

**Sugarbeet tolerance of overlapping residuals for control of herbicide-resistant waterhemp**

Trial ID: SB02-18 Study Dir.: Sprague, Powell, Stiles  
 Conducted: SVREC Investigator: Christy Sprague

**Planting Date:** Apr-23-2018 **Row Spacing:** 30 IN  
**Variety:** Crystal G515 **No. of Reps:** 4  
**Population:** 4.375 " spacing **% OM:** 2.3  
**Soil Type:** CL clay loam **pH:** 8.0  
**Plot Size:** 10 X 30 FT **Study Design:** Randomized Complete Block (RCB)

**Tillage/Previous Crops:** Fall moldboard plow; early spring field cultivated; planted into a stale seedbed.

**Fertilizer:**

**Crop and Weed Description**

Weed	Code	Common Name	Scientific Name
1	POLCO	buckwheat, wild	Polygonum convolvulus
2	CHEAL	lambquarters, common	Chenopodium album
3	AMAPO	amaranth, Powell	Amaranthus powellii

Crop	Code	Common Name
1	BETVU	Sugarbeet

**Application Description**

	A	B	C
<b>Application Timing:</b>	PRE	2-leaf	6-8 leaf
<b>Date Treated:</b>	Apr-23-2018	May-23-2018	Jun-19-2018
<b>Time Treated:</b>	4:45 PM	2:00 PM	11:30 AM
<b>% Cloud Cover:</b>	10	0	95
<b>Air Temp., Unit:</b>	69 F	75 F	75 F
<b>% Relative Humidity:</b>	32	36	39
<b>Wind Speed/Unit/Dir:</b>	8 mph E	1 mph W	1 mph W
<b>Soil Temp, Unit:</b>	48 F	68 F	73 F
<b>Leaf Moist/Dew Presence (Y/N):</b>	5	3	5
<b>Soil Moist:</b>	3	3	4

**Crop Stage at Each Application**

	A	B	C
<b>Crop 1 Name:</b>	BETVU	BETVU	BETVU
<b>Height:</b>	1 "	8 "	
<b>Stage:</b>	2L	8L	

**Weed Stage at Each Application**

	A	B	C
<b>Weed 1 Name:</b>	POLCO	POLCO	POLCO
<b>Height:</b>		3-4 " (3.5)	2-4 " (3)
<b>Stage:</b>		2-4L	4-8L
<b>Weed 2 Name:</b>	CHEAL	CHEAL	CHEAL
<b>Height:</b>		1 "	1-2 " (1.5)
<b>Stage:</b>		2-4L	2-6L
<b>Weed 3 Name:</b>	AMAPO	AMAPO	AMAPO
<b>Height:</b>			1-2 " (1.5)
<b>Stage:</b>			6-8L

**Application Equipment**

Appl	Sprayer	Ground Speed	Nozzle Type	Nozzle Size	Nozzle Height	Nozzle Spacing	Boom Width	Spray Volume	Carrier	Operation Pressure
A	CUB	3.8 mph	AIXR	11003	20 "	20 "	100 "	19 GPA	WATER	30 psi
B	CUB	3.8 mph	AIXR	11003	23 "	20 "	100 "	19 GPA	WATER	30 psi
C	CUB	3.8 mph	AIXR	11003	24 "	20 "	100 "	19 GPA	WATER	30 psi

**Comments:**

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Location: SVREC

Investigator: Christy Sprague

Study Director: Sprague, Powell, Stiles

Pest Code	BETVU	POLCO	CHEAL	BETVU	POLCO
Crop Code	May-30-2018	May-30-2018	May-30-2018	Jun-19-2018	Jun-19-2018
Rating Date	injury	control	control	injury	control
Rating Type	percent	percent	percent	percent	percent
Rating Unit	7 DA-B	7 DA-B	7 DA-B	0 DA-C	0 DA-C
Trt-Eval Interval	0	0	0	0	0
Number of Decimals					

Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Growth Stage	Appl Code						
1	Roundup PowerMax	4.5	SL	32 fl oz/a		2 leaf	B	1	64	95	0	91	
1	AMS		WG	17 lb/100 gal		2 leaf	B						
1	Roundup PowerMax	4.5	SL	22 fl oz/a		6-8 leaf	C						
1	AMS		WG	17 lb/100 gal		6-8 leaf	C						
2	Dual II Magnum	7.64	L	1 pt/a		2 leaf	B	9	71	100	3	88	
2	Roundup PowerMax	4.5	SL	32 fl oz/a		2 leaf	B						
2	AMS		WG	17 lb/100 gal		2 leaf	B						
2	Dual II Magnum	7.64	L	1 pt/a		6-8 leaf	C						
2	Roundup PowerMax	4.5	SL	22 fl oz/a		6-8 leaf	C						
2	AMS		WG	17 lb/100 gal		6-8 leaf	C						
3	Warrant	3	L	3 pt/a		2 leaf	B	2	60	67	0	77	
3	Roundup PowerMax	4.5	SL	32 fl oz/a		2 leaf	B						
3	AMS		WG	17 lb/100 gal		2 leaf	B						
3	Warrant	3	L	3 pt/a		6-8 leaf	C						
3	Roundup PowerMax	4.5	SL	22 fl oz/a		6-8 leaf	C						
3	AMS		WG	17 lb/100 gal		6-8 leaf	C						
4	Outlook	6	L	12 fl oz/a		2 leaf	B	6	69	92	1	85	
4	Roundup PowerMax	4.5	SL	32 fl oz/a		2 leaf	B						
4	AMS		WG	17 lb/100 gal		2 leaf	B						
4	Outlook	6	L	12 fl oz/a		6-8 leaf	C						
4	Roundup PowerMax	4.5	SL	22 fl oz/a		6-8 leaf	C						
4	AMS		WG	17 lb/100 gal		6-8 leaf	C						
5	Ethofumesate	4	L	2 pt/a		PRE	A	3	84	100	0	95	
5	Dual II Magnum	7.64	L	1 pt/a		2 leaf	B						
5	Roundup PowerMax	4.5	SL	32 fl oz/a		2 leaf	B						
5	AMS		WG	17 lb/100 gal		2 leaf	B						
5	Dual II Magnum	7.64	L	1 pt/a		6-8 leaf	C						
5	Roundup PowerMax	4.5	SL	22 fl oz/a		6-8 leaf	C						
5	AMS		WG	17 lb/100 gal		6-8 leaf	C						
6	Ethofumesate	4	L	2 pt/a		PRE	A	11	80	87	4	93	
6	Warrant	3	L	3 pt/a		2 leaf	B						
6	Roundup PowerMax	4.5	SL	32 fl oz/a		2 leaf	B						
6	AMS		WG	17 lb/100 gal		2 leaf	B						
6	Warrant	3	L	3 pt/a		6-8 leaf	C						
6	Roundup PowerMax	4.5	SL	22 fl oz/a		6-8 leaf	C						
6	AMS		WG	17 lb/100 gal		6-8 leaf	C						
7	Ethofumesate	4	L	2 pt/a		PRE	A	18	83	99	4	94	
7	Outlook	6	L	12 fl oz/a		2 leaf	B						
7	Roundup PowerMax	4.5	SL	32 fl oz/a		2 leaf	B						
7	AMS		WG	17 lb/100 gal		2 leaf	B						
7	Outlook	6	L	12 fl oz/a		6-8 leaf	C						
7	Roundup PowerMax	4.5	SL	22 fl oz/a		6-8 leaf	C						
7	AMS		WG	17 lb/100 gal		6-8 leaf	C						

