

**Waterhemp control with various PRE herbicides in LibertyLink GT27 soybean**

Trial ID: SOY18-19 Study Dir.: Sprague, Powell, Stiles  
 Conducted: Isabella Co. Investigator: Christy Sprague

**Planting Date:** Jul-8-2019 **Row Spacing:** 30 IN  
**Variety:** Credenz 2579 LLGT27 **No. of Reps:** 4  
**Population:** 150000 seeds/A **% OM:** 2.4  
**Soil Type:** SL sandy loam **pH:** 6.1  
**Plot Size:** 10 X 25 FT **Study Design:** Randomized Complete Block (RCB)

**Tillage/Previous Crops:** Spring disked; spring cultimulched  
**Fertilizer:**

**Crop and Weed Description**

<b>Weed</b>	<b>Code</b>	<b>Common Name</b>	<b>Scientific Name</b>
1	AMATU	waterhemp, tall	Amaranthus tuberculatus
<b>Crop</b>	<b>Code</b>	<b>Common Name</b>	
1	GLXMA	Soybean	

**Application Description**

	<b>A</b>	<b>B</b>
<b>Application Timing:</b>		
<b>Date Treated:</b>	Jul-8-2019	Aug-7-2019
<b>Time Treated:</b>	2:30 PM	9:30 AM
<b>% Cloud Cover:</b>	15	50
<b>Air Temp., Unit:</b>	76 F	70 F
<b>% Relative Humidity:</b>	41	77
<b>Wind Speed/Unit/Dir:</b>	5 mph NE	8 mph NW
<b>Soil Temp, Unit:</b>	78 F	72 F
<b>Leaf Moist/Dew Presence (Y/N):</b>	5	2
<b>Soil Moist:</b>	5	2

**Crop Stage at Each Application**

	<b>A</b>	<b>B</b>
<b>Crop 1 Name:</b>	GLXMA	GLXMA
<b>Height:</b>		12 "
<b>Stage:</b>		V4

**Weed Stage at Each Application**

	<b>A</b>	<b>B</b>
<b>Weed 1 Name:</b>	AMATU	AMATU
<b>Height:</b>		2-8 " (5)
<b>Stage:</b>		6-18L

**Weed Density**

	<b>1</b>
<b>Date:</b>	Aug-7-2019
<b>Weed Name:</b>	AMATU
<b>Density:</b>	35 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	22 "	20 "	120 "	19 GPA	WATER	30 psi
B	CUB	3.8 mph	AIXR	11003	28 "	20 "	120 "	19 GPA	WATER	30 psi

**Comments:** The waterhemp population at this location is Group 2 (ALS) and Group 9 (glyphosate) resistant.

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Pest Code	GLXMA	AMATU	CHEAL	GLXMA	AMATU
Crop Type, Code	Jul-29-2019	Jul-29-2019	Jul-29-2019	Aug-8-2019	Aug-8-2019
Rating Date	injury	control	control	injury	control
Rating Type	percent	percent	percent	percent	percent
Rating Unit	21 DA-A	21 DA-A	21 DA-A	31 DA-A	31 DA-A
Trt-Eval Interval	0	0	0	0	0
Number of Decimals					

Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Appl Timing	Appl Code	GLXMA Jul-29-2019 injury percent	AMATU Jul-29-2019 control percent	CHEAL Jul-29-2019 control percent	GLXMA Aug-8-2019 injury percent	AMATU Aug-8-2019 control percent
1	Alite	4	L	3 fl oz/a		PRE	A	0	43	100	0	35
1	Liberty	2.34	L	32 fl oz/a		POST	B					
1	Roundup PowerMax	4.5	SL	32 fl oz/a		POST	B					
1	AMS		WG	17 lb/100 gal		POST	B					
2	Valor	51	WG	2 oz/a		PRE	A	11	77	93	4	70
2	Liberty	2.34	L	32 fl oz/a		POST	B					
2	Roundup PowerMax	4.5	SL	32 fl oz/a		POST	B					
2	AMS		WG	17 lb/100 gal		POST	B					
3	Spartan	4	L	8 fl oz/a		PRE	A	3	56	100	1	43
3	Liberty	2.34	L	32 fl oz/a		POST	B					
3	Roundup PowerMax	4.5	SL	32 fl oz/a		POST	B					
3	AMS		WG	17 lb/100 gal		POST	B					
4	Metribuzin	75	WG	8 oz/a		PRE	A	0	33	100	0	18
4	Liberty	2.34	L	32 fl oz/a		POST	B					
4	Roundup PowerMax	4.5	SL	32 fl oz/a		POST	B					
4	AMS		WG	17 lb/100 gal		POST	B					
5	Alite	4	L	3 fl oz/a		PRE	A	1	70	100	3	47
5	Metribuzin	75	WG	6 oz/a		PRE	A					
5	Liberty	2.34	L	32 fl oz/a		POST	B					
5	Roundup PowerMax	4.5	SL	32 fl oz/a		POST	B					
5	AMS		WG	17 lb/100 gal		POST	B					
6	Dimetric Charged	3.67	L	12 fl oz/a		PRE	A	18	100	100	15	96
6	Liberty	2.34	L	32 fl oz/a		POST	B					
6	Roundup PowerMax	4.5	SL	32 fl oz/a		POST	B					
6	AMS		WG	17 lb/100 gal		POST	B					
7	Authority MTZ	45	WG	16 oz/a		PRE	A	3	76	100	0	66
7	Liberty	2.34	L	32 fl oz/a		POST	B					
7	Roundup PowerMax	4.5	SL	32 fl oz/a		POST	B					
7	AMS		WG	17 lb/100 gal		POST	B					
8	Untreated							0	0	0	0	0
9	Zidua	4.17	L	4 fl oz/a		PRE	A	3	84	86	3	65
9	Liberty	2.34	L	32 fl oz/a		POST	B					
9	Roundup PowerMax	4.5	SL	32 fl oz/a		POST	B					
9	AMS		WG	17 lb/100 gal		POST	B					
10	Dual II Magnum	7.64	L	1.33 pt/a		PRE	A	4	88	69	3	68
10	Liberty	2.34	L	32 fl oz/a		POST	B					
10	Roundup PowerMax	4.5	SL	32 fl oz/a		POST	B					
10	AMS		WG	17 lb/100 gal		POST	B					

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Pest Code	GLXMA	AMATU	CHEAL	GLXMA	AMATU
Crop Type, Code	Jul-29-2019	Jul-29-2019	Jul-29-2019	Aug-8-2019	Aug-8-2019
Rating Date	injury	control	control	injury	control
Rating Type	percent	percent	percent	percent	percent
Rating Unit	21 DA-A	21 DA-A	21 DA-A	31 DA-A	31 DA-A
Trt-Eval Interval	0	0	0	0	0
Number of Decimals					

Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Appl Timing	Appl Code					
11	Warrant	3	L	3	pt/a	PRE	A	11	100	59	8	97
11	Liberty	2.34	L	32	fl oz/a	POST	B					
11	Roundup PowerMax	4.5	SL	32	fl oz/a	POST	B					
11	AMS		WG	17	lb/100 gal	POST	B					
12	Outlook	6	L	18	fl oz/a	PRE	A	3	98	69	3	80
12	Liberty	2.34	L	32	fl oz/a	POST	B					
12	Roundup PowerMax	4.5	SL	32	fl oz/a	POST	B					
12	AMS		WG	17	lb/100 gal	POST	B					
13	Alite	4	L	2	fl oz/a	PRE	A	1	92	90	1	80
13	Zidua	4.17	L	4	fl oz/a	PRE	A					
13	Liberty	2.34	L	32	fl oz/a	POST	B					
13	Roundup PowerMax	4.5	SL	32	fl oz/a	POST	B					
13	AMS		WG	17	lb/100 gal	POST	B					
14	Fierce	76	WG	3	oz/a	PRE	A	18	100	99	14	99
14	Liberty	2.34	L	32	fl oz/a	POST	B					
14	AMS		WG	17	lb/100 gal	POST	B					
15	Authority Supreme	4.16	L	7.7	fl oz/a	PRE	A	6	98	100	6	90
15	Liberty	2.34	L	32	fl oz/a	POST	B					
15	AMS		WG	17	lb/100 gal	POST	B					
16	Fierce MTZ	2.64	L	16	fl oz/a	PRE	A	16	100	100	14	99
16	Liberty	2.34	L	32	fl oz/a	POST	B					
16	AMS		WG	17	lb/100 gal	POST	B					
	LSD P=.05							5.8	12.0	14.6	4.1	15.5
	Standard Deviation							4.1	8.4	10.3	2.9	10.9
	CV							67.81	11.13	12.06	63.64	16.58

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Pest Code	AMATU		AMATU		GLXMA
Crop Type, Code	GLXMA	AMATU	GLXMA	AMATU	GLXMA
Rating Date	Aug-14-2019	Aug-14-2019	Aug-21-2019	Aug-21-2019	Sep-11-2019
Rating Type	injury	control	injury	control	injury
Rating Unit	percent	percent	percent	percent	percent
Trt-Eval Interval	7 DA-B	7 DA-B	14 DA-B	14 DA-B	35 DA-B
Number of Decimals	0	0	0	0	0

Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Appl Timing	Appl Code	0	94	0	83	0
1	Alite	4	L	3 fl oz/a		PRE	A	0	94	0	83	0
1	Liberty	2.34	L	32 fl oz/a		POST	B					
1	Roundup PowerMax	4.5	SL	32 fl oz/a		POST	B					
1	AMS		WG	17 lb/100 gal		POST	B					
2	Valor	51	WG	2 oz/a		PRE	A	4	99	0	93	0
2	Liberty	2.34	L	32 fl oz/a		POST	B					
2	Roundup PowerMax	4.5	SL	32 fl oz/a		POST	B					
2	AMS		WG	17 lb/100 gal		POST	B					
3	Spartan	4	L	8 fl oz/a		PRE	A	1	97	0	91	0
3	Liberty	2.34	L	32 fl oz/a		POST	B					
3	Roundup PowerMax	4.5	SL	32 fl oz/a		POST	B					
3	AMS		WG	17 lb/100 gal		POST	B					
4	Metribuzin	75	WG	8 oz/a		PRE	A	0	94	0	79	0
4	Liberty	2.34	L	32 fl oz/a		POST	B					
4	Roundup PowerMax	4.5	SL	32 fl oz/a		POST	B					
4	AMS		WG	17 lb/100 gal		POST	B					
5	Alite	4	L	3 fl oz/a		PRE	A	2	95	0	89	0
5	Metribuzin	75	WG	6 oz/a		PRE	A					
5	Liberty	2.34	L	32 fl oz/a		POST	B					
5	Roundup PowerMax	4.5	SL	32 fl oz/a		POST	B					
5	AMS		WG	17 lb/100 gal		POST	B					
6	Dimetric Charged	3.67	L	12 fl oz/a		PRE	A	3	100	0	100	0
6	Liberty	2.34	L	32 fl oz/a		POST	B					
6	Roundup PowerMax	4.5	SL	32 fl oz/a		POST	B					
6	AMS		WG	17 lb/100 gal		POST	B					
7	Authority MTZ	45	WG	16 oz/a		PRE	A	0	96	0	91	0
7	Liberty	2.34	L	32 fl oz/a		POST	B					
7	Roundup PowerMax	4.5	SL	32 fl oz/a		POST	B					
7	AMS		WG	17 lb/100 gal		POST	B					
8	Untreated							0	0	0	0	0
9	Zidua	4.17	L	4 fl oz/a		PRE	A	1	97	0	95	0
9	Liberty	2.34	L	32 fl oz/a		POST	B					
9	Roundup PowerMax	4.5	SL	32 fl oz/a		POST	B					
9	AMS		WG	17 lb/100 gal		POST	B					
10	Dual II Magnum	7.64	L	1.33 pt/a		PRE	A	3	98	0	98	0
10	Liberty	2.34	L	32 fl oz/a		POST	B					
10	Roundup PowerMax	4.5	SL	32 fl oz/a		POST	B					
10	AMS		WG	17 lb/100 gal		POST	B					

