

Purdue University Weed Science

FIERCE - SOYBEAN MARKET SUPPORT

Trial ID: 15S-THP-CTS-13 Trial Year: 2015
 Protocol ID: VUSA2015FIERCCEMD64.01 Investigator: Dr. Bill Johnson
 Project ID: 4600.39359 Sponsor Contact: Valent

General Trial Information

Study Director: Joe Ikley **Title:** Research Associate
Investigator: Dr. Bill Johnson **Title:** Professor

Discipline: H herbicide
Trial Status: E established
Initiation Date: May-12-2015

Trial Location

City: Lafayette **Country:** USA United States
State/Prov.: Indiana
Postal Code: 47909

Conducted Under GLP: No
Conducted Under GEP: No

Study Rules: Default

No.	Guideline	Description
1.	ADM-C-PUB	Confidentiality - Public Trial - No Secrecy Agreement Required

Objectives:

To demonstrate the advantage of using Fierce at 3 oz/A for weed control and increased yield in a Roundup Ready system. Key measure is weed control at 28, 42 and 56 days after application and crop yield. Also to compare Fierce to Boundry and Authority Maxx at labeled use rates.

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 W State Street **Phone No.:** 765-494-4656
City+State/Prov: West Lafayette, IN, USA **Mobile No.:** 765-404-9801
Postal Code: 47907 **E-mail:** wgj@purdue.edu

Cooperator/Landowner

Cooperator: Jay Young **Role:** Purdue Ag Center
Organization: Purdue University
Address 1: 8343 US 231 S
City: Lafayette **Phone No.:** 765-538-3422
State/Prov: IN **Fax No.:** 765-538-3423
Postal Code: 47909
Country: USA United States **E-mail:** jayyoung@purdue.edu

Crop Description

Crop 1: GLXMA Glycine max Soybean
Variety: Asgrow 2933 **BBCH Scale:** BSOY
Description: RR
Planting Rate, Unit: 140000 S/A
Depth, Unit: 1.25 IN
Row Spacing, Unit: 15 IN
Soil Temperature, Unit: 62 F
Soil Moisture: SLIDRY slightly dry
Planting Date: May-14-2015
Planting Method: SEEDED seeded
Planting Equipment: PP Plot Planter
Emergence Date: May-21-2015

Pest Description

Pest 1 Type: W **Code:** AMBTR Ambrosia trifida
Common Name: Giant ragweed
Pest 2 Type: W **Code:** SETFA Setaria faberi
Common Name: Giant foxtail
Pest 3 Type: W **Code:** CHEAL Chenopodium album
Common Name: Common lambsquarters

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Site and Design	
Treated Plot Width: 10 FT Treated Plot Length: 30 FT Treated Plot Area: 300 FT ² Treatments: 5 Replications: 4 Untreated Arrangement: INCLUDED single control randomized in each block	Site Type: FIELD field Experimental Unit: 1 PLOT plot Tillage Type: CONTIL conventional-till Study Design: RACOB� Randomized Complete Block (RCB)

Soil Description	
Description Name: TPAC -Field 4A % OM: 3.1 pH: 6 CEC: 11.1	Texture: SIL silt loam Soil Name: Toronto-Millbrook

Application Description		
	A	B
Application Date:	May-14-2015	Jun-9-2015
Appl. Start Time:	19:00	18:30
Appl. Stop Time:	19:15	20:00
Application Method:	SPRAY	SPRAY
Application Timing:	PRE	POST
Application Placement:	SOIL	BROADC
Applied By:	DS	TC
Air Temperature, Unit:	67 F	81 F
% Relative Humidity:	45	44
Wind Velocity, Unit:	5 MPH	3 MPH
Wind Direction:	SE	W
Dew Presence (Y/N):	N no	N no
Soil Temperature, Unit:	62 F	78 F
Soil Moisture:	SLIWET	WET
% Cloud Cover:	100	10

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

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Pest Stage At Each Application

	A	B
Pest 1 Code, Type, Scale:	AMBTR W	AMBTR W
Stage Majority, Percent:		32G
Stage Minimum, Percent:		31G
Stage Maximum, Percent:		34G
Height, Unit:		7 IN
Height Minimum, Maximum:		4 10
Density, Unit:		300 YD2
Pest 2 Code, Type, Scale:	SETFA W	SETFA W
Stage Majority, Percent:		15
Stage Minimum, Percent:		13
Stage Maximum, Percent:		16
Height, Unit:		3 IN
Height Minimum, Maximum:		2 4
Density, Unit:		90 YD2
Pest 3 Code, Type, Scale:	CHEAL W	CHEAL W
Stage Majority, Percent:		32G
Stage Minimum, Percent:		31G
Stage Maximum, Percent:		33G
Height, Unit:		2 IN
Height Minimum, Maximum:		1 3
Density, Unit:		25 YD2

