

Purdue University Weed Science

2013/SOYBEAN/AUTHORITY/MARVEL/PRE/POST/PROGRAM/PURDUE

Trial ID: 13S-PIP-CTS-03 Location: PPAC Trial Year:
 Protocol ID: 13S-PIP-CTS-03 Investigator: Dr. Bill Johnson
 Project ID: Study Director: Joe Ikley
 Sponsor Contact: FMC - Joe Reed

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: 5/7/2013
Completion Date: 10/22/2013

Trial Location

City: Wanatah **Country:** USA United States
State/Prov.: Indiana
Postal Code: 46390

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

Cooperator/Landowner

Cooperator: Jon Leuck **Role:** Farm Manager
Organization: Pinney-Purdue Agricultural Center **Org. Type:** University
Address 1: 11402 County Line Road
City: Wanatah **Phone No.:** 765-479-3759
State/Prov: IN **Fax No.:** 219-733-2379
Postal Code: 46390 **Mobile No.:** 765-479-3759
Country: USA United States **E-mail:** leuckj@purdue.edu

Crop Description

Crop 1: GLXMA Glycine max Soybean
Variety: Asgrow 2933
Description: RR

Planting Rate, Unit: 57 LB/A
Depth, Unit: 1.25 IN
Row Spacing, Unit: 30 IN

Planting Date: 5/7/2013
Planting Method: DIRDRI direct drilled

Planting Density, Unit: 140000 S/A
Soil Temperature, Unit: 68 F
Soil Moisture: SLIWET slightly wet, moist

Emergence Date: 5/16/2013
Harvest Date: 10/22/2013
Harvested Width, Unit: 10 FT
Harvested Length, Unit: 25 FT
Harvest Equipment: Gleaner F3
% Standard Moisture: 13.0
Moisture Meter: Harvest Master
Weighing Equipment: Harvest Master

Pest Description

Pest 1 Type: W **Code:** AMBTR Ambrosia trifida
Common Name: Giant ragweed

Site and Design

Treated Plot Width: 10 FT
Treated Plot Length: 30 FT
Treated Plot Area: 300 FT² **Treatments:** 12
Replications: 4

Site Type: FIELD field
Experimental Unit: 1 PLOT plot
Tillage Type: CONTIL conventional-till
Study Design: RAOBL Randomized Complete Block (RCB)

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Soil Description	
Description Name: Pinney M2	
% OM: 2.2	Texture: SL sandy loam
pH: 6.3	Soil Name: Tracy Sandy Loam
CEC: 6	
Soil Drainage: E	excellent

Application Description		
	A	B
Application Date:	5/7/2013	6/4/2013
Appl. Start Time:	13:00	10:30
Appl. Stop Time:	2:00 PM	11:45 AM
Application Method:	SPRAY	SPRAY
Application Timing:	PREPRE	POSPOS
Application Placement:	SOIL	BROADC
Applied By:	Legleiter	Spaunhorst
Air Temperature, Unit:	75 F	73 F
% Relative Humidity:	40	50
Wind Velocity, Unit:	5 MPH	2.5 MPH
Wind Direction:	NNW	SE
Dew Presence (Y/N):	N no	N no
Soil Temperature, Unit:	68 F	64 F
Soil Moisture:	SLIWET	SLIWET
% Cloud Cover:	50	20
Next Moisture Occurred On:	5/10/2013	
Time to Next Moisture, Unit:	48 HR	

Crop Stage At Each Application		
	A	B
Crop 1 Code, BBCH Scale:	GLXMA BSOY	GLXMA BSOY
Stage Scale Used:	BBCH	BBCH
Stage Majority, Percent:	00	12
Stage Minimum, Percent:		12
Stage Maximum, Percent:		13
Height, Unit:		5 IN
Height Minimum, Maximum:		4 6

Pest Stage At Each Application		
	A	B
Pest 1 Code, Type, Scale:	AMBTR W	AMBTR W
Stage Majority, Percent:	00	12
Stage Minimum, Percent:		11
Stage Maximum, Percent:		14
Height, Unit:		1 IN
Height Minimum, Maximum:		0.75 2
Density, Unit:		10 YD2

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Application Equipment		
	A	B
Appl. Equipment:	CO2 Backpack	CO2 Backpack
Equipment Type:	SPRBAC	SPRBAC
Operation Pressure, Unit:	17 PSI	17 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