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Location: SVREC

Investigator: Christy Sprague

Study Director: Sprague, Powell, Stiles

Pest Code										
Crop Code						BETVU	POLCO	CHEAL	BETVU	POLCO
Rating Date						May-30-2018	May-30-2018	May-30-2018	Jun-19-2018	Jun-19-2018
Rating Type						injury	control	control	injury	control
Rating Unit						percent	percent	percent	percent	percent
Trt-Eval Interval						7 DA-B	7 DA-B	7 DA-B	0 DA-C	0 DA-C
Number of Decimals						0	0	0	0	0

Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Growth Stage	Appl Code						
8	Ethofumesate	4	L	2	pt/a	PRE	A	17	90	100	0	94	
8	Ethofumesate	4	L	2	pt/a	2 leaf	B						
8	Roundup PowerMax	4.5	SL	32	fl oz/a	2 leaf	B						
8	Destiny HC		L	1.5	pt/a	2 leaf	B						
8	AMS		WG	17	lb/100 gal	2 leaf	B						
8	Ethofumesate	4	L	2	pt/a	6-8 leaf	C						
8	Roundup PowerMax	4.5	SL	22	fl oz/a	6-8 leaf	C						
8	Destiny HC		L	1.5	pt/a	6-8 leaf	C						
8	AMS		WG	17	lb/100 gal	6-8 leaf	C						
9	Dual II Magnum	7.64	L	0.5	pt/a	PRE	A	6	85	100	1	88	
9	Dual II Magnum	7.64	L	1	pt/a	2 leaf	B						
9	Roundup PowerMax	4.5	SL	32	fl oz/a	2 leaf	B						
9	AMS		WG	17	lb/100 gal	2 leaf	B						
9	Dual II Magnum	7.64	L	1	pt/a	6-8 leaf	C						
9	Roundup PowerMax	4.5	SL	22	fl oz/a	6-8 leaf	C						
9	AMS		WG	17	lb/100 gal	6-8 leaf	C						
10	Dual II Magnum	7.64	L	0.5	pt/a	PRE	A	11	75	80	3	88	
10	Warrant	3	L	3	pt/a	2 leaf	B						
10	Roundup PowerMax	4.5	SL	32	fl oz/a	2 leaf	B						
10	AMS		WG	17	lb/100 gal	2 leaf	B						
10	Warrant	3	L	3	pt/a	6-8 leaf	C						
10	Roundup PowerMax	4.5	SL	22	fl oz/a	6-8 leaf	C						
10	AMS		WG	17	lb/100 gal	6-8 leaf	C						
11	Dual II Magnum	7.64	L	0.5	pt/a	PRE	A	15	70	95	1	88	
11	Outlook	6	L	12	fl oz/a	2 leaf	B						
11	Roundup PowerMax	4.5	SL	32	fl oz/a	2 leaf	B						
11	AMS		WG	17	lb/100 gal	2 leaf	B						
11	Outlook	6	L	12	fl oz/a	6-8 leaf	C						
11	Roundup PowerMax	4.5	SL	22	fl oz/a	6-8 leaf	C						
11	AMS		WG	17	lb/100 gal	6-8 leaf	C						
12	Dual II Magnum	7.64	L	0.5	pt/a	PRE	A	6	84	97	0	96	
12	Ethofumesate	4	L	2	pt/a	2 leaf	B						
12	Roundup PowerMax	4.5	SL	32	fl oz/a	2 leaf	B						
12	Destiny HC		L	1.5	pt/a	2 leaf	B						
12	AMS		WG	17	lb/100 gal	2 leaf	B						
12	Ethofumesate	4	L	2	pt/a	6-8 leaf	C						
12	Roundup PowerMax	4.5	SL	22	fl oz/a	6-8 leaf	C						
12	Destiny HC		L	1.5	pt/a	6-8 leaf	C						
12	AMS		WG	17	lb/100 gal	6-8 leaf	C						
13	Ethofumesate	4	L	2	pt/a	PRE	A	14	98	100	3	91	
13	Betamix	1.3	L	2	pt/a	2 leaf	B						
13	Roundup PowerMax	4.5	SL	32	fl oz/a	2 leaf	B						
13	AMS		WG	17	lb/100 gal	2 leaf	B						
13	Betamix	1.3	L	3	pt/a	6-8 leaf	C						
13	Roundup PowerMax	4.5	SL	22	fl oz/a	6-8 leaf	C						
13	AMS		WG	17	lb/100 gal	6-8 leaf	C						