Application Equipment

	A	B
Appl. Equipment:	CO2 BACKPACK	CO2 BACKPACK
Equipment Type:	BACSPR	BACSPR
Operation Pressure, Unit:	18 PSI	18 PSI
Nozzle Type:	FLAT FAN	FLAT FAN
Nozzle Size:	XR 11002	XR 11002
Nozzle Spacing, Unit:	15 IN	15 IN
Nozzles/Row:	8	8
Boom Length, Unit:	10 FT	10 FT
Boom Height, Unit:	17 IN	17 IN
Ground Speed, Unit:	3 MPH	3 MPH
Carrier:	MEIGS	MEIGS
Spray Volume, Unit:	15 gal/ac	15 gal/ac
Mix Size, Unit:	1.8 liters	1.8 liters
Propellant:	CO2	CO2

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Trial Year: 2015
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Reps: 4 Appl Code: A Plots: 10 by 30 feet
 Spray vol: 15 GAL/AC Mix Size: 1.8 liters (calculated mix size 1.5642)

Trt No.	Treatment Name	Form Conc	Form Unit	Form Type	Rate	Growth Stage	Appl Code	Amt Product to Measure	Rep 1	Rep 2	Rep 3	Rep 4
3	FIERCE XLT	62.41 %W/W	WG		4 oz wt/a	PRE	A	3.595 g/mx	103	202	303	401
4	AUTHORITY MAXX	66 %W/W	WG		6 oz wt/a	PRE	A	5.392 g/mx	104	201	305	404
5	BOUNDARY	6.5 LB/GAL	EC		1.8 pt/a	PRE	A	27.0 ml/mx	105	204	302	403

Reps: 4 Appl Code: B Plots: 10 by 30 feet
 Spray vol: 15 GAL/AC Mix Size: 1.8 liters (calculated mix size 1.5642)

Trt No.	Treatment Name	Form Conc	Form Unit	Form Type	Rate	Growth Stage	Appl Code	Amt Product to Measure	Rep 1	Rep 2	Rep 3	Rep 4
2	ROUNDUP POWERMAX	4.5 LBAE/GAL	SL		32 fl oz/a		B	30.0 ml/mx	102	205	304	405
	N-PAK - AMS	3.4 LBA/GAL	SL		2.5 lb ai/a		B	88.23 ml/mx				
	ACTIVATOR 90 - NIS	90 %	L		0.25 % v/v	28 DAP	B	4.5 ml/mx				
3	ROUNDUP POWERMAX	4.5 LBAE/GAL	SL		32 fl oz/a		B	30.0 ml/mx	103	202	303	401
	N-PAK - AMS	3.4 LBA/GAL	SL		2.5 lb ai/a		B	88.23 ml/mx				
	ACTIVATOR 90 - NIS	90 %	L		0.25 % v/v	28 DAP	B	4.5 ml/mx				
4	ROUNDUP POWERMAX	4.5 LBAE/GAL	SL		32 fl oz/a		B	30.0 ml/mx	104	201	305	404
	N-PAK - AMS	3.4 LBA/GAL	SL		2.5 lb ai/a		B	88.23 ml/mx				
	ACTIVATOR 90 - NIS	90 %	L		0.25 % v/v	28 DAP	B	4.5 ml/mx				
5	ROUNDUP POWERMAX	4.5 LBAE/GAL	SL		32 fl oz/a		B	30.0 ml/mx	105	204	302	403
	N-PAK - AMS	3.4 LBA/GAL	SL		2.5 lb ai/a		B	88.23 ml/mx				
	ACTIVATOR 90 - NIS	90 %	L		0.25 % v/v	28 DAP	B	4.5 ml/mx				

Reps: 4 Appl Code: _ Plots: 10 by 30 feet
 Spray vol: 15 GAL/AC Mix Size: 1.8 liters (calculated mix size 1.5642)

Trt No.	Treatment Name	Form Conc	Form Unit	Form Type	Rate	Growth Stage	Appl Code	Amt Product to Measure	Rep 1	Rep 2	Rep 3	Rep 4
1	Untreated Check								101	203	301	402

Sort Order: Application Code, 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
150.000	ml	ROUNDUP POWERMAX	4.5	SL	
441.129	ml	N-PAK - AMS	3.4	SL	
22.498	ml	ACTIVATOR 90 - NIS	90	L	
4.493	g	FIERCE XLT	62.41	WG	
6.740	g	AUTHORITY MAXX	66	WG	
33.750	ml	BOUNDARY	6.5	EC	

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

* Product amount calculations increased 25 % for overage adjustment.

