

Glyphosate-resistant horseweed control in LibertyLink soybean

Trial ID: NTS09-17 Study Dir.: Sprague, Powell, Stiles
 Conducted: Isabella Co. Investigator: Christy Sprague

Planting Date: May-19-2017 **Row Spacing:** 30 IN
Variety: DF 9251LL **No. of Reps:** 4
Population: 150000 S/A **% OM:** 2.2
Soil Type: SL sandy loam **pH:** 7.2
Plot Size: 10 X 30 FT **Study Design:** Randomized Complete Block (RCB)

Tillage/Previous Crops: No-tilled into soybean stubble
Fertilizer:

Crop and Weed Description

Weed	Code	Common Name	Scientific Name
1	ERICA	horseweed	Conyza canadensis
2	POAAN	bluegrass, annual	Poa annua
3	TAROF	dandelion	Taraxacum officinale

Crop	Code	Common Name
1	GLXMA	Soybean

Application Description

	A	B
Application Timing:	7 EPP	POST
Date Treated:	May-10-2017	Jul-5-2017
Time Treated:	12:30 PM	12:30 PM
% Cloud Cover:	50	10
Air Temp., Unit:	63 F	79 F
% Relative Humidity:	31	77
Wind Speed/Unit/Dir:	4 mph W	3.5 mph W
Soil Temp, Unit:	58 F	81 F
Leaf Moist/Dew Presence (Y/N):	5	5
Soil Moist:	4	4

Crop Stage at Each Application

	A	B
Crop 1 Name:	GLXMA	GLXMA
Height:		9-11 " (10)
Stage:		V4

Weed Stage at Each Application

	A	B
Weed 1 Name:	ERICA	ERICA
Height:	.50-1 " (.75)	2-6 " (5)
Stage:	8-12L	boltin
Weed 2 Name:	POAAN	POAAN
Height:	1 "	
Stage:	flower	
Weed 3 Name:	TAROF	TAROF
Height:	12 "	
Stage:	flower	

Weed Density

	1	2	3
Date:	May-10-2017	May-10-2017	May-10-2017
Weed Name:	ERICA	POAAN	TAROF
Density:	13 FT2	5 FT2	2 FT2

Application Equipment

Appl	Sprayer Type	Ground Speed	Nozzle Type	Nozzle Size	Nozzle Height	Nozzle Spacing	Boom Width	Spray Volume	Carrier	Operation Pressure
A	Cub	3.8 MPH	AIXR	11003	24 "	20 "	100 "	19 GPA	WATER	30 PSI
B	Cub	3.8 MPH	AIXR	11003	28 "	20 "	100 "	19 GPA	WATER	30 PSI

Comments: The horseweed population at this location is resistant to Group 2 (ALS-inhibitors) and Group 9 (glyphosate) herbicides.

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Pest Code	ERICA	POAAN	TAROF	ERICA	POAAN
Crop Code					
Rating Date	May-19-2017	May-19-2017	May-19-2017	May-31-2017	May-31-2017
Rating Type	control	control	control	control	control
Rating Unit	percent	percent	percent	percent	percent
Trt-Eval Interval	9 DA-A	9 DA-A	9 DA-A	21 DA-A	21 DA-A
Number of Decimals	0	0	0	0	0

Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Appl Code	*	*	*	*	*
1	Roundup PowerMax	4.5	SL	32 fl oz/a		A	16	85	15	20	99
1	AMS		WG	17 lb/100 gal		A					
2	Roundup PowerMax	4.5	SL	32 fl oz/a		A	18	85	15	21	100
2	AMS		WG	17 lb/100 gal		A					
2	Liberty	2.34	L	32 fl oz/a		B					
2	AMS		WG	8.5 lb/100 gal		B					
3	Roundup PowerMax	4.5	SL	32 fl oz/a		A	16	86	15	19	100
3	AMS		WG	17 lb/100 gal		A					
3	Liberty	2.34	L	43 fl oz/a		B					
3	AMS		WG	8.5 lb/100 gal		B					
4	Untreated						0	0	0	0	0
5	Sharpen	2.85	L	1 fl oz/a		A	100	81	89	99	99
5	Roundup PowerMax	4.5	SL	32 fl oz/a		A					
5	MSO		L	1 % v/v		A					
5	AMS		WG	17 lb/100 gal		A					
5	Liberty	2.34	L	32 fl oz/a		B					
5	AMS		WG	8.5 lb/100 gal		B					
6	Metribuzin	75	WG	8 oz/a		A	100	73	86	100	94
6	Sharpen	2.85	L	1 fl oz/a		A					
6	Roundup PowerMax	4.5	SL	32 fl oz/a		A					
6	MSO		L	1 % v/v		A					
6	AMS		WG	17 lb/100 gal		A					
6	Liberty	2.34	L	32 fl oz/a		B					
6	AMS		WG	8.5 lb/100 gal		B					
7	2,4-D ester	4	SL	1 pt/a		A	74	74	64	90	96
7	Roundup PowerMax	4.5	SL	32 fl oz/a		A					
7	AMS		WG	17 lb/100 gal		A					
7	Liberty	2.34	L	32 fl oz/a		B					
7	AMS		WG	8.5 lb/100 gal		B					
8	Authority MTZ	45	WG	16 oz/a		A	94	85	61	100	89
8	2,4-D ester	4	SL	1 pt/a		A					
8	Roundup PowerMax	4.5	SL	32 fl oz/a		A					
8	AMS		WG	17 lb/100 gal		A					
8	Liberty	2.34	L	32 fl oz/a		B					
8	AMS		WG	8.5 lb/100 gal		B					

* Adjusted means

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Glyphosate-resistant horseweed control in LibertyLink soybean

Trial ID: NTS09-17 Location: Isabella Co. Trial Year: 2017
 Protocol ID: NTS09-17 Investigator: Christy Sprague
 Study Director: Sprague. Powell, Stiles

Pest Code	ERICA	POAAN	TAROF	ERICA	POAAN
Crop Code					
Rating Date	May-19-2017	May-19-2017	May-19-2017	May-31-2017	May-31-2017
Rating Type	control	control	control	control	control
Rating Unit	percent	percent	percent	percent	percent
Trt-Eval Interval	9 DA-A	9 DA-A	9 DA-A	21 DA-A	21 DA-A
Number of Decimals	0	0	0	0	0

Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Appl Code	*	*	*	*	*
9	Valor	51	WG	2 oz/a		A	93	78	74	100	90
9	Sencor	75	WG	6 oz/a		A					
9	2,4-D ester	4	SL	1 pt/a		A					
9	Roundup PowerMax	4.5	SL	32 fl oz/a		A					
9	AMS		WG	17 lb/100 gal		A					
9	Liberty	2.34	L	32 fl oz/a		B					
9	AMS		WG	8.5 lb/100 gal		B					
10	Authority MTZ	45	WG	16 oz/a		A	65	48	60	90	88
10	Elevore		L	1 fl oz/a		A					
10	Roundup PowerMax	4.5	SL	32 fl oz/a		A					
10	AMS		WG	17 lb/100 gal		A					
10	Liberty	2.34	L	32 fl oz/a		B					
10	AMS		WG	8.5 lb/100 gal		B					
11	Valor	51	WG	2 oz/a		A	78	43	60	98	91
11	Sencor	75	WG	6 oz/a		A					
11	Elevore		L	1 fl oz/a		A					
11	Roundup PowerMax	4.5	SL	32 fl oz/a		A					
11	AMS		WG	17 lb/100 gal		A					
11	Liberty	2.34	L	32 fl oz/a		B					
11	AMS		WG	8.5 lb/100 gal		B					
12	Authority MTZ	45	WG	16 oz/a		A	90	74	68	99	91
12	2,4-D ester	4	SL	1 pt/a		A					
12	Roundup PowerMax	4.5	SL	32 fl oz/a		A					
12	AMS		WG	17 lb/100 gal		A					
12	Liberty	2.34	L	32 fl oz/a		B					
12	Warrant	3	L	3 pt/a		B					
12	AMS		WG	8.5 lb/100 gal		B					
	LSD P=.05						9.3	8.5	11.5	9.4	6.2
	Standard Deviation						6.5	5.9	8.0	6.5	4.3
	CV						10.46	8.79	15.85	9.35	4.96