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	UNTREATED									101	503	605	805
2	AUTHORITY XL MARVEL COC	70 %W/W 3 LB/GAL	WG SC	196 g ai/ha 190 g ai/ha 1 % v/v	4 oz/a 7.25 fl oz/a 1 % v/v		A B B	3.592 g/mx 6.771 ml/mx 18.0 ml/mx	102	501	505	904	
3	AUTHORITY XL CADET ROUNDUP POWERMAX N-Pak AMS	70 %W/W .910000026 LB/GAL 4.5 LBAE/GAL 3.4 LBA/GAL	WG EC SL SL	196 g ai/ha 7.2 g ai/ha 870 g ae/ha 2.5 % v/v	4 oz/a 0.9 fl oz/a 22 fl oz/a 8.5 lb ai/100 gal		A B B B	3.592 g/mx 0.8458 ml/mx 20.67 ml/mx 45.0 ml/mx	103	405	704	1002	
4	AUTHORITY XL MARVEL ROUNDUP POWERMAX N-Pak AMS	70 %W/W 3 LB/GAL 4.5 LBAE/GAL 3.4 LBA/GAL	WG SC SL SL	196 g ai/ha 190 g ai/ha 870 g ae/ha 2.5 % v/v	4 oz/a 7.25 fl oz/a 22 fl oz/a 8.5 lb ai/100 gal		A B B B	3.592 g/mx 6.771 ml/mx 20.67 ml/mx 45.0 ml/mx	104	401	602	902	
5	AUTHORITY FIRST DF MARVEL COC	70 %W/W 3 LB/GAL	WG SC	196 g ai/ha 190 g ai/ha 1 % v/v	4 oz/a 7.25 fl oz/a 1 % v/v		A B B	3.592 g/mx 6.771 ml/mx 18.0 ml/mx	105	304	705	905	
6	AUTHORITY FIRST DF CADET ROUNDUP POWERMAX N-Pak AMS	70 %W/W .910000026 LB/GAL 4.5 LBAE/GAL 3.4 LBA/GAL	WG EC SL SL	196 g ai/ha 7.2 g ai/ha 870 g ae/ha 2.5 % v/v	4 oz/a 0.9 fl oz/a 22 fl oz/a 8.5 lb ai/100 gal		A B B B	3.592 g/mx 0.8458 ml/mx 20.67 ml/mx 45.0 ml/mx	201	402	702	1003	
7	AUTHORITY FIRST DF MARVEL ROUNDUP POWERMAX N-Pak AMS	70 %W/W 3 LB/GAL 4.5 LBAE/GAL 3.4 LBA/GAL	WG SC SL SL	196 g ai/ha 190 g ai/ha 870 g ae/ha 2.5 % v/v	4 oz/a 7.25 fl oz/a 22 fl oz/a 8.5 lb ai/100 gal		A B B B	3.592 g/mx 6.771 ml/mx 20.67 ml/mx 45.0 ml/mx	202	305	701	803	
8	AUTHORITY MTZ CADET ROUNDUP POWERMAX N-Pak AMS	45 %W/W .910000026 LB/GAL 4.5 LBAE/GAL 3.4 LBA/GAL	WG EC SL SL	504 g ai/ha 7.2 g ai/ha 870 g ae/ha 2.5 % v/v	16 oz/a 0.9 fl oz/a 22 fl oz/a 8.5 lb ai/100 gal		A B B B	14.37 g/mx 0.8458 ml/mx 20.67 ml/mx 45.0 ml/mx	203	504	603	1001	
9	AUTHORITY MTZ MARVEL ROUNDUP POWERMAX N-Pak AMS	45 %W/W 3 LB/GAL 4.5 LBAE/GAL 3.4 LBA/GAL	WG SC SL SL	504 g ai/ha 190 g ai/ha 870 g ae/ha 2.5 % v/v	16 oz/a 7.25 fl oz/a 22 fl oz/a 8.5 lb ai/100 gal		A B B B	14.37 g/mx 6.771 ml/mx 20.67 ml/mx 45.0 ml/mx	204	404	703	804	
10	VALOR SX COBRA ROUNDUP POWERMAX N-Pak AMS	51 %W/W 2 LB/GAL 4.5 LBAE/GAL 3.4 LBA/GAL	WG EC SL SL	71.5 g ai/ha 210 g ai/ha 870 g ae/ha 2.5 % v/v	2 oz/a 12 fl oz/a 22 fl oz/a 8.5 lb ai/100 gal		A B B B	1.799 g/mx 11.23 ml/mx 20.67 ml/mx 45.0 ml/mx	205	403	801	802	
11	Valor Classic COBRA ROUNDUP POWERMAX N-Pak AMS	51 % 25 %AW/W 2 LB/GAL 4.5 LBAE/GAL 3.4 LBA/GAL	WG DF EC SL SL	63 g ai/ha 21.7 g ai/ha 210 g ai/ha 870 g ae/ha 2.5 % v/v	1.76 oz/a 1.24 oz/a 12 fl oz/a 22 fl oz/a 8.5 lb ai/100 gal		A A B B B	1.585 g/mx 1.114 g/mx 11.23 ml/mx 20.67 ml/mx 45.0 ml/mx	301	303	601	901	
12	COMMAND 3ME MARVEL ROUNDUP POWERMAX N-Pak AMS	3 LB/GAL 3 LB/GAL 4.5 LBAE/GAL 3.4 LBA/GAL	CS SC SL SL	840 g ai/ha 190 g ai/ha 870 g ae/ha 2.5 % v/v	2 pt/a 7.25 fl oz/a 22 oz/a 8.5 lb ai/100 gal		A B B B	29.93 ml/mx 6.771 ml/mx 20.67 ml/mx 45.0 ml/mx	302	502	604	903	

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
10.776	g	AUTHORITY XL	70	WG	
40.624	ml	MARVEL	3	SC	
36.000	ml	COC			
2.538	ml	CADET	.910000026	EC	

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

Amount*	Unit	Treatment Name	Form Conc	Form Type	Lot Code
186.016	ml	ROUNDUP POWERMAX	4.5	SL	
405.000	ml	N-Pak AMS	3.4	SL	
10.776	g	AUTHORITY FIRST DF	70	WG	
28.736	g	AUTHORITY MTZ	45	WG	
1.799	g	VALOR SX	51	WG	
22.450	ml	COBRA	2	EC	
1.585	g	Valor	51	WG	
1.114	g	Classic	25	DF	
29.934	ml	COMMAND 3ME	3	CS	

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

* 'Per volume' calculations use spray volume= 15 gal/ac, mix size= 1.8 liters.