* '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	CHEAL	SETFA		
Pest Name			Giant ragweed	Common lambsqu	Giant foxtail		
Crop Code	GLXMA	GLXMA					GLXMA
Crop Name	Soybean	Soybean					Soybean
Part Rated	PLOT C	PLOT C	PLOT P	PLOT P	PLOT P	PLOT C	
Rating Date	May-29-2015	Jun-9-2015	Jun-9-2015	Jun-9-2015	Jun-9-2015	Jun-23-2015	
Rating Type	PHYGEN	PHYGEN	CONTRO	CONTRO	CONTRO	PHYGEN	
Rating Unit	%	%	%	%	%	%	
Number of Subsamples	1	1	1	1	1	1	
Days After First/Last Applic.	15 15	26 26	26 26	26 26	26 26	40 14	
Tri-Eval Interval	15 DA-A	0 DA-B	0 DA-B	0 DA-B	0 DA-B	14 DA-B	
Days After Emergence	8 DE-1	19 DE-1	19 DE-1	19 DE-1	19 DE-1	33 DE-1	
ARM Action Codes	P	P	P	P	P	P	
Number of Decimals	0	0	0	0	0	0	
Tri Treatment	Rate	Appl					
No. Name	Rate Unit	Code Plot	1	2	3	4	5
1 Untreated Check		101	0	0	0	0	0
		203	0	0	0	0	0
		301	0	0	0	0	0
		402	0	0	0	0	0
		Mean =	0	0	0	0	0
2 ROUNDUP POWERMAX	32 fl oz/a	B 102	0	0	0	0	0
N-PAK - AMS	2.5 lb ai/a	B 205	0	0	0	0	0
ACTIVATOR 90 - NIS	0.25 % v/v	B 304	0	0	0	0	0
		405	0	0	0	0	0
		Mean =	0	0	0	0	0
3 FIERCE XLT	4 oz wt/a	A 103	5	15	50	95	85
ROUNDUP POWERMAX	32 fl oz/a	B 202	5	15	80	100	90
N-PAK - AMS	2.5 lb ai/a	B 303	5	10	50	90	70
ACTIVATOR 90 - NIS	0.25 % v/v	B 401	5	5	55	95	95
		Mean =	5	11	59	95	85
4 AUTHORITY MAXX	6 oz wt/a	A 104	0	5	60	95	80
ROUNDUP POWERMAX	32 fl oz/a	B 201	0	0	90	100	85
N-PAK - AMS	2.5 lb ai/a	B 305	0	0	80	95	80
ACTIVATOR 90 - NIS	0.25 % v/v	B 404	0	0	66*	90	95
		Mean =	0	1	74	95	85
5 BOUNDARY	1.8 pt/a	A 105	0	0	60	95	100
ROUNDUP POWERMAX	32 fl oz/a	B 204	0	0	50	90	95
N-PAK - AMS	2.5 lb ai/a	B 302	0	0	0	90	90
ACTIVATOR 90 - NIS	0.25 % v/v	B 403	0	0	0	95	95
		Mean =	0	0	28	93	95