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Pest Code		POLCO	CHEAL		POLCO
Crop Code		BETVU		BETVU	
Rating Date		May-30-2018	May-30-2018	May-30-2018	Jun-19-2018
Rating Type		injury	control	control	injury
Rating Unit		percent	percent	percent	percent
Trt-Eval Interval		7 DA-B	7 DA-B	7 DA-B	0 DA-C
Number of Decimals		0	0	0	0

Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Growth Stage	Appl Code					
14	Ethofumesate	4	L	2	pt/a	PRE	A	11	97	100	0	90
14	Betamix	1.3	L	2	pt/a	2 leaf	B					
14	Roundup PowerMax	4.5	SL	32	fl oz/a	2 leaf	B					
14	AMS		WG	17	lb/100 gal	2 leaf	B					
14	Dual II Magnum	7.64	L	1.33	pt/a	6-8 leaf	C					
14	Betamix	1.3	L	3	pt/a	6-8 leaf	C					
14	Roundup PowerMax	4.5	SL	22	fl oz/a	6-8 leaf	C					
14	AMS		WG	17	lb/100 gal	6-8 leaf	C					
15	Ethofumesate	4	L	2	pt/a	PRE	A	13	97	99	3	89
15	Betamix	1.3	L	2	pt/a	2 leaf	B					
15	Roundup PowerMax	4.5	SL	32	fl oz/a	2 leaf	B					
15	AMS		WG	17	lb/100 gal	2 leaf	B					
15	Warrant	3	L	3	pt/a	6-8 leaf	C					
15	Betamix	1.3	L	3	pt/a	6-8 leaf	C					
15	Roundup PowerMax	4.5	SL	22	fl oz/a	6-8 leaf	C					
15	AMS		WG	17	lb/100 gal	6-8 leaf	C					
16	Ethofumesate	4	L	2	pt/a	PRE	A	14	99	100	6	93
16	Betamix	1.3	L	2	pt/a	2 leaf	B					
16	Roundup PowerMax	4.5	SL	32	fl oz/a	2 leaf	B					
16	AMS		WG	17	lb/100 gal	2 leaf	B					
16	Outlook	6	L	21	fl oz/a	6-8 leaf	C					
16	Betamix	1.3	L	3	pt/a	6-8 leaf	C					
16	Roundup PowerMax	4.5	SL	22	fl oz/a	6-8 leaf	C					
16	AMS		WG	17	lb/100 gal	6-8 leaf	C					
	LSD P=.05							12.0	13.8	8.3	3.3	11.9
	Standard Deviation							8.4	9.7	5.8	2.3	8.4
	CV							86.24	11.85	6.14	135.35	9.34

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Study Director: Sprague, Powell, Stiles

Pest Code	CHEAL	AMAPO	BETVU	CHEAL	POLCO
Crop Code					
Rating Date	Jun-19-2018	Jun-19-2018	Jul-3-2018	Jul-3-2018	Jul-3-2018
Rating Type	control	control	injury	control	control
Rating Unit	percent	percent	percent	percent	percent
Trt-Eval Interval	0 DA-C	0 DA-C	14 DA-C	14 DA-C	14 DA-C
Number of Decimals	0	0	0	0	0

Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Growth Stage	Appl Code					
1	Roundup PowerMax	4.5	SL	32	fl oz/a	2 leaf	B	94	98	0	98	93
1	AMS		WG	17	lb/100 gal	2 leaf	B					
1	Roundup PowerMax	4.5	SL	22	fl oz/a	6-8 leaf	C					
1	AMS		WG	17	lb/100 gal	6-8 leaf	C					
2	Dual II Magnum	7.64	L	1	pt/a	2 leaf	B	98	100	0	99	93
2	Roundup PowerMax	4.5	SL	32	fl oz/a	2 leaf	B					
2	AMS		WG	17	lb/100 gal	2 leaf	B					
2	Dual II Magnum	7.64	L	1	pt/a	6-8 leaf	C					
2	Roundup PowerMax	4.5	SL	22	fl oz/a	6-8 leaf	C					
2	AMS		WG	17	lb/100 gal	6-8 leaf	C					
3	Warrant	3	L	3	pt/a	2 leaf	B	85	100	0	88	84
3	Roundup PowerMax	4.5	SL	32	fl oz/a	2 leaf	B					
3	AMS		WG	17	lb/100 gal	2 leaf	B					
3	Warrant	3	L	3	pt/a	6-8 leaf	C					
3	Roundup PowerMax	4.5	SL	22	fl oz/a	6-8 leaf	C					
3	AMS		WG	17	lb/100 gal	6-8 leaf	C					
4	Outlook	6	L	12	fl oz/a	2 leaf	B	89	95	0	100	88
4	Roundup PowerMax	4.5	SL	32	fl oz/a	2 leaf	B					
4	AMS		WG	17	lb/100 gal	2 leaf	B					
4	Outlook	6	L	12	fl oz/a	6-8 leaf	C					
4	Roundup PowerMax	4.5	SL	22	fl oz/a	6-8 leaf	C					
4	AMS		WG	17	lb/100 gal	6-8 leaf	C					
5	Ethofumesate	4	L	2	pt/a	PRE	A	94	100	0	100	96
5	Dual II Magnum	7.64	L	1	pt/a	2 leaf	B					
5	Roundup PowerMax	4.5	SL	32	fl oz/a	2 leaf	B					
5	AMS		WG	17	lb/100 gal	2 leaf	B					
5	Dual II Magnum	7.64	L	1	pt/a	6-8 leaf	C					
5	Roundup PowerMax	4.5	SL	22	fl oz/a	6-8 leaf	C					
5	AMS		WG	17	lb/100 gal	6-8 leaf	C					
6	Ethofumesate	4	L	2	pt/a	PRE	A	89	100	0	98	95
6	Warrant	3	L	3	pt/a	2 leaf	B					
6	Roundup PowerMax	4.5	SL	32	fl oz/a	2 leaf	B					
6	AMS		WG	17	lb/100 gal	2 leaf	B					
6	Warrant	3	L	3	pt/a	6-8 leaf	C					
6	Roundup PowerMax	4.5	SL	22	fl oz/a	6-8 leaf	C					
6	AMS		WG	17	lb/100 gal	6-8 leaf	C					
7	Ethofumesate	4	L	2	pt/a	PRE	A	91	100	0	100	98
7	Outlook	6	L	12	fl oz/a	2 leaf	B					
7	Roundup PowerMax	4.5	SL	32	fl oz/a	2 leaf	B					
7	AMS		WG	17	lb/100 gal	2 leaf	B					
7	Outlook	6	L	12	fl oz/a	6-8 leaf	C					
7	Roundup PowerMax	4.5	SL	22	fl oz/a	6-8 leaf	C					
7	AMS		WG	17	lb/100 gal	6-8 leaf	C					

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Pest Code	CHEAL	AMAPO	BETVU	CHEAL	POLCO
Crop Code					
Rating Date	Jun-19-2018	Jun-19-2018	Jul-3-2018	Jul-3-2018	Jul-3-2018
Rating Type	control	control	injury	control	control
Rating Unit	percent	percent	percent	percent	percent
Trt-Eval Interval	0 DA-C	0 DA-C	14 DA-C	14 DA-C	14 DA-C
Number of Decimals	0	0	0	0	0

Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Growth Stage	Appl Code					
8	Ethofumesate	4	L	2	pt/a	PRE	A	96	100	1	99	98
8	Ethofumesate	4	L	2	pt/a	2 leaf	B					
8	Roundup PowerMax	4.5	SL	32	fl oz/a	2 leaf	B					
8	Destiny HC		L	1.5	pt/a	2 leaf	B					
8	AMS		WG	17	lb/100 gal	2 leaf	B					
8	Ethofumesate	4	L	2	pt/a	6-8 leaf	C					
8	Roundup PowerMax	4.5	SL	22	fl oz/a	6-8 leaf	C					
8	Destiny HC		L	1.5	pt/a	6-8 leaf	C					
8	AMS		WG	17	lb/100 gal	6-8 leaf	C					
9	Dual II Magnum	7.64	L	0.5	pt/a	PRE	A	96	100	0	100	91
9	Dual II Magnum	7.64	L	1	pt/a	2 leaf	B					
9	Roundup PowerMax	4.5	SL	32	fl oz/a	2 leaf	B					
9	AMS		WG	17	lb/100 gal	2 leaf	B					
9	Dual II Magnum	7.64	L	1	pt/a	6-8 leaf	C					
9	Roundup PowerMax	4.5	SL	22	fl oz/a	6-8 leaf	C					
9	AMS		WG	17	lb/100 gal	6-8 leaf	C					
10	Dual II Magnum	7.64	L	0.5	pt/a	PRE	A	83	100	0	90	91
10	Warrant	3	L	3	pt/a	2 leaf	B					
10	Roundup PowerMax	4.5	SL	32	fl oz/a	2 leaf	B					
10	AMS		WG	17	lb/100 gal	2 leaf	B					
10	Warrant	3	L	3	pt/a	6-8 leaf	C					
10	Roundup PowerMax	4.5	SL	22	fl oz/a	6-8 leaf	C					
10	AMS		WG	17	lb/100 gal	6-8 leaf	C					
11	Dual II Magnum	7.64	L	0.5	pt/a	PRE	A	93	100	0	100	94
11	Outlook	6	L	12	fl oz/a	2 leaf	B					
11	Roundup PowerMax	4.5	SL	32	fl oz/a	2 leaf	B					
11	AMS		WG	17	lb/100 gal	2 leaf	B					
11	Outlook	6	L	12	fl oz/a	6-8 leaf	C					
11	Roundup PowerMax	4.5	SL	22	fl oz/a	6-8 leaf	C					
11	AMS		WG	17	lb/100 gal	6-8 leaf	C					
12	Dual II Magnum	7.64	L	0.5	pt/a	PRE	A	96	100	0	99	96
12	Ethofumesate	4	L	2	pt/a	2 leaf	B					
12	Roundup PowerMax	4.5	SL	32	fl oz/a	2 leaf	B					
12	Destiny HC		L	1.5	pt/a	2 leaf	B					
12	AMS		WG	17	lb/100 gal	2 leaf	B					
12	Ethofumesate	4	L	2	pt/a	6-8 leaf	C					
12	Roundup PowerMax	4.5	SL	22	fl oz/a	6-8 leaf	C					
12	Destiny HC		L	1.5	pt/a	6-8 leaf	C					
12	AMS		WG	17	lb/100 gal	6-8 leaf	C					
13	Ethofumesate	4	L	2	pt/a	PRE	A	91	93	0	100	98
13	Betamix	1.3	L	2	pt/a	2 leaf	B					
13	Roundup PowerMax	4.5	SL	32	fl oz/a	2 leaf	B					
13	AMS		WG	17	lb/100 gal	2 leaf	B					
13	Betamix	1.3	L	3	pt/a	6-8 leaf	C					
13	Roundup PowerMax	4.5	SL	22	fl oz/a	6-8 leaf	C					
13	AMS		WG	17	lb/100 gal	6-8 leaf	C					

