

# Purdue University Weed Science

## Glyphosate-Resistant Palmer Amaranth Programs in Liberty-Link Beans

Trial ID: 14S-CCP-CTS-02      Location: 12 MILE      Trial Year: 2014  
 Protocol ID: 14S-CCP-CTS-02      Investigator: Dr. Bill Johnson  
 Project ID: HP14USAWGB      Study Director: Joe Ikley  
 Sponsor Contact: Bayer - Alan Kurtz

### 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  
**Initiation Date:** 5/6/2014  
**Completion Date:** 7/16/2014

### Trial Location

**City:** Twelve Mile      **Country:** USA United States  
**State/Prov.:** Indiana  
**Postal Code:** 46988

### 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

### Crop Description

**Crop 1:** GLXMA      Glycine max Soybean  
**Variety:** BECKS 298L4  
**Description:** LL

**Planting Rate, Unit:** 140000 S/A      **Planting Date:** 5/6/2014  
**Depth, Unit:** 1.5 IN      **Planting Method:** PLANTD planted  
**Row Spacing, Unit:** 30 IN      **Planting Equipment:** PP Plot Planter  
**Soil Temperature, Unit:** 60 F      **Emergence Date:** 5/10/2014  
**Soil Moisture:** DRY dry

### 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 FT<sup>2</sup>      **Treatments:** 15      **Tillage Type:** CONTIL conventional-till  
**Replications:** 4      **Study Design:** RACOB� Randomized Complete Block (RCB)

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Application Description					
	A	B	C	D	E
<b>Application Date:</b>	5/7/2014	6/6/2014	6/9/2014	6/16/2014	6/26/2014
<b>Appl. Start Time:</b>	6:30	13:00	12:00	12:30	10:20
<b>Appl. Stop Time:</b>	9:00 AM	2:00 PM	12:15 PM	1:00 PM	10:30 AM
<b>Application Method:</b>	SPRAY	SPRAY	SPRAY	SPRAY	SPRAY
<b>Application Timing:</b>	PRE	V2	E POST	E POST	L POST
<b>Application Placement:</b>	BROADC	BROADC	BROADC	BROADC	BROADC
<b>Applied By:</b>	Legleiter	Ikley	Ikley	Ikley	Ikley
<b>Air Temperature, Unit:</b>	50 F	77 F	72 F	81 F	63 F
<b>% Relative Humidity:</b>	58	36	64	65	94
<b>Wind Velocity, Unit:</b>	5 MPH	2 MPH	3 MPH	3 MPH	1 MPH
<b>Wind Direction:</b>	E	E	ESE	S	N
<b>Dew Presence (Y/N):</b>	N no	N no	N no	N no	Y yes
<b>Soil Temperature, Unit:</b>	55 F	82 F	74 F	72 F	70 F
<b>Soil Moisture:</b>	DRY	SLIWET	WET	SLIWET	SLIWET
<b>% Cloud Cover:</b>	70	15	50	80	100

Crop Stage At Each Application					
	A	B	C	D	E
<b>Crop 1 Code, BBCH Scale:</b>	GLXMA BSOY	GLXMA BSOY	GLXMA BSOY	GLXMA BSOY	GLXMA BSOY
<b>Stage Scale Used:</b>		BBCH	BBCH	BBCH	BBCH
<b>Stage Majority, Percent:</b>		13	14	15	59
<b>Stage Minimum, Percent:</b>		13	14	15	
<b>Stage Maximum, Percent:</b>		14	14	15	
<b>Height, Unit:</b>		7.5 IN	9 IN	10 IN	19 IN
<b>Height Minimum, Maximum:</b>		6 9	8 10	8 12	18 20

Pest Stage At Each Application					
	A	B	C	D	E
<b>Pest 1 Code, Type, Scale:</b>	AMAPA W	AMAPA W	AMAPA W	AMAPA W	AMAPA W
<b>Stage Majority, Percent:</b>		19	19	34G	33G
<b>Stage Minimum, Percent:</b>		16	19	31G	31G
<b>Stage Maximum, Percent:</b>		19	19	38G	36G
<b>Height, Unit:</b>		3.5 IN	3 IN	1.5 IN	2.5 IN
<b>Height Minimum, Maximum:</b>		1 6	2 4	0.5 3	1 5
<b>Density, Unit:</b>		25 YD2	8 YD2	15 YD2	10 YD2

## Purdue University Weed Science

Application Equipment					
	A	B	C	D	E
<b>Appl. Equipment:</b>	CO2 Backpack	CO2 Backpack	CO2 Backpack	CO2 Backpack	CO2 Backpack
<b>Equipment Type:</b>	SPRBAC	SPRBAC	SPRBAC	SPRBAC	SPRBAC
<b>Operation Pressure, Unit:</b>	18 PSI	18 PSI	18 PSI	18 PSI	18 PSI
<b>Nozzle Type:</b>	Flat Fan	Flat Fan	Flat Fan	Flat Fan	Flat Fan
<b>Nozzle Size:</b>	XR11002	XR11002	XR11002	XR11002	XR11002
<b>Nozzle Spacing, Unit:</b>	15 IN	15 IN	15 IN	15 IN	15 IN
<b>Nozzles/Row:</b>	8	8	8	8	8
<b>Boom Length, Unit:</b>	10 FT	10 FT	10 FT	10 FT	10 FT
<b>Boom Height, Unit:</b>	18 IN	18 IN	18 IN	18 IN	18 IN
<b>Ground Speed, Unit:</b>	3 MPH	3 MPH	3 MPH	3 MPH	3 MPH
<b>Carrier:</b>	H2O	H2O	H2O	H2O	H2O
<b>Water Hardness (ppm CaCO3):</b>	150	150	150	150	150
<b>Spray Volume, Unit:</b>	15 GAL/AC	15 GAL/AC	15 GAL/AC	15 GAL/AC	15 GAL/AC
<b>Mix Size, Unit:</b>	1.8 Liters	1.8 Liters	1.8 Liters	1.8 Liters	1.8 Liters
<b>Propellant:</b>	CO2	CO2	CO2	CO2	CO2
<b>Tank Mix (Y/N):</b>	N no	N no	N no	N no	N no

**Trt No Treatment Application Comment**

6 APPLICATION C WAS APPLIED TO TREATMENT 6 ONLY ON 6/9/14  
 APPLICATION C IN TRT LIST IS REPORTED AS APPLICATION D UNDER APPLICATION TABS FOR EVERY TRT EXCEPT 6  
 APPLICATION D IS REPORTED AS APPLICATION E UNDER APPLICATION TABS

Trial Comments

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## Glyphosate-Resistant Palmer Amaranth Programs in Liberty-Link Beans

Trial ID: 14S-CCP-CTS-02  
Protocol ID: 14S-CCP-CTS-02  
Project ID: HP14USAWGB

Location: 12 MILE Trial Year: 2014  
Investigator: Dr. Bill Johnson  
Study Director: Joe Ikley  
Sponsor Contact: Bayer - Alan Kurtz

Reps: 4 Plots: 10 by 30 feet  
Spray vol: 15 gal/ac Mix size: 3 gallons (min .41322)

Trt No.	Treatment Name	Form Conc	Form Unit	Form Type	Rate Rate	Growth Stage	Appl Code	Appl Description	Amt Product to Measure	Rep 1	2	3	4
1	Untreated Check									101	501	705	1005
2	AUTHORITY FIRST	70 %		DF	6.5 oz/a	PRE	A	PRE	36.85 g/mx	102	406	802	1003
	LIBERTY 280 SL	2.34 LB/GAL	SL		29 fl oz/a	2-4" WEEDS	C	2-4" AMAPA	171.5 ml/mx				
	N-PAK - AMS	3.4 LBA/GAL	SL		2.5 % v/v	2-4" WEEDS	C	2-4" AMAPA	283.9 ml/mx				
	LIBERTY 280 SL	2.34 LB/GAL	SL		29 fl oz/a	LATE POST	D	LATE POST	171.5 ml/mx				
	N-PAK - AMS	3.4 LBA/GAL	SL		2.5 % v/v	LATE POST	D	LATE POST	283.9 ml/mx				
3	FIERCE	76 %		WG	4 oz/a	PRE	A	PRE	22.68 g/mx	103	304	701	902
	LIBERTY 280 SL	2.34 LB/GAL	SL		29 fl oz/a	2-4" WEEDS	C	2-4" AMAPA	171.5 ml/mx				
	N-PAK - AMS	3.4 LBA/GAL	SL		2.5 % v/v	2-4" WEEDS	C	2-4" AMAPA	283.9 ml/mx				
	LIBERTY 280 SL	2.34 LB/GAL	SL		29 fl oz/a	LATE POST	D	LATE POST	171.5 ml/mx				
	N-PAK - AMS	3.4 LBA/GAL	SL		2.5 % v/v	LATE POST	D	LATE POST	283.9 ml/mx				
4	VALOR XLT @ 3.5 OZ/A									104	405	601	905
	VALOR SX	51 %		WG	2.05 oz/a	PRE	A	PRE	11.62 g/mx				
	CLASSIC	25 %		WG	1.45 oz/a	PRE	A	PRE	8.221 g/mx				
	LIBERTY 280 SL	2.34 LB/GAL	SL		29 fl oz/a	V2 SOYBEAN	B	V2 GLXMA	171.5 ml/mx				
	ZIDUA	85 %		WG	2 oz/a	V2 SOYBEAN	B	V2 GLXMA	11.34 g/mx				
	N-PAK - AMS	3.4 LBA/GAL	SL		2.5 % v/v	V2 SOYBEAN	B	V2 GLXMA	283.9 ml/mx				
	LIBERTY 280 SL	2.34 LB/GAL	SL		29 fl oz/a	LATE POST	D	LATE POST	171.5 ml/mx				
	N-PAK - AMS	3.4 LBA/GAL	SL		2.5 % v/v	LATE POST	D	LATE POST	283.9 ml/mx				
5	LIBERTY 280 SL	2.34 LB/GAL	SL		29 fl oz/a	V2 SOYBEAN	B	V2 GLXMA	171.5 ml/mx	105	504	803	804
	PREFIX	5.29 LB/GAL	EC		2 pt/a	V2 SOYBEAN	B	V2 GLXMA	189.3 ml/mx				
	N-PAK - AMS	3.4 LBA/GAL	SL		2.5 % v/v	V2 SOYBEAN	B	V2 GLXMA	283.9 ml/mx				
	LIBERTY 280 SL	2.34 LB/GAL	SL		29 fl oz/a	2-4" WEEDS	C	2-4" AMAPA	171.5 ml/mx				
	WARRANT	3 LB/GAL	EC		3 pt/a	2-4" WEEDS	C	2-4" AMAPA	283.9 ml/mx				
	N-PAK - AMS	3.4 LBA/GAL	SL		2.5 % v/v	2-4" WEEDS	C	2-4" AMAPA	283.9 ml/mx				
6	OPTILL PRO @ 12 OZ/A									106	502	605	805
	OPTILL	68 %		WG	2 oz/a	PRE	A	PRE	11.34 g/mx				
	OUTLOOK	6 LB/GAL	EC		10 fl oz/a	PRE	A	PRE	59.15 ml/mx				
	LIBERTY 280 SL	2.34 LB/GAL	SL		29 fl oz/a	2-4" WEEDS	C	2-4" AMAPA	171.5 ml/mx				
	N-PAK - AMS	3.4 LBA/GAL	SL		2.5 % v/v	2-4" WEEDS	C	2-4" AMAPA	283.9 ml/mx				
	LIBERTY 280 SL	2.34 LB/GAL	SL		29 fl oz/a	LATE POST	D	LATE POST	171.5 ml/mx				
	N-PAK - AMS	3.4 LBA/GAL	SL		2.5 % v/v	LATE POST	D	LATE POST	283.9 ml/mx				
7	ENVIVE @ 4 OZ/A									201	503	606	1004
	CLASSIC	25 %		WG	1.44 oz/a	PRE	A	PRE	8.165 g/mx				
	HARMONY SG	50 %		SG	0.228 oz/a	PRE	A	PRE	1.293 g/mx				
	VALOR SX	51 %		WG	2.24 oz/a	PRE	A	PRE	12.7 g/mx				
	LIBERTY 280 SL	2.34 LB/GAL	SL		29 fl oz/a	V2 SOYBEAN	B	V2 GLXMA	171.5 ml/mx				
	OUTLOOK	6 LB/GAL	EC		14 oz/a	V2 SOYBEAN	B	V2 GLXMA	82.81 ml/mx				
	N-PAK - AMS	3.4 LBA/GAL	SL		2.5 % v/v	V2 SOYBEAN	B	V2 GLXMA	283.9 ml/mx				
	LIBERTY 280 SL	2.34 LB/GAL	SL		29 fl oz/a	LATE POST	D	LATE POST	171.5 ml/mx				
	N-PAK - AMS	3.4 LBA/GAL	SL		2.5 % v/v	LATE POST	D	LATE POST	283.9 ml/mx				
8	LIBERTY 280 SL	2.34 LB/GAL	SL		29 fl oz/a	V2 SOYBEAN	B	V2 GLXMA	171.5 ml/mx	202	402	706	1002
	OUTLOOK	6 LB/GAL	EC		14 fl oz/a	V2 SOYBEAN	B	V2 GLXMA	82.81 ml/mx				
	N-PAK - AMS	3.4 LBA/GAL	SL		2.5 % v/v	V2 SOYBEAN	B	V2 GLXMA	283.9 ml/mx				
	LIBERTY 280 SL	2.34 LB/GAL	SL		29 fl oz/a	2-4" WEEDS	C	2-4" AMAPA	171.5 ml/mx				
	WARRANT	3 LB/GAL	EC		3 pt/a	2-4" WEEDS	C	2-4" AMAPA	283.9 ml/mx				
	N-PAK - AMS	3.4 LBA/GAL	SL		2.5 % v/v	2-4" WEEDS	C	2-4" AMAPA	283.9 ml/mx				
9	FIERCE XLT @ 4 OZ/A									203	401	704	1006
	FIERCE	76 %		WG	2.93 oz/a	PRE	A	PRE	16.61 g/mx				
	CLASSIC	25 %		WG	1.07 oz/a	PRE	A	PRE	6.067 g/mx				
	LIBERTY 280 SL	2.34 LB/GAL	SL		29 fl oz/a	2-4" WEEDS	C	2-4" AMAPA	171.5 ml/mx				
	N-PAK - AMS	3.4 LBA/GAL	SL		2.5 % v/v	2-4" WEEDS	C	2-4" AMAPA	283.9 ml/mx				
	LIBERTY 280 SL	2.34 LB/GAL	SL		29 fl oz/a	LATE POST	D	LATE POST	171.5 ml/mx				
	N-PAK - AMS	3.4 LBA/GAL	SL		2.5 % v/v	LATE POST	D	LATE POST	283.9 ml/mx				

# Purdue University Weed Science

Reps: 4  
Spray vol: 15 gal/acPlots: 10 by 30 feet  
Mix size: 3 gallons (min .41322)

Trt No.	Treatment Name	Form Conc	Form Unit	Form Type	Rate	Growth Stage	Appl Code	Appl Description	Amt Product to Measure	Rep 1	2	3	4
10	VALOR XLT @ 3.5 OZ/A									204	506	702	903
	VALOR SX	51 %		WG	2.05 oz/a	PRE	A	PRE	11.62 g/mx				
	CLASSIC	25 %		WG	1.45 oz/a	PRE	A	PRE	8.221 g/mx				
	LIBERTY 280 SL	2.34 LB/GAL		SL	29 fl oz/a	2-4" WEEDS	C	2-4" AMAPA	171.5 ml/mx				
	WARRANT	3 LB/GAL		EC	3 pt/a	2-4" WEEDS	C	2-4" AMAPA	283.9 ml/mx				
	N-PAK - AMS	3.4 LBA/GAL		SL	2.5 % v/v	2-4" WEEDS	C	2-4" AMAPA	283.9 ml/mx				
	LIBERTY 280 SL	2.34 LB/GAL		SL	29 fl oz/a	LATE POST	D	LATE POST	171.5 ml/mx				
N-PAK - AMS	3.4 LBA/GAL		SL	2.5 % v/v	LATE POST	D	LATE POST	283.9 ml/mx					
11	AUTHORITY MTZ	45 %		WG	16 oz/a	PRE	A	PRE	90.72 g/mx	205	404	703	1001
	LIBERTY 280 SL	2.34 LB/GAL		SL	29 fl oz/a	2-4" WEEDS	C	2-4" AMAPA	171.5 ml/mx				
	N-PAK - AMS	3.4 LBA/GAL		SL	2.5 % v/v	2-4" WEEDS	C	2-4" AMAPA	283.9 ml/mx				
	LIBERTY 280 SL	2.34 LB/GAL		SL	29 fl oz/a	LATE POST	D	LATE POST	171.5 ml/mx				
N-PAK - AMS	3.4 LBA/GAL		SL	2.5 % v/v	LATE POST	D	LATE POST	283.9 ml/mx					
12	LIBERTY 280 SL	2.34 LB/GAL		SL	29 fl oz/a	V2 SOYBEAN	B	V2 GLXMA	171.5 ml/mx	206	305	603	901
	PREFIX	5.29 LB/GAL		EC	2 pt/a	V2 SOYBEAN	B	V2 GLXMA	189.3 ml/mx				
	N-PAK - AMS	3.4 LBA/GAL		SL	2.5 % v/v	V2 SOYBEAN	B	V2 GLXMA	283.9 ml/mx				
	LIBERTY 280 SL	2.34 LB/GAL		SL	29 fl oz/a	2-4" WEEDS	C	2-4" AMAPA	171.5 ml/mx				
	ZIDUA	85 %		WG	2 oz/a	2-4" WEEDS	C	2-4" AMAPA	11.34 g/mx				
N-PAK - AMS	3.4 LBA/GAL		SL	2.5 % v/v	2-4" WEEDS	C	2-4" AMAPA	283.9 ml/mx					
13	VALOR SX	51 %		WG	2 oz/a	PRE	A	PRE	11.34 g/mx	301	403	602	906
	LIBERTY 280 SL	2.34 LB/GAL		SL	29 fl oz/a	V2 SOYBEAN	B	V2 GLXMA	171.5 ml/mx				
	ZIDUA	85 %		WG	2 oz/a	V2 SOYBEAN	B	V2 GLXMA	11.34 g/mx				
	N-PAK - AMS	3.4 LBA/GAL		SL	2.5 % v/v	V2 SOYBEAN	B	V2 GLXMA	283.9 ml/mx				
	LIBERTY 280 SL	2.34 LB/GAL		SL	29 fl oz/a	LATE POST	D	LATE POST	171.5 ml/mx				
	N-PAK - AMS	3.4 LBA/GAL		SL	2.5 % v/v	LATE POST	D	LATE POST	283.9 ml/mx				
14	VALOR XLT @ 3.5 OZ/A									302	505	801	904
	VALOR SX	51 %		WG	2.05 oz/a	PRE	A	PRE	11.62 g/mx				
	CLASSIC	25 %		WG	1.45 oz/a	PRE	A	PRE	8.221 g/mx				
	LIBERTY 280 SL	2.34 LB/GAL		SL	29 fl oz/a	2-4" WEEDS	C	2-4" AMAPA	171.5 ml/mx				
	N-PAK - AMS	3.4 LBA/GAL		SL	2.5 % v/v	2-4" WEEDS	C	2-4" AMAPA	283.9 ml/mx				
	LIBERTY 280 SL	2.34 LB/GAL		SL	29 fl oz/a	LATE POST	D	LATE POST	171.5 ml/mx				
	N-PAK - AMS	3.4 LBA/GAL		SL	2.5 % v/v	LATE POST	D	LATE POST	283.9 ml/mx				
15	LIBERTY 280 SL	2.34 LB/GAL		SL	29 fl oz/a	V2 SOYBEAN	B	V2 GLXMA	171.5 ml/mx	303	306	604	806
	WARRANT	3 LB/GAL		EC	3 pt/a	V2 SOYBEAN	B	V2 GLXMA	283.9 ml/mx				
	N-PAK - AMS	3.4 LBA/GAL		SL	2.5 % v/v	V2 SOYBEAN	B	V2 GLXMA	283.9 ml/mx				
	LIBERTY 280 SL	2.34 LB/GAL		SL	29 fl oz/a	2-4" WEEDS	C	2-4" AMAPA	171.5 ml/mx				
	OUTLOOK	6 LB/GAL		EC	14 fl oz/a	2-4" WEEDS	C	2-4" AMAPA	82.81 ml/mx				
	N-PAK - AMS	3.4 LBA/GAL		SL	2.5 % v/v	2-4" WEEDS	C	2-4" AMAPA	283.9 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
36.854	g	AUTHORITY FIRST	70	DF	
4,802.737	ml	LIBERTY 280 SL	2.34	SL	
7,948.501	ml	N-PAK - AMS	3.4	SL	
39.292	g	FIERCE	76	WG	
58.910	g	VALOR SX	51	WG	
38.896	g	CLASSIC	25	WG	
34.019	g	ZIDUA	85	WG	
378.500	ml	PREFIX	5.29	EC	
1,135.500	ml	WARRANT	3	EC	
11.340	g	OPTILL	68	WG	
307.564	ml	OUTLOOK	6	EC	
1.293	g	HARMONY SG	50	SG	
90.718	g	AUTHORITY MTZ	45	WG	