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			W Weed AMBTR Giant ragweed	W Weed SETFA Giant foxtail	W Weed AMBTR Giant ragweed	W Weed SETFA Giant foxtail
Pest Type						
Pest Code						
Pest Name						
Crop Code						
Crop Name						
Part Rated						
Rating Date			PLOT P Jun-23-2015	PLOT P Jun-23-2015	PLOT P Jul-6-2015	PLOT P Jul-6-2015
Rating Type			CONTRO	CONTRO	CONTRO	CONTRO
Rating Unit			%	%	%	%
Number of Subsamples			1	1	1	1
Days After First/Last Applic.			40 14	40 14	53 27	53 27
Tri-Eval Interval			14 DA-B	14 DA-B	27 DA-B	27 DA-B
Days After Emergence			33 DE-1	33 DE-1	46 DE-1	46 DE-1
ARM Action Codes			P	P	P	P
Number of Decimals			0	0	0	0
Tri Treatment	Rate	Appl				
No. Name	Rate Unit	Code Plot	7	8	9	10
1 Untreated Check		101	0	0	0	0
		203	0	0	0	0
		301	0	0	0	0
		402	0	0	0	0
		Mean =	0	0	0	0
2 ROUNDUP POWERMAX	32 fl oz/a	B 102	80	90	80	80
N-PAK - AMS	2.5 lb ai/a	B 205	90	95	85	80
ACTIVATOR 90 - NIS	0.25 % v/v	B 304	90	90	80	80
		405	85	95	80	70
		Mean =	86	93	81	78
3 FIERCE XLT	4 oz wt/a	A 103	80	100	80	100
ROUNDUP POWERMAX	32 fl oz/a	B 202	95	95	90	100
N-PAK - AMS	2.5 lb ai/a	B 303	90	100	80	100
ACTIVATOR 90 - NIS	0.25 % v/v	B 401	90	100	85	100
		Mean =	89	99	84	100
4 AUTHORITY MAXX	6 oz wt/a	A 104	91	100	80	95
ROUNDUP POWERMAX	32 fl oz/a	B 201	95	100	95	100
N-PAK - AMS	2.5 lb ai/a	B 305	95	100	85	90
ACTIVATOR 90 - NIS	0.25 % v/v	B 404	90	100	75	90
		Mean =	93	100	84	94
5 BOUNDARY	1.8 pt/a	A 105	90	100	85	100
ROUNDUP POWERMAX	32 fl oz/a	B 204	90	100	80	100
N-PAK - AMS	2.5 lb ai/a	B 302	90	100	80	95
ACTIVATOR 90 - NIS	0.25 % v/v	B 403	90	100	85	100
		Mean =	90	100	83	99

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 Project ID: 4600.39359

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 Investigator: Dr. Bill Johnson

Sponsor Contact: Valent

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

Pest Code
 AMBTR, Ambrosia trifida, = US
 CHEAL, Chenopodium album, = US
 SETFA, Setaria faberi, = US

Crop Code
 GLXMA, BSOY, Glycine max, = US

Part Rated
 PLOT = plot
 C = Crop is Part Rated
 P = Pest is Part Rated

Rating Type
 PHYGEN = phytotoxicity - general / injury
 CONTRO = control / burndown or knockdown

Rating Unit
 % = percent

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

Pest Type	GLXMA	GLXMA	W Weed AMBTR Giant ragweed	W Weed CHEAL Common lambsqu>	W Weed SETFA Giant foxtail	GLXMA Soybean		
Pest Code								
Pest Name								
Crop Code	GLXMA	GLXMA				GLXMA		
Crop Name	Soybean	Soybean				Soybean		
Part Rated	PLOT C	PLOT C	PLOT P	PLOT P	PLOT P	PLOT C		
Rating Date	May-29-2015	Jun-9-2015	Jun-9-2015	Jun-9-2015	Jun-9-2015	Jun-23-2015		
Rating Type	PHYGEN	PHYGEN	CONTRO	CONTRO	CONTRO	PHYGEN		
Rating Unit	%	%	%	%	%	%		
Number of Subsamples	1	1	1	1	1	1		
Days After First/Last Applic.	15 15	26 26	26 26	26 26	26 26	40 14		
Trt-Eval Interval	15 DA-A	0 DA-B	0 DA-B	0 DA-B	0 DA-B	14 DA-B		
Days After Emergence	8 DE-1	19 DE-1	19 DE-1	19 DE-1	19 DE-1	33 DE-1		
ARM Action Codes	P	P	P	P	P	P		
Number of Decimals	0	0	0	0	0	0		
Trt Treatment	Rate	Appl	1	2	3	4	5	6
No. Name	Rate Unit	Code						
1 Untreated Check			0 a	0 b	0 c	0 b	0 c	0 a
2 ROUNDUP POWERMAX	32 fl oz/a	B	0 a	0 b	0 c	0 b	0 c	0 a
N-PAK - AMS	2.5 lb ai/a	B						
ACTIVATOR 90 - NIS	0.25 % v/v	B						
3 FIERCE XLT	4 oz wt/a	A	5 a	11 a	59 a	95 a	85 b	0 a
ROUNDUP POWERMAX	32 fl oz/a	B						
N-PAK - AMS	2.5 lb ai/a	B						
ACTIVATOR 90 - NIS	0.25 % v/v	B						
4 AUTHORITY MAXX	6 oz wt/a	A	0 a	1 b	74 a	95 a	85 b	0 a
ROUNDUP POWERMAX	32 fl oz/a	B						
N-PAK - AMS	2.5 lb ai/a	B						
ACTIVATOR 90 - NIS	0.25 % v/v	B						
5 BOUNDARY	1.8 pt/a	A	0 a	0 b	28 b	93 a	95 a	0 a
ROUNDUP POWERMAX	32 fl oz/a	B						
N-PAK - AMS	2.5 lb ai/a	B						
ACTIVATOR 90 - NIS	0.25 % v/v	B						
LSD P=.05			0.0	3.5	25.8	4.4	8.2	0.0
Standard Deviation			0.0	2.3	16.6	2.9	5.3	0.0
CV			0.0	91.29	51.69	5.11	10.04	0.0
Bartlett's X2			0.0	1.148	2.19	0.414	2.417	0.0
P(Bartlett's X2)			.	0.284	0.335	0.813	0.299	.
Skewness			1.6245*	1.9298*	0.4185	-0.4311	-0.375	.
Kurtosis			0.6985	2.547*	-1.5775	-2.0105*	-1.9822	.
Replicate F			0.000	1.600	1.481	1.000	2.471	0.000
Replicate Prob(F)			1.0000	0.2411	0.2736	0.4262	0.1119	1.0000
Treatment F			0.000	18.600	16.575	1277.400	332.824	0.000
Treatment Prob(F)			1.0000	0.0001	0.0001	0.0001	0.0001	1.0000