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Pest Type	W Weed			W Weed	W Weed	
Pest Code	AMBTR			AMBTR	AMBTR	
Pest Scientific Name	Ambrosia trifi>			Ambrosia trifi>	Ambrosia trifi>	
Pest Name	Giant ragweed			Giant ragweed	Giant ragweed	
Crop Code		GLXMA	GLXMA			GLXMA
BBCH Scale		BSOY	BSOY			BSOY
Crop Scientific Name		Glycine max	Glycine max			Glycine max
Crop Name		Soybean	Soybean			Soybean
Part Rated	PLOT P	PLOT C	PLOT C	PLOT P	PLOT P	PLOT C
Rating Date	5/22/2013	5/29/2013	6/4/2013	6/4/2013	6/11/2013	6/18/2013
Rating Type	CONTRO	PHYGEN	PHYGEN	CONTRO	CONTRO	PHYGEN
Rating Unit	%	%	%	%	%	%
Sample Size, Unit	1 PLOT	1 PLOT	1 PLOT	1 PLOT	1 PLOT	1 PLOT
Days After First/Last Applic.	15 15	22 22	28 28	28 28	35 7	42 14
Trt-Eval Interval	15 DA-A	22 DA-A	0 DA-B	0 DA-B	7 DA-B	14 DA-B
ARM Action Codes	P	P	P	P	P	P
Number of Decimals	0	0	0	0	0	0
Trt Treatment	Rate	Appl				
No. Name	Rate Unit	Code Plot	1	2	3	4
1 UNTREATED		101	0	0	0	0
		503	0	0	0	0
		605	0	0	0	0
		805	0	0	0	0
		Mean =	0	0	0	0
2 AUTHORITY XL	196 g ai/ha	A 102	85	0	0	85
MARVEL	190 g ai/ha	B 501	65	0	0	60
COC	1 % v/v	B 505	95	0	0	95
		904	82*	5	0	80*
		Mean =	82	1	0	80
3 AUTHORITY XL	196 g ai/ha	A 103	90	5	0	75
CADET	7.2 g ai/ha	B 405	100	0	0	95
ROUNDUP POWERMAX	870 g ae/ha	B 704	95*	5	0	85*
N-Pak AMS	2.5 % v/v	B 1002	95*	0	5	85*
		Mean =	95	3	1	85
4 AUTHORITY XL	196 g ai/ha	A 104	95	0	0	90
MARVEL	190 g ai/ha	B 401	60	5	0	60
ROUNDUP POWERMAX	870 g ae/ha	B 602	78*	0	0	75*
N-Pak AMS	2.5 % v/v	B 902	78*	0	5	75*
		Mean =	78	1	1	75
5 AUTHORITY FIRST DF	196 g ai/ha	A 105	100	0	0	100
MARVEL	190 g ai/ha	B 304	85	0	0	95
COC	1 % v/v	B 705	93*	0	0	98*
		905	93*	0	0	98*
		Mean =	93	0	0	98
6 AUTHORITY FIRST DF	196 g ai/ha	A 201	80	0	0	85
CADET	7.2 g ai/ha	B 402	70	0	0	40
ROUNDUP POWERMAX	870 g ae/ha	B 702	75*	0	0	63*
N-Pak AMS	2.5 % v/v	B 1003	75*	0	0	63*
		Mean =	75	0	0	63
7 AUTHORITY FIRST DF	196 g ai/ha	A 202	75	0	0	70
MARVEL	190 g ai/ha	B 305	95	0	0	100
ROUNDUP POWERMAX	870 g ae/ha	B 701	85*	5	5	85*
N-Pak AMS	2.5 % v/v	B 803	85*	0	0	85*
		Mean =	85	1	1	85
8 AUTHORITY MTZ	504 g ai/ha	A 203	15	10	0	35
CADET	7.2 g ai/ha	B 504	100	0	0	85
ROUNDUP POWERMAX	870 g ae/ha	B 603	58*	0	0	60*
N-Pak AMS	2.5 % v/v	B 1001	58*	0	0	60*
		Mean =	58	3	0	60

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Pest Type	W Weed				W Weed		W Weed	
Pest Code	AMBTR				AMBTR		AMBTR	
Pest Scientific Name	Ambrosia trifi>				Ambrosia trifi>		Ambrosia trifi>	
Pest Name	Giant ragweed				Giant ragweed		Giant ragweed	
Crop Code			GLXMA	GLXMA				
BBCH Scale			BSOY	BSOY				
Crop Scientific Name			Glycine max	Glycine max			Glycine max	
Crop Name			Soybean	Soybean			Soybean	
Part Rated	PLOT P	PLOT C	PLOT C	PLOT C	PLOT P	PLOT P	PLOT C	PLOT C
Rating Date	5/22/2013	5/29/2013	6/4/2013	6/4/2013	6/4/2013	6/11/2013	6/18/2013	6/18/2013
Rating Type	CONTRO	PHYGEN	PHYGEN	PHYGEN	CONTRO	CONTRO	PHYGEN	PHYGEN
Rating Unit	%	%	%	%	%	%	%	%
Sample Size, Unit	1 PLOT	1 PLOT	1 PLOT	1 PLOT	1 PLOT	1 PLOT	1 PLOT	1 PLOT
Days After First/Last Applic.	15 15	22 22	28 28	28 28	28 28	35 7	42 14	42 14
Trt-Eval Interval	15 DA-A	22 DA-A	0 DA-B	0 DA-B	0 DA-B	7 DA-B	14 DA-B	14 DA-B
ARM Action Codes	P	P	P	P	P	P	P	P
Number of Decimals	0	0	0	0	0	0	0	0
Trt Treatment	Rate	Appl						
No. Name	Rate Unit	Code Plot	1	2	3	4	5	6
9 AUTHORITY MTZ	504 g ai/ha	A 204	70	5	0	45	95	5
MARVEL	190 g ai/ha	B 404	85	0	0	75	100	0
ROUNDUP POWERMAX	870 g ae/ha	B 703	78*	5	0	60*	98*	0
N-Pak AMS	2.5 % v/v	B 804	78*	5	1	60*	98*	0
		Mean =	78	4	0	60	98	1
10 VALOR SX	71.5 g ai/ha	A 205	80	5	5	90	100	5
COBRA	210 g ai/ha	B 403	65	10	5	90*	95	5
ROUNDUP POWERMAX	870 g ae/ha	B 801	73*	10	10	90*	98*	5
N-Pak AMS	2.5 % v/v	B 802	73*	10	15	90*	98*	5
		Mean =	73	9	9	90	98	5
11 Valor	63 g ai/ha	A 301	60	0	10	50	90	5
Classic	21.7 g ai/ha	A 303	50	5	5	65	100	5
COBRA	210 g ai/ha	B 601	55*	0	5	58*	95*	5
ROUNDUP POWERMAX	870 g ae/ha	B 901	55*	0	10	58*	95*	5
N-Pak AMS	2.5 % v/v	B						
		Mean =	55	1	8	58	95	5
12 COMMAND 3ME	840 g ai/ha	A 302	20	0	0	10	80	5
MARVEL	190 g ai/ha	B 502	20	5	0	10	90	0
ROUNDUP POWERMAX	870 g ae/ha	B 604	20*	5	0	10*	85*	5
N-Pak AMS	2.5 % v/v	B 903	20*	5	0	10*	85*	0
		Mean =	20	4	0	10	85	3

