AMAPA	AMAPA	GOSHI	GOSHI	GOSHI		
Crop Code											
Rating Data Type		control	control	control	control	control	injury	injury	injury		
Rating Unit		%	%	%	%	%	%	%	%		
Rating Date		May-14-08	May-23-08	May-30-08	Jun-11-08	Jun-26-08	May-23-08	May-30-08	Jun-11-08		
Trt-Eval Interval		21 DA-A	9 DA-B	4 DA-C	16 DA-C	31 DA-C	9 DA-B	4 DA-C	16 DA-C		
Trt No.	Treatment Name	Rate	Unit	1	2	3	4	5	6	7	8
1	Staple LX Direx	2 1.8	OZ/A PT/A	99 a	95 ab	81 c	72 d	53 e	0 b	0 b	2 cd
2	Staple LX Direx Roundup PowerMax Staple LX	2 1.8 22 2.7	OZ/A PT/A OZ/A OZ/A	99 a	93 b	93 ab	88 abc	70 d	0 b	35 a	6 cd
3	Staple LX Direx Dual Magnum Roundup PowerMax Staple LX	2 1.8 1.33 22 2.7	OZ/A PT/A PT/A OZ/A OZ/A	99 a	95 ab	94 ab	93 ab	86 ab	4 ab	33 a	7 bc
4	Staple LX Direx Dual Magnum	2 1.8 1.33	OZ/A PT/A PT/A	99 a	94 ab	86 bc	78 cd	67 d	2 ab	2 b	2 cd
5	Non-treated			0 c	0 c	0 d	0 e	0 f	0 b	0 b	0 d
6	Staple LX Reflex Dual Magnum	2 1 1.33	OZ/A PT/A PT/A	99 a	98 ab	99 a	86 a-d	74 cd	4 ab	0 b	0 d
7	Staple LX Reflex Dual Magnum Roundup PowerMax Staple LX	2 1 1.33 22 2.7	OZ/A PT/A PT/A OZ/A OZ/A	99 a	97 ab	96 a	96 a	84 abc	6 a	29 a	6 cd
8	Direx Reflex Dual Magnum	1.8 1 1.33	PT/A PT/A PT/A	99 a	97 ab	97 a	97 a	85 abc	5 a	0 b	2 cd
9	Direx Reflex Staple LX	1.8 1 2	PT/A PT/A OZ/A	99 a	99 a	93 ab	85 a-d	89 ab	0 b	0 b	0 d
10	Direx Reflex Staple LX NIS	1.8 1 2 0.25	PT/A PT/A OZ/A % V/V	99 a	99 ab	96 a	97 a	89 ab	0 b	7 b	0 d
11	Reflex Dual Magnum	1 1.33	PT/A PT/A	99 a	97 ab	92 ab	79 bcd	72 d	3 ab	0 b	0 d
12	Reflex Dual Magnum Staple LX NIS	1 1.33 2 0.25	PT/A PT/A OZ/A % V/V	98 b	99 a	97 a	93 ab	83 bc	2 ab	9 b	2 cd
13	Non-treated			0 c	0 c	0 d	0 e	0 f	0 b	0 b	0 d
14	Direx Reflex Staple LX NIS Dual Magnum	1.8 1 2 0.25 1.33	PT/A PT/A OZ/A % V/V PT/A	99 a	95 ab	98 a	93 ab	86 ab	0 b	28 a	13 b

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Weed Code		AMAPA	AMAPA	AMAPA	AMAPA	AMAPA	GOSHI	GOSHI	GOSHI		
Crop Code											
Rating Data Type		control	control	control	control	control	injury	injury	injury		
Rating Unit		%	%	%	%	%	%	%	%		
Rating Date		May-14-08	May-23-08	May-30-08	Jun-11-08	Jun-26-08	May-23-08	May-30-08	Jun-11-08		
Trt-Eval Interval		21 DA-A	9 DA-B	4 DA-C	16 DA-C	31 DA-C	9 DA-B	4 DA-C	16 DA-C		
Trt No.	Treatment Name	Rate	Unit	1	2	3	4	5	6	7	8
15	Direx	1.8	PT/A	99 a	98 ab	98 a	99 a	95 ab	0 b	33 a	12 b
	Reflex	1	PT/A								
	Roundup PowerMax	22	OZ/A								
	Staple LX	2	OZ/A								
	Dual Magnum	1.33	PT/A								
16	Direx	1.8	PT/A	99 a	96 ab	96 a	97 a	96 a	0 b	27 a	22 a
	Reflex	1	PT/A								
	Roundup PowerMax	22	OZ/A								
	Staple LX	2	OZ/A								
	Direx	8	OZ/A								
LSD (P=.05)				0.7	4.5	8.1	12.7	10.2	3.6	8.5	5.7
Standard Deviation				0.4	2.7	4.9	7.6	6.1	2.2	5.1	3.4
CV				0.5	3.22	5.93	9.72	8.7	138.13	40.12	75.64
Bartlett's X2				0.0	9.264	21.799	35.73	11.331	0.363	6.865	5.19
P(Bartlett's X2)				.	0.598	0.04*	0.001*	0.583	0.996	0.551	0.817

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

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Weed Code			GOSHI injury %
Crop Code			
Rating Data Type			
Rating Unit			
Rating Date			
Trt-Eval Interval			Jun-24-08 29 DA-C
Trt No.	Treatment Name	Rate Unit	9
1	Staple LX Direx	2 OZ/A 1.8 PT/A	0 b
2	Staple LX Direx Roundup PowerMax Staple LX	2 OZ/A 1.8 PT/A 22 OZ/A 2.7 OZ/A	0 b
3	Staple LX Direx Dual Magnum Roundup PowerMax Staple LX	2 OZ/A 1.8 PT/A 1.33 PT/A 22 OZ/A 2.7 OZ/A	0 b
4	Staple LX Direx Dual Magnum	2 OZ/A 1.8 PT/A 1.33 PT/A	0 b
5	Non-treated		0 b
6	Staple LX Reflex Dual Magnum	2 OZ/A 1 PT/A 1.33 PT/A	0 b
7	Staple LX Reflex Dual Magnum Roundup PowerMax Staple LX	2 OZ/A 1 PT/A 1.33 PT/A 22 OZ/A 2.7 OZ/A	0 b
8	Direx Reflex Dual Magnum	1.8 PT/A 1 PT/A 1.33 PT/A	0 b
9	Direx Reflex Staple LX	1.8 PT/A 1 PT/A 2 OZ/A	0 b
10	Direx Reflex Staple LX NIS	1.8 PT/A 1 PT/A 2 OZ/A 0.25 % V/V	0 b
11	Reflex Dual Magnum	1 PT/A 1.33 PT/A	0 b
12	Reflex Dual Magnum Staple LX NIS	1 PT/A 1.33 PT/A 2 OZ/A 0.25 % V/V	0 b
13	Non-treated		0 b
14	Direx Reflex Staple LX NIS Dual Magnum	1.8 PT/A 1 PT/A 2 OZ/A 0.25 % V/V 1.33 PT/A	0 b
15	Direx Reflex Roundup PowerMax Staple LX Dual Magnum	1.8 PT/A 1 PT/A 22 OZ/A 2 OZ/A 1.33 PT/A	0 b

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Weed Code				
Crop Code				GOSHI
Rating Data Type				injury
Rating Unit				%
Rating Date				Jun-24-08
Trt-Eval Interval				29 DA-C
Trt No.	Treatment Name	Rate	Unit	
				9
16	Direx	1.8	PT/A	20 a
	Reflex	1	PT/A	
	Roundup PowerMax	22	OZ/A	
	Staple LX	2	OZ/A	
	Direx	8	OZ/A	
LSD (P=.05)				0.0
Standard Deviation				0.0
CV				0.0
Bartlett's X2				0.0
P(Bartlett's X2)				.

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

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Prot (USA-900 SE)

Trial ID: C9-08 Study Dir.: Stanley Culpepper
Location: Macon County 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-23-08
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: DP 555 BR
Planting Date: Apr-23-08 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: 82 F Soil Moisture: moist Emergence Date: Apr-29-08

SITE AND DESIGN

Plot Width, Unit: 6 FT Plot Length, Unit: 25 FT Reps: 3
Site Type: On Farm
Tillage Type: Conventional Study Design: RANDOMIZED COMPLETE BLOCK

Trial Initiation Comments:

	Previous Crops	Previous Pesticides	Year
1.			

MAINTENANCE

Field Prep./Maintenance:

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

SOIL DESCRIPTION

% Sand: 82 % OM: 2 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
Application Date:	Apr-23-08	May-14-08	May-26-08
Time of Day:	7:00 pm	8:00 am	7:00 am
Application Method:	broadcast	broadcast	broadcast
Application Timing:	PRE	0" AMA	1" AMA
Applic. Placement:	on soil	overtop	overtop
Air Temp., Unit:	78 F	68 F	76 F
% Relative Humidity:	44	56	70
Wind Velocity, Unit:	6 mph	2 mph	0 mph
Dew Presence (Y/N):	N	N	Y
Water Hardness:			
Soil Temp., Unit:	82 F	68 F	78 F
Soil Moisture:	moist	moist	fair
% Cloud Cover:	10	50	0

CROP STAGE AT EACH APPLICATION

	A	B	C
Crop 1 Code, Stage:	GOSHI PRE	GOSHI B	GOSHI C
Stage Scale:	not up	2 leaf	6 leaf
Height, Unit:	0 in	2 in	6 inch

WEED STAGE AT EACH APPLICATION

	A	B	C
Weed 1 Code, Stage:	AMAPA A	AMAPA B	AMAPA C
Stage Scale:	not up	0 in	2 inch
Density, Unit:	0 ydsq	0 ydsq	12 ydsq

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APPLICATION EQUIPMENT

	A	B	C
Appl. Equipment:	backpack	backpack	backpack
Operating Pressure:	24	2	2
Nozzle Type:	flat fan	flat fan	flat fan
Nozzle Size:	11002	11002	11002
Nozzle Spacing, Unit:	18 in	18 in	18 in
Nozzles/Row:	2	2	2
Band Width, Unit:			
Boom Length, Unit:	4.5 ft	4.5 ft	4.5 ft
Boom Height, Unit:	15 in	15 in	15 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):	y	y	y

Trt No	Treatment Application Comment