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				W Weed AMBTR Giant ragweed	W Weed SETFA Giant foxtail	W Weed AMBTR Giant ragweed	W Weed SETFA Giant foxtail
Pest Type							
Pest Code							
Pest Name							
Crop Code							
Crop Name							
Part Rated				PLOT P	PLOT P	PLOT P	PLOT P
Rating Date				Jun-23-2015	Jun-23-2015	Jul-6-2015	Jul-6-2015
Rating Type				CONTRO	CONTRO	CONTRO	CONTRO
Rating Unit				%	%	%	%
Number of Subsamples				1	1	1	1
Days After First/Last Applic.				40 14	40 14	53 27	53 27
Trt-Eval Interval				14 DA-B	14 DA-B	27 DA-B	27 DA-B
Days After Emergence				33 DE-1	33 DE-1	46 DE-1	46 DE-1
ARM Action Codes				P	P	P	P
Number of Decimals				0	0	0	0
Trt No.	Treatment Name	Rate	Appl Code	7	8	9	10
1	Untreated Check			0 c	0 c	0 b	0 d
2	ROUNDUP POWERMAX N-PAK - AMS ACTIVATOR 90 - NIS	32 fl oz/a 2.5 lb ai/a 0.25 % v/v	B B B	86 b	93 b	81 a	78 c
3	FIERCE XLT ROUNDUP POWERMAX N-PAK - AMS ACTIVATOR 90 - NIS	4 oz wt/a 32 fl oz/a 2.5 lb ai/a 0.25 % v/v	A B B B	89 ab	99 a	84 a	100 a
4	AUTHORITY MAXX ROUNDUP POWERMAX N-PAK - AMS ACTIVATOR 90 - NIS	6 oz wt/a 32 fl oz/a 2.5 lb ai/a 0.25 % v/v	A B B B	93 a	100 a	84 a	94 b
5	BOUNDARY ROUNDUP POWERMAX N-PAK - AMS ACTIVATOR 90 - NIS	1.8 pt/a 32 fl oz/a 2.5 lb ai/a 0.25 % v/v	A B B B	90 ab	100 a	83 a	99 a
LSD P=.05				4.7	2.8	6.9	4.7
Standard Deviation				3.0	1.8	4.4	3.1
CV				4.23	2.33	6.72	4.14
Bartlett's X2				1.927	0.06	5.256	1.408
P(Bartlett's X2)				0.382	0.807	0.154	0.495
Skewness				-1.5797*	-1.5992*	-1.559*	-1.4376*
Kurtosis				0.6216	0.6549	0.6042	0.3553
Replicate F				3.566	0.375	1.579	1.778
Replicate Prob(F)				0.0473	0.7727	0.2458	0.2048
Treatment F				699.856	2307.750	277.421	764.467
Treatment Prob(F)				0.0001	0.0001	0.0001	0.0001

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Rating Unit

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