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Role of MSMA in control of GR Palmer amaranth in no-till RR cotton

Trial ID: C18-07 Protocol ID:
Location: Macon County Study Director: Culpepper
Investigator: Alan C. York

Reps: 4 Plots: 9 by 23 feet
Spray vol: 15 gal/ac Mix size: 1.5 liters (min 1.0793)

Trt No.	Treatment Name	Form Conc	Form Unit	Form Type	Rate	Rate Unit	Growth Stage	Appl Code	Amt Product to Measure	Plot No. By Rep 1	2	3	4
1	Prowl H2O	3.8	lba/gal	L	2.1	PT/A	PRE	A	26.25 ml/mx	105	209	302	401
	Reflex	2	lba/gal	L	1	PT/A	PRE	A	12.5 ml/mx				
	Sequence	5.25	lba/gal	L	3	PT/A	POST	B	37.5 ml/mx				
	No MSMA (check)												
2	Prowl H2O	3.8	lba/gal	L	2.1	PT/A	PRE	A	26.25 ml/mx	102	203	309	402
	Reflex	2	lba/gal	L	1	PT/A	PRE	A	12.5 ml/mx				
	Sequence	5.25	lba/gal	L	3	PT/A	POST	B	37.5 ml/mx				
	MSMA 6.6	6.6	lba/gal	L	2.4	PT/A	Layby	C	30.0 ml/mx				
3	Prowl H2O	3.8	lba/gal	L	2.1	PT/A	PRE	A	26.25 ml/mx	108	207	308	403
	Reflex	2	lba/gal	L	1	PT/A	PRE	A	12.5 ml/mx				
	Sequence	5.25	lba/gal	L	3	PT/A	POST	B	37.5 ml/mx				
	Direx	4	lba/gal	L	1.6	PT/A	Layby	C	20.0 ml/mx				
	Induce			L	0.5	% V/V	Layby	C	7.499 ml/mx				
	No MSMA												
4	Prowl H2O	3.8	lba/gal	L	2.1	PT/A	PRE	A	26.25 ml/mx	110	204	305	404
	Reflex	2	lba/gal	L	1	PT/A	PRE	A	12.5 ml/mx				
	Sequence	5.25	lba/gal	L	3	PT/A	POST	B	37.5 ml/mx				
	Direx	4	lba/gal	L	1.6	PT/A	Layby	C	20.0 ml/mx				
	Induce			L	0.5	% V/V	Layby	C	7.499 ml/mx				
	MSMA 6.6	6.6	lba/gal	L	2.4	PT/A	Layby	C	30.0 ml/mx				
5	Prowl H2O	3.8	lba/gal	L	2.1	PT/A	PRE	A	26.25 ml/mx	107	206	310	405
	Reflex	2	lba/gal	L	1	PT/A	PRE	A	12.5 ml/mx				
	Sequence	5.25	lba/gal	L	3	PT/A	POST	B	37.5 ml/mx				
	Layby Pro	4	lba/gal	L	2	PT/A	Layby	C	25.0 ml/mx				
	Induce			L	0.5	% V/V	Layby	C	7.499 ml/mx				
	No MSMA												
6	Prowl H2O	3.8	lba/gal	L	2.1	PT/A	PRE	A	26.25 ml/mx	101	205	306	406
	Reflex	2	lba/gal	L	1	PT/A	PRE	A	12.5 ml/mx				
	Sequence	5.25	lba/gal	L	3	PT/A	POST	B	37.5 ml/mx				
	Layby Pro	4	lba/gal	L	2	PT/A	Layby	C	25.0 ml/mx				
	Induce			L	0.5	% V/V	Layby	C	7.499 ml/mx				
	MSMA 6.6	6.6	lba/gal	L	2.4	PT/A	Layby	C	30.0 ml/mx				
7	Prowl H2O	3.8	lba/gal	L	2.1	PT/A	PRE	A	26.25 ml/mx	106	201	303	407
	Reflex	2	lba/gal	L	1	PT/A	PRE	A	12.5 ml/mx				
	Sequence	5.25	lba/gal	L	3	PT/A	POST	B	37.5 ml/mx				
	Suprend	80	%	WG	1.25	LB/A	Layby	C	14.98 g/mx				
	Induce			L	0.5	% V/V	Layby	C	7.499 ml/mx				
	No MSMA												
8	Prowl H2O	3.8	lba/gal	L	2.1	PT/A	PRE	A	26.25 ml/mx	104	202	307	408
	Reflex	2	lba/gal	L	1	PT/A	PRE	A	12.5 ml/mx				
	Sequence	5.25	lba/gal	L	3	PT/A	POST	B	37.5 ml/mx				
	Suprend	80	%	WG	1.25	LB/A	Layby	C	14.98 g/mx				
	Induce			L	0.5	% V/V	Layby	C	7.499 ml/mx				
	MSMA 6.6	6.6	lba/gal	L	2.4	PT/A	Layby	C	30.0 ml/mx				