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				W Weed AMBTR Ambrosia trifid Giant ragweed		W Weed AMBTR Ambrosia trifid Giant ragweed		GLXMA BSOY Glycine max Soybean		GLXMA BSOY Glycine max Soybean		GLXMA BSOY Glycine max Soybean			
Pest Type	Pest Code	Pest Scientific Name	Pest Name	PLOT P		PLOT C		PLOT P		PLOT P		PLOT P			
Crop Code	BBCH Scale	Crop Scientific Name	Crop Name	6/18/2013		7/2/2013		7/2/2013		10/22/2013		10/22/2013			
Part Rated	Rating Date	Rating Type	Rating Unit	CONTRO		PHYGEN		CONTRO		YIELD		YIELD			
Sample Size, Unit	Days After First/Last Applic.	Trt-Eval Interval	ARM Action Codes	1 PLOT		1 PLOT		1 PLOT		1 PLOT		1 PLOT			
Number of Decimals				42 14		56 28		56 28		168 140		168 140			
				14 DA-B		28 DA-B		28 DA-B			TY1		TY2		
				P		P		P			1		1		
				0		0		0		1		1		1	
Trt Treatment	Rate	Appl		7		8		9		10		11		12	
No. Name	Rate Unit	Code	Plot												
1 UNTREATED			101	0	0	0	0	0	0	0	0	0	0	0	0
			503	0	0	0	0	0	0	0	0	0	0	0	0
			605	0	0	0	0	0	0	0	0	0	0	0	0
			805	0	0	0	0	0	0	0	0	0	0	0	0
			Mean =	0	0	0	0	0	0	0	0	0	0	0	0
2 AUTHORITY XL	196 g ai/ha	A	102	70	0	95	15.2	44.1	2966.7						
MARVEL	190 g ai/ha	B	501	80	5	85	13.3	38.5	2588.1						
COC	1 % v/v	B	505	100	0	100	14.5	42.1	2830.0						
			904	83*	5	93*	14.4	41.9	2819.4						
			Mean =	83	3	93	14.3	41.7	2801.0						
3 AUTHORITY XL	196 g ai/ha	A	103	75	0	95	15.8	45.8	3082.3						
CADET	7.2 g ai/ha	B	405	100	0	100	18.1	52.6	3534.5						
ROUNDUP POWERMAX	870 g ae/ha	B	704	88*	0	98*	12.8	37.1	2493.5						
N-Pak AMS	2.5 % v/v	B	1002	88*	0	98*	10.2	29.6	1988.8						
			Mean =	88	0	98	14.2	41.3	2774.8						
4 AUTHORITY XL	196 g ai/ha	A	104	100	0	100	19.8	57.6	3870.9						
MARVEL	190 g ai/ha	B	401	95	0	90	17.4	50.5	3397.8						
ROUNDUP POWERMAX	870 g ae/ha	B	602	98*	0	95*	15.3	44.4	2987.7						
N-Pak AMS	2.5 % v/v	B	902	98*	0	95*	17.9	52.1	3502.9						
			Mean =	98	0	95	17.6	51.1	3439.8						
5 AUTHORITY FIRST DF	196 g ai/ha	A	105	100	0	100	14.4	41.9	2819.4						
MARVEL	190 g ai/ha	B	304	95	0	95	20.0	58.0	3902.5						
COC	1 % v/v	B	705	98*	0	98*	12.7	36.8	2472.5						
			905	98*	0	98*	14.8	42.9	2882.5						
			Mean =	98	0	98	15.5	44.9	3019.2						
6 AUTHORITY FIRST DF	196 g ai/ha	A	201	90	0	75	14.8	42.9	2882.5						
CADET	7.2 g ai/ha	B	402	90	5	85	16.0	46.5	3124.4						
ROUNDUP POWERMAX	870 g ae/ha	B	702	90*	0	80*	13.9	40.4	2714.3						
N-Pak AMS	2.5 % v/v	B	1003	90*	0	80*	11.7	34.1	2293.7						
			Mean =	90	1	80	14.1	40.9	2753.7						
7 AUTHORITY FIRST DF	196 g ai/ha	A	202	85	0	80	16.2	46.9	3155.9						
MARVEL	190 g ai/ha	B	305	100	0	100	17.3	50.2	3376.7						
ROUNDUP POWERMAX	870 g ae/ha	B	701	93*	0	90*	13.9	40.4	2714.3						
N-Pak AMS	2.5 % v/v	B	803	93*	5	90*	9.3	26.9	1810.0						
			Mean =	93	1	90	14.2	41.1	2764.2						
8 AUTHORITY MTZ	504 g ai/ha	A	203	75	0	70	13.1	38.0	2556.6						
CADET	7.2 g ai/ha	B	504	100	0	100	15.1	43.8	2945.6						
ROUNDUP POWERMAX	870 g ae/ha	B	603	88*	0	85*	14.2	41.3	2777.4						
N-Pak AMS	2.5 % v/v	B	1001	88*	0	85*	12.4	36.1	2430.4						
			Mean =	88	0	85	13.7	39.8	2677.5						