\* 'Per area' calculations based on spray volume= 15 gal/ac, mix size= 3 gallons (mix size basis).

\* 'Per volume' calculations use spray volume= 15 gal/ac, mix size= 3 gallons.

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## Glyphosate-Resistant Palmer Amaranth Programs in Liberty-Link Beans

Trial ID: 14S-CCP-CTS-02      Location: 12 MILE      Trial Year: 2014  
 Protocol ID: 14S-CCP-CTS-02      Investigator: Dr. Bill Johnson  
 Project ID: HP14USAWGB      Study Director: Joe Ikley  
 Sponsor Contact: Bayer - Alan Kurtz

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	6/6/2014	6/19/2014	6/26/2014	7/3/2014
Rating Type	CONTRO	CONTRO	CONTRO	CONTRO
Rating Unit	%	%	%	%
Days After First/Last Applic.	30 30	43 3	50 10	57 7
Trt-Eval Interval	0 DA-B	13 DA-B	0 DA-E	7 DA-E
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
			3	4
1 Untreated Check		101	0	0
		501	0	0
		705	0	0
		1005	0	0
		Mean =	0	0
2 AUTHORITY FIRST	6.5 oz/a A	102	97	100
LIBERTY 280 SL	29 fl oz/a C	406	95	90
N-PAK - AMS	2.5 % v/v C	802	95	100
LIBERTY 280 SL	29 fl oz/a D	1003	100	100
N-PAK - AMS	2.5 % v/v D			
		Mean =	97	99
3 FIERCE	4 oz/a A	103	100	100
LIBERTY 280 SL	29 fl oz/a C	304	97	100
N-PAK - AMS	2.5 % v/v C	701	95	100
LIBERTY 280 SL	29 fl oz/a D	902	97	100
N-PAK - AMS	2.5 % v/v D			
		Mean =	97	100
4 VALOR XLT @ 3.5 OZ/A		104	97	100
VALOR SX	2.05 oz/a A	405	95	100
CLASSIC	1.45 oz/a A	601	95	100
LIBERTY 280 SL	29 fl oz/a B	905	100	100
ZIDUA	2 oz/a B			
N-PAK - AMS	2.5 % v/v B			
LIBERTY 280 SL	29 fl oz/a D			
N-PAK - AMS	2.5 % v/v D			
		Mean =	97	100
5 LIBERTY 280 SL	29 fl oz/a B	105	0	100
PREFIX	2 pt/a B	504	0	100
N-PAK - AMS	2.5 % v/v B	803	0	100
LIBERTY 280 SL	29 fl oz/a C	804	0	100
WARRANT	3 pt/a C			
N-PAK - AMS	2.5 % v/v C			
		Mean =	0	100
6 OPTILL PRO @ 12 OZ/A		106	85	100
OPTILL	2 oz/a A	502	80	100
OUTLOOK	10 fl oz/a A	605	80	100
LIBERTY 280 SL	29 fl oz/a C	805	80	100
N-PAK - AMS	2.5 % v/v C			
LIBERTY 280 SL	29 fl oz/a D			
N-PAK - AMS	2.5 % v/v D			
		Mean =	81	100

# Purdue University Weed Science

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	6/6/2014	6/19/2014	6/26/2014	7/3/2014
Rating Type	CONTRO	CONTRO	CONTRO	CONTRO
Rating Unit	%	%	%	%
Days After First/Last Applic.	30 30	43 3	50 10	57 7
Trt-Eval Interval	0 DA-B	13 DA-B	0 DA-E	7 DA-E
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
7 ENVIVE @ 4 OZ/A		201	90	100
CLASSIC	1.44 oz/a A	503	100	100
HARMONY SG	0.228 oz/a A	606	95	100
VALOR SX	2.24 oz/a A	1004	100	100
LIBERTY 280 SL	29 fl oz/a B			
OUTLOOK	14 oz/a B			
N-PAK - AMS	2.5 % v/v B			
LIBERTY 280 SL	29 fl oz/a D			
N-PAK - AMS	2.5 % v/v D			
	Mean =		96	100
8 LIBERTY 280 SL	29 fl oz/a B	202	0	100
OUTLOOK	14 fl oz/a B	402	0	95
N-PAK - AMS	2.5 % v/v B	706	0	100
LIBERTY 280 SL	29 fl oz/a C	1002	0	100
WARRANT	3 pt/a C			97
N-PAK - AMS	2.5 % v/v C			
	Mean =		0	99
9 FIERCE XLT @ 4 OZ/A		203	100	100
FIERCE	2.93 oz/a A	401	95	95
CLASSIC	1.07 oz/a A	704	95	90
LIBERTY 280 SL	29 fl oz/a C	1006	100	100
N-PAK - AMS	2.5 % v/v C			100
LIBERTY 280 SL	29 fl oz/a D			
N-PAK - AMS	2.5 % v/v D			
	Mean =		98	96
10 VALOR XLT @ 3.5 OZ/A		204	97	95
VALOR SX	2.05 oz/a A	506	85	85
CLASSIC	1.45 oz/a A	702	97	95
LIBERTY 280 SL	29 fl oz/a C	903	100	100
WARRANT	3 pt/a C			100
N-PAK - AMS	2.5 % v/v C			
LIBERTY 280 SL	29 fl oz/a D			
N-PAK - AMS	2.5 % v/v D			
	Mean =		95	94
11 AUTHORITY MTZ	16 oz/a A	205	90	80
LIBERTY 280 SL	29 fl oz/a C	404	95	95
N-PAK - AMS	2.5 % v/v C	703	90	95
LIBERTY 280 SL	29 fl oz/a D	1001	90	95
N-PAK - AMS	2.5 % v/v D			92
	Mean =		91	91
12 LIBERTY 280 SL	29 fl oz/a B	206	0	100
PREFIX	2 pt/a B	305	0	100
N-PAK - AMS	2.5 % v/v B	603	0	100
LIBERTY 280 SL	29 fl oz/a C	901	0	100
ZIDUA	2 oz/a C			100
N-PAK - AMS	2.5 % v/v C			
	Mean =		0	100
13 VALOR SX	2 oz/a A	301	97	100
LIBERTY 280 SL	29 fl oz/a B	403	95	100
ZIDUA	2 oz/a B	602	80	100
N-PAK - AMS	2.5 % v/v B	906	90	100
LIBERTY 280 SL	29 fl oz/a D			100
N-PAK - AMS	2.5 % v/v D			
	Mean =		91	100

# Purdue University Weed Science

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	6/6/2014	6/19/2014	6/26/2014	7/3/2014
Rating Type	CONTRO	CONTRO	CONTRO	CONTRO
Rating Unit	%	%	%	%
Days After First/Last Applic.	30 30	43 3	50 10	57 7
Trt-Eval Interval	0 DA-B	13 DA-B	0 DA-E	7 DA-E
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
			3	4
14 VALOR XLT @ 3.5 OZ/A		302	100	100
VALOR SX	2.05 oz/a A	505	90	90
CLASSIC	1.45 oz/a A	801	97	100
LIBERTY 280 SL	29 fl oz/a C	904	100	95
N-PAK - AMS	2.5 % v/v C			100
LIBERTY 280 SL	29 fl oz/a D			
N-PAK - AMS	2.5 % v/v D			
	Mean =		97	95
			100	100
15 LIBERTY 280 SL	29 fl oz/a B	303	0	100
WARRANT	3 pt/a B	306	0	100
N-PAK - AMS	2.5 % v/v B	604	0	100
LIBERTY 280 SL	29 fl oz/a C	806	0	93
OUTLOOK	14 fl oz/a C			95
N-PAK - AMS	2.5 % v/v C			
	Mean =		0	98
			99	100



# Purdue University Weed Science

Pest Type				W Weed
Pest Code				AMAPA
Pest Scientific Name				Amaranthus pal>
Pest Name				Palmer amaranth
Part Rated				PLOT P
Rating Date				7/16/2014
Rating Type				CONTRO
Rating Unit				%
Days After First/Last Applic.				70 20
Trt-Eval Interval				20 DA-E
ARM Action Codes				P
Number of Decimals				0
Trt Treatment	Rate	Appl		
No. Name	Rate	Unit	Code	Plot
				5
1 Untreated Check			101	0
			501	0
			705	0
			1005	0
			Mean =	0
2 AUTHORITY FIRST	6.5 oz/a	A	102	100
LIBERTY 280 SL	29 fl oz/a	C	406	95
N-PAK - AMS	2.5 % v/v	C	802	95
LIBERTY 280 SL	29 fl oz/a	D	1003	80
N-PAK - AMS	2.5 % v/v	D		
			Mean =	93
3 FIERCE	4 oz/a	A	103	95
LIBERTY 280 SL	29 fl oz/a	C	304	100
N-PAK - AMS	2.5 % v/v	C	701	100
LIBERTY 280 SL	29 fl oz/a	D	902	99
N-PAK - AMS	2.5 % v/v	D		
			Mean =	99
4 VALOR XLT @ 3.5 OZ/A			104	99
VALOR SX	2.05 oz/a	A	405	93
CLASSIC	1.45 oz/a	A	601	100
LIBERTY 280 SL	29 fl oz/a	B	905	100
ZIDUA	2 oz/a	B		
N-PAK - AMS	2.5 % v/v	B		
LIBERTY 280 SL	29 fl oz/a	D		
N-PAK - AMS	2.5 % v/v	D		
			Mean =	98
5 LIBERTY 280 SL	29 fl oz/a	B	105	93
PREFIX	2 pt/a	B	504	100
N-PAK - AMS	2.5 % v/v	B	803	95
LIBERTY 280 SL	29 fl oz/a	C	804	100
WARRANT	3 pt/a	C		
N-PAK - AMS	2.5 % v/v	C		
			Mean =	97
6 OPTILL PRO @ 12 OZ/A			106	100
OPTILL	2 oz/a	A	502	100
OUTLOOK	10 fl oz/a	A	605	100
LIBERTY 280 SL	29 fl oz/a	C	805	95
N-PAK - AMS	2.5 % v/v	C		
LIBERTY 280 SL	29 fl oz/a	D		
N-PAK - AMS	2.5 % v/v	D		
			Mean =	99

# Purdue University Weed Science

Trt No.	Treatment Name	Rate	Unit	Appl Code	Plot	W Weed
						AMAPA
						Amaranthus pal>
						Palmer amaranth
						PLOT P
						7/16/2014
						CONTRO
						%
						70 20
						20 DA-E
						P
						0
Trt No.	Treatment Name	Rate	Unit	Appl Code	Plot	W Weed
7	ENVIVE @ 4 OZ/A				201	100
	CLASSIC	1.44 oz/a	A		503	100
	HARMONY SG	0.228 oz/a	A		606	95
	VALOR SX	2.24 oz/a	A		1004	80
	LIBERTY 280 SL	29 fl oz/a	B			
	OUTLOOK	14 oz/a	B			
	N-PAK - AMS	2.5 % v/v	B			
	LIBERTY 280 SL	29 fl oz/a	D			
	N-PAK - AMS	2.5 % v/v	D			
					Mean =	94
8	LIBERTY 280 SL	29 fl oz/a	B		202	100
	OUTLOOK	14 fl oz/a	B		402	100
	N-PAK - AMS	2.5 % v/v	B		706	100
	LIBERTY 280 SL	29 fl oz/a	C		1002	75
	WARRANT	3 pt/a	C			
	N-PAK - AMS	2.5 % v/v	C			
					Mean =	94
9	FIERCE XLT @ 4 OZ/A				203	97
	FIERCE	2.93 oz/a	A		401	100
	CLASSIC	1.07 oz/a	A		704	95
	LIBERTY 280 SL	29 fl oz/a	C		1006	85
	N-PAK - AMS	2.5 % v/v	C			
	LIBERTY 280 SL	29 fl oz/a	D			
	N-PAK - AMS	2.5 % v/v	D			
					Mean =	94
10	VALOR XLT @ 3.5 OZ/A				204	99
	VALOR SX	2.05 oz/a	A		506	100
	CLASSIC	1.45 oz/a	A		702	100
	LIBERTY 280 SL	29 fl oz/a	C		903	100
	WARRANT	3 pt/a	C			
	N-PAK - AMS	2.5 % v/v	C			
	LIBERTY 280 SL	29 fl oz/a	D			
	N-PAK - AMS	2.5 % v/v	D			
					Mean =	100
11	AUTHORITY MTZ	16 oz/a	A		205	100
	LIBERTY 280 SL	29 fl oz/a	C		404	100
	N-PAK - AMS	2.5 % v/v	C		703	100
	LIBERTY 280 SL	29 fl oz/a	D		1001	80
	N-PAK - AMS	2.5 % v/v	D			
					Mean =	95
12	LIBERTY 280 SL	29 fl oz/a	B		206	97
	PREFIX	2 pt/a	B		305	100
	N-PAK - AMS	2.5 % v/v	B		603	100
	LIBERTY 280 SL	29 fl oz/a	C		901	100
	ZIDUA	2 oz/a	C			
	N-PAK - AMS	2.5 % v/v	C			
					Mean =	99
13	VALOR SX	2 oz/a	A		301	100
	LIBERTY 280 SL	29 fl oz/a	B		403	100
	ZIDUA	2 oz/a	B		602	100
	N-PAK - AMS	2.5 % v/v	B		906	100
	LIBERTY 280 SL	29 fl oz/a	D			
	N-PAK - AMS	2.5 % v/v	D			
					Mean =	100

## Purdue University Weed Science

Pest Type					W Weed
Pest Code					AMAPA
Pest Scientific Name					Amaranthus pal>
Pest Name					Palmer amaranth
Part Rated					PLOT P
Rating Date					7/16/2014
Rating Type					CONTRO
Rating Unit					%
Days After First/Last Applic.					70 20
Trt-Eval Interval					20 DA-E
ARM Action Codes					P
Number of Decimals					0
Trt Treatment	Rate	Appl			
No. Name	Rate Unit	Code	Plot		
				5	
14 VALOR XLT @ 3.5 OZ/A			302	100	
VALOR SX	2.05 oz/a	A	505	100	
CLASSIC	1.45 oz/a	A	801	95	
LIBERTY 280 SL	29 fl oz/a	C	904	99	
N-PAK - AMS	2.5 % v/v	C			
LIBERTY 280 SL	29 fl oz/a	D			
N-PAK - AMS	2.5 % v/v	D			
			Mean =	99	
15 LIBERTY 280 SL	29 fl oz/a	B	303	100	
WARRANT	3 pt/a	B	306	100	
N-PAK - AMS	2.5 % v/v	B	604	100	
LIBERTY 280 SL	29 fl oz/a	C	806	100	
OUTLOOK	14 fl oz/a	C			
N-PAK - AMS	2.5 % v/v	C			
			Mean =	100	

## Purdue University Weed Science

### Glyphosate-Resistant Palmer Amaranth Programs in Liberty-Link Beans

Trial ID: 14S-CCP-CTS-02      Location: 12 MILE      Trial Year: 2014  
Protocol ID: 14S-CCP-CTS-02      Investigator: Dr. Bill Johnson  
Project ID: HP14USAWGB      Study Director: Joe Ikley  
Sponsor Contact: Bayer - Alan Kurtz

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

ARM Action Codes

P = Rating scale of 0 to 100 (e.g. % control or injury)

# Purdue University Weed Science

## Glyphosate-Resistant Palmer Amaranth Programs in Liberty-Link Beans

Trial ID: 14S-CCP-CTS-02  
 Protocol ID: 14S-CCP-CTS-02  
 Project ID: HP14USAWGB

Location: 12 MILE Trial Year: 2014  
 Investigator: Dr. Bill Johnson  
 Study Director: Joe Ikley  
 Sponsor Contact: Bayer - Alan Kurtz

Pest Type	W Weed	W Weed	W Weed	W Weed	W Weed			
Pest Code	AMAPA	AMAPA	AMAPA	AMAPA	AMAPA			
Pest Scientific Name	Amaranthus pal>	Amaranthus pal>	Amaranthus pal>	Amaranthus pal>	Amaranthus pal>			
Pest Name	Palmer amaranth	Palmer amaranth	Palmer amaranth	Palmer amaranth	Palmer amaranth			
Part Rated	PLOT P	PLOT P	PLOT P	PLOT P	PLOT P			
Rating Date	6/6/2014	6/19/2014	6/26/2014	7/3/2014	7/16/2014			
Rating Type	CONTRO	CONTRO	CONTRO	CONTRO	CONTRO			
Rating Unit	%	%	%	%	%			
Days After First/Last Applic.	30 30	43 3	50 10	57 7	70 20			
Trt-Eval Interval	0 DA-B	13 DA-B	0 DA-E	7 DA-E	20 DA-E			
ARM Action Codes	P	P	P	P	P			
Number of Decimals	0	0	0	0	0			
Trt Treatment No. Name	Rate	Appl Unit	Code	1	2	3	4	5
1 Untreated Check				0 c	0 b	0 c	0 b	0 b
2 AUTHORITY FIRST	6.5 oz/a	A		97 a	95 a	97 a	99 a	93 a
LIBERTY 280 SL	29 fl oz/a	C						
N-PAK - AMS	2.5 % v/v	C						
LIBERTY 280 SL	29 fl oz/a	D						
N-PAK - AMS	2.5 % v/v	D						
3 FIERCE	4 oz/a	A		97 a	99 a	100 a	100 a	99 a
LIBERTY 280 SL	29 fl oz/a	C						
N-PAK - AMS	2.5 % v/v	C						
LIBERTY 280 SL	29 fl oz/a	D						
N-PAK - AMS	2.5 % v/v	D						
4 VALOR XLT @ 3.5 OZ/A				97 a	100 a	100 a	100 a	98 a
VALOR SX	2.05 oz/a	A						
CLASSIC	1.45 oz/a	A						
LIBERTY 280 SL	29 fl oz/a	B						
ZIDUA	2 oz/a	B						
N-PAK - AMS	2.5 % v/v	B						
LIBERTY 280 SL	29 fl oz/a	D						
N-PAK - AMS	2.5 % v/v	D						
5 LIBERTY 280 SL	29 fl oz/a	B		0 c	100 a	100 a	100 a	97 a
PREFIX	2 pt/a	B						
N-PAK - AMS	2.5 % v/v	B						
LIBERTY 280 SL	29 fl oz/a	C						
WARRANT	3 pt/a	C						
N-PAK - AMS	2.5 % v/v	C						
6 OPTILL PRO @ 12 OZ/A				81 b	100 a	83 b	100 a	99 a
OPTILL	2 oz/a	A						
OUTLOOK	10 fl oz/a	A						
LIBERTY 280 SL	29 fl oz/a	C						
N-PAK - AMS	2.5 % v/v	C						
LIBERTY 280 SL	29 fl oz/a	D						
N-PAK - AMS	2.5 % v/v	D						
7 ENVIVE @ 4 OZ/A				96 a	100 a	100 a	100 a	94 a
CLASSIC	1.44 oz/a	A						
HARMONY SG	0.228 oz/a	A						
VALOR SX	2.24 oz/a	A						
LIBERTY 280 SL	29 fl oz/a	B						
OUTLOOK	14 oz/a	B						
N-PAK - AMS	2.5 % v/v	B						
LIBERTY 280 SL	29 fl oz/a	D						
N-PAK - AMS	2.5 % v/v	D						

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.