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Spray vol: 15 gal/ac Mix size: 1.5 liters (min 1.0793)

Trt No.	Treatment Name	Form Conc	Form Unit	Form Type	Rate	Rate Unit	Growth Stage	Appl Code	Amt Product to Measure	Plot No. By Rep 1	2	3	4
9	Prowl H2O	3.8	lba/gal	L	2.1	PT/A	PRE	A	26.25 ml/mx	103	208	304	409
	Reflex	2	lba/gal	L	1	PT/A	PRE	A	12.5 ml/mx				
	Sequence	5.25	lba/gal	L	3	PT/A	POST	B	37.5 ml/mx				
	Valor	51	%	WG	2	OZ WT/A	Layby	C	1.498 g/mx				
	Induce			L	0.5	% V/V	Layby	C	7.499 ml/mx				
	No MSMA												
10	Prowl H2O	3.8	lba/gal	L	2.1	PT/A	PRE	A	26.25 ml/mx	109	210	301	410
	Reflex	2	lba/gal	L	1	PT/A	PRE	A	12.5 ml/mx				
	Sequence	5.25	lba/gal	L	3	PT/A	POST	B	37.5 ml/mx				
	Valor	51	%	WG	2	OZ WT/A	Layby	C	1.498 g/mx				
	Induce			L	0.5	% V/V	Layby	C	7.499 ml/mx				
	MSMA 6.6	6.6	lba/gal	L	2.4	PT/A	Layby	C	30.0 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
328.090	ml	Prowl H2O	3.8	L	
156.234	ml	Reflex	2	L	
468.701	ml	Sequence	5.25	L	
187.480	ml	MSMA 6.6	6.6	L	
49.995	ml	Direx	4	L	
74.992	ml	Induce		L	
62.493	ml	Layby Pro	4	L	
37.446	g	Suprend	80	WG	
3.745	g	Valor	51	WG	

* 'Per area' calculations based on spray volume= 15 gal/ac, mix size= 1.5 liters (mix size basis).
* Product amount calculations increased 25 % for overage adjustment.
* 'Per volume' calculations use spray volume= 15 gal/ac, mix size= 1.5 liters.

Trial Comments

OBJECTIVE: Determine the value of MSMA when mixed with layby herbicides in controlling emerged glyphosate-resistant Palmer amaranth.

Palmer amaranth response:
1. At 7 DAT, interaction means were significant with numerical benefits in control ranging from 7 to 15% when adding MSMA in mixture with Direx, Layby Pro, Suprend, or Valor.
2. At 24 and 45 DAT, main effect means were significant. When pooled over tank mix partners, MSMA improved control by 19% at 24 DAT and by 30% by 45 DAT.

Cotton Response:
1. Injury was generally similar among most treatments with injury (stem necrosis or leaf chlorosis) being greater than 10% only with Valor plus MSMA. Cotton recovered quickly.

