

Purdue University Weed Science

PREEMERGENCE PROGRAMS FOR PALMER AMARANTH CONTROL

Trial ID: 13S-CCP-CTF-09 Location: CASS COUNTY Trial Year: 2013
 Protocol ID: 13S-CCP-CTF-09 Investigator: Dr. Bill Johnson
 Project ID: Study Director: JOE IKLEY
 Sponsor Contact: MONSANTO - DAN CHILDS

General Trial Information

Study Director: JOE IKLEY **Title:** RESEARCH ASSOCIATE
Investigator: DR. BILL JOHNSON **Title:** PROFESSOR

Discipline: H HERBICIDE
Trial Status: F ONE-YEAR/FINAL **Trial Reliability:** HIGH
Initiation Date: 5/13/2013
Completion Date: 7/1/2013

Trial Location

City: 12 MILE **Country:** USA UNITED STATES
State/Prov.: INDIANA

Contacts

Study Director: JOE IKLEY **Title:** RESEARCH ASSOCIATE
Organization: PURDUE UNIVERSITY
Address: 915 WEST STATE STREET **Phone No.:** 765-494-0891
City+State/Prov: WEST LAFAYETTE **Mobile No.:** 410-596-9091
Postal Code: 47907 **E-mail:** JIKLEY@PURDUE.EDU

Investigator: DR. BILL JOHNSON **Title:** PROFESSOR
Organization: PURDUE UNIVERSITY
Address: 915 WEST STATE STREET **Phone No.:** 765-494-4656
City+State/Prov: WEST LAFAYETTE **Mobile No.:** 765-404-9801
Postal Code: 47907 **E-mail:** WGJ@PURDUE.EDU

Pest Description

Pest 1 Type: W **Code:** AMAPA AMARANTHUS PALMERI
Common Name: PALMER AMARANTH
Description: GLY-RES

Site and Design

Treated Plot Width: 10 FT **Site Type:** FIELD FIELD
Treated Plot Length: 30 FT **Experimental Unit:** 1 PLOT PLOT
Treated Plot Area: 300 FT² **Treatments:** 15 **Tillage Type:** CONTIL CONVENTIONAL-TILL
Replications: 4 **Study Design:** FACTOR Factorial

Soil Description

Description Name: BLOOMFIELD LOAMY FINE SAND
Texture: LFS LOAMY FINE SAND
Soil Name: BLOOMFIELD LOAMY FINE SAND
Soil Drainage: E EXCELLENT

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Application Description

	A	B
Application Date:	5/13/2013	6/3/2013
Appl. Start Time:	11:30	14:00
Appl. Stop Time:	12:30 PM	3:30 PM
Application Method:	SPRAY	SPRAY
Application Timing:	PREPRE	POSPOS
Application Placement:	BROADC	BROADC
Applied By:	LEGLEITER	HENEGHAN
Air Temperature, Unit:	61 F	73 F
% Relative Humidity:	30	60
Wind Velocity, Unit:	5 MPH	2 MPH
Wind Direction:	NW	NNE
Dew Presence (Y/N):	N NO	N NO
Soil Temperature, Unit:	58 F	76 F
Soil Moisture:	SLIWET	SLIWET
% Cloud Cover:	30	0

Pest Stage At Each Application

	A	B
Pest 1 Code, Type, Scale:	AMAPA W	AMAPA W
Stage Majority, Percent:		34
Stage Minimum, Percent:		32
Stage Maximum, Percent:		35
Height, Unit:		3 IN
Height Minimum, Maximum:		2 4.5
Density, Unit:		200 YD2

Application Equipment

	A	B
Appl. Equipment:	CO2 BACKPACK	CO2 BACKPACK
Equipment Type:	SPRBAC	SPRBAC
Operation Pressure, Unit:	18 PSI	18 PSI
Nozzle Type:	FLAT FAN	FLAT FAN
Nozzle Size:	XR11002	XR11002
Nozzle Spacing, Unit:	15 IN	15 IN
Nozzles/Row:	8	8
Boom Length, Unit:	10 FT	10 FT
Boom Height, Unit:	18 IN	18 IN
Ground Speed, Unit:	3 MPH	3 MPH
Carrier:	H2O	H2O
Water Hardness (ppm CaCO3):	150	150
Spray Volume, Unit:	15 GAL/AC	15 GAL/AC
Mix Size, Unit:	1.8 LITERS	1.8 LITERS
Propellant:	CO2	CO2
Tank Mix (Y/N):	N NO	N NO

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Trial Comments

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Reps: 4 Plots: 10 by 30 feet
 Spray vol: 15 gal/ac Mix size: 1.8 liters (min 1.5642)

Trt No.	Treatment Name	Form Conc	Form Unit	Form Type	Rate Rate Unit	Other Rate	Other Rate Unit	Appl Code	Amt Product to Measure	Rep 1	2	3	4
1	CLARITY	480.02	GAE/L	SL	0 g ae/ha		0 lb ae/a	A		101	501	701	805
	VALOR	51 %		WG	0 g ai/ha		0 lb ai/a	A					
	WARRANT	3 LBA/GAL		EC	0 g ai/ha		0 lb ai/a	A					
2	CLARITY	480.02	GAE/L	SL	0 g ae/ha		0 lb ae/a	A		102	504	603	1004
	VALOR	51 %		WG	0 g ai/ha		0 lb ai/a	A					
	WARRANT	3 LBA/GAL		EC	1260 g ai/ha	1.12	lb ai/a	A	44.9 ml/mx				
3	CLARITY	480.02	GAE/L	SL	0 g ae/ha		0 lb ae/a	A		103	401	802	901
	VALOR	51 %		WG	71.5 g ai/ha	0.0638	lb ai/a	A	1.799 g/mx				
	WARRANT	3 LBA/GAL		EC	0 g ai/ha		0 lb ai/a	A					
4	CLARITY	480.02	GAE/L	SL	0 g ae/ha		0 lb ae/a	A		104	503	704	1002
	VALOR	51 %		WG	71.5 g ai/ha	0.0638	lb ai/a	A	1.799 g/mx				
	WARRANT	3 LBA/GAL		EC	1260 g ai/ha	1.12	lb ai/a	A	44.9 ml/mx				
5	CLARITY	480.02	GAE/L	SL	560 g ae/ha		0.5 lb ae/a	A	14.97 ml/mx	105	505	602	1001
	VALOR	51 %		WG	0 g ai/ha		0 lb ai/a	A					
	WARRANT	3 LBA/GAL		EC	0 g ai/ha		0 lb ai/a	A					
6	CLARITY	480.02	GAE/L	SL	560 g ae/ha		0.5 lb ae/a	A	14.97 ml/mx	106	404	606	804
	VALOR	51 %		WG	0 g ai/ha		0 lb ai/a	A					
	WARRANT	3 LBA/GAL		EC	1260 g ai/ha	1.12	lb ai/a	A	44.9 ml/mx				
7	CLARITY	480.02	GAE/L	SL	560 g ae/ha		0.5 lb ae/a	A	14.97 ml/mx	201	403	705	1003
	VALOR	51 %		WG	71.5 g ai/ha	0.0638	lb ai/a	A	1.799 g/mx				
	WARRANT	3 LBA/GAL		EC	0 g ai/ha		0 lb ai/a	A					
8	CLARITY	480.02	GAE/L	SL	560 g ae/ha		0.5 lb ae/a	A	14.97 ml/mx	202	502	803	903
	VALOR	51 %		WG	71.5 g ai/ha	0.0638	lb ai/a	A	1.799 g/mx				
	WARRANT	3 LBA/GAL		EC	1260 g ai/ha	1.12	lb ai/a	A	44.9 ml/mx				
9	CLARITY	480.02	GAE/L	SL	1120 g ae/ha		1 lb ae/a	A	29.93 ml/mx	203	402	706	806
	VALOR	51 %		WG	0 g ai/ha		0 lb ai/a	A					
	WARRANT	3 LBA/GAL		EC	0 g ai/ha		0 lb ai/a	A					
10	CLARITY	480.02	GAE/L	SL	1120 g ae/ha		1 lb ae/a	A	29.93 ml/mx	204	506	703	902
	VALOR	51 %		WG	0 g ai/ha		0 lb ai/a	A					
	WARRANT	3 LBA/GAL		EC	1260 g ai/ha	1.12	lb ai/a	A	44.9 ml/mx				
11	CLARITY	480.02	GAE/L	SL	1120 g ae/ha		1 lb ae/a	A	29.93 ml/mx	205	406	604	1006
	VALOR	51 %		WG	71.5 g ai/ha	0.0638	lb ai/a	A	1.799 g/mx				
	WARRANT	3 LBA/GAL		EC	0 g ai/ha		0 lb ai/a	A					
12	CLARITY	480.02	GAE/L	SL	1120 g ae/ha		1 lb ae/a	A	29.93 ml/mx	206	306	702	906
	VALOR	51 %		WG	71.5 g ai/ha	0.0638	lb ai/a	A	1.799 g/mx				
	WARRANT	3 LBA/GAL		EC	1260 g ai/ha	1.12	lb ai/a	A	44.9 ml/mx				