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Pest Type									
Pest Code									
Pest Scientific Name									
Pest Name									
Crop Code							GLXMA	GLXMA	GLXMA
BBCH Scale							BSOY	BSOY	BSOY
Crop Scientific Name							Glycine max	Glycine max	Glycine max
Crop Name							Soybean	Soybean	Soybean
Part Rated									
Rating Date									
Rating Type									
Rating Unit									
Sample Size, Unit									
Days After First/Last Applic.									
Trt-Eval Interval									
ARM Action Codes									
Number of Decimals									
W Weed									
AMBTR									
Ambrosia trifi>									
Giant ragweed									
PLOT P									
6/18/2013									
CONTR0									
%									
1 PLOT									
42 14									
14 DA-B									
P									
0									
PLOT C									
7/2/2013									
PHYGEN									
%									
1 PLOT									
56 28									
28 DA-B									
P									
0									
PLOT P									
7/2/2013									
CONTR0									
%									
1 PLOT									
56 28									
28 DA-B									
P									
0									
GLXMA									
BSOY									
Glycine max									
Soybean									
YIELD C									
10/22/2013									
YIELD									
lb/plot									
1 PLOT									
168 140									
1 PLOT									
168 140									
TY1									
1									
GLXMA									
BSOY									
Glycine max									
Soybean									
YIELD C									
10/22/2013									
YIELD									
kg/ha									
1 PLOT									
168 140									
TY2									
1									
Trt Treatment	Rate	Appl							
No. Name	Rate Unit	Code	Plot	7	8	9	10	11	12
9 AUTHORITY MTZ	504 g ai/ha	A	204	100	0	95	15.8	46.0	3092.8
MARVEL	190 g ai/ha	B	404	95	0	95	21.3	61.9	4165.4
ROUNDUP POWERMAX	870 g ae/ha	B	703	98*	0	95*	12.2	35.4	2377.8
N-Pak AMS	2.5 % v/v	B	804	98*	0	95*	11.3	32.7	2199.1
			Mean =	98	0	95	15.1	44.0	2958.8
10 VALOR SX	71.5 g ai/ha	A	205	100	0	100	17.2	49.9	3355.7
COBRA	210 g ai/ha	B	403	95	0	80	16.6	48.2	3240.0
ROUNDUP POWERMAX	870 g ae/ha	B	801	98*	0	90*	14.8	42.9	2882.5
N-Pak AMS	2.5 % v/v	B	802	98*	0	90*	14.2	41.3	2777.4
			Mean =	98	0	90	15.7	45.6	3063.9
11 Valor	63 g ai/ha	A	301	95	0	85	15.2	44.3	2977.2
Classic	21.7 g ai/ha	A	303	100	0	90	17.1	49.6	3334.7
COBRA	210 g ai/ha	B	601	98*	0	88*	15.7	45.7	3071.8
ROUNDUP POWERMAX	870 g ae/ha	B	901	98*	0	88*	16.4	47.6	3198.0
N-Pak AMS	2.5 % v/v	B							
			Mean =	98	0	88	16.1	46.8	3145.4
12 COMMAND 3ME	840 g ai/ha	A	302	85	0	90	19.1	55.4	3723.7
MARVEL	190 g ai/ha	B	502	90	0	95	14.6	42.4	2851.0
ROUNDUP POWERMAX	870 g ae/ha	B	604	88*	5	93*	12.8	37.1	2493.5
N-Pak AMS	2.5 % v/v	B	903	88*	0	93*	17.0	49.4	3324.2
			Mean =	88	1	93	15.9	46.1	3098.1

Purdue University Weed Science

2013/SOYBEAN/AUTHORITY/MARVEL/PRE/POST/PROGRAM/PURDUE

Trial ID: 13S-PIP-CTS-03 Location: PPAC Trial Year:
 Protocol ID: 13S-PIP-CTS-03 Investigator: Dr. Bill Johnson
 Project ID: Study Director: Joe Ikley
 Sponsor Contact: FMC - Joe Reed

Pest Type

W, Weed, G-BYRW7, G-WedStg = Weed or volunteer crop

Pest Code

AMBTR, Ambrosia trifida, = US

Crop Code

GLXMA, BSOY, Glycine max, = US

Part Rated

PLOT = plot

YIELD = yield

P = Pest is Part Rated

C = Crop is Part Rated

Rating Type

CONTRO = control / burndown or knockdown

PHYGEN = phytotoxicity - general / injury

YIELD = yield

Rating Unit

% = percent

lb/plot = pounds per plot

bu/ac = bushels per acre

kg/ha = kilograms per hectare

PLOT = total plot

ARM Action Codes

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

TY1 = 2.904*[10]

TY2 = 195.2984*[10]

Purdue University Weed Science

2013/SOYBEAN/AUTHORITY/MARVEL/PRE/POST/PROGRAM/PURDUE

Trial ID: 13S-PIP-CTS-03 Location: PPAC Trial Year:
 Protocol ID: 13S-PIP-CTS-03 Investigator: Dr. Bill Johnson
 Project ID: Study Director: Joe Ikley
 Sponsor Contact: FMC - Joe Reed

Pest Type	W Weed			W Weed	W Weed			
Pest Code	AMBTR			AMBTR	AMBTR			
Pest Scientific Name	Ambrosia trifi>			Ambrosia trifi>	Ambrosia trifi>			
Pest Name	Giant ragweed			Giant ragweed	Giant ragweed			
Crop Code		GLXMA	GLXMA			GLXMA		
BBCH Scale		BSOY	BSOY			BSOY		
Crop Scientific Name		Glycine max	Glycine max			Glycine max		
Crop Name		Soybean	Soybean			Soybean		
Part Rated	PLOT P	PLOT C	PLOT C	PLOT P	PLOT P	PLOT C		
Rating Date	5/22/2013	5/29/2013	6/4/2013	6/4/2013	6/11/2013	6/18/2013		
Rating Type	CONTRO	PHYGEN	PHYGEN	CONTRO	CONTRO	PHYGEN		
Rating Unit	%	%	%	%	%	%		
Sample Size, Unit	1 PLOT	1 PLOT	1 PLOT	1 PLOT	1 PLOT	1 PLOT		
Days After First/Last Applic.	15 15	22 22	28 28	28 28	35 7	42 14		
Trt-Eval Interval	15 DA-A	22 DA-A	0 DA-B	0 DA-B	7 DA-B	14 DA-B		
ARM Action Codes	P	P	P	P	P	P		
Number of Decimals	0	0	0	0	0	0		
Trt Treatment	Rate	Appl						
No. Name	Rate Unit	Code	1	2	3	4	5	6
1 UNTREATED			0 c	0 b	0 b	0 b	0 b	0 b
2 AUTHORITY XL	196 g ai/ha A		82 a	1 b	0 b	80 a	87 a	3 ab
MARVEL	190 g ai/ha B							
COC	1 % v/v B							
3 AUTHORITY XL	196 g ai/ha A		95 a	3 b	1 b	85 a	95 a	0 b
CADET	7.2 g ai/ha B							
ROUNDUP POWERMAX	870 g ae/ha B							
N-Pak AMS	2.5 % v/v B							
4 AUTHORITY XL	196 g ai/ha A		78 a	1 b	1 b	75 a	90 a	1 ab
MARVEL	190 g ai/ha B							
ROUNDUP POWERMAX	870 g ae/ha B							
N-Pak AMS	2.5 % v/v B							
5 AUTHORITY FIRST DF	196 g ai/ha A		93 a	0 b	0 b	98 a	98 a	0 b
MARVEL	190 g ai/ha B							
COC	1 % v/v B							
6 AUTHORITY FIRST DF	196 g ai/ha A		75 a	0 b	0 b	63 a	85 a	0 b
CADET	7.2 g ai/ha B							
ROUNDUP POWERMAX	870 g ae/ha B							
N-Pak AMS	2.5 % v/v B							
7 AUTHORITY FIRST DF	196 g ai/ha A		85 a	1 b	1 b	85 a	98 a	3 ab
MARVEL	190 g ai/ha B							
ROUNDUP POWERMAX	870 g ae/ha B							
N-Pak AMS	2.5 % v/v B							
8 AUTHORITY MTZ	504 g ai/ha A		58 ab	3 b	0 b	60 a	85 a	0 b
CADET	7.2 g ai/ha B							
ROUNDUP POWERMAX	870 g ae/ha B							
N-Pak AMS	2.5 % v/v B							
9 AUTHORITY MTZ	504 g ai/ha A		78 a	4 b	0 b	60 a	98 a	1 ab
MARVEL	190 g ai/ha B							
ROUNDUP POWERMAX	870 g ae/ha B							
N-Pak AMS	2.5 % v/v B							
10 VALOR SX	71.5 g ai/ha A		73 a	9 a	9 a	90 a	98 a	5 a
COBRA	210 g ai/ha B							
ROUNDUP POWERMAX	870 g ae/ha B							
N-Pak AMS	2.5 % v/v B							