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Investigator: Alan C. York

Trt No.	Treatment Name	Rate	Rate Unit	1	2	3	4	5
	Pest Code			AMAPA	AMAPA	AMAPA	INJURY	INJURY
	Crop Code						GOSHI	GOSHI
	BBCH Scale						BCOT	BCOT
	Rating Date			Jun-29-07	Jul-16-07	Aug-06-07	Jun-29-07	Jul-16-07
	Rating Data Type			%	%	%	%	%
	Rating Unit			control	control	control	control	control
	Days After First/Last Applic.			8	25	46	8	25
	Trt-Eval Interval			7 DA-D	24 DA-D	45 DA-D	7 DA-D	24 DA-D
1	Prowl H2O	2.1	PT/A	0 d	0 d	0 d	0 c	0 a
	Reflex	1	PT/A					
	Sequence	3	PT/A					
	No MSMA (check)							
2	Prowl H2O	2.1	PT/A	51 c	25 c	26 bc	10 ab	0 a
	Reflex	1	PT/A					
	Sequence	3	PT/A					
	MSMA 6.6	2.4	PT/A					
3	Prowl H2O	2.1	PT/A	65 bc	35 c	20 c	10 ab	0 a
	Reflex	1	PT/A					
	Sequence	3	PT/A					
	Direx	1.6	PT/A					
	Induce	0.5	% V/V					
	No MSMA							
4	Prowl H2O	2.1	PT/A	74 ab	55 b	41 b	9 ab	0 a
	Reflex	1	PT/A					
	Sequence	3	PT/A					
	Direx	1.6	PT/A					
	Induce	0.5	% V/V					
	MSMA 6.6	2.4	PT/A					
5	Prowl H2O	2.1	PT/A	74 ab	55 b	63 a	11 ab	0 a
	Reflex	1	PT/A					
	Sequence	3	PT/A					
	Layby Pro	2	PT/A					
	Induce	0.5	% V/V					
	No MSMA							
6	Prowl H2O	2.1	PT/A	86 a	81 a	75 a	10 ab	0 a
	Reflex	1	PT/A					
	Sequence	3	PT/A					
	Layby Pro	2	PT/A					
	Induce	0.5	% V/V					
	MSMA 6.6	2.4	PT/A					
7	Prowl H2O	2.1	PT/A	61 bc	50 b	25 bc	7 b	0 a
	Reflex	1	PT/A					
	Sequence	3	PT/A					
	Suprend	1.25	LB/A					
	Induce	0.5	% V/V					
	No MSMA							

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Trt No.	Treatment Name	Rate	Rate Unit	1	2	3	4	5
Pest Code				AMAPA	AMAPA	AMAPA	INJURY	INJURY
Crop Code							GOSHI	GOSHI
BBCH Scale							BCOT	BCOT
Rating Date				Jun-29-07	Jul-16-07	Aug-06-07	Jun-29-07	Jul-16-07
Rating Data Type				%	%	%	%	%
Rating Unit				control	control	control	control	control
Days After First/Last Applic.				8	25	46	8	25
Trt-Eval Interval				7 DA-D	24 DA-D	45 DA-D	7 DA-D	24 DA-D
8	Prowl H2O	2.1	PT/A	77 ab	59 b	71 a	10 ab	0 a
	Reflex	1	PT/A					
	Sequence	3	PT/A					
	Suprend	1.25	LB/A					
	Induce	0.5	% V/V					
	MSMA 6.6	2.4	PT/A					
9	Prowl H2O	2.1	PT/A	70 b	60 b	28 bc	8 ab	0 a
	Reflex	1	PT/A					
	Sequence	3	PT/A					
	Valor	2	OZ WT/A					
	Induce	0.5	% V/V					
	No MSMA							
10	Prowl H2O	2.1	PT/A	77 ab	76 a	71 a	13 a	0 a
	Reflex	1	PT/A					
	Sequence	3	PT/A					
	Valor	2	OZ WT/A					
	Induce	0.5	% V/V					
	MSMA 6.6	2.4	PT/A					
LSD (P=.05)				14.3	11.8	15.2	4.8	0.0
Standard Deviation				9.8	8.1	10.5	3.3	0.0
CV				15.54	16.38	24.94	37.66	0.0
Bartlett's X2				5.372	9.406	10.229	3.667	0.0
P(Bartlett's X2)				0.717	0.309	0.176	0.886	.