Sort Order: Replicate 1

Product quantities required for listed treatments and applications of trials included in this table:

Amount*	Unit	Treatment Name	Form Conc	Form Type	Lot Code
179.594	ml	CLARITY	480.02	SL	
10.791	g	VALOR	51	WG	
269.403	ml	WARRANT	3	EC	

* 'Per area' calculations based on spray volume= 15 gal/ac, mix size= 1.8 liters (mix size basis).

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Pest Type	W WEED	W WEED	W WEED	W WEED
Pest Code	AMAPA	AMAPA	AMAPA	AMAPA
Pest Scientific Name	AMARANTHUS PAL>	AMARANTHUS PAL>	AMARANTHUS PAL>	AMARANTHUS PAL>
Pest Name	PALMER AMARANTH	PALMER AMARANTH	PALMER AMARANTH	PALMER AMARANTH
Part Rated	PLOT P	PLOT P	PLOT P	PLOT P
Rating Date	5/29/2013	6/11/2013	6/18/2013	7/1/2013
Rating Type	CONTRO	CONTRO	CONTRO	CONTRO
Rating Unit	%	%	%	%
Sample Size, Unit	1 PLOT	1 PLOT	1 PLOT	1 PLOT
Days After First/Last Applic.	16 16	29 8	36 15	49 28
Trt-Eval Interval	16 DA-A	29 DA-A	15 DA-B	28 DA-B
ARM Action Codes	P	P	P	P
Number of Decimals	0	0	0	0
Trt Treatment	Rate	Appl		
No. Name	Rate Unit	Code Plot	1	2
1 CLARITY	0 g ae/ha A	101	0	0
VALOR	0 g ai/ha A	501	0	0
WARRANT	0 g ai/ha A	701	0	0
		805	0	0
		Mean =	0	0
2 CLARITY	0 g ae/ha A	102	10	0
VALOR	0 g ai/ha A	504	30	0
WARRANT	1260 g ai/ha A	603	35	20
		1004	30	0
		Mean =	26	5
3 CLARITY	0 g ae/ha A	103	60	50
VALOR	71.5 g ai/ha A	401	70	35
WARRANT	0 g ai/ha A	802	60	15
		901	85	40
		Mean =	69	35
4 CLARITY	0 g ae/ha A	104	100	100
VALOR	71.5 g ai/ha A	503	100	100
WARRANT	1260 g ai/ha A	704	95	85
		1002	100	100
		Mean =	99	96
5 CLARITY	560 g ae/ha A	105	60	35
VALOR	0 g ai/ha A	505	35	25
WARRANT	0 g ai/ha A	602	30	30
		1001	50	25
		Mean =	44	29
6 CLARITY	560 g ae/ha A	106	70	50
VALOR	0 g ai/ha A	404	65	40
WARRANT	1260 g ai/ha A	606	65	65
		804	50	65
		Mean =	63	55
7 CLARITY	560 g ae/ha A	201	90	75
VALOR	71.5 g ai/ha A	403	90	90
WARRANT	0 g ai/ha A	705	100	80
		1003	95	100
		Mean =	94	86
8 CLARITY	560 g ae/ha A	202	100	100
VALOR	71.5 g ai/ha A	502	95	95
WARRANT	1260 g ai/ha A	803	100	100
		903	100	100
		Mean =	99	99
9 CLARITY	1120 g ae/ha A	203	50	50
VALOR	0 g ai/ha A	402	60	40
WARRANT	0 g ai/ha A	706	35	30
		806	50	35
		Mean =	49	39