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Pest Code	AMATU		AMATU		GLXMA
Crop Type, Code	GLXMA	AMATU	GLXMA	AMATU	GLXMA
Rating Date	Aug-14-2019	Aug-14-2019	Aug-21-2019	Aug-21-2019	Sep-11-2019
Rating Type	injury	control	injury	control	injury
Rating Unit	percent	percent	percent	percent	percent
Trt-Eval Interval	7 DA-B	7 DA-B	14 DA-B	14 DA-B	35 DA-B
Number of Decimals	0	0	0	0	0

Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Appl Timing	Appl Code					
11	Warrant	3	L	3	pt/a	PRE	A	2	100	0	99	0
11	Liberty	2.34	L	32	fl oz/a	POST	B					
11	Roundup PowerMax	4.5	SL	32	fl oz/a	POST	B					
11	AMS		WG	17	lb/100 gal	POST	B					
12	Outlook	6	L	18	fl oz/a	PRE	A	1	100	0	100	0
12	Liberty	2.34	L	32	fl oz/a	POST	B					
12	Roundup PowerMax	4.5	SL	32	fl oz/a	POST	B					
12	AMS		WG	17	lb/100 gal	POST	B					
13	Alite	4	L	2	fl oz/a	PRE	A	1	99	0	99	0
13	Zidua	4.17	L	4	fl oz/a	PRE	A					
13	Liberty	2.34	L	32	fl oz/a	POST	B					
13	Roundup PowerMax	4.5	SL	32	fl oz/a	POST	B					
13	AMS		WG	17	lb/100 gal	POST	B					
14	Fierce	76	WG	3	oz/a	PRE	A	3	100	0	100	0
14	Liberty	2.34	L	32	fl oz/a	POST	B					
14	AMS		WG	17	lb/100 gal	POST	B					
15	Authority Supreme	4.16	L	7.7	fl oz/a	PRE	A	2	100	0	100	0
15	Liberty	2.34	L	32	fl oz/a	POST	B					
15	AMS		WG	17	lb/100 gal	POST	B					
16	Fierce MTZ	2.64	L	16	fl oz/a	PRE	A	2	100	0	100	0
16	Liberty	2.34	L	32	fl oz/a	POST	B					
16	AMS		WG	17	lb/100 gal	POST	B					
	LSD P=.05							3.1	2.3	.	7.1	.
	Standard Deviation							2.2	1.6	0.0	5.0	0.0
	CV							161.94	1.76	0.0	5.63	0.0

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Location: Isabella Co.

Investigator: Christy Sprague

Study Director: Sprague, Powell, Stiles

Pest Code	AMATU
Crop Type, Code	
Rating Date	Sep-11-2019
Rating Type	control
Rating Unit	percent
Trt-Eval Interval	35 DA-B
Number of Decimals	0

Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Appl Timing	Appl Code	
1	Alite	4	L	3 fl oz/a		PRE	A	73
1	Liberty	2.34	L	32 fl oz/a		POST	B	
1	Roundup PowerMax	4.5	SL	32 fl oz/a		POST	B	
1	AMS		WG	17 lb/100 gal		POST	B	
2	Valor	51	WG	2 oz/a		PRE	A	90
2	Liberty	2.34	L	32 fl oz/a		POST	B	
2	Roundup PowerMax	4.5	SL	32 fl oz/a		POST	B	
2	AMS		WG	17 lb/100 gal		POST	B	
3	Spartan	4	L	8 fl oz/a		PRE	A	83
3	Liberty	2.34	L	32 fl oz/a		POST	B	
3	Roundup PowerMax	4.5	SL	32 fl oz/a		POST	B	
3	AMS		WG	17 lb/100 gal		POST	B	
4	Metribuzin	75	WG	8 oz/a		PRE	A	70
4	Liberty	2.34	L	32 fl oz/a		POST	B	
4	Roundup PowerMax	4.5	SL	32 fl oz/a		POST	B	
4	AMS		WG	17 lb/100 gal		POST	B	
5	Alite	4	L	3 fl oz/a		PRE	A	84
5	Metribuzin	75	WG	6 oz/a		PRE	A	
5	Liberty	2.34	L	32 fl oz/a		POST	B	
5	Roundup PowerMax	4.5	SL	32 fl oz/a		POST	B	
5	AMS		WG	17 lb/100 gal		POST	B	
6	Dimetric Charged	3.67	L	12 fl oz/a		PRE	A	99
6	Liberty	2.34	L	32 fl oz/a		POST	B	
6	Roundup PowerMax	4.5	SL	32 fl oz/a		POST	B	
6	AMS		WG	17 lb/100 gal		POST	B	
7	Authority MTZ	45	WG	16 oz/a		PRE	A	87
7	Liberty	2.34	L	32 fl oz/a		POST	B	
7	Roundup PowerMax	4.5	SL	32 fl oz/a		POST	B	
7	AMS		WG	17 lb/100 gal		POST	B	
8	Untreated							0
9	Zidua	4.17	L	4 fl oz/a		PRE	A	93
9	Liberty	2.34	L	32 fl oz/a		POST	B	
9	Roundup PowerMax	4.5	SL	32 fl oz/a		POST	B	
9	AMS		WG	17 lb/100 gal		POST	B	
10	Dual II Magnum	7.64	L	1.33 pt/a		PRE	A	92
10	Liberty	2.34	L	32 fl oz/a		POST	B	
10	Roundup PowerMax	4.5	SL	32 fl oz/a		POST	B	
10	AMS		WG	17 lb/100 gal		POST	B	

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Study Director: Sprague, Powell, Stiles

Pest Code	AMATU
Crop Type, Code	
Rating Date	Sep-11-2019
Rating Type	control
Rating Unit	percent
Trt-Eval Interval	35 DA-B
Number of Decimals	0

Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Appl Timing	Appl Code	
11	Warrant	3	L	3	pt/a	PRE	A	98
11	Liberty	2.34	L	32	fl oz/a	POST	B	
11	Roundup PowerMax	4.5	SL	32	fl oz/a	POST	B	
11	AMS		WG	17	lb/100 gal	POST	B	
12	Outlook	6	L	18	fl oz/a	PRE	A	98
12	Liberty	2.34	L	32	fl oz/a	POST	B	
12	Roundup PowerMax	4.5	SL	32	fl oz/a	POST	B	
12	AMS		WG	17	lb/100 gal	POST	B	
13	Alite	4	L	2	fl oz/a	PRE	A	99
13	Zidua	4.17	L	4	fl oz/a	PRE	A	
13	Liberty	2.34	L	32	fl oz/a	POST	B	
13	Roundup PowerMax	4.5	SL	32	fl oz/a	POST	B	
13	AMS		WG	17	lb/100 gal	POST	B	
14	Fierce	76	WG	3	oz/a	PRE	A	100
14	Liberty	2.34	L	32	fl oz/a	POST	B	
14	AMS		WG	17	lb/100 gal	POST	B	
15	Authority Supreme	4.16	L	7.7	fl oz/a	PRE	A	99
15	Liberty	2.34	L	32	fl oz/a	POST	B	
15	AMS		WG	17	lb/100 gal	POST	B	
16	Fierce MTZ	2.64	L	16	fl oz/a	PRE	A	100
16	Liberty	2.34	L	32	fl oz/a	POST	B	
16	AMS		WG	17	lb/100 gal	POST	B	
	LSD P=.05							9.5
	Standard Deviation							6.7
	CV							7.82