## Purdue University Weed Science

Pest Type	W Weed	W Weed	W Weed	W Weed	W Weed				
Pest Code	AMAPA	AMAPA	AMAPA	AMAPA	AMAPA				
Pest Scientific Name	Amaranthus pal>	Amaranthus pal>	Amaranthus pal>	Amaranthus pal>	Amaranthus pal>				
Pest Name	Palmer amaranth	Palmer amaranth	Palmer amaranth	Palmer amaranth	Palmer amaranth				
Part Rated	PLOT P	PLOT P	PLOT P	PLOT P	PLOT P				
Rating Date	6/6/2014	6/19/2014	6/26/2014	7/3/2014	7/16/2014				
Rating Type	CONTRO	CONTRO	CONTRO	CONTRO	CONTRO				
Rating Unit	%	%	%	%	%				
Days After First/Last Applic.	30 30	43 3	50 10	57 7	70 20				
Trt-Eval Interval	0 DA-B	13 DA-B	0 DA-E	7 DA-E	20 DA-E				
ARM Action Codes	P	P	P	P	P				
Number of Decimals	0	0	0	0	0				
Trt No.	Treatment Name	Rate	Appl Unit	Code	1	2	3	4	5
8	LIBERTY 280 SL	29 fl oz/a	B		0 c	99 a	99 a	99 a	94 a
	OUTLOOK	14 fl oz/a	B						
	N-PAK - AMS	2.5 % v/v	B						
	LIBERTY 280 SL	29 fl oz/a	C						
	WARRANT	3 pt/a	C						
	N-PAK - AMS	2.5 % v/v	C						
9	FIERCE XLT @ 4 OZ/A				98 a	96 a	99 a	100 a	94 a
	FIERCE	2.93 oz/a	A						
	CLASSIC	1.07 oz/a	A						
	LIBERTY 280 SL	29 fl oz/a	C						
	N-PAK - AMS	2.5 % v/v	C						
	LIBERTY 280 SL	29 fl oz/a	D						
	N-PAK - AMS	2.5 % v/v	D						
10	VALOR XLT @ 3.5 OZ/A				95 a	94 a	100 a	100 a	100 a
	VALOR SX	2.05 oz/a	A						
	CLASSIC	1.45 oz/a	A						
	LIBERTY 280 SL	29 fl oz/a	C						
	WARRANT	3 pt/a	C						
	N-PAK - AMS	2.5 % v/v	C						
	LIBERTY 280 SL	29 fl oz/a	D						
	N-PAK - AMS	2.5 % v/v	D						
11	AUTHORITY MTZ	16 oz/a	A		91 a	91 a	98 a	100 a	95 a
	LIBERTY 280 SL	29 fl oz/a	C						
	N-PAK - AMS	2.5 % v/v	C						
	LIBERTY 280 SL	29 fl oz/a	D						
	N-PAK - AMS	2.5 % v/v	D						
12	LIBERTY 280 SL	29 fl oz/a	B		0 c	100 a	100 a	100 a	99 a
	PREFIX	2 pt/a	B						
	N-PAK - AMS	2.5 % v/v	B						
	LIBERTY 280 SL	29 fl oz/a	C						
	ZIDUA	2 oz/a	C						
	N-PAK - AMS	2.5 % v/v	C						
13	VALOR SX	2 oz/a	A		91 a	100 a	100 a	100 a	100 a
	LIBERTY 280 SL	29 fl oz/a	B						
	ZIDUA	2 oz/a	B						
	N-PAK - AMS	2.5 % v/v	B						
	LIBERTY 280 SL	29 fl oz/a	D						
	N-PAK - AMS	2.5 % v/v	D						
14	VALOR XLT @ 3.5 OZ/A				97 a	95 a	100 a	100 a	99 a
	VALOR SX	2.05 oz/a	A						
	CLASSIC	1.45 oz/a	A						
	LIBERTY 280 SL	29 fl oz/a	C						
	N-PAK - AMS	2.5 % v/v	C						
	LIBERTY 280 SL	29 fl oz/a	D						
	N-PAK - AMS	2.5 % v/v	D						
15	LIBERTY 280 SL	29 fl oz/a	B		0 c	98 a	99 a	100 a	100 a
	WARRANT	3 pt/a	B						
	N-PAK - AMS	2.5 % v/v	B						
	LIBERTY 280 SL	29 fl oz/a	C						
	OUTLOOK	14 fl oz/a	C						
	N-PAK - AMS	2.5 % v/v	C						
LSD (P=.05)		4.8			4.8	5.8	3.4	1.3	7.4
Standard Deviation		3.4			3.4	4.0	2.4	0.9	5.2
CV		5.4			5.4	4.43	2.6	1.01	5.72
Bartlett's X2		12.121			12.121	9.711	15.177	6.066	35.895
P(Bartlett's X2)		0.207			0.207	0.206	0.019*	0.048*	0.001*
Skewness		-0.6868*			-0.6868*	-3.3781*	-3.371*	-3.5563*	-3.284*
Kurtosis		-1.5311*			-1.5311*	10.1575*	10.1*	11.0342*	9.6715*

# Purdue University Weed Science

## Glyphosate-Resistant Palmer Amaranth Programs in Liberty-Link Beans

Trial ID: 14S-CCP-CTS-02      Location: 12 MILE      Trial Year: 2014  
 Protocol ID: 14S-CCP-CTS-02      Investigator: Dr. Bill Johnson  
 Project ID: HP14USAWGB      Study Director: Joe Ikley  
 Sponsor Contact: Bayer - Alan Kurtz

Randomized Complete Block (RCB) AOV For W Weed AMAPA Amaranthus palmeri Palmer amaranth PLOT P 6/6/2014 CONTRO % 30 30 0 DA-B P 0 (Data Column 1)

Source	DF	Sum of Squares	Mean Square	F	Prob(F)
Total	59	119046.400000			
Replicate	3	70.933333	23.644444	2.073	0.1183
Treatment	14	118496.400000	8464.028571	742.045	0.0001
Error	42	479.066667	11.406349		

Randomized Complete Block (RCB) AOV For W Weed AMAPA Amaranthus palmeri Palmer amaranth PLOT P 6/19/2014 CONTRO % 43 3 13 DA-B P 0 (Data Column 2)

Source	DF	Sum of Squares	Mean Square	F	Prob(F)
Total	59	36806.933333			
Replicate	3	97.200000	32.400000	1.992	0.1299
Treatment	14	36026.433333	2573.316667	158.173	0.0001
Error	42	683.300000	16.269048		

Randomized Complete Block (RCB) AOV For W Weed AMAPA Amaranthus palmeri Palmer amaranth PLOT P 6/26/2014 CONTRO % 50 10 0 DA-E P 0 (Data Column 3)

Source	DF	Sum of Squares	Mean Square	F	Prob(F)
Total	59	37305.650000			
Replicate	3	32.850000	10.950000	1.925	0.1402
Treatment	14	37033.900000	2645.278571	465.055	0.0001
Error	42	238.900000	5.688095		

Randomized Complete Block (RCB) AOV For W Weed AMAPA Amaranthus palmeri Palmer amaranth PLOT P 7/3/2014 CONTRO % 57 7 7 DA-E P 0 (Data Column 4)

Source	DF	Sum of Squares	Mean Square	F	Prob(F)
Total	59	37235.650000			
Replicate	3	1.383333	0.461111	0.525	0.6673
Treatment	14	37197.400000	2656.957143	3026.914	0.0001
Error	42	36.866667	0.877778		

Randomized Complete Block (RCB) AOV For W Weed AMAPA Amaranthus palmeri Palmer amaranth PLOT P 7/16/2014 CONTRO % 70 20 20 DA-E P 0 (Data Column 5)

Source	DF	Sum of Squares	Mean Square	F	Prob(F)
Total	59	37068.400000			
Replicate	3	392.933333	130.977778	4.874	0.0054
Treatment	14	35546.900000	2539.064286	94.492	0.0001
Error	42	1128.566667	26.870635		

### 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

### ARM Action Codes

P = Rating scale of 0 to 100 (e.g. % control or injury)