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Glyphosate-resistant horseweed control in LibertyLink soybean

Trial ID: NTS09-17 **Location: Isabella Co.** **Trial Year: 2017**
Protocol ID: NTS09-17 **Investigator: Christy Sprague**
Study Director: Sprague, Powell, Stiles

Pest Code	TAROF		ERICA		ERICA	
	GLXMA	GLXMA	GLXMA	GLXMA	GLXMA	GLXMA
Crop Code	May-31-2017	Jun-15-2017	Jun-15-2017	Jul-5-2017	Jul-5-2017	Jul-17-2017
Rating Date	control	injury	control	injury	control	injury
Rating Type	percent	percent	percent	percent	percent	percent
Rating Unit	21 DA-A	36 DA-A	36 DA-A	56 DA-A	56 DA-A	12 DA-B
Trt-Eval Interval	0	0	0	0	0	0
Number of Decimals						

Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Appl Code	*	*	*	*	*	*
1	Roundup PowerMax	4.5	SL	32 fl oz/a		A	79	0	18	0	21	0
1	AMS		WG	17 lb/100 gal		A						
2	Roundup PowerMax	4.5	SL	32 fl oz/a		A	85	0	20	0	21	0
2	AMS		WG	17 lb/100 gal		A						
2	Liberty	2.34	L	32 fl oz/a		B						
2	AMS		WG	8.5 lb/100 gal		B						
3	Roundup PowerMax	4.5	SL	32 fl oz/a		A	88	0	18	0	19	0
3	AMS		WG	17 lb/100 gal		A						
3	Liberty	2.34	L	43 fl oz/a		B						
3	AMS		WG	8.5 lb/100 gal		B						
4	Untreated						0	0	0	0	0	0
5	Sharpen	2.85	L	1 fl oz/a		A	87	0	98	0	96	0
5	Roundup PowerMax	4.5	SL	32 fl oz/a		A						
5	MSO		L	1 % v/v		A						
5	AMS		WG	17 lb/100 gal		A						
5	Liberty	2.34	L	32 fl oz/a		B						
5	AMS		WG	8.5 lb/100 gal		B						
6	Metribuzin	75	WG	8 oz/a		A	73	0	99	0	100	0
6	Sharpen	2.85	L	1 fl oz/a		A						
6	Roundup PowerMax	4.5	SL	32 fl oz/a		A						
6	MSO		L	1 % v/v		A						
6	AMS		WG	17 lb/100 gal		A						
6	Liberty	2.34	L	32 fl oz/a		B						
6	AMS		WG	8.5 lb/100 gal		B						
7	2,4-D ester	4	SL	1 pt/a		A	81	0	73	0	63	0
7	Roundup PowerMax	4.5	SL	32 fl oz/a		A						
7	AMS		WG	17 lb/100 gal		A						
7	Liberty	2.34	L	32 fl oz/a		B						
7	AMS		WG	8.5 lb/100 gal		B						
8	Authority MTZ	45	WG	16 oz/a		A	84	0	98	0	96	0
8	2,4-D ester	4	SL	1 pt/a		A						
8	Roundup PowerMax	4.5	SL	32 fl oz/a		A						
8	AMS		WG	17 lb/100 gal		A						
8	Liberty	2.34	L	32 fl oz/a		B						
8	AMS		WG	8.5 lb/100 gal		B						

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 Study Director: Sprague, Powell, Stiles

