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Fall vs. Spring Treatments of Residual Herbicides for Marestail Control Programs

Trial ID: 11F-SEP-NTS-01 Protocol ID: 11F-SEP-NTS-01
 Location: SEPAC Study Director: Paul Marquardt
 Project ID: Investigator: Dr. Bill Johnson
 Sponsor Contact: John Willis

General Trial Information

Study Director: Paul Marquardt **Title:** Research Associate
Investigator: Dr. Bill Johnson **Title:** Professor

Discipline: H herbicide
Trial Status: E established
Initiation Date: 11-14-2011

Trial Location

City: Butleville
State/Prov.: IN
Postal Code: 47223
Country: USA

Personnel

Study Director: Paul Marquardt **Title:** Research Associate

Affiliation: Purdue University
Address: 915 W. State Street
Location: West Lafayette, IN
Postal Code: 47907 **E-mail:** pmarquar@purdue.edu
Phone No.: 765-494-0891 **Mobile No.:** 765-409-6369

Investigator: Dr. Bill Johnson **Title:** Professor

Affiliation: Purdue University
Address: 915 W. State Street
Location: West Lafayette, IN
Postal Code: 47907 **E-mail:** wgj@purdue.edu
Phone No.: 765-494-4656 **Mobile No.:** 765-404-9801

Cooperator/Landowner

Cooperator: Don Biehle **Role:** Director
Organization: Southeast Purdue Agricultural Center **Org. Type:** University
Address 1: 4425 E. CR 350 N

City: Butleville **Phone No.:** 812-458-6977
State/Prov.: IN **Fax No.:** 812-458-6979
Postal Code: 47223 **Mobile No.:** 812-592-8426
Country: USA United States **E-mail:** biehled@purdue.edu

Crop Description

Crop 1: GLXMA Glycine max Soybean
Variety: AG2931 **Description:** Roundup Ready
BBCH Scale: BSOY **Planting Date:** 5-3-2012
Planting Method: DIRDRI direct drilled **Rate, Unit:** 140000 S/A
Depth, Unit: 1 IN
Row Spacing, Unit: 30 IN **Spacing Within Row, Unit:** 2 IN
Seed Bed: MEDIUM medium **Soil Temperature, Unit:** 70 F
Soil Moisture: MOIST **Emergence Date:** 5-8-2012

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Pest Description

- Pest 1 Type:** W **Code:** ALLVI *Allium vineale*
Common Name: Wild garlic
- Pest 2 Type:** W **Code:** ERICA *Conyza canadensis*
Common Name: Canada horseweed
- Pest 3 Type:** W **Code:** RANAB *Ranunculus abortivus*
Common Name: Smallflower buttercup
- Pest 4 Type:** W **Code:** CERVU *Cerastium fontanum vulgare*
Common Name: Mouse-ear chickweed
- Pest 5 Type:** W **Code:** LAMPU *Lamium purpureum*
Common Name: Purple deadnettel
- Pest 6 Type:** W **Code:** TAROF *Taraxacum officinale*
Common Name: Common dandelion
- Pest 7 Type:** W **Code:** CARPA *Cardamine parviflora*
Common Name: Small-flowered bittercress
- Pest 8 Type:** W **Code:** POAAN *Poa annua*
Common Name: Annual bluegrass
- Pest 9 Type:** W **Code:** SENGL *Senecio glabellus*
Common Name: Cressleaf groundsel
- Pest10 Type:** W **Code:** CAPBP *Capsella bursa-pastoris*
Common Name: Shepherd's purse
- Pest11 Type:** W **Code:** BROTE *Bromus tectorum*
Common Name: Downy brome
- Pest12 Type:** W **Code:** LACSE *Lactuca serriola*
Common Name: Prickly lettuce
- Pest13 Type:** W **Code:** VERAR *Veronica arvensis*
Common Name: Corn speedwell
- Pest14 Type:** W **Code:** ERIPH *Erigeron philadelphicus*
Common Name: Daisy fleabane
- Pest15 Type:** W **Code:** LEPVI *Lepidium virginicum*
Common Name: Virginia pepperweed
- Pest16 Type:** W **Code:** GGGAN Annual grasses
Common Name: Annual grasses
- Pest17 Type:** W **Code:** AMBEL *Ambrosia artemisiifolia*
Common Name: Common ragweed
- Pest18 Type:** W **Code:** XANST *Xanthium strumarium*
Common Name: Heart-leaf cocklebur

Site and Design

Plot Width, Unit: 10 FT	Site Type: FIELD field	
Plot Length, Unit: 30 FT	Experimental Unit: 1 PLOT plot	
Plot Area, Unit: 300 FT ²	Tillage Type: NOTILL no-till	
Replications: 4	Study Design: RACOB	Randomized Complete Block (RCB)
	Untreated Arrangement: INCLUDED	single control randomized in each block

Soil Description

Description Name: SEPAC-Field U41

% Sand: 20	% OM: 1.3	Texture: SIL silt loam
% Silt: 65	pH: 6.5	Soil Name: Avonburg
% Clay: 15	CEC: 5.7	Fert. Level: G good
		Soil Drainage: P poor

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Application Description

	A	B	C	D
Application Date:	12-2-2011	4-12-2012	4-26-2012	6-7-2012
Time of Day:	12:20 PM	12:30 PM	10:30 AM	10 AM
Application Method:	SPRAY	SPRAY	SPRAY	SPRAY
Application Timing:	FALL A	30 DPP	1-7 DPP	EAPOCR
Application Placement:	BAND	BAND	BAND	BAND
Applied By:	PM	JR	JR	TL
Air Temperature, Unit:	50.1 F	62 F	65 F	78 F
% Relative Humidity:	63	32	68	76
Wind Velocity, Unit:	2 MPH	3 MPH	2.3 MPH	1.8 MPH
Wind Direction:	N	W	NW	NW
Dew Presence (Y/N):	N no	N no	Y yes	Y yes
Soil Temperature, Unit:	42 F	57 F	70 F	69 F
Soil Moisture:	WET	DRY	DRY	DRY
% Cloud Cover:	20	0	80	0

Crop Stage At Each Application

	A	B	C	D
Crop 1 Code, BBCH Scale:	GLXMA BSOY	GLXMA BSOY	GLXMA BSOY	GLXMA BSOY
Stage Scale Used:				BBCH
Stage Majority, Percent:				15 100
Height, Unit:				6 IN
Height Minimum, Maximum:				4 8

Pest Stage At Each Application

	A	B	C	D
Pest 1 Code, Type, Scale:	ALLVI W	ALLVI W	ALLVI W	ALLVI W
Stage Majority, Percent:	11 100		13 100	
Height, Unit:	5 IN		13 IN	
Height Minimum, Maximum:	2 8		8 18	
Density, Unit:	27.5 YD2		10 YD2	
Pest 2 Code, Type, Scale:	ERICA W	ERICA W	ERICA W	ERICA W
Stage Majority, Percent:	11 100	30 100	31 100	36 100
Height, Unit:	2 IN	3.5 IN	4 IN	12.5 IN
Height Minimum, Maximum:	1 3	1 6	2 6	1 24
Density, Unit:	3 YD2	10 YD2	10 YD2	9.5 YD2
Pest 3 Code, Type, Scale:	RANAB W	RANAB W	RANAB W	RANAB W
Stage Majority, Percent:	11 100	65 100		
Height, Unit:	2.5 IN	8 IN		
Height Minimum, Maximum:	1 4	4 12		
Density, Unit:	12.5 YD2	10 YD2		
Pest 4 Code, Type, Scale:	CERVU W	CERVU W	CERVU W	CERVU W
Stage Majority, Percent:	11 100	65 100		
Height, Unit:	2 IN	5 IN		
Height Minimum, Maximum:	1 3	2 8		
Density, Unit:	5.5 YD2	25 YD2		
Pest 5 Code, Type, Scale:	LAMPU W	LAMPU W	LAMPU W	LAMPU W

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Stage Majority, Percent:	11 100	65 100		
Height, Unit:	2 IN	3.5 IN		
Height Minimum, Maximum:	1 3	1 6		
Density, Unit:	2 YD2	7.5 YD2		
Pest 6 Code, Type, Scale:	TAROF W	TAROF W	TAROF W	TAROF W
Stage Majority, Percent:	15 100		61 100	
Diameter, Unit:	4.5 IN			
Height, Unit:			7 IN	
Height Minimum, Maximum:			2 12	
Density, Unit:	3 YD2		3.5 YD2	
Pest 7 Code, Type, Scale:	CARPA W	CARPA W	CARPA W	CARPA W
Stage Majority, Percent:	13 100			
Height, Unit:	2.5 IN			
Height Minimum, Maximum:	1 4			
Density, Unit:	2 YD2			
Pest 8 Code, Type, Scale:	POAAN W	POAAN W	POAAN W	POAAN W
Stage Majority, Percent:	21 100		21 100	
Height, Unit:	2 IN		3.5 IN	
Height Minimum, Maximum:	1 3		1 6	
Density, Unit:	6 YD2		1.5 YD2	
Pest 9 Code, Type, Scale:	SENGL W	SENGL W	SENGL W	SENGL W
Stage Majority, Percent:	11 100	65 100		
Height, Unit:	2.5 IN	4.5 IN		
Height Minimum, Maximum:	1 4	1 8		
Density, Unit:	10.5 YD2	1.5 YD2		
Pest10 Code, Type, Scale:	CAPBP W	CAPBP W	CAPBP W	CAPBP W
Stage Majority, Percent:		89 100		
Height, Unit:		8 IN		
Height Minimum, Maximum:		4 12		
Density, Unit:		5 YD2		
Pest11 Code, Type, Scale:	BROTE W	BROTE W	BROTE W	BROTE W
Stage Majority, Percent:		25 100	25 100	
Height, Unit:		6.5 IN	4 IN	
Height Minimum, Maximum:		1 12	2 6	
Density, Unit:		37.5 YD2	17.5 YD2	
Pest12 Code, Type, Scale:	LACSE W	LACSE W	LACSE W	LACSE W
Stage Majority, Percent:		65 100		
Height, Unit:		3.5 IN		
Height Minimum, Maximum:		1 6		
Density, Unit:		5 YD2		
Pest13 Code, Type, Scale:	VERAR W	VERAR W	VERAR W	VERAR W
Stage Majority, Percent:		15 100		
Height, Unit:		5 IN		
Height Minimum, Maximum:		4 6		
Density, Unit:		1.5 YD2		
Pest14 Code, Type, Scale:	ERIPH W	ERIPH W	ERIPH W	ERIPH W
Stage Majority, Percent:			60 100	

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Height, Unit:			1	IN
Height Minimum, Maximum:			1	1
Density, Unit:			2.5	
Pest15 Code, Type, Scale:	LEPVI W	LEPVI W	LEPVI W	LEPVI W
Stage Majority, Percent:			89	100
Height, Unit:			9	IN
Height Minimum, Maximum:			6	12
Density, Unit:			12.5	
Pest16 Code, Type, Scale:	GGGAN W	GGGAN W	GGGAN W	GGGAN W
Stage Majority, Percent:			22	100
Height, Unit:			5.5	IN
Height Minimum, Maximum:			1	10
Density, Unit:			20	YD2
Pest17 Code, Type, Scale:	AMBEL W	AMBEL W	AMBEL W	AMBEL W
Stage Majority, Percent:			12	100
Height, Unit:			3	IN
Height Minimum, Maximum:			1	5
Density, Unit:			2.5	YD2
Pest18 Code, Type, Scale:	XANST W	XANST W	XANST W	XANST W
Stage Majority, Percent:			14	100
Height, Unit:			4.5	IN
Height Minimum, Maximum:			1	8
Density, Unit:			5.5	

Application Equipment

	A	B	C	D
Appl. Equipment:	CO2 Backpack	CO2 Backpack	CO2 Backpack	
Equipment Type:	SPRBAC	SPRBAC	SPRBAC	
Operation Pressure, Unit:	17 PSI	17 PSI	17 PSI	
Nozzle Type:	Flat Fan	Flat Fan	Flat Fan	
Nozzle Size:	XR11002	XR11002	XR11002	
Nozzle Spacing, Unit:	15 IN	15 IN	15 IN	
Boom Length, Unit:	7.5 FT	7.5 FT	7.5 FT	
Boom Height, Unit:	18 IN	18 IN	18 IN	
Ground Speed, Unit:	3 MPH	3 MPH	3 MPH	
Carrier:	H2O	H2O	H2O	
Water Hardness (ppm CaCO3):	150	150	150	
Spray Volume, Unit:	15 gal/ac	15 gal/ac	15 gal/ac	
Mix Size, Unit:	1.8 liters	1.8 liters	1.8 liters	
Propellant:	CO2	CO2	CO2	
Tank Mix (Y/N):	N no	N no	N no	

Trt No Treatment Application Comment

2 EAPOCR D: treatments were only applied to plots 102 and 501

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Fall vs. Spring Treatments of Residual Herbicides for Marestalk Control Programs

Trial ID: 11F-SEP-NTS-01 Protocol ID: 11F-SEP-NTS-01
 Location: SEPAC Study Director: Paul Marquardt
 Project ID: Investigator: Dr. Bill Johnson
 Sponsor Contact: John Willis

Pest Type	W Weed ERICA	W Weed ALLVI	W Weed POAAN	W Weed ERICA	W Weed ALLVI	W Weed TAROF	W Weed POAAN
Pest Code	Conyza canadensis	Allium vineale	Poa annua	Conyza canadensis	Allium vineale	Taraxacum officinale	Poa annua
Pest Scientific Name	Conyza canadensis	Allium vineale	Poa annua	Conyza canadensis	Allium vineale	Taraxacum officinale	Poa annua
Pest Name	Canada horseweed	Wild garlic	Annual bluegrass	Canada horseweed	Wild garlic	Common dandelion	Annual bluegrass
Crop Code	GLXMA	GLXMA	GLXMA	GLXMA	GLXMA	GLXMA	GLXMA
BBCH Scale	BSOY	BSOY	BSOY	BSOY	BSOY	BSOY	BSOY
Crop Scientific Name	Glycine max	Glycine max	Glycine max	Glycine max	Glycine max	Glycine max	Glycine max
Crop Name	Soybean	Soybean	Soybean	Soybean	Soybean	Soybean	Soybean
Crop Variety							
Description							
Part Rated	PLOT P	PLOT P	PLOT P	PLOT P	PLOT P	PLOT P	PLOT P
Rating Date	4-19-2012	4-19-2012	4-19-2012	4-26-2012	4-26-2012	4-26-2012	4-26-2012
Rating Type	CONTRO	CONTRO	CONTRO	CONTRO	CONTRO	CONTRO	CONTRO
Rating Unit	%	%	%	%	%	%	%
Number of Subsamples	1	1	1	1	1	1	1
Crop Stage Majority							
Pest Stage Majority	1-6 IN	8-18 IN	2-4 IN	1-6 IN	8-18 IN	2-12 IN	1-3 IN
Pest Density, Unit	5 M2	10 M2	1.5 M2	7.5 M2	10 M2	3.5 M2	1.5 M2
Assessed By	PM	PM	PM	PM/JR	PM/JR	PM/JR	PM/JR
Days After First/Last Applic.	139 7	139 7	139 7	146 14	146 14	146 14	146 14
Plant-Eval Interval	-14 DP-1	-14 DP-1	-14 DP-1	-7 DP-1	-7 DP-1	-7 DP-1	-7 DP-1
Days After Emergence	-19 DE-1	-19 DE-1	-19 DE-1	-12 DE-1	-12 DE-1	-12 DE-1	-12 DE-1
Trt No.	1	2	3	4	5	6	7
Treatment Name							
Rate							
Unit							
Appl Code							
1	0.0 b	0.0 b	0.0 b	0.0 b	0.0 c	0.0 b	0.0 b
2 Roundup PowerMAX 840 g ae/ha B N-Pak AMS 5 % v/v B FirstRate 17.7 g ai/ha D Roundup PowerMAX 840 g ae/ha D N-Pak AMS 5 % v/v D				75.0 a	27.5 bc	88.8 a	100.0 a
3 2,4-D Amine 560 g ai/ha B Roundup PowerMAX 840 g ae/ha B N-Pak AMS 5 % v/v B Roundup PowerMAX 840 g ae/ha D N-Pak AMS 5 % v/v D				94.5 a	67.5 a	66.3 a	92.5 a
4 Clarity 560 g ae/ha B Roundup PowerMAX 840 g ae/ha B N-Pak AMS 5 % v/v B Roundup PowerMAX 840 g ae/ha D N-Pak AMS 5 % v/v D				91.6 a	18.6 bc	94.0 a	97.0 a
5 Sharpen 25 g ai/ha C Roundup PowerMAX 840 g ae/ha C MSO 1 % v/v C N-Pak AMS 5 % v/v C Roundup PowerMAX 840 g ae/ha D N-Pak AMS 5 % v/v D							
6 Sharpen 25 g ai/ha C Roundup PowerMAX 840 g ae/ha C COC 1 % v/v C N-Pak AMS 5 % v/v C Roundup PowerMAX 840 g ae/ha D N-Pak AMS 5 % v/v D							

Means followed by same letter do not significantly differ (P=0.05, Student-Newman-Keuls)
 Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

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Pest Type	W Weed ERICA	W Weed ALLVI	W Weed POAAN	W Weed ERICA	W Weed ALLVI	W Weed TAROF	W Weed POAAN		
Pest Code	Conyza canadens>	Allium vineale	Poa annua	Conyza canadens>	Allium vineale	Taraxacum offi>	Poa annua		
Pest Scientific Name	Canada horsewe>	Wild garlic	Annual bluegra>	Canada horsewe>	Wild garlic	Common dandel>	Annual bluegra>		
Pest Name	GLXMA BSOY								
Crop Code	Glycine max Soybean								
BBCH Scale									
Crop Scientific Name									
Crop Name									
Crop Variety									
Description									
Part Rated	PLOT P								
Rating Date	4-19-2012	4-19-2012	4-19-2012	4-26-2012	4-26-2012	4-26-2012	4-26-2012		
Rating Type	CONTRO								
Rating Unit	%	%	%	%	%	%	%		
Number of Subsamples	1	1	1	1	1	1	1		
Crop Stage Majority									
Pest Stage Majority	1-6 IN	8-18 IN	2-4 IN	1-6 IN	8-18 IN	2-12 IN	1-3 IN		
Pest Density, Unit	5 M2	10 M2	1.5 M2	7.5 M2	10 M2	3.5 M2	1.5 M2		
Assessed By	PM	PM	PM	PM/JR	PM/JR	PM/JR	PM/JR		
Days After First/Last Applic.	139 7	139 7	139 7	146 14	146 14	146 14	146 14		
Plant-Eval Interval	-14 DP-1	-14 DP-1	-14 DP-1	-7 DP-1	-7 DP-1	-7 DP-1	-7 DP-1		
Days After Emergence	-19 DE-1	-19 DE-1	-19 DE-1	-12 DE-1	-12 DE-1	-12 DE-1	-12 DE-1		
Trt Treatment	Rate	Appl							
No. Name	Rate Unit	Code	1	2	3	4	5	6	7
15 2,4-D Amine	560 g ai/ha A	A	100.0 a	73.8 a	68.8 a	100.0 a	86.3 a	91.5 a	73.8 a
Authority First DF	316 g ai/ha A	A							
Express	5.25 g ai/ha A	A							
Roundup PowerMAX	840 g ae/ha A	A							
COC	1 % v/v A	A							
N-Pak AMS	5 % v/v A	A							
Sharpen	25 g ai/ha C	C							
Roundup PowerMAX	840 g ae/ha C	C							
MSO	1 % v/v C	C							
N-Pak AMS	5 % v/v C	C							
Roundup PowerMAX	840 g ae/ha D	D							
N-Pak AMS	5 % v/v D	D							
16 2,4-D Amine	560 g ai/ha B	B				92.5 a	76.3 a	93.8 a	93.3 a
Authority First DF	316 g ai/ha B	B							
Express	5.25 g ai/ha B	B							
Roundup PowerMAX	840 g ae/ha B	B							
COC	1 % v/v B	B							
N-Pak AMS	5 % v/v B	B							
Roundup PowerMAX	840 g ae/ha D	D							
N-Pak AMS	5 % v/v D	D							
LSD (P=.05)			12.63	31.70	42.59	14.43	27.35	21.15	29.76
Standard Deviation			8.33	20.90	28.08	9.99	18.94	14.65	20.61
CV			10.25	36.4	41.46	11.77	32.81	17.62	24.67
Bartlett's X2			13.688	10.105	14.082	17.146	14.088	31.157	47.88
P(Bartlett's X2)			0.001*	0.039*	0.007*	0.071	0.169	0.001*	0.001*
Replicate F			1.341	2.358	1.263	2.701	1.882	2.196	1.133
Replicate Prob(F)			0.3010	0.1157	0.3251	0.0605	0.1506	0.1059	0.3492
Treatment F			92.279	7.602	6.130	25.909	7.895	12.022	7.011
Treatment Prob(F)			0.0001	0.0012	0.0033	0.0001	0.0001	0.0001	0.0001

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Pest Type	W Weed	W Weed	W Weed	W Weed	W Weed	W Weed	W Weed			
Pest Code	ERICA	ALLVI	POAAN	TAROF	ERICA	ALLVI	POAAN			
Pest Scientific Name	Conyza canadens>	Allium vineale	Poa annua	Taraxacum offi>	Conyza canadens>	Allium vineale	Poa annua			
Pest Name	Canada horsewe>	Wild garlic	Annual bluegra>	Common dandel>	Canada horsewe>	Wild garlic	Annual bluegra>			
Crop Code	GLXMA	GLXMA	GLXMA	GLXMA	GLXMA	GLXMA	GLXMA			
BBCH Scale	BSOY	BSOY	BSOY	BSOY	BSOY	BSOY	BSOY			
Crop Scientific Name	Glycine max	Glycine max	Glycine max	Glycine max	Glycine max	Glycine max	Glycine max			
Crop Name	Soybean	Soybean	Soybean	Soybean	Soybean	Soybean	Soybean			
Crop Variety	AG2931	AG2931	AG2931	AG2931	AG2931	AG2931	AG2931			
Description					<1 IN	<1 IN	<1 IN			
Part Rated	PLOT P	PLOT P	PLOT P	PLOT P	PLOT P	PLOT P	PLOT P			
Rating Date	5-3-2012	5-3-2012	5-3-2012	5-3-2012	5-10-2012	5-10-2012	5-10-2012			
Rating Type	CONTRO	CONTRO	CONTRO	CONTRO	CONTRO	CONTRO	CONTRO			
Rating Unit	%	%	%	%	%	%	%			
Number of Subsamples	1	1	1	1	1	1	1			
Crop Stage Majority	00	00	00	00	09	09	09			
Pest Stage Majority	1-10 IN	4-18 IN	1-6 IN	1-8 IN	2-10 IN	10-24 IN	2-4 IN			
Pest Density, Unit	8.5 M2	9 M2	15 M2	2.5 M2	10 M2	15 M2	10 M2			
Assessed By	JR	JR	JR	JR	PM	PM	PM			
Days After First/Last Applic.	153 7	153 7	153 7	153 7	160 14	160 14	160 14			
Plant-Eval Interval	0 DP-1	0 DP-1	0 DP-1	0 DP-1	7 DP-1	7 DP-1	7 DP-1			
Days After Emergence	-5 DE-1	-5 DE-1	-5 DE-1	-5 DE-1	2 DE-1	2 DE-1	2 DE-1			
Trt No.	Treatment Name	Rate	Appl Code	8	9	10	11	12	13	14
1				0.0 c	0.0 c	0.0 d	0.0 b	0.0 c	0.0 b	0.0 b
2	Roundup PowerMAX N-Pak AMS FirstRate Roundup PowerMAX N-Pak AMS	840 g ae/ha B 5 % v/v B 17.7 g ai/ha D 840 g ae/ha D 5 % v/v D		52.5 b	17.5 bc	97.0 a	95.0 a	67.5 b	60.0 a	100.0 a
3	2,4-D Amine Roundup PowerMAX N-Pak AMS Roundup PowerMAX N-Pak AMS	560 g ai/ha B 840 g ae/ha B 5 % v/v B 840 g ae/ha D 5 % v/v D		85.5 a	55.0 abc	80.0 abc	71.3 a	78.8 ab	53.8 a	96.3 a
4	Clarity Roundup PowerMAX N-Pak AMS Roundup PowerMAX N-Pak AMS	560 g ae/ha B 840 g ae/ha B 5 % v/v B 840 g ae/ha D 5 % v/v D		97.0 a	45.0 abc	95.0 ab	80.8 a	99.5 a	62.5 a	100.0 a
5	Sharpen Roundup PowerMAX MSO N-Pak AMS Roundup PowerMAX N-Pak AMS	25 g ai/ha C 840 g ae/ha C 1 % v/v C 5 % v/v C 840 g ae/ha D 5 % v/v D		97.5 a	61.3 abc	70.0 bc	87.8 a	100.0 a	91.5 a	99.5 a
6	Sharpen Roundup PowerMAX COC N-Pak AMS Roundup PowerMAX N-Pak AMS	25 g ai/ha C 840 g ae/ha C 1 % v/v C 5 % v/v C 840 g ae/ha D 5 % v/v D		96.8 a	40.0 abc	86.3 abc	90.3 a	100.0 a	66.3 a	100.0 a

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Pest Type	W Weed	W Weed	W Weed	W Weed	W Weed	W Weed	W Weed		
Pest Code	ERICA	ALLVI	POAAN	TAROF	ERICA	ALLVI	POAAN		
Pest Scientific Name	Conyza canadens>	Allium vineale	Poa annua	Taraxacum offi>	Conyza canadens>	Allium vineale	Poa annua		
Pest Name	Canada horsewe>	Wild garlic	Annual bluegra>	Common dandel>	Canada horsewe>	Wild garlic	Annual bluegra>		
Crop Code	GLXMA	GLXMA	GLXMA	GLXMA	GLXMA	GLXMA	GLXMA		
BBCH Scale	BSOY	BSOY	BSOY	BSOY	BSOY	BSOY	BSOY		
Crop Scientific Name	Glycine max	Glycine max	Glycine max	Glycine max	Glycine max	Glycine max	Glycine max		
Crop Name	Soybean	Soybean	Soybean	Soybean	Soybean	Soybean	Soybean		
Crop Variety	AG2931	AG2931	AG2931	AG2931	AG2931	AG2931	AG2931		
Description					<1 IN	<1 IN	<1 IN		
Part Rated	PLOT P	PLOT P	PLOT P	PLOT P	PLOT P	PLOT P	PLOT P		
Rating Date	5-3-2012	5-3-2012	5-3-2012	5-3-2012	5-10-2012	5-10-2012	5-10-2012		
Rating Type	CONTRO	CONTRO	CONTRO	CONTRO	CONTRO	CONTRO	CONTRO		
Rating Unit	%	%	%	%	%	%	%		
Number of Subsamples	1	1	1	1	1	1	1		
Crop Stage Majority	00	00	00	00	09	09	09		
Pest Stage Majority	1-10 IN	4-18 IN	1-6 IN	1-8 IN	2-10 IN	10-24 IN	2-4 IN		
Pest Density, Unit	8.5 M2	9 M2	15 M2	2.5 M2	10 M2	15 M2	10 M2		
Assessed By	JR	JR	JR	JR	PM	PM	PM		
Days After First/Last Applic.	153 7	153 7	153 7	153 7	160 14	160 14	160 14		
Plant-Eval Interval	0 DP-1	0 DP-1	0 DP-1	0 DP-1	7 DP-1	7 DP-1	7 DP-1		
Days After Emergence	-5 DE-1	-5 DE-1	-5 DE-1	-5 DE-1	2 DE-1	2 DE-1	2 DE-1		
Trt Treatment	Rate	Appl							
No. Name	Rate Unit	Code	8	9	10	11	12	13	14
7 Valor XLT	85 g ai/ha	A	100.0 a	80.5 ab	95.0 ab	96.3 a	100.0 a	85.8 a	100.0 a
Express	5.25 g ai/ha	A							
2,4-D Amine	560 g ai/ha	A							
Roundup PowerMAX	840 g ae/ha	A							
COC	1 % v/v	A							
N-Pak AMS	5 % v/v	A							
Sharpen	25 g ai/ha	C							
Roundup PowerMAX	840 g ae/ha	C							
MSO	1 % v/v	C							
N-Pak AMS	5 % v/v	C							
Roundup PowerMAX	840 g ae/ha	D							
N-Pak AMS	5 % v/v	D							
8 Valor XLT	85 g ai/ha	B	90.8 a	65.0 ab	95.0 ab	96.3 a	100.0 a	75.0 a	98.3 a
Express	5.25 g ai/ha	B							
2,4-D Amine	560 g ai/ha	B							
Roundup PowerMAX	840 g ae/ha	B							
COC	1 % v/v	B							
N-Pak AMS	5 % v/v	B							
Roundup PowerMAX	840 g ae/ha	D							
N-Pak AMS	5 % v/v	D							
9 Authority MTZ	347 g ai/ha	A	100.0 a	88.8 a	81.3 abc	100.0 a	100.0 a	95.8 a	100.0 a
Express	5.25 g ai/ha	A							
2,4-D Amine	560 g ai/ha	A							
Roundup PowerMAX	840 g ae/ha	A							
COC	1 % v/v	A							
N-Pak AMS	5 % v/v	A							
Sharpen	25 g ai/ha	C							
Roundup PowerMAX	840 g ae/ha	C							
MSO	1 % v/v	C							
N-Pak AMS	5 % v/v	C							
Roundup PowerMAX	840 g ae/ha	D							
N-Pak AMS	5 % v/v	D							
10 Authority MTZ	347 g ai/ha	B	98.8 a	31.3 abc	67.0 c	93.8 a	100.0 a	55.0 a	99.0 a
Express	5.25 g ai/ha	B							
2,4-D Amine	560 g ai/ha	B							
Roundup PowerMAX	840 g ae/ha	B							
COC	1 % v/v	B							
N-Pak AMS	5 % v/v	B							
Roundup PowerMAX	840 g ae/ha	D							
N-Pak AMS	5 % v/v	D							

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Pest Type	W Weed ERICA	W Weed ALLVI	W Weed POAAN	W Weed TAROF	W Weed ERICA	W Weed ALLVI	W Weed POAAN
Pest Code	Conyza canadens>	Allium vineale	Poa annua	Taraxacum offi>	Conyza canadens>	Allium vineale	Poa annua
Pest Scientific Name	Canada horsewe>	Wild garlic	Annual bluegra>	Common dandel>	Canada horsewe>	Wild garlic	Annual bluegra>
Pest Name	GLXMA BSOY	GLXMA BSOY	GLXMA BSOY	GLXMA BSOY	GLXMA BSOY	GLXMA BSOY	GLXMA BSOY
Crop Code	Glycine max	Glycine max	Glycine max	Glycine max	Glycine max	Glycine max	Glycine max
BBCH Scale	Soybean	Soybean	Soybean	Soybean	Soybean	Soybean	Soybean
Crop Scientific Name	AG2931	AG2931	AG2931	AG2931	AG2931	AG2931	AG2931
Crop Name							
Crop Variety	PLOT P	PLOT P	PLOT P	PLOT P	PLOT P	PLOT P	PLOT P
Description	5-3-2012	5-3-2012	5-3-2012	5-3-2012	5-10-2012	5-10-2012	5-10-2012
Part Rated	CONTRO	CONTRO	CONTRO	CONTRO	CONTRO	CONTRO	CONTRO
Rating Date	%	%	%	%	%	%	%
Rating Type	1	1	1	1	1	1	1
Rating Unit	00	00	00	00	09	09	09
Number of Subsamples	1-10 IN	4-18 IN	1-6 IN	1-8 IN	2-10 IN	10-24 IN	2-4 IN
Crop Stage Majority	8.5 M2	9 M2	15 M2	2.5 M2	10 M2	15 M2	10 M2
Pest Stage Majority	JR	JR	JR	JR	PM	PM	PM
Pest Density, Unit	153 7	153 7	153 7	153 7	160 14	160 14	160 14
Assessed By	0 DP-1	0 DP-1	0 DP-1	0 DP-1	7 DP-1	7 DP-1	7 DP-1
Days After First/Last Applic.	-5 DE-1	-5 DE-1	-5 DE-1	-5 DE-1	2 DE-1	2 DE-1	2 DE-1
Plant-Eval Interval							
Days After Emergence							
Trt Treatment							
No. Name	Rate Unit	Rate Unit	Rate Unit	Rate Unit	Rate Unit	Rate Unit	Rate Unit
	8	9	10	11	12	13	14
11 Authority XL	100.0 a	80.5 ab	96.3 ab	100.0 a	100.0 a	92.8 a	100.0 a
Spartan	175 g ai/ha A						
Classic	22 g ai/ha A						
Express	5.25 g ai/ha A						
2,4-D Amine	560 g ai/ha A						
Roundup PowerMAX	840 g ae/ha A						
COC	1 % v/v A						
N-Pak AMS	5 % v/v A						
Sharpen	25 g ai/ha C						
Roundup PowerMAX	840 g ae/ha C						
MSO	1 % v/v C						
N-Pak AMS	5 % v/v C						
Roundup PowerMAX	840 g ae/ha D						
N-Pak AMS	5 % v/v D						
12 Authority XL	99.5 a	55.0 abc	94.5 ab	92.5 a	100.0 a	77.5 a	100.0 a
Spartan	175 g ai/ha B						
Classic	22 g ai/ha B						
Express	5.25 g ai/ha B						
2,4-D Amine	560 g ai/ha B						
Roundup PowerMAX	840 g ae/ha B						
COC	1 % v/v B						
N-Pak AMS	5 % v/v B						
Roundup PowerMAX	840 g ae/ha D						
N-Pak AMS	5 % v/v D						
13 2,4-D Amine	100.0 a	83.0 ab	91.3 ab	100.0 a	100.0 a	89.0 a	100.0 a
Express	560 g ai/ha A						
MON 63410	5.25 g ai/ha A						
Roundup PowerMAX	1260 g ai/ha A						
N-Pak AMS	840 g ae/ha A						
Sharpen	5 % v/v A						
Roundup PowerMAX	25 g ai/ha C						
MSO	840 g ae/ha C						
N-Pak AMS	1 % v/v C						
Roundup PowerMAX	5 % v/v C						
N-Pak AMS	840 g ae/ha D						
N-Pak AMS	5 % v/v D						
14 2,4-D Amine	81.3 a	40.0 abc	98.3 a	97.8 a	100.0 a	64.5 a	100.0 a
Express	560 g ai/ha B						
MON 63410	5.25 g ai/ha B						
Roundup PowerMAX	1260 g ai/ha B						
N-Pak AMS	840 g ae/ha B						
Roundup PowerMAX	5 % v/v B						
N-Pak AMS	840 g ae/ha D						
N-Pak AMS	5 % v/v D						

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Pest Type	W Weed ERICA	W Weed ALLVI	W Weed POAAN	W Weed TAROF	W Weed ERICA	W Weed ALLVI	W Weed POAAN
Pest Code	Conyza canadens>	Allium vineale	Poa annua	Taraxacum offi>	Conyza canadens>	Allium vineale	Poa annua
Pest Scientific Name	Canada horsewe>	Wild garlic	Annual bluegra>	Common dandel>	Canada horsewe>	Wild garlic	Annual bluegra>
Pest Name	GLXMA BSOY	GLXMA BSOY	GLXMA BSOY	GLXMA BSOY	GLXMA BSOY	GLXMA BSOY	GLXMA BSOY
Crop Code	Glycine max	Glycine max	Glycine max	Glycine max	Glycine max	Glycine max	Glycine max
BBCH Scale	Soybean	Soybean	Soybean	Soybean	Soybean	Soybean	Soybean
Crop Scientific Name	AG2931	AG2931	AG2931	AG2931	AG2931	AG2931	AG2931
Crop Name	<1 IN	<1 IN	<1 IN	<1 IN	<1 IN	<1 IN	<1 IN
Crop Variety	PLOT P	PLOT P	PLOT P	PLOT P	PLOT P	PLOT P	PLOT P
Description	5-3-2012	5-3-2012	5-3-2012	5-3-2012	5-10-2012	5-10-2012	5-10-2012
Part Rated	CONTRO	CONTRO	CONTRO	CONTRO	CONTRO	CONTRO	CONTRO
Rating Date	%	%	%	%	%	%	%
Rating Type	1	1	1	1	1	1	1
Rating Unit	00	00	00	00	09	09	09
Number of Subsamples	1-10 IN	4-18 IN	1-6 IN	1-8 IN	2-10 IN	10-24 IN	2-4 IN
Crop Stage Majority	8.5 M2	9 M2	15 M2	2.5 M2	10 M2	15 M2	10 M2
Pest Stage Majority	JR	JR	JR	JR	PM	PM	PM
Pest Density, Unit	153 7	153 7	153 7	153 7	160 14	160 14	160 14
Assessed By	0 DP-1	0 DP-1	0 DP-1	0 DP-1	7 DP-1	7 DP-1	7 DP-1
Days After First/Last Applic.	-5 DE-1	-5 DE-1	-5 DE-1	-5 DE-1	2 DE-1	2 DE-1	2 DE-1
Plant-Eval Interval							
Days After Emergence							
Trt Treatment							
No. Name	8	9	10	11	12	13	14
15 2,4-D Amine	560 g ai/ha A	560 g ai/ha A	560 g ai/ha A	560 g ai/ha A	560 g ai/ha A	560 g ai/ha A	560 g ai/ha A
Authority First DF	316 g ai/ha A	316 g ai/ha A	316 g ai/ha A	316 g ai/ha A	316 g ai/ha A	316 g ai/ha A	316 g ai/ha A
Express	5.25 g ai/ha A	5.25 g ai/ha A	5.25 g ai/ha A	5.25 g ai/ha A	5.25 g ai/ha A	5.25 g ai/ha A	5.25 g ai/ha A
Roundup PowerMAX	840 g ae/ha A	840 g ae/ha A	840 g ae/ha A	840 g ae/ha A	840 g ae/ha A	840 g ae/ha A	840 g ae/ha A
COC	1 % v/v A	1 % v/v A	1 % v/v A	1 % v/v A	1 % v/v A	1 % v/v A	1 % v/v A
N-Pak AMS	5 % v/v A	5 % v/v A	5 % v/v A	5 % v/v A	5 % v/v A	5 % v/v A	5 % v/v A
Sharpen	25 g ai/ha C	25 g ai/ha C	25 g ai/ha C	25 g ai/ha C	25 g ai/ha C	25 g ai/ha C	25 g ai/ha C
Roundup PowerMAX	840 g ae/ha C	840 g ae/ha C	840 g ae/ha C	840 g ae/ha C	840 g ae/ha C	840 g ae/ha C	840 g ae/ha C
MSO	1 % v/v C	1 % v/v C	1 % v/v C	1 % v/v C	1 % v/v C	1 % v/v C	1 % v/v C
N-Pak AMS	5 % v/v C	5 % v/v C	5 % v/v C	5 % v/v C	5 % v/v C	5 % v/v C	5 % v/v C
Roundup PowerMAX	840 g ae/ha D	840 g ae/ha D	840 g ae/ha D	840 g ae/ha D	840 g ae/ha D	840 g ae/ha D	840 g ae/ha D
N-Pak AMS	5 % v/v D	5 % v/v D	5 % v/v D	5 % v/v D	5 % v/v D	5 % v/v D	5 % v/v D
16 2,4-D Amine	560 g ai/ha B	560 g ai/ha B	560 g ai/ha B	560 g ai/ha B	560 g ai/ha B	560 g ai/ha B	560 g ai/ha B
Authority First DF	316 g ai/ha B	316 g ai/ha B	316 g ai/ha B	316 g ai/ha B	316 g ai/ha B	316 g ai/ha B	316 g ai/ha B
Express	5.25 g ai/ha B	5.25 g ai/ha B	5.25 g ai/ha B	5.25 g ai/ha B	5.25 g ai/ha B	5.25 g ai/ha B	5.25 g ai/ha B
Roundup PowerMAX	840 g ae/ha B	840 g ae/ha B	840 g ae/ha B	840 g ae/ha B	840 g ae/ha B	840 g ae/ha B	840 g ae/ha B
COC	1 % v/v B	1 % v/v B	1 % v/v B	1 % v/v B	1 % v/v B	1 % v/v B	1 % v/v B
N-Pak AMS	5 % v/v B	5 % v/v B	5 % v/v B	5 % v/v B	5 % v/v B	5 % v/v B	5 % v/v B
Roundup PowerMAX	840 g ae/ha D	840 g ae/ha D	840 g ae/ha D	840 g ae/ha D	840 g ae/ha D	840 g ae/ha D	840 g ae/ha D
N-Pak AMS	5 % v/v D	5 % v/v D	5 % v/v D	5 % v/v D	5 % v/v D	5 % v/v D	5 % v/v D
LSD (P=.05)	17.71	38.66	15.57	16.73	12.99	25.83	2.85
Standard Deviation	12.39	27.05	10.89	11.71	9.09	18.08	1.99
CV	14.27	49.38	13.09	13.37	10.07	25.39	2.14
Bartlett's X2	40.327	23.21	28.443	43.482	40.392	17.529	19.743
P(Bartlett's X2)	0.001*	0.057	0.012*	0.001*	0.001*	0.176	0.001*
Replicate F	2.136	0.604	5.727	5.062	1.211	5.056	1.411
Replicate Prob(F)	0.1089	0.6157	0.0021	0.0042	0.3167	0.0042	0.2518
Treatment F	17.816	3.698	19.677	17.748	32.236	7.091	624.310
Treatment Prob(F)	0.0001	0.0003	0.0001	0.0001	0.0001	0.0001	0.0001

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Pest Type	W Weed	W Weed	W Weed	W Weed	W Weed	W Weed	W Weed			
Pest Code	TAROF	GGGAN	ERICA	AMBEL	XANST	GGGAN	ERICA			
Pest Scientific Name	Taraxacum offi>	Annual grasses	Conyza canad>	Ambrosia artem>	Xanthium strum>	Annual grasses	Conyza canad>			
Pest Name	Common dandel>	Annual grasses	Canada horsewe>	Common ragweed	Heart-leaf coc>	Annual grasses	Canada horsewe>			
Crop Code	GLXMA	GLXMA	GLXMA	GLXMA	GLXMA	GLXMA	GLXMA			
BBCH Scale	BSOY	BSOY	BSOY	BSOY	BSOY	BSOY	BSOY			
Crop Scientific Name	Glycine max	Glycine max	Glycine max	Glycine max	Glycine max	Glycine max	Glycine max			
Crop Name	Soybean	Soybean	Soybean	Soybean	Soybean	Soybean	Soybean			
Crop Variety	AG2931	AG2931	AG2931	AG2931	AG2931	AG2931	AG2931			
Description	<1 IN	4-8 IN	4-8 IN	4-8 IN	4-8 IN	4-8 IN	4-8 IN			
Part Rated	PLOT P	PLOT P	PLOT P	PLOT P	PLOT P	PLOT P	PLOT P			
Rating Date	5-10-2012	6-7-2012	6-7-2012	6-7-2012	6-7-2012	6-20-2012	6-20-2012			
Rating Type	CONTRO	CONTRO	CONTRO	CONTRO	CONTRO	CONTRO	CONTRO			
Rating Unit	%	%	%	%	%	%	%			
Number of Subsamples	1	1	1	1	1	1	1			
Crop Stage Majority	09	15	15	15	15	51	51			
Pest Stage Majority	2-8 IN	1-10 IN	1-18 IN	1-5 IN	1-8 IN	1-18 IN	1-24 IN			
Pest Density, Unit	1.5 M2	20 M2	9 M2	2.5 M2	10 M2	20 M2	9 M2			
Assessed By	PM	JS/TL	JS/TL	JS/TL	JS/TL	PM	PM			
Days After First/Last Applic.	160 14	188 42	188 42	188 42	188 42	201 13	201 13			
Plant-Eval Interval	7 DP-1	35 DP-1	35 DP-1	35 DP-1	35 DP-1	48 DP-1	48 DP-1			
Days After Emergence	2 DE-1	30 DE-1	30 DE-1	30 DE-1	30 DE-1	43 DE-1	43 DE-1			
Trt No.	Treatment Name	Rate	Appl Code	15	16	17	18	19	20	21
1				0.0 b	0.0 b	0.0 c	0.0 c	0.0 b	0.0 c	0.0 c
2	Roundup PowerMAX N-Pak AMS FirstRate Roundup PowerMAX N-Pak AMS	840 g ae/ha B 5 % v/v B 17.7 g ai/ha D 840 g ae/ha D 5 % v/v D		100.0 a	5.0 b	60.0 b	32.5 bc	58.8 a	45.8 b	61.3 b
3	2,4-D Amine Roundup PowerMAX N-Pak AMS Roundup PowerMAX N-Pak AMS	560 g ai/ha B 840 g ae/ha B 5 % v/v B 840 g ae/ha D 5 % v/v D		77.5 a	5.0 b	63.8 b	58.8 ab	41.3 ab	98.5 a	88.0 a
4	Clarity Roundup PowerMAX N-Pak AMS Roundup PowerMAX N-Pak AMS	560 g ae/ha B 840 g ae/ha B 5 % v/v B 840 g ae/ha D 5 % v/v D		93.3 a	12.5 b	100.0 a	90.0 ab	37.5 ab	99.0 a	91.3 a
5	Sharpen Roundup PowerMAX MSO N-Pak AMS Roundup PowerMAX N-Pak AMS	25 g ai/ha C 840 g ae/ha C 1 % v/v C 5 % v/v C 840 g ae/ha D 5 % v/v D		100.0 a	25.0 b	100.0 a	93.8 a	86.3 a	99.0 a	98.0 a
6	Sharpen Roundup PowerMAX COC N-Pak AMS Roundup PowerMAX N-Pak AMS	25 g ai/ha C 840 g ae/ha C 1 % v/v C 5 % v/v C 840 g ae/ha D 5 % v/v D		100.0 a	3.8 b	87.5 a	75.0 ab	88.8 a	98.5 a	97.5 a

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Pest Type	W Weed	W Weed	W Weed	W Weed	W Weed	W Weed	W Weed			
Pest Code	TAROF	GGGAN	ERICA	AMBEL	XANST	GGGAN	ERICA			
Pest Scientific Name	Taraxacum offi>	Annual grasses	Conyza canadens>	Ambrosia artem>	Xanthium strum>	Annual grasses	Conyza canadens>			
Pest Name	Common dandel>	Annual grasses	Canada horsewe>	Common ragweed	Heart-leaf coc>	Annual grasses	Canada horsewe>			
Crop Code	GLXMA	GLXMA	GLXMA	GLXMA	GLXMA	GLXMA	GLXMA			
BBCH Scale	BSOY	BSOY	BSOY	BSOY	BSOY	BSOY	BSOY			
Crop Scientific Name	Glycine max	Glycine max	Glycine max	Glycine max	Glycine max	Glycine max	Glycine max			
Crop Name	Soybean	Soybean	Soybean	Soybean	Soybean	Soybean	Soybean			
Crop Variety	AG2931	AG2931	AG2931	AG2931	AG2931	AG2931	AG2931			
Description	<1 IN	4-8 IN	4-8 IN	4-8 IN	4-8 IN	4-8 IN	4-8 IN			
Part Rated	PLOT P	PLOT P	PLOT P	PLOT P	PLOT P	PLOT P	PLOT P			
Rating Date	5-10-2012	6-7-2012	6-7-2012	6-7-2012	6-7-2012	6-20-2012	6-20-2012			
Rating Type	CONTRO	CONTRO	CONTRO	CONTRO	CONTRO	CONTRO	CONTRO			
Rating Unit	%	%	%	%	%	%	%			
Number of Subsamples	1	1	1	1	1	1	1			
Crop Stage Majority	09	15	15	15	15	51	51			
Pest Stage Majority	2-8 IN	1-10 IN	1-18 IN	1-5 IN	1-8 IN	1-18 IN	1-24 IN			
Pest Density, Unit	1.5 M2	20 M2	9 M2	2.5 M2	10 M2	20 M2	9 M2			
Assessed By	PM	JS/TL	JS/TL	JS/TL	JS/TL	PM	PM			
Days After First/Last Applic.	160 14	188 42	188 42	188 42	188 42	201 13	201 13			
Plant-Eval Interval	7 DP-1	35 DP-1	35 DP-1	35 DP-1	35 DP-1	48 DP-1	48 DP-1			
Days After Emergence	2 DE-1	30 DE-1	30 DE-1	30 DE-1	30 DE-1	43 DE-1	43 DE-1			
Trt No.	Treatment Name	Rate	Appl Code	15	16	17	18	19	20	21
7	Valor XLT	85 g ai/ha	A	100.0 a	27.5 b	100.0 a	100.0 a	86.3 a	97.3 a	100.0 a
	Express	5.25 g ai/ha	A							
	2,4-D Amine	560 g ai/ha	A							
	Roundup PowerMAX	840 g ae/ha	A							
	COC	1 % v/v	A							
	N-Pak AMS	5 % v/v	A							
	Sharpen	25 g ai/ha	C							
	Roundup PowerMAX	840 g ae/ha	C							
	MSO	1 % v/v	C							
	N-Pak AMS	5 % v/v	C							
	Roundup PowerMAX	840 g ae/ha	D							
	N-Pak AMS	5 % v/v	D							
8	Valor XLT	85 g ai/ha	B	100.0 a	48.8 ab	95.0 a	100.0 a	76.3 a	98.5 a	91.3 a
	Express	5.25 g ai/ha	B							
	2,4-D Amine	560 g ai/ha	B							
	Roundup PowerMAX	840 g ae/ha	B							
	COC	1 % v/v	B							
	N-Pak AMS	5 % v/v	B							
	Roundup PowerMAX	840 g ae/ha	D							
	N-Pak AMS	5 % v/v	D							
9	Authority MTZ	347 g ai/ha	A	100.0 a	21.3 b	100.0 a	90.0 ab	65.0 a	98.5 a	100.0 a
	Express	5.25 g ai/ha	A							
	2,4-D Amine	560 g ai/ha	A							
	Roundup PowerMAX	840 g ae/ha	A							
	COC	1 % v/v	A							
	N-Pak AMS	5 % v/v	A							
	Sharpen	25 g ai/ha	C							
	Roundup PowerMAX	840 g ae/ha	C							
	MSO	1 % v/v	C							
	N-Pak AMS	5 % v/v	C							
	Roundup PowerMAX	840 g ae/ha	D							
	N-Pak AMS	5 % v/v	D							
10	Authority MTZ	347 g ai/ha	B	97.5 a	42.5 ab	96.3 a	60.0 ab	63.8 a	98.5 a	98.8 a
	Express	5.25 g ai/ha	B							
	2,4-D Amine	560 g ai/ha	B							
	Roundup PowerMAX	840 g ae/ha	B							
	COC	1 % v/v	B							
	N-Pak AMS	5 % v/v	B							
	Roundup PowerMAX	840 g ae/ha	D							
	N-Pak AMS	5 % v/v	D							

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Pest Type	W Weed	W Weed	W Weed	W Weed	W Weed	W Weed	W Weed			
Pest Code	TAROF	GGGAN	ERICA	AMBEL	XANST	GGGAN	ERICA			
Pest Scientific Name	Taraxacum offi>	Annual grasses	Conyza canadens>	Ambrosia artem>	Xanthium strum>	Annual grasses	Conyza canadens>			
Pest Name	Common dandel>	Annual grasses	Canada horsewe>	Common ragweed	Heart-leaf coc>	Annual grasses	Canada horsewe>			
Crop Code	GLXMA	GLXMA	GLXMA	GLXMA	GLXMA	GLXMA	GLXMA			
BBCH Scale	BSOY	BSOY	BSOY	BSOY	BSOY	BSOY	BSOY			
Crop Scientific Name	Glycine max	Glycine max	Glycine max	Glycine max	Glycine max	Glycine max	Glycine max			
Crop Name	Soybean	Soybean	Soybean	Soybean	Soybean	Soybean	Soybean			
Crop Variety	AG2931	AG2931	AG2931	AG2931	AG2931	AG2931	AG2931			
Description	<1 IN	4-8 IN	4-8 IN	4-8 IN	4-8 IN	4-8 IN	4-8 IN			
Part Rated	PLOT P	PLOT P	PLOT P	PLOT P	PLOT P	PLOT P	PLOT P			
Rating Date	5-10-2012	6-7-2012	6-7-2012	6-7-2012	6-7-2012	6-20-2012	6-20-2012			
Rating Type	CONTRO	CONTRO	CONTRO	CONTRO	CONTRO	CONTRO	CONTRO			
Rating Unit	%	%	%	%	%	%	%			
Number of Subsamples	1	1	1	1	1	1	1			
Crop Stage Majority	09	15	15	15	15	51	51			
Pest Stage Majority	2-8 IN	1-10 IN	1-18 IN	1-5 IN	1-8 IN	1-18 IN	1-24 IN			
Pest Density, Unit	1.5 M2	20 M2	9 M2	2.5 M2	10 M2	20 M2	9 M2			
Assessed By	PM	JS/TL	JS/TL	JS/TL	JS/TL	PM	PM			
Days After First/Last Applic.	160 14	188 42	188 42	188 42	188 42	201 13	201 13			
Plant-Eval Interval	7 DP-1	35 DP-1	35 DP-1	35 DP-1	35 DP-1	48 DP-1	48 DP-1			
Days After Emergence	2 DE-1	30 DE-1	30 DE-1	30 DE-1	30 DE-1	43 DE-1	43 DE-1			
Trt No.	Treatment Name	Rate	Appl Code	15	16	17	18	19	20	21
11	Authority XL			100.0 a	32.5 b	100.0 a	91.3 ab	75.0 a	98.8 a	100.0 a
	Spartan	175 g ai/ha	A							
	Classic	22 g ai/ha	A							
	Express	5.25 g ai/ha	A							
	2,4-D Amine	560 g ai/ha	A							
	Roundup PowerMAX	840 g ae/ha	A							
	COC	1 % v/v	A							
	N-Pak AMS	5 % v/v	A							
	Sharpen	25 g ai/ha	C							
	Roundup PowerMAX	840 g ae/ha	C							
	MSO	1 % v/v	C							
	N-Pak AMS	5 % v/v	C							
	Roundup PowerMAX	840 g ae/ha	D							
	N-Pak AMS	5 % v/v	D							
12	Authority XL			99.5 a	86.0 a	100.0 a	88.8 ab	95.0 a	96.5 a	100.0 a
	Spartan	175 g ai/ha	B							
	Classic	22 g ai/ha	B							
	Express	5.25 g ai/ha	B							
	2,4-D Amine	560 g ai/ha	B							
	Roundup PowerMAX	840 g ae/ha	B							
	COC	1 % v/v	B							
	N-Pak AMS	5 % v/v	B							
	Roundup PowerMAX	840 g ae/ha	D							
	N-Pak AMS	5 % v/v	D							
13	2,4-D Amine	560 g ai/ha	A	100.0 a	42.5 ab	100.0 a	82.5 ab	93.8 a	92.0 a	100.0 a
	Express	5.25 g ai/ha	A							
	MON 63410	1260 g ai/ha	A							
	Roundup PowerMAX	840 g ae/ha	A							
	N-Pak AMS	5 % v/v	A							
	Sharpen	25 g ai/ha	C							
	Roundup PowerMAX	840 g ae/ha	C							
	MSO	1 % v/v	C							
	N-Pak AMS	5 % v/v	C							
	Roundup PowerMAX	840 g ae/ha	D							
	N-Pak AMS	5 % v/v	D							
14	2,4-D Amine	560 g ai/ha	B	100.0 a	38.8 ab	93.8 a	40.0 abc	46.3 ab	98.5 a	88.8 a
	Express	5.25 g ai/ha	B							
	MON 63410	1260 g ai/ha	B							
	Roundup PowerMAX	840 g ae/ha	B							
	N-Pak AMS	5 % v/v	B							
	Roundup PowerMAX	840 g ae/ha	D							
	N-Pak AMS	5 % v/v	D							

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Pest Type	W Weed	W Weed	W Weed	W Weed	W Weed	W Weed	W Weed			
Pest Code	TAROF	GGGAN	ERICA	AMBEL	XANST	GGGAN	ERICA			
Pest Scientific Name	Taraxacum offi>	Annual grasses	Conyza canad>	Ambrosia artem>	Xanthium strum>	Annual grasses	Conyza canad>			
Pest Name	Common dandel>	Annual grasses	Canada horsewe>	Common ragweed	Heart-leaf coc>	Annual grasses	Canada horsewe>			
Crop Code	GLXMA	GLXMA	GLXMA	GLXMA	GLXMA	GLXMA	GLXMA			
BBCH Scale	BSOY	BSOY	BSOY	BSOY	BSOY	BSOY	BSOY			
Crop Scientific Name	Glycine max	Glycine max	Glycine max	Glycine max	Glycine max	Glycine max	Glycine max			
Crop Name	Soybean	Soybean	Soybean	Soybean	Soybean	Soybean	Soybean			
Crop Variety	AG2931	AG2931	AG2931	AG2931	AG2931	AG2931	AG2931			
Description	<1 IN	4-8 IN	4-8 IN	4-8 IN	4-8 IN	4-8 IN	4-8 IN			
Part Rated	PLOT P	PLOT P	PLOT P	PLOT P	PLOT P	PLOT P	PLOT P			
Rating Date	5-10-2012	6-7-2012	6-7-2012	6-7-2012	6-7-2012	6-20-2012	6-20-2012			
Rating Type	CONTRO	CONTRO	CONTRO	CONTRO	CONTRO	CONTRO	CONTRO			
Rating Unit	%	%	%	%	%	%	%			
Number of Subsamples	1	1	1	1	1	1	1			
Crop Stage Majority	09	15	15	15	15	51	51			
Pest Stage Majority	2-8 IN	1-10 IN	1-18 IN	1-5 IN	1-8 IN	1-18 IN	1-24 IN			
Pest Density, Unit	1.5 M2	20 M2	9 M2	2.5 M2	10 M2	20 M2	9 M2			
Assessed By	PM	JS/TL	JS/TL	JS/TL	JS/TL	PM	PM			
Days After First/Last Applic.	160 14	188 42	188 42	188 42	188 42	201 13	201 13			
Plant-Eval Interval	7 DP-1	35 DP-1	35 DP-1	35 DP-1	35 DP-1	48 DP-1	48 DP-1			
Days After Emergence	2 DE-1	30 DE-1	30 DE-1	30 DE-1	30 DE-1	43 DE-1	43 DE-1			
Trt No.	Treatment Name	Rate	Appl Code	15	16	17	18	19	20	21
15	2,4-D Amine	560 g ai/ha	A	100.0 a	20.0 b	100.0 a	91.3 ab	80.0 a	99.0 a	100.0 a
	Authority First DF	316 g ai/ha	A							
	Express	5.25 g ai/ha	A							
	Roundup PowerMAX	840 g ae/ha	A							
	COC	1 % v/v	A							
	N-Pak AMS	5 % v/v	A							
	Sharpen	25 g ai/ha	C							
	Roundup PowerMAX	840 g ae/ha	C							
	MSO	1 % v/v	C							
	N-Pak AMS	5 % v/v	C							
	Roundup PowerMAX	840 g ae/ha	D							
	N-Pak AMS	5 % v/v	D							
16	2,4-D Amine	560 g ai/ha	B	100.0 a	44.0 ab	100.0 a	85.0 ab	100.0 a	96.0 a	100.0 a
	Authority First DF	316 g ai/ha	B							
	Express	5.25 g ai/ha	B							
	Roundup PowerMAX	840 g ae/ha	B							
	COC	1 % v/v	B							
	N-Pak AMS	5 % v/v	B							
	Roundup PowerMAX	840 g ae/ha	D							
	N-Pak AMS	5 % v/v	D							
	LSD (P=.05)			14.19	32.51	19.83	34.58	39.90	19.43	9.85
	Standard Deviation			9.93	22.75	13.87	24.20	27.92	13.59	6.89
	CV			10.83	79.99	15.9	32.84	40.84	15.38	7.8
	Bartlett's X2			28.237	26.492	16.771	21.95	21.951	165.067	11.81
	P(Bartlett's X2)			0.001*	0.022*	0.005*	0.038*	0.056	0.001*	0.107
	Replicate F			1.728	2.123	1.940	0.995	0.882	0.544	0.820
	Replicate Prob(F)			0.1748	0.1106	0.1368	0.4037	0.4574	0.6547	0.4895
	Treatment F			25.590	3.810	14.622	5.485	3.635	15.736	54.965
	Treatment Prob(F)			0.0001	0.0002	0.0001	0.0001	0.0004	0.0001	0.0001