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.
 Missing data estimates are included in columns: Average=1,4,5,7,9

Purdue University Weed Science

Pest Type	W Weed	AMBTR	GLXMA	GLXMA	W Weed	W Weed	GLXMA
Pest Code	AMBTR				AMBTR	AMBTR	GLXMA
Pest Scientific Name	Ambrosia trifi>				Ambrosia trifi>	Ambrosia trifi>	GLXMA
Pest Name	Giant ragweed				Giant ragweed	Giant ragweed	GLXMA
Crop Code			GLXMA	GLXMA			GLXMA
BBCH Scale			BSOY	BSOY			BSOY
Crop Scientific Name			Glycine max	Glycine max			Glycine max
Crop Name			Soybean	Soybean			Soybean
Part Rated	PLOT P	PLOT C	PLOT C	PLOT C	PLOT P	PLOT P	PLOT C
Rating Date	5/22/2013	5/29/2013	6/4/2013	6/4/2013	6/11/2013	6/11/2013	6/18/2013
Rating Type	CONTRO	PHYGEN	PHYGEN	PHYGEN	CONTRO	CONTRO	PHYGEN
Rating Unit	%	%	%	%	%	%	%
Sample Size, Unit	1 PLOT	1 PLOT	1 PLOT	1 PLOT	1 PLOT	1 PLOT	1 PLOT
Days After First/Last Applic.	15 15	22 22	28 28	28 28	35 7	35 7	42 14
Trt-Eval Interval	15 DA-A	22 DA-A	0 DA-B	0 DA-B	7 DA-B	7 DA-B	14 DA-B
ARM Action Codes	P	P	P	P	P	P	P
Number of Decimals	0	0	0	0	0	0	0
Trt Treatment	Rate	Appl					
No. Name	Rate Unit	Code	1	2	3	4	5
11 Valor	63 g ai/ha	A	55 ab	1 b	8 a	58 a	95 a
Classic	21.7 g ai/ha	A					
COBRA	210 g ai/ha	B					
ROUNDUP POWERMAX	870 g ae/ha	B					
N-Pak AMS	2.5 % v/v	B					
12 COMMAND 3ME	840 g ai/ha	A	20 bc	4 b	0 b	10 b	85 a
MARVEL	190 g ai/ha	B					
ROUNDUP POWERMAX	870 g ae/ha	B					
N-Pak AMS	2.5 % v/v	B					
LSD (P=.05)			32.5	3.8	2.7	31.5	10.7
Standard Deviation			21.1	2.6	1.9	20.2	6.9
CV			32.05	120.6	112.54	31.81	8.23
Bartlett's X2			9.037	3.22	9.643	3.885	3.034
P(Bartlett's X2)			0.434	0.92	0.086	0.867	0.981
Skewness			-0.7734	1.2149*	2.2218*	-0.5841	-1.9153*
Kurtosis			-0.8506	0.3737	4.6579*	-1.1115	2.1426*