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

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Trial ID: C18-07 Protocol ID:
Location: Macon County Study Director: Culpepper
Investigator: Alan C. York

General Trial Information

Study Director: Alan C. York **Title:** Ext. Weed Science
Affiliation: N. C. State University
Postal Code: 27695 **E-mail:** _____

Investigator: Stanley Culpepper **Title:** Ext. Weed Science
Affiliation: Univ. of Georgia
Postal Code: 31794 **E-mail:** _____

Keywords:

Trial Location

City: Macon County **Trial Status:** completed
State/Prov.: GA **Trial Reliability:** good
Postal Code: _____ **Initiation Date:** Apr-18-07
Country: USA **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 Gossypium hirsutum Cotton, American upland
Variety: DP 555 BRR **Description:** _____
BBCH Scale: BCOT **Planting Date:** Apr-18-07
Planting Method: hill drop **Rate, Unit:** 2 8 inch
Depth, Unit: 0.5 in **Perennial Age, Unit:** ____ _____
Row Spacing, Unit: 36 in **Spacing Within Row, Unit:** 36 inch
Seed Bed: flat **Soil Temperature, Unit:** 68 F
Soil Moisture: moist **Emergence Date:** Apr-25-07
Harvest Date: _____ **Harvest Equipment:** _____
Harvested Width, Unit: _____ _____ **Harvested Length, Unit:** _____ _____
% Standard Moisture: _____ **Moisture Meter:** _____
Weighing Equipment: _____

Pest Description

Pest 1 Type: W **Code:** AMAPA Amaranth, Palmer
Common Name: Amaranthus palmeri
Description: _____

Site and Design

Plot Width, Unit: 9 FT **Site Type:** On farm
Plot Length, Unit: 23 FT **Tillage Type:** Conventional
Replications: 4 **Study Design:** Factorial
% 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:** 2.0 **Texture:** loamy sand
% Silt: 14 **pH:** 6.3 **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	B	C
Application Date:	Apr-18-07	May-10-07	Jun-21-07
Time of Day:	7:00 pm	4:00 pm	7:00 pm
Application Method:	broadcast	broadcast	broadcast
Application Timing:	PRE	POST	Layby
Application Placement:	on soil	overtop	directed
Applied By:			
Air Temperature, Unit:	70 F	88 F	87 F
% Relative Humidity:	50	49	44
Wind Velocity, Unit:	3 mph	5 mph	4 mph
Wind Direction:			
Dew Presence (Y/N):	N	N	N
Water Hardness:			
Soil Temperature, Unit:	68 F	92 F	94 F
Soil Moisture:	moist	fair	fair
% Cloud Cover:	0	0	0
Next Rain Occurred On:			

Crop Stage At Each Application

	A	B	C
Crop 1 Code, BBCH Scale:	GOSHI BCOT	GOSHI BCOT	GOSHI BCOT
Stage Scale Used:	BBCH	BBCH	BBCH
Stage Majority, Percent:	not up 100	2 leaf 100	10 leaf 100
Stage Minimum, Percent:	not up 100	2 leaf 100	10 leaf 100
Stage Maximum, Percent:	not up 100	2 leaf 100	10 leaf 100
Diameter, Unit:	0 in		
Height, Unit:	0 in	1.5 in	15 in
Height Minimum, Maximum:	0 0	1 2	13 17

Pest Stage At Each Application

	A	B	C
Pest 1 Code, Disc., Scale:	AMAPA W PRE	AMAPA W POST	AMAPA W layb
Stage Majority, Percent:	not up 100	6 leaf 50	8 leaf 50
Stage Minimum, Percent:	not up 100	2 leaf 10	4 leaf 10
Stage Maximum, Percent:	not up 100	8 leaf 10	10leaf 10
Diameter, Unit:			
Height, Unit:	0 in	3.5 in	2.5 in
Height Minimum, Maximum:	0 0	2 5	1 5
Density, Unit:	0 ydsq	8 ydsq	8 ydsq
Coverage, Unit:	100 %	100 %	100 %

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Application Equipment

	A	B	C
Appl. Equipment:	backpack	backpack	backpack
Operating Pressure, Unit:	24 PSI	24 PSI	26 PSI
Nozzle Type:	flat fan	flat fan	floodjet
Nozzle Size:	11002	11002	TK2
Nozzle Spacing, Unit:	18 in	18 in	36 in
Nozzles/Row:	2	2	1
Nozzle Calibration, Unit:			
Band Width, Unit:			
Boom ID:			
Boom Length, Unit:	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 GAL/AC	15 GAL/AC	15 GAL/AC
Mix Size, Unit:			
Spray pH:			
Propellant:	CO2	CO2	CO2
Tank Mix (Y/N):	Y	Y	Y

Equipment Comment:

Trt No Treatment Application Comment

___

Date By Notes

_____ _____

Date By Deviations

_____ _____

Reasons: