The Ohio State University

Glyphosate resistant horseweed burndown programs

Trial ID: 13 NTBURN2 Location: Western Branch Trial Year: 2013
Protocol ID: 13 NTBURN2 Investigator: Dr. Mark M. Loux
Project ID: sulf.soy.13/USHESOY002 Study Director: Bryan Reeb
Sponsor Contact: Joe Reed, FMC; Dain Bruns, Syngenta

General Trial Information

Study Director: Bryan Reeb **Title:** Research Technician
Investigator: Dr. Mark M. Loux **Title:** Professor

Latitude of LL Corner °: 3951.528 N
Longitude of LL Corner °: 8340.324 W

Crop Description

Crop 1: GLXMA Glycine max Soybean
Variety: Asgrow 3533 **BBCH Scale:** BSOY
Description: Round Up Ready

Planting Rate, Unit: 135000 S/A
Depth, Unit: 0.75 IN
Row Spacing, Unit: 15 IN

Soil Temperature, Unit: 54 F
Soil Moisture: SLIWET slightly wet, moist
Seed Bed: FINTRA fine/trashy

Planting Date: Apr-27-2013
Planting Method: PLANTD planted
Planting Equipment: PP Plot Planter
Emergence Date: May-17-2013
Harvest Date: Sep-27-2013
Harvested Width, Unit: 6.25 FT
Harvested Length, Unit: 30 FT
Harvest Equipment: Massey Ferguson 8 XP
% Standard Moisture: 13.0
Moisture Meter: Harvest Master
Weighing Equipment: Harvest Master

Pest Description

Pest 1 Type: W **Code:** LAMPU Lamium purpureum
Common Name: Purple deadnettel

Pest 2 Type: W **Code:** STEME Stellaria media
Common Name: Common chickweed

Pest 3 Type: W **Code:** SENGL Senecio glabellus
Common Name: Cressleaf groundsel

Pest 4 Type: W **Code:** ERICA Conyza canadensis
Common Name: Canada horseweed

Pest 5 Type: W **Code:** CAPBP Capsella bursa-pastoris
Common Name: Shepherd's purse

Pest 6 Type: W **Code:** RANAB Ranunculus abortivus
Common Name: Smallflower buttercup

Pest 7 Type: W **Code:** ERPSS Erophila sp.
Common Name: Whitlowgrass

Pest 8 Type: W **Code:** ERYRE Erysimum repandum
Common Name: Bushy wallflower

Pest 9 Type: W **Code:** VERAR Veronica arvensis
Common Name: Corn speedwell

Pest10 Type: W **Code:** TAROF Taraxacum officinale
Common Name: Common dandelion

Pest11 Type: W **Code:** AMBEL Ambrosia artemisiifolia
Common Name: Common ragweed

Pest12 Type: W **Code:** AMBTR Ambrosia trifida
Common Name: Giant ragweed

Pest13 Type: W **Code:** CHEAL Chenopodium album
Common Name: Common lambsquarters

Pest14 Type: W **Code:** SETFA Setaria faberi
Common Name: Giant foxtail

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Site and Design

Treated Plot Width: 10 FT
Treated Plot Length: 30 FT
Treated Plot Area: 300 FT2 **Treatments:** 12
Replications: 3
Site Type: FIELD field
Experimental Unit: 1 PLOT plot
Tillage Type: NOTILL no-till
Study Design: RACOBL Randomized Complete Block (RCB)

Soil Description

Description Name: F-9 West
% OM: 2
pH: 6.2
CEC: 9.7
Texture: SICL silty clay loam
Soil Name: Kokomo
Fert. Level: G good
Soil Drainage: G good

Application Description

	A	B	C
Application Date:	Apr-15-2013	Apr-27-2013	May-30-2013
Appl. Start Time:	1:45 PM	12:15 PM	8:00 AM
Appl. Stop Time:	2:00 PM	12:50 PM	
Application Method:	SPRAY	SPRAY	SPRAY
Application Timing:	14 EPP	ATPL	POST
Application Placement:	BROSOI	BROSOI	BROFOL
Applied By:	DOBBELS	REEB	REEB
Air Temperature, Unit:	66.3 F	65 F	72.5 F
% Relative Humidity:	59	42	69.1
Wind Velocity, Unit:	6 MPH	6.5 MPH	4.9 MPH
Wind Direction:	SSE	E	SSW
Dew Presence (Y/N):	N no	N no	N no
Soil Temperature, Unit:	53 F	54 F	66 F
Soil Moisture:	SLIWET	SLIWET	MOIST
% Cloud Cover:	80	50	30
Next Moisture Occurred On:	Apr-16-2013	Apr-28-2013	May-31-2013

Crop Stage At Each Application

	A	B	C
Crop 1 Code, BBCH Scale:	GLXMA BSOY	GLXMA BSOY	GLXMA BSOY
Stage Scale Used:			BBCH
Stage Majority, Percent:			12
Stage Minimum, Percent:			12
Stage Maximum, Percent:			13

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Pest Stage At Each Application

	A	B	C
Pest 1 Code, Type, Scale:	LAMPU W	LAMPU W	LAMPU W
Stage Majority, Percent:	65 100	65 100	
Diameter, Unit:	3.5 IN	3.5 IN	
Height, Unit:	1.5 IN	4.5 IN	
Height Minimum, Maximum:	1 3	3 5	
Density, Unit:	33.2 M2		
Pest 2 Code, Type, Scale:	STEME W	STEME W	STEME W
Stage Majority, Percent:	65 100	65 100	
Diameter, Unit:	4 IN	9 IN	
Height, Unit:	0.75 IN	1.5 IN	
Height Minimum, Maximum:	0.5 1	1 2	
Density, Unit:	29.2 M2		
Pest 3 Code, Type, Scale:	SENGL W	SENGL W	SENGL W
Stage Majority, Percent:	19 100	19 100	67 100
Diameter, Unit:	4 IN	4 IN	
Height, Unit:	4 IN	6 IN	10 IN
Height Minimum, Maximum:	3 5	4 6	10 15
Density, Unit:	4 M2		
Pest 4 Code, Type, Scale:	ERICA W	ERICA W	ERICA W
Stage Majority, Percent:	19 100	19 100	19 100
Diameter, Unit:	1.5 IN	2.5 IN	
Height, Unit:	1 IN	2 IN	6 IN
Height Minimum, Maximum:	0.5 1.5	1 2	6 10
Density, Unit:	41.2 M2		
Pest 5 Code, Type, Scale:	CAPBP W	CAPBP W	CAPBP W
Stage Majority, Percent:	65 100	65 100	
Diameter, Unit:	3.5 IN	3.5 IN	
Height, Unit:	6 IN	9 IN	
Height Minimum, Maximum:	5 8	7 9	
Density, Unit:	4 M2		
Pest 6 Code, Type, Scale:	RANAB W	RANAB W	RANAB W
Stage Majority, Percent:	12 100	65 100	
Diameter, Unit:	1 IN	3 IN	
Height, Unit:	1 IN	3 IN	
Height Minimum, Maximum:	1 1.5	2 4	
Pest 7 Code, Type, Scale:	ERPSS W	ERPSS W	ERPSS W
Stage Majority, Percent:	65 100		
Diameter, Unit:	1.5 IN		
Height, Unit:	1.5 IN		
Height Minimum, Maximum:	1 2		
Pest 8 Code, Type, Scale:	ERYRE W	ERYRE W	ERYRE W
Density, Unit:	10.6 M2		
Pest 9 Code, Type, Scale:	VERAR W	VERAR W	VERAR W
Stage Majority, Percent:			67 100
Height, Unit:			3 IN
Height Minimum, Maximum:			3 4
Density, Unit:	16 M2		
Pest10 Code, Type, Scale:	TAROF W	TAROF W	TAROF W
Density, Unit:	1.3 M2		
Pest11 Code, Type, Scale:	AMBEL W	AMBEL W	AMBEL W
Stage Majority, Percent:			18 100
Height, Unit:			2 IN
Height Minimum, Maximum:			2 3
Pest12 Code, Type, Scale:	AMBTR W	AMBTR W	AMBTR W
Stage Majority, Percent:			19 100
Height, Unit:			4 IN
Height Minimum, Maximum:			4 9
Pest13 Code, Type, Scale:	CHEAL W	CHEAL W	CHEAL W
Stage Majority, Percent:			19 100
Height, Unit:			2 IN
Height Minimum, Maximum:			2 5
Pest14 Code, Type, Scale:	SETFA W	SETFA W	SETFA W
Stage Majority, Percent:			13 100
Height, Unit:			4 IN
Height Minimum, Maximum:			4 5

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Application Equipment

	A	B	C
Appl. Equipment:	Backpack	Backpack	Backpack
Equipment Type:	SPRBAC	SPRBAC	SPRBAC
Operation Pressure, Unit:	48 PSI	48 PSI	48 PSI
Nozzle Type:	AIXR	AIXR	AIXR
Nozzle Size:	110015	110015	110015
Nozzle Spacing, Unit:	18 IN	18 IN	18 IN
Boom Length, Unit:	6 FT	6 FT	6 FT
Boom Height, Unit:	18 IN	18 IN	18 IN
Ground Speed, Unit:	3 MPH	3 MPH	3 MPH
Carrier:	WATER	WATER	WATER
Spray Volume, Unit:	15 gal/ac	15 gal/ac	15 gal/ac
Mix Size, Unit:	1 Liters	1 Liters	1 Liters
Propellant:	COMCO2	COMCO2	COMCO2

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Trt No.	Treatment Name	Other Rate	Other Rate Unit	Growth Stage	Appl Code	24	25	26
	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
	Rating Date					Sep-27-201 3	Sep-27-201 3	Sep-27-201 3
	Rating Type					MOICON	WEIGHT	YIELD
	Rating Unit					%	lb/plot	BU
	Number of Subsamples					1	1	1
	SE Group No.					23	24	25
	Days After First/Last Applic.					165 120	165 120	165 120
	Plant-Eval Interval					153 DP-1	153 DP-1	153 DP-1
	Days After Emergence					133 DE-1	133 DE-1	133 DE-1
	ARM Action Codes					AL		TY1
	Number of Decimals					1	1	1
1	UTC					12.0 a	12.9 b	50.7 b
2	Authority MTZ	5.5	oz/a	ATPL	B	13.5 a	20.2 a	77.8 a
2	Gramoxone Inteon	24	oz/a	ATPL	B			
2	COC	0.6	qt/a	ATPL	B			
2	N-pak ams	2.25	qt/a	ATPL	B			
2	Anthem	6	oz/a	POST	C			
2	Classic	0.75	oz/a	POST	C			
2	Roundup Power Max	32	oz/a	POST	C			
2	N-pak ams	2.25	qt/a	POST	C			
3	Authority MTZ	5.5	oz/a	ATPL	B	12.4 a	20.3 a	79.0 a
3	Gramoxone Inteon	32	oz/a	ATPL	B			
3	COC	0.6	qt/a	ATPL	B			
3	N-pak ams	2.25	qt/a	ATPL	B			
3	Anthem	6	oz/a	POST	C			
3	Classic	0.75	oz/a	POST	C			
3	Roundup Power Max	32	oz/a	POST	C			
3	N-pak ams	2.25	qt/a	POST	C			
4	Spartan	2.4	oz/a	ATPL	B	11.7 a	19.5 a	76.8 a
4	Sencor DF	5	oz/a	ATPL	B			
4	Gramoxone Inteon	24	oz/a	ATPL	B			
4	COC	0.6	qt/a	ATPL	B			
4	N-pak ams	2.25	qt/a	ATPL	B			
4	Anthem	6	oz/a	POST	C			
4	Classic	0.75	oz/a	POST	C			
4	Roundup Power Max	32	oz/a	POST	C			
4	N-pak ams	2.25	qt/a	POST	C			
5	Spartan	2.4	oz/a	ATPL	B	13.2 a	20.6 a	79.3 a
5	Sencor DF	5	oz/a	ATPL	B			
5	Gramoxone Inteon	32	oz/a	ATPL	B			
5	COC	0.6	qt/a	ATPL	B			
5	N-pak ams	2.25	qt/a	ATPL	B			
5	Anthem	6	oz/a	POST	C			
5	Classic	0.75	oz/a	POST	C			
5	Roundup Power Max	32	oz/a	POST	C			
5	N-pak ams	2.25	qt/a	POST	C			

Means followed by same letter do not significantly differ (P=.05, LSD)
t=Mean descriptions are reported in transformed data units, and are not de-transformed.
Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

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	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
	Rating Date					Sep-27-2013	Sep-27-2013	Sep-27-2013
	Rating Type					MOICON	WEIGHT	YIELD
	Rating Unit					%	lb/plot	BU
	Number of Subsamples					1	1	1
	SE Group No.					23	24	25
	Days After First/Last Applic.					165 120	165 120	165 120
	Plant-Eval Interval					153 DP-1	153 DP-1	153 DP-1
	Days After Emergence					133 DE-1	133 DE-1	133 DE-1
	ARM Action Codes					AL		TY1
	Number of Decimals					1	1	1
6	Spartan	1.6	oz/a	ATPL	B	12.3 a	20.2 a	79.0 a
6	Sencor DF	5	oz/a	ATPL	B			
6	Gramoxone Inteon	24	oz/a	ATPL	B			
6	COC	0.6	qt/a	ATPL	B			
6	N-pak ams	2.25	qt/a	ATPL	B			
6	Anthem	6	oz/a	POST	C			
6	Classic	0.75	oz/a	POST	C			
6	Roundup Power Max	32	oz/a	POST	C			
6	N-pak ams	2.25	qt/a	POST	C			
7	Spartan	1.6	oz/a	ATPL	B	11.9 a	19.3 a	75.9 a
7	Sencor DF	5	oz/a	ATPL	B			
7	Gramoxone Inteon	32	oz/a	ATPL	B			
7	COC	0.6	qt/a	ATPL	B			
7	N-pak ams	2.25	qt/a	ATPL	B			
7	Anthem	6	oz/a	POST	C			
7	Classic	0.75	oz/a	POST	C			
7	Roundup Power Max	32	oz/a	POST	C			
7	N-pak ams	2.25	qt/a	POST	C			
8	Boundary	1.75	pt/a	14 EPP	A	12.4 a	20.6 a	80.2 a
8	2,4-D Ester	1	pt/a	14 EPP	A			
8	Sencor DF	3.2	oz/a	14 EPP	A			
8	Touchdown Total	24	oz/a	14 EPP	A			
8	N-pak ams	3	qt/a	14 EPP	A			
8	Touchdown Total	36	oz/a	POST	C			
8	N-pak ams	3	qt/a	POST	C			
9	Boundary	1.75	pt/a	14 EPP	A	12.0 a	19.9 a	78.0 a
9	2,4-D Ester	1	pt/a	14 EPP	A			
9	Authority MTZ	5.33	oz/a	14 EPP	A			
9	Touchdown Total	24	oz/a	14 EPP	A			
9	N-pak ams	3	qt/a	14 EPP	A			
9	Touchdown Total	36	oz/a	POST	C			
9	N-pak ams	3	qt/a	POST	C			
10	Boundary	1.75	pt/a	14 EPP	A	12.3 a	21.7 a	84.6 a
10	2,4-D Ester	1	pt/a	14 EPP	A			
10	Sencor DF	3.2	oz/a	14 EPP	A			
10	Touchdown Total	24	oz/a	14 EPP	A			
10	N-pak ams	3	qt/a	14 EPP	A			
10	Flexstar GT 3.5	4	pt/a	POST	C			
10	N-pak ams	3	qt/a	POST	C			

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	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
	Rating Date					Sep-27-2013	Sep-27-2013	Sep-27-2013
	Rating Type					MOICON	WEIGHT	YIELD
	Rating Unit					%	lb/plot	BU
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	Days After Emergence					133 DE-1	133 DE-1	133 DE-1
	ARM Action Codes					AL		TY1
	Number of Decimals					1	1	1
11	Boundary	1.75	pt/a	14 EPP	A	12.5 a	20.2 a	78.8 a
11	2,4-D Ester	1	pt/a	14 EPP	A			
11	Sencor DF	3.2	oz/a	14 EPP	A			
11	Gramoxone Inteon	3	pt/a	14 EPP	A			
11	COC	0.6	qt/a	14 EPP	A			
11	N-pak ams	3	qt/a	14 EPP	A			
11	Flexstar GT 3.5	4	pt/a	POST	C			
11	N-pak ams	3	qt/a	POST	C			
12	Boundary	1.75	pt/a	14 EPP	A	14.9 a	20.8 a	78.6 a
12	Gramoxone Inteon	3	pt/a	14 EPP	A			
12	Sharpen	1.5	oz/a	14 EPP	A			
12	MSO	0.6	qt/a	14 EPP	A			
12	N-pak ams	3	qt/a	14 EPP	A			
12	Flexstar GT 3.5	4	pt/a	POST	C			
12	N-pak ams	3	qt/a	POST	C			
	LSD (P=.05)					0.07t	2.42	9.67
	Standard Deviation					0.04t	1.43	5.71
	CV					3.52	7.25	7.46
	Bartlett's X2					6.828	25.33	28.357
	P(Bartlett's X2)					0.813	0.008*	0.003*
	Skewness					1.1313*	-1.9162*	-1.7975*
	Kurtosis					1.2308	4.4582*	4.1083*
	Replicate F					12.633	2.130	4.046
	Replicate Prob(F)					0.0002	0.1427	0.0319
	Treatment F					1.400	7.200	6.512
	Treatment Prob(F)					0.2412	0.0001	0.0001

Crop Code
GLXMA, BSOY, Glycine max, = US
Rating Type
MOICON = moisture content
WEIGHT = weight
YIELD = yield
Rating Unit
% = percent
lb/plot = pounds per plot
BU = bushel
Plant-Eval Interval
153 DP-1 = 1 GLXMA Apr-27-2013
ARM Action Codes
AL = Automatic log transformation of X+1
TY1 = 3.872*[C25]*(100-[C24])/87