Purdue University Weed Science

Pest Type			W Weed		W Weed				
Pest Code			AMBTR		AMBTR				
Pest Scientific Name			Ambrosia trif>		Ambrosia trif>				
Pest Name			Giant ragweed		Giant ragweed				
Crop Code						GLXMA	GLXMA	GLXMA	
BBCH Scale						BSOY	BSOY	BSOY	
Crop Scientific Name						Glycine max	Glycine max	Glycine max	
Crop Name						Soybean	Soybean	Soybean	
Part Rated			PLOT P	PLOT C	PLOT P	YIELD C	YIELD C	YIELD C	
Rating Date			6/18/2013	7/2/2013	7/2/2013	10/22/2013	10/22/2013	10/22/2013	
Rating Type			CONTRO	PHYGEN	CONTRO	YIELD	YIELD	YIELD	
Rating Unit			%	%	%	lb/plot	bu/ac	kg/ha	
Sample Size, Unit			1 PLOT	1 PLOT	1 PLOT	1 PLOT	1 PLOT	1 PLOT	
Days After First/Last Applic.			42 14	56 28	56 28	168 140	168 140	168 140	
Trt-Eval Interval			14 DA-B	28 DA-B	28 DA-B				
ARM Action Codes			P	P	P		TY1	TY2	
Number of Decimals			0	0	0	1	1	1	
Trt No.	Treatment Name	Rate Unit	Appl Code	7	8	9	10	11	12
1	UNTREATED			0 b	0 a	0 b			
2	AUTHORITY XL MARVEL COC	196 g ai/ha 190 g ai/ha 1 % v/v	A B B	83 a	3 a	93 a	14.3 a	41.7 a	2801.0 a
3	AUTHORITY XL CADET ROUNDUP POWERMAX N-Pak AMS	196 g ai/ha 7.2 g ai/ha 870 g ae/ha 2.5 % v/v	A B B B	88 a	0 a	98 a	14.2 a	41.3 a	2774.8 a
4	AUTHORITY XL MARVEL ROUNDUP POWERMAX N-Pak AMS	196 g ai/ha 190 g ai/ha 870 g ae/ha 2.5 % v/v	A B B B	98 a	0 a	95 a	17.6 a	51.1 a	3439.8 a
5	AUTHORITY FIRST DF MARVEL COC	196 g ai/ha 190 g ai/ha 1 % v/v	A B B	98 a	0 a	98 a	15.5 a	44.9 a	3019.2 a
6	AUTHORITY FIRST DF CADET ROUNDUP POWERMAX N-Pak AMS	196 g ai/ha 7.2 g ai/ha 870 g ae/ha 2.5 % v/v	A B B B	90 a	1 a	80 a	14.1 a	40.9 a	2753.7 a
7	AUTHORITY FIRST DF MARVEL ROUNDUP POWERMAX N-Pak AMS	196 g ai/ha 190 g ai/ha 870 g ae/ha 2.5 % v/v	A B B B	93 a	1 a	90 a	14.2 a	41.1 a	2764.2 a
8	AUTHORITY MTZ CADET ROUNDUP POWERMAX N-Pak AMS	504 g ai/ha 7.2 g ai/ha 870 g ae/ha 2.5 % v/v	A B B B	88 a	0 a	85 a	13.7 a	39.8 a	2677.5 a
9	AUTHORITY MTZ MARVEL ROUNDUP POWERMAX N-Pak AMS	504 g ai/ha 190 g ai/ha 870 g ae/ha 2.5 % v/v	A B B B	98 a	0 a	95 a	15.1 a	44.0 a	2958.8 a
10	VALOR SX COBRA ROUNDUP POWERMAX N-Pak AMS	71.5 g ai/ha 210 g ai/ha 870 g ae/ha 2.5 % v/v	A B B B	98 a	0 a	90 a	15.7 a	45.6 a	3063.9 a

Purdue University Weed Science

Pest Type		W Weed		W Weed			
Pest Code		AMBTR		AMBTR			
Pest Scientific Name		Ambrosia trifi>		Ambrosia trifi>			
Pest Name		Giant ragweed		Giant ragweed			
Crop Code					GLXMA	GLXMA	GLXMA
BBCH Scale					BSOY	BSOY	BSOY
Crop Scientific Name					Glycine max	Glycine max	Glycine max
Crop Name					Soybean	Soybean	Soybean
Part Rated		PLOT P	PLOT C	PLOT P	YIELD C	YIELD C	YIELD C
Rating Date		6/18/2013	7/2/2013	7/2/2013	10/22/2013	10/22/2013	10/22/2013
Rating Type		CONTRO	PHYGEN	CONTRO	YIELD	YIELD	YIELD
Rating Unit		%	%	%	lb/plot	bu/ac	kg/ha
Sample Size, Unit		1 PLOT	1 PLOT	1 PLOT	1 PLOT	1 PLOT	1 PLOT
Days After First/Last Applic.		42 14	56 28	56 28	168 140	168 140	168 140
Trt-Eval Interval		14 DA-B	28 DA-B	28 DA-B			
ARM Action Codes		P	P	P		TY1	TY2
Number of Decimals		0	0	0	1	1	1
Trt Treatment	Rate	Appl					
No. Name	Rate Unit	Code	7	8	9	10	11
11 Valor	63 g ai/ha	A	98 a	0 a	88 a	16.1 a	46.8 a
Classic	21.7 g ai/ha	A					
COBRA	210 g ai/ha	B					
ROUNDUP POWERMAX	870 g ae/ha	B					
N-Pak AMS	2.5 % v/v	B					
12 COMMAND 3ME	840 g ai/ha	A	88 a	1 a	93 a	15.9 a	46.1 a
MARVEL	190 g ai/ha	B					
ROUNDUP POWERMAX	870 g ae/ha	B					
N-Pak AMS	2.5 % v/v	B					
LSD (P=.05)			14.5	2.2	14.6	3.05	8.84
Standard Deviation			9.4	1.5	9.5	2.11	6.13
CV			11.15	290.45	11.31	13.94	13.94
Bartlett's X2			7.964	0.094	6.388	16.626	16.626
P(Bartlett's X2)			0.538	0.993	0.701	0.083	0.083
Skewness			-1.8416*	2.6759*	-1.8633*	0.1372	0.1372
Kurtosis			1.9223*	5.3834*	1.9906*	0.2499	0.2499

Purdue University Weed Science

2013/SOYBEAN/AUTHORITY/MARVEL/PRE/POST/PROGRAM/PURDUE

Trial ID: 13S-PIP-CTS-03 Location: PPAC Trial Year:
 Protocol ID: 13S-PIP-CTS-03 Investigator: Dr. Bill Johnson
 Project ID: Study Director: Joe Ikley
 Sponsor Contact: FMC - Joe Reed

Randomized Complete Block (RCB) AOV For W Weed AMBTR Ambrosia trifida Giant ragweed PLOT P 5/22/2013 CONTRO % 1 PLOT 15 15 15 DA-A P 0 (Data Column 1)

Source	DF	Sum of Squares	Mean Square	F	Prob(F)
Total	26	42187.268519			
Replicate	3	48.263889	16.087963	0.036	0.9903
Treatment	11	36808.101852	3346.191077	7.532	0.0008
Error	12	5330.902778	444.241898		