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Pest Type	W Weed	W Weed			
Pest Code	GGGAN	ERICA			
Pest Scientific Name	Annual grasses	Conyza canadens			
Pest Name	Annual grasses	Canada horsewee			
Crop Code	GLXMA	GLXMA			
BBCH Scale	BSOY	BSOY			
Crop Scientific Name	Glycine max	Glycine max			
Crop Name	Soybean	Soybean			
Crop Variety	AG2931	AG2931			
Description	24 IN	24 IN			
Part Rated	PLOT P	PLOT P			
Rating Date	7-5-2012	7-5-2012			
Rating Type	CONTRO	CONTRO			
Rating Unit	%	%			
Number of Subsamples	1	1			
Crop Stage Majority	69	69			
Pest Stage Majority	1-18 IN	1-24 IN			
Pest Density, Unit	20 M2	9 M2			
Assessed By	PM	PM			
Days After First/Last Applic.	216 28	216 28			
Plant-Eval Interval	63 DP-1	63 DP-1			
Days After Emergence	58 DE-1	58 DE-1			
Trt No.	Treatment	Rate	Appl Code		
1				22	23
2	Roundup PowerMAX	840 g ae/ha	B	45.8 b	61.3 b
	N-Pak AMS	5 % v/v	B		
	FirstRate	17.7 g ai/ha	D		
	Roundup PowerMAX	840 g ae/ha	D		
	N-Pak AMS	5 % v/v	D		
3	2,4-D Amine	560 g ai/ha	B	98.5 a	88.0 a
	Roundup PowerMAX	840 g ae/ha	B		
	N-Pak AMS	5 % v/v	B		
	Roundup PowerMAX	840 g ae/ha	D		
	N-Pak AMS	5 % v/v	D		
4	Clarity	560 g ae/ha	B	99.0 a	91.3 a
	Roundup PowerMAX	840 g ae/ha	B		
	N-Pak AMS	5 % v/v	B		
	Roundup PowerMAX	840 g ae/ha	D		
	N-Pak AMS	5 % v/v	D		
5	Sharpen	25 g ai/ha	C	99.0 a	98.0 a
	Roundup PowerMAX	840 g ae/ha	C		
	MSO	1 % v/v	C		
	N-Pak AMS	5 % v/v	C		
	Roundup PowerMAX	840 g ae/ha	D		
	N-Pak AMS	5 % v/v	D		
6	Sharpen	25 g ai/ha	C	98.5 a	97.5 a
	Roundup PowerMAX	840 g ae/ha	C		
	COC	1 % v/v	C		
	N-Pak AMS	5 % v/v	C		
	Roundup PowerMAX	840 g ae/ha	D		
	N-Pak AMS	5 % v/v	D		

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Pest Type	W Weed	W Weed			
Pest Code	GGGAN	ERICA			
Pest Scientific Name	Annual grasses	Conyza canadens			
Pest Name	Annual grasses	Canada horsewee			
Crop Code	GLXMA	GLXMA			
BBCH Scale	BSOY	BSOY			
Crop Scientific Name	Glycine max	Glycine max			
Crop Name	Soybean	Soybean			
Crop Variety	AG2931	AG2931			
Description	24 IN	24 IN			
Part Rated	PLOT P	PLOT P			
Rating Date	7-5-2012	7-5-2012			
Rating Type	CONTRO	CONTRO			
Rating Unit	%	%			
Number of Subsamples	1	1			
Crop Stage Majority	69	69			
Pest Stage Majority	1-18 IN	1-24 IN			
Pest Density, Unit	20 M2	9 M2			
Assessed By	PM	PM			
Days After First/Last Applic.	216 28	216 28			
Plant-Eval Interval	63 DP-1	63 DP-1			
Days After Emergence	58 DE-1	58 DE-1			
Trt No.	Treatment Name	Rate	Appl Code	22	23
7	Valor XLT	85 g ai/ha	A	97.3 a	100.0 a
	Express	5.25 g ai/ha	A		
	2,4-D Amine	560 g ai/ha	A		
	Roundup PowerMAX	840 g ae/ha	A		
	COC	1 % v/v	A		
	N-Pak AMS	5 % v/v	A		
	Sharpen	25 g ai/ha	C		
	Roundup PowerMAX	840 g ae/ha	C		
	MSO	1 % v/v	C		
	N-Pak AMS	5 % v/v	C		
	Roundup PowerMAX	840 g ae/ha	D		
	N-Pak AMS	5 % v/v	D		
8	Valor XLT	85 g ai/ha	B	98.5 a	91.3 a
	Express	5.25 g ai/ha	B		
	2,4-D Amine	560 g ai/ha	B		
	Roundup PowerMAX	840 g ae/ha	B		
	COC	1 % v/v	B		
	N-Pak AMS	5 % v/v	B		
	Roundup PowerMAX	840 g ae/ha	D		
	N-Pak AMS	5 % v/v	D		
9	Authority MTZ	347 g ai/ha	A	98.5 a	100.0 a
	Express	5.25 g ai/ha	A		
	2,4-D Amine	560 g ai/ha	A		
	Roundup PowerMAX	840 g ae/ha	A		
	COC	1 % v/v	A		
	N-Pak AMS	5 % v/v	A		
	Sharpen	25 g ai/ha	C		
	Roundup PowerMAX	840 g ae/ha	C		
	MSO	1 % v/v	C		
	N-Pak AMS	5 % v/v	C		
	Roundup PowerMAX	840 g ae/ha	D		
	N-Pak AMS	5 % v/v	D		
10	Authority MTZ	347 g ai/ha	B	98.5 a	98.8 a
	Express	5.25 g ai/ha	B		
	2,4-D Amine	560 g ai/ha	B		
	Roundup PowerMAX	840 g ae/ha	B		
	COC	1 % v/v	B		
	N-Pak AMS	5 % v/v	B		
	Roundup PowerMAX	840 g ae/ha	D		
	N-Pak AMS	5 % v/v	D		

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Pest Type	W Weed	W Weed
Pest Code	GCGAN	ERICA
Pest Scientific Name	Annual grasses	Conyza canadens>
Pest Name	Annual grasses	Canada horsewe>
Crop Code	GLXMA	GLXMA
BBCH Scale	BSOY	BSOY
Crop Scientific Name	Glycine max	Glycine max
Crop Name	Soybean	Soybean
Crop Variety	AG2931	AG2931
Description	24 IN	24 IN
Part Rated	PLOT P	PLOT P
Rating Date	7-5-2012	7-5-2012
Rating Type	CONTRO	CONTRO
Rating Unit	%	%
Number of Subsamples	1	1
Crop Stage Majority	69	69
Pest Stage Majority	1-18 IN	1-24 IN
Pest Density, Unit	20 M2	9 M2
Assessed By	PM	PM
Days After First/Last Applic.	216 28	216 28
Plant-Eval Interval	63 DP-1	63 DP-1
Days After Emergence	58 DE-1	58 DE-1
Trt Treatment	Rate	Appl
No. Name	Rate Unit	Code
		22
		23
15 2,4-D Amine	560 g ai/ha A	99.0 a
Authority First DF	316 g ai/ha A	
Express	5.25 g ai/ha A	
Roundup PowerMAX	840 g ae/ha A	
COC	1 % v/v A	
N-Pak AMS	5 % v/v A	
Sharpen	25 g ai/ha C	
Roundup PowerMAX	840 g ae/ha C	
MSO	1 % v/v C	
N-Pak AMS	5 % v/v C	
Roundup PowerMAX	840 g ae/ha D	
N-Pak AMS	5 % v/v D	
16 2,4-D Amine	560 g ai/ha B	96.0 a
Authority First DF	316 g ai/ha B	
Express	5.25 g ai/ha B	
Roundup PowerMAX	840 g ae/ha B	
COC	1 % v/v B	
N-Pak AMS	5 % v/v B	
Roundup PowerMAX	840 g ae/ha D	
N-Pak AMS	5 % v/v D	
LSD (P=.05)	19.43	9.85
Standard Deviation	13.59	6.89
CV	15.38	7.8
Bartlett's X2	165.067	11.81
P(Bartlett's X2)	0.001*	0.107
Replicate F	0.544	0.820
Replicate Prob(F)	0.6547	0.4895
Treatment F	15.736	54.965
Treatment Prob(F)	0.0001	0.0001

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Fall vs. Spring Treatments of Residual Herbicides for Marestail Control Programs

Trial ID: 11F-SEP-NTS-01 Protocol ID: 11F-SEP-NTS-01
 Location: SEPAC Study Director: Paul Marquardt
 Project ID: Investigator: Dr. Bill Johnson
 Sponsor Contact: John Willis

Pest Type

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

Pest Code

ERICA, Conyza canadensis, = US
 ALLVI, Allium vineale, = US
 POAAN, Poa annua, = US
 TAROF, Taraxacum officinale, = US
 GGGAN, Annual grasses, = US
 AMBEL, Ambrosia artemisiifolia, = US
 XANST, Xanthium strumarium, = US

Crop Code

GLXMA, BSOY, Glycine max, = US

Part Rated

PLOT = plot
 P = Pest is Part Rated

Rating Type

CONTRO = control / burndown or knockdown

Rating Unit

% = percent

Crop Stage Majority

00 = Dry seed
 09 = Emergence: hypocotyl and cotyledons emerge above soil surface ("cracking stage")
 15 = Trifoliolate leaf on the 5th node unfolded
 51 = First flower buds visible
 69 = End of flowering: first pods visible (approx. 5 mm length)

M2 = per square meter

Plant-Eval Interval

-14 DP-1 = 1 GLXMA 5-3-2012
 -7 DP-1 = 1 GLXMA 5-3-2012
 0 DP-1 = 1 GLXMA 5-3-2012
 7 DP-1 = 1 GLXMA 5-3-2012
 35 DP-1 = 1 GLXMA 5-3-2012
 48 DP-1 = 1 GLXMA 5-3-2012
 63 DP-1 = 1 GLXMA 5-3-2012