Pest Code	TAROF		ERICA		ERICA						
Crop Code	GLXMA	GLXMA	GLXMA	GLXMA	GLXMA	GLXMA					
Rating Date	May-31-2017	Jun-15-2017	Jun-15-2017	Jul-5-2017	Jul-5-2017	Jul-17-2017					
Rating Type	control	injury	control	injury	control	injury					
Rating Unit	percent	percent	percent	percent	percent	percent					
Trt-Eval Interval	21 DA-A	36 DA-A	36 DA-A	56 DA-A	56 DA-A	12 DA-B					
Number of Decimals	0	0	0	0	0	0					
Trt No.	Treatment Name	Form Conc	Form Type	Rate Unit	Appl Code	*	*	*	*	*	*
9	Valor	51	WG	2 oz/a	A	88	0	99	0	93	0
9	Sencor	75	WG	6 oz/a	A						
9	2,4-D ester	4	SL	1 pt/a	A						
9	Roundup PowerMax	4.5	SL	32 fl oz/a	A						
9	AMS		WG	17 lb/100 gal	A						
9	Liberty	2.34	L	32 fl oz/a	B						
9	AMS		WG	8.5 lb/100 gal	B						
10	Authority MTZ	45	WG	16 oz/a	A	76	8	91	0	91	0
10	Elevore		L	1 fl oz/a	A						
10	Roundup PowerMax	4.5	SL	32 fl oz/a	A						
10	AMS		WG	17 lb/100 gal	A						
10	Liberty	2.34	L	32 fl oz/a	B						
10	AMS		WG	8.5 lb/100 gal	B						
11	Valor	51	WG	2 oz/a	A	79	6	99	0	89	0
11	Sencor	75	WG	6 oz/a	A						
11	Elevore		L	1 fl oz/a	A						
11	Roundup PowerMax	4.5	SL	32 fl oz/a	A						
11	AMS		WG	17 lb/100 gal	A						
11	Liberty	2.34	L	32 fl oz/a	B						
11	AMS		WG	8.5 lb/100 gal	B						
12	Authority MTZ	45	WG	16 oz/a	A	76	6	95	0	83	0
12	2,4-D ester	4	SL	1 pt/a	A						
12	Roundup PowerMax	4.5	SL	32 fl oz/a	A						
12	AMS		WG	17 lb/100 gal	A						
12	Liberty	2.34	L	32 fl oz/a	B						
12	Warrant	3	L	3 pt/a	B						
12	AMS		WG	8.5 lb/100 gal	B						
LSD	P=.05					10.9	3.5	8.8	.	10.5	.
Standard Deviation						7.6	2.4	6.1	0.0	7.3	0.0
CV						10.22	142.08	9.12	0.0	11.38	0.0

* Adjusted means

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Glyphosate-resistant horseweed control in LibertyLink soybean

Trial ID: NTS09-17 **Location: Isabella Co.** **Trial Year: 2017**
Protocol ID: NTS09-17 **Investigator: Christy Sprague**
Study Director: Sprague, Powell, Stiles

	ERICA	GLXMA	ERICA	ERICA	ERICA
Pest Code	Jul-17-2017	Aug-1-2017	Aug-1-2017	Aug-16-2017	Sep-21-2017
Crop Code	control	injury	control	control	control
Rating Date	percent	percent	percent	percent	percent
Rating Type	12 DA-B	27 DA-B	27 DA-B	42 DA-B	78 DA-B
Rating Unit	0	0	0	0	0
Trt-Eval Interval					
Number of Decimals					

Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Appl Code	*	*	*	*	*
1	Roundup PowerMax	4.5	SL	32 fl oz/a		A	18	0	10	0	0
1	AMS		WG	17 lb/100 gal		A					
2	Roundup PowerMax	4.5	SL	32 fl oz/a		A	93	0	87	85	77
2	AMS		WG	17 lb/100 gal		A					
2	Liberty	2.34	L	32 fl oz/a		B					
2	AMS		WG	8.5 lb/100 gal		B					
3	Roundup PowerMax	4.5	SL	32 fl oz/a		A	94	0	85	86	77
3	AMS		WG	17 lb/100 gal		A					
3	Liberty	2.34	L	43 fl oz/a		B					
3	AMS		WG	8.5 lb/100 gal		B					
4	Untreated						0	0	0	0	0
5	Sharpen	2.85	L	1 fl oz/a		A	100	0	97	93	91
5	Roundup PowerMax	4.5	SL	32 fl oz/a		A					
5	MSO		L	1 % v/v		A					
5	AMS		WG	17 lb/100 gal		A					
5	Liberty	2.34	L	32 fl oz/a		B					
5	AMS		WG	8.5 lb/100 gal		B					
6	Metribuzin	75	WG	8 oz/a		A	100	0	100	97	96
6	Sharpen	2.85	L	1 fl oz/a		A					
6	Roundup PowerMax	4.5	SL	32 fl oz/a		A					
6	MSO		L	1 % v/v		A					
6	AMS		WG	17 lb/100 gal		A					
6	Liberty	2.34	L	32 fl oz/a		B					
6	AMS		WG	8.5 lb/100 gal		B					
7	2,4-D ester	4	SL	1 pt/a		A	99	0	93	91	87
7	Roundup PowerMax	4.5	SL	32 fl oz/a		A					
7	AMS		WG	17 lb/100 gal		A					
7	Liberty	2.34	L	32 fl oz/a		B					
7	AMS		WG	8.5 lb/100 gal		B					
8	Authority MTZ	45	WG	16 oz/a		A	100	0	96	93	90
8	2,4-D ester	4	SL	1 pt/a		A					
8	Roundup PowerMax	4.5	SL	32 fl oz/a		A					
8	AMS		WG	17 lb/100 gal		A					
8	Liberty	2.34	L	32 fl oz/a		B					
8	AMS		WG	8.5 lb/100 gal		B					

* Adjusted means

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 Study Director: Sprague, Powell, Stiles

	ERICA	GLXMA	ERICA	ERICA	ERICA
Pest Code	ERICA	GLXMA	ERICA	ERICA	ERICA
Crop Code					
Rating Date	Jul-17-2017	Aug-1-2017	Aug-1-2017	Aug-16-2017	Sep-21-2017
Rating Type	control	injury	control	control	control
Rating Unit	percent	percent	percent	percent	percent
Trt-Eval Interval	12 DA-B	27 DA-B	27 DA-B	42 DA-B	78 DA-B
Number of Decimals	0	0	0	0	0

Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Appl Code	*	*	*	*	*
9	Valor	51	WG	2 oz/a		A	100	0	96	95	86
9	Sencor	75	WG	6 oz/a		A					
9	2,4-D ester	4	SL	1 pt/a		A					
9	Roundup PowerMax	4.5	SL	32 fl oz/a		A					
9	AMS		WG	17 lb/100 gal		A					
9	Liberty	2.34	L	32 fl oz/a		B					
9	AMS		WG	8.5 lb/100 gal		B					
10	Authority MTZ	45	WG	16 oz/a		A	100	0	96	92	93
10	Elevore		L	1 fl oz/a		A					
10	Roundup PowerMax	4.5	SL	32 fl oz/a		A					
10	AMS		WG	17 lb/100 gal		A					
10	Liberty	2.34	L	32 fl oz/a		B					
10	AMS		WG	8.5 lb/100 gal		B					
11	Valor	51	WG	2 oz/a		A	100	0	98	94	91
11	Sencor	75	WG	6 oz/a		A					
11	Elevore		L	1 fl oz/a		A					
11	Roundup PowerMax	4.5	SL	32 fl oz/a		A					
11	AMS		WG	17 lb/100 gal		A					
11	Liberty	2.34	L	32 fl oz/a		B					
11	AMS		WG	8.5 lb/100 gal		B					
12	Authority MTZ	45	WG	16 oz/a		A	99	0	99	100	100
12	2,4-D ester	4	SL	1 pt/a		A					
12	Roundup PowerMax	4.5	SL	32 fl oz/a		A					
12	AMS		WG	17 lb/100 gal		A					
12	Liberty	2.34	L	32 fl oz/a		B					
12	Warrant	3	L	3 pt/a		B					
12	AMS		WG	8.5 lb/100 gal		B					
	LSD P=.05						4.5	.	6.1	6.7	10.3
	Standard Deviation						3.1	0.0	4.3	4.7	7.2
	CV						3.74	0.0	5.35	6.06	9.69

* Adjusted means

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