Randomized Complete Block (RCB) AOV For GLXMA BSOY Glycine max Soybean PLOT C 5/29/2013 PHYGEN % 1 PLOT 22 22 22 DA-A P 0 (Data Column 2)

Source	DF	Sum of Squares	Mean Square	F	Prob(F)
Total	47	495.312500			
Replicate	3	1.562500	0.520833	0.075	0.9731
Treatment	11	264.062500	24.005682	3.449	0.0028
Error	33	229.687500	6.960227		

Randomized Complete Block (RCB) AOV For GLXMA BSOY Glycine max Soybean PLOT C 6/4/2013 PHYGEN % 1 PLOT 28 28 0 DA-B P 0 (Data Column 3)

Source	DF	Sum of Squares	Mean Square	F	Prob(F)
Total	47	564.312500			
Replicate	3	31.729167	10.576389	2.932	0.0478
Treatment	11	413.562500	37.596591	10.424	0.0001
Error	33	119.020833	3.606692		

Randomized Complete Block (RCB) AOV For W Weed AMBTR Ambrosia trifida Giant ragweed PLOT P 6/4/2013 CONTRO % 1 PLOT 28 28 0 DA-B P 0 (Data Column 4)

Source	DF	Sum of Squares	Mean Square	F	Prob(F)
Total	25	45160.416667			
Replicate	3	94.791667	31.597222	0.077	0.9709
Treatment	11	40572.916667	3688.446970	9.031	0.0005
Error	11	4492.708333	408.428030		

Randomized Complete Block (RCB) AOV For W Weed AMBTR Ambrosia trifida Giant ragweed PLOT P 6/11/2013 CONTRO % 1 PLOT 35 7 7 DA-B P 0 (Data Column 5)

Source	DF	Sum of Squares	Mean Square	F	Prob(F)
Total	26	32904.629630			
Replicate	3	38.888889	12.962963	0.269	0.8464
Treatment	11	32287.962963	2935.269360	60.963	0.0001
Error	12	577.777778	48.148148		

Randomized Complete Block (RCB) AOV For GLXMA BSOY Glycine max Soybean PLOT C 6/18/2013 PHYGEN % 1 PLOT 42 14 14 DA-B P 0 (Data Column 6)

Source	DF	Sum of Squares	Mean Square	F	Prob(F)
Total	47	266.666667			
Replicate	3	4.166667	1.388889	0.423	0.7377
Treatment	11	154.166667	14.015152	4.269	0.0006
Error	33	108.333333	3.282828		

Randomized Complete Block (RCB) AOV For W Weed AMBTR Ambrosia trifida Giant ragweed PLOT P 6/18/2013 CONTRO % 1 PLOT 42 14 14 DA-B P 0 (Data Column 7)

Source	DF	Sum of Squares	Mean Square	F	Prob(F)
Total	26	33709.490741			
Replicate	3	210.763889	70.254630	0.789	0.5229
Treatment	11	32430.324074	2948.211279	33.113	0.0001
Error	12	1068.402778	89.033565		

Randomized Complete Block (RCB) AOV For PLOT C 7/2/2013 PHYGEN % 1 PLOT 56 28 28 DA-B P 0 (Data Column 8)

Source	DF	Sum of Squares	Mean Square	F	Prob(F)
Total	47	111.979167			
Replicate	3	5.729167	1.909722	0.834	0.4846
Treatment	11	30.729167	2.793561	1.221	0.3124
Error	33	75.520833	2.288510		

Purdue University Weed Science

Randomized Complete Block (RCB) AOV For W Weed AMBTR Ambrosia trifida Giant ragweed PLOT P 7/2/2013 CONTRO % 1 PLOT 56 28 28 DA-B P 0 (Data Column 9)

Source	DF	Sum of Squares	Mean Square	F	Prob(F)
Total	26	32801.851852			
Replicate	3	43.055556	14.351852	0.160	0.9209
Treatment	11	31685.185185	2880.471380	32.196	0.0001
Error	12	1073.611111	89.467593		

Randomized Complete Block (RCB) AOV For GLXMA BSOY Glycine max Soybean YIELD C 10/22/2013 YIELD lb/plot 1 PLOT 168 140 1 (Data Column 10)

Source	DF	Sum of Squares	Mean Square	F	Prob(F)
Total	43	277.265059			
Replicate	3	89.492498	29.830833	6.706	0.0013
Treatment	10	54.311798	5.431180	1.221	0.3178
Error	30	133.460763	4.448692		

Randomized Complete Block (RCB) AOV For GLXMA BSOY Glycine max Soybean YIELD C 10/22/2013 YIELD bu/ac 1 PLOT 168 140 TY1 1 (Data Column 11)

Source	DF	Sum of Squares	Mean Square	F	Prob(F)
Total	43	2338.236133			
Replicate	3	754.709569	251.569856	6.706	0.0013
Treatment	10	458.023122	45.802312	1.221	0.3178
Error	30	1125.503442	37.516781		

Randomized Complete Block (RCB) AOV For GLXMA BSOY Glycine max Soybean YIELD C 10/22/2013 YIELD kg/ha 1 PLOT 168 140 TY2 1 (Data Column 12)

Source	DF	Sum of Squares	Mean Square	F	Prob(F)
Total	43	10575295.559660			
Replicate	3	3413374.997716	1137791.665905	6.706	0.0013
Treatment	10	2071531.534055	207153.153405	1.221	0.3178
Error	30	5090389.027889	169679.634263		

Pest Type

W, Weed, G-BYRW7, G-WedStg = Weed or volunteer crop

Pest Code

AMBTR, Ambrosia trifida, = US

Crop Code

GLXMA, BSOY, Glycine max, = US

Part Rated

PLOT = plot

YIELD = yield

P = Pest is Part Rated

C = Crop is Part Rated

Rating Type

CONTRO = control / burndown or knockdown

PHYGEN = phytotoxicity - general / injury

YIELD = yield

Rating Unit

% = percent

lb/plot = pounds per plot

bu/ac = bushels per acre

kg/ha = kilograms per hectare

PLOT = total plot

ARM Action Codes

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

TY1 = 2.904*[10]

TY2 = 1.95.2984*[10]