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	W WEED		W WEED		W WEED		W WEED	
	AMAPA		AMAPA		AMAPA		AMAPA	
Pest Type	AMARANTHUS PAL>		AMARANTHUS PAL>		AMARANTHUS PAL>		AMARANTHUS PAL>	
Pest Code	PALMER AMARANTH		PALMER AMARANTH		PALMER AMARANTH		PALMER AMARANTH	
Pest Scientific Name	PLOT P		PLOT P		PLOT P		PLOT P	
Pest Name	5/29/2013		6/11/2013		6/18/2013		7/1/2013	
Part Rated	CONTRO		CONTRO		CONTRO		CONTRO	
Rating Date	%		%		%		%	
Rating Type	1 PLOT		1 PLOT		1 PLOT		1 PLOT	
Rating Unit	16 16		29 8		36 15		49 28	
Sample Size, Unit	16 DA-A		29 DA-A		15 DA-B		28 DA-B	
Days After First/Last Applic.	P		P		P		P	
Trt-Eval Interval	0		0		0		0	
ARM Action Codes								
Number of Decimals								
Trt Treatment	Rate	Appl						
No. Name	Rate Unit	Code Plot	1	2	3	4		
10 CLARITY	1120 g ae/ha A	204	95	80	75	60		
VALOR	0 g ai/ha A	506	80	80	80	70		
WARRANT	1260 g ai/ha A	703	85	85	85	60		
		902	100	100	90	75		
		Mean =	90	86	83	66		
11 CLARITY	1120 g ae/ha A	205	100	90	90	70		
VALOR	71.5 g ai/ha A	406	90	90	80	60		
WARRANT	0 g ai/ha A	604	80	85	75	65		
		1006	100	100	90	80		
		Mean =	93	91	84	69		
12 CLARITY	1120 g ae/ha A	206	100	100	100	95		
VALOR	71.5 g ai/ha A	306	100	100	95	90		
WARRANT	1260 g ai/ha A	702	100	95	90	90		
		906	100	95	95	90		
		Mean =	100	98	95	91		

Pest Type
 W, WEED, G-BYRW7, G-WEDSTG = Weed or volunteer crop
Pest Code
 AMAPA, AMARANTHUS PALMERI, = US
Part Rated
 PLOT = plot
 P = Pest is Part Rated
Rating Type
 CONTRO = control / burndown or knockdown
Rating Unit
 % = percent

PLOT = total plot
ARM Action Codes
 P = Rating scale of 0 to 100 (e.g. % control or injury)

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 Project ID:

Location: CASS COUNTY Trial Year: 2013
 Investigator: Dr. Bill Johnson
 Study Director: JOE IKLEY
 Sponsor Contact: MONSANTO - DAN CHILDS

Pest Type	W WEED	W WEED	W WEED	W WEED	
Pest Code	AMAPA	AMAPA	AMAPA	AMAPA	
Pest Scientific Name	AMARANTHUS PAL>	AMARANTHUS PAL>	AMARANTHUS PAL>	AMARANTHUS PAL>	
Pest Name	PALMER AMARANTH	PALMER AMARANTH	PALMER AMARANTH	PALMER AMARANTH	
Part Rated	PLOT P	PLOT P	PLOT P	PLOT P	
Rating Date	5/29/2013	6/11/2013	6/18/2013	7/1/2013	
Rating Type	CONTRO	CONTRO	CONTRO	CONTRO	
Rating Unit	%	%	%	%	
Sample Size, Unit	1 PLOT	1 PLOT	1 PLOT	1 PLOT	
Days After First/Last Applic.	16 16	29 8	36 15	49 28	
Trt-Eval Interval	16 DA-A	29 DA-A	15 DA-B	28 DA-B	
ARM Action Codes	P	P	P	P	
Number of Decimals	0	0	0	0	
Trt Treatment No. Name	Rate	Rate	Rate	Rate	
Rate Unit	Appl Code	Appl Code	Appl Code	Appl Code	
1	2	3	4		
1 CLARITY VALOR WARRANT	0 g ae/ha A 0 g ai/ha A 0 g ai/ha A	0 e	0 d	0 d	0 c
2 CLARITY VALOR WARRANT	0 g ae/ha A 0 g ai/ha A 1260 g ai/ha A	26 d	5 d	1 d	1 c
3 CLARITY VALOR WARRANT	0 g ae/ha A 71.5 g ai/ha A 0 g ai/ha A	69 b	35 c	24 c	16 c
4 CLARITY VALOR WARRANT	0 g ae/ha A 71.5 g ai/ha A 1260 g ai/ha A	99 a	96 a	94 a	93 a
5 CLARITY VALOR WARRANT	560 g ae/ha A 0 g ai/ha A 0 g ai/ha A	44 c	29 c	19 c	10 c
6 CLARITY VALOR WARRANT	560 g ae/ha A 0 g ai/ha A 1260 g ai/ha A	63 b	55 b	48 b	21 c
7 CLARITY VALOR WARRANT	560 g ae/ha A 71.5 g ai/ha A 0 g ai/ha A	94 a	86 a	84 a	76 ab
8 CLARITY VALOR WARRANT	560 g ae/ha A 71.5 g ai/ha A 1260 g ai/ha A	99 a	99 a	96 a	91 a
9 CLARITY VALOR WARRANT	1120 g ae/ha A 0 g ai/ha A 0 g ai/ha A	49 c	39 c	26 c	16 c
10 CLARITY VALOR WARRANT	1120 g ae/ha A 0 g ai/ha A 1260 g ai/ha A	90 a	86 a	83 a	66 b
11 CLARITY VALOR WARRANT	1120 g ae/ha A 71.5 g ai/ha A 0 g ai/ha A	93 a	91 a	84 a	69 b
12 CLARITY VALOR WARRANT	1120 g ae/ha A 71.5 g ai/ha A 1260 g ai/ha A	100 a	98 a	95 a	91 a
LSD (P=.05)	12.0	12.3	12.7	14.4	
Standard Deviation	8.3	8.5	8.8	10.0	
CV	12.11	14.2	16.19	21.69	
Bartlett's X2	12.741	13.315	25.984	28.025	
P(Bartlett's X2)	0.175	0.207	0.004*	0.002*	
Skewness	-0.796*	-0.3876	-0.2192	0.0207	
Kurtosis	-0.5313	-1.3618*	-1.6278*	-1.7533*	

Means followed by same letter do not significantly differ (P=.05, Student-Newman-Keuls)
 Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

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Factorial AOV For W WEED AMAPA AMARANTHUS PALMERI PALMER AMARANTH PLOT P 5/29/2013 CONTRO % 1 PLOT 16 16 16 DA-A P 0 (Data Column 1)

Source	DF	Sum of Squares	Mean Square	F	Prob(F)
Total	47	50586.979167			
Replicate	3	251.562500	83.854167	1.214	0.3200
Treatment	11	48055.729167	4368.702652	63.240	0.0001
Error	33	2279.687500	69.081439		

Factorial AOV For W WEED AMAPA AMARANTHUS PALMERI PALMER AMARANTH PLOT P 6/11/2013 CONTRO % 1 PLOT 29 8 29 DA-A P 0 (Data Column 2)

Source	DF	Sum of Squares	Mean Square	F	Prob(F)
Total	47	63774.479167			
Replicate	3	268.229167	89.409722	1.236	0.3124
Treatment	11	61118.229167	5556.202652	76.781	0.0001
Error	33	2388.020833	72.364268		

Factorial AOV For W WEED AMAPA AMARANTHUS PALMERI PALMER AMARANTH PLOT P 6/18/2013 CONTRO % 1 PLOT 36 15 15 DA-B P 0 (Data Column 3)

Source	DF	Sum of Squares	Mean Square	F	Prob(F)
Total	47	68031.250000			
Replicate	3	293.750000	97.916667	1.264	0.3027
Treatment	11	65181.250000	5925.568182	76.496	0.0001
Error	33	2556.250000	77.462121		

Factorial AOV For W WEED AMAPA AMARANTHUS PALMERI PALMER AMARANTH PLOT P 7/1/2013 CONTRO % 1 PLOT 49 28 28 DA-B P 0 (Data Column 4)

Source	DF	Sum of Squares	Mean Square	F	Prob(F)
Total	47	67082.812500			
Replicate	3	218.229167	72.743056	0.733	0.5398
Treatment	11	63589.062500	5780.823864	58.240	0.0001
Error	33	3275.520833	99.258207		

Pest Type
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Pest Code
 AMAPA, AMARANTHUS PALMERI, = US
Part Rated
 PLOT = plot
 P = Pest is Part Rated
Rating Type
 CONTRO = control / burndown or knockdown
Rating Unit
 % = percent
 PLOT = total plot
ARM Action Codes
 P = Rating scale of 0 to 100 (e.g. % control or injury)