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Crop Code					
Rating Date	Jun-19-2018	Jun-19-2018	Jul-3-2018	Jul-3-2018	Jul-3-2018
Rating Type	control	control	injury	control	control
Rating Unit	percent	percent	percent	percent	percent
Trt-Eval Interval	0 DA-C	0 DA-C	14 DA-C	14 DA-C	14 DA-C
Number of Decimals	0	0	0	0	0

Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Growth Stage	Appl Code					
14	Ethofumesate	4	L	2	pt/a	PRE	A	91	99	0	100	96
14	Betamix	1.3	L	2	pt/a	2 leaf	B					
14	Roundup PowerMax	4.5	SL	32	fl oz/a	2 leaf	B					
14	AMS		WG	17	lb/100 gal	2 leaf	B					
14	Dual II Magnum	7.64	L	1.33	pt/a	6-8 leaf	C					
14	Betamix	1.3	L	3	pt/a	6-8 leaf	C					
14	Roundup PowerMax	4.5	SL	22	fl oz/a	6-8 leaf	C					
14	AMS		WG	17	lb/100 gal	6-8 leaf	C					
15	Ethofumesate	4	L	2	pt/a	PRE	A	86	100	0	99	97
15	Betamix	1.3	L	2	pt/a	2 leaf	B					
15	Roundup PowerMax	4.5	SL	32	fl oz/a	2 leaf	B					
15	AMS		WG	17	lb/100 gal	2 leaf	B					
15	Warrant	3	L	3	pt/a	6-8 leaf	C					
15	Betamix	1.3	L	3	pt/a	6-8 leaf	C					
15	Roundup PowerMax	4.5	SL	22	fl oz/a	6-8 leaf	C					
15	AMS		WG	17	lb/100 gal	6-8 leaf	C					
16	Ethofumesate	4	L	2	pt/a	PRE	A	89	98	0	100	96
16	Betamix	1.3	L	2	pt/a	2 leaf	B					
16	Roundup PowerMax	4.5	SL	32	fl oz/a	2 leaf	B					
16	AMS		WG	17	lb/100 gal	2 leaf	B					
16	Outlook	6	L	21	fl oz/a	6-8 leaf	C					
16	Betamix	1.3	L	3	pt/a	6-8 leaf	C					
16	Roundup PowerMax	4.5	SL	22	fl oz/a	6-8 leaf	C					
16	AMS		WG	17	lb/100 gal	6-8 leaf	C					
	LSD P=.05							8.2	5.4	0.5	5.8	6.8
	Standard Deviation							5.7	3.8	0.4	4.0	4.8
	CV							6.3	3.87	809.04	4.11	5.11

## Sugarbeet tolerance of overlapping residuals for control of herbicide-resistant waterhemp

Trial ID: SB02-18

Location: SVREC

Investigator: Christy Sprague

Study Director: Sprague, Powell, Stiles

Pest Code	AMAPO	BETVU	BETVU	BETVU	BETVU
Crop Code	Jul-3-2018	Sep-18-2018	Sep-18-2018	Sep-18-2018	Sep-18-2018
Rating Date	control	stand count	% sugar	yield	RWST
Rating Type	percent	100' row		ton/acre	#/ton
Rating Unit	14 DA-C	148 DA-A	148 DA-A	148 DA-A	148 DA-A
Trt-Eval Interval	0	0	1	1	0
Number of Decimals					

Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Growth Stage	Appl Code					
1	Roundup PowerMax	4.5	SL	32 fl oz/a		2 leaf	B	97	200	15.5	27.2	220
1	AMS		WG	17 lb/100 gal		2 leaf	B					
1	Roundup PowerMax	4.5	SL	22 fl oz/a		6-8 leaf	C					
1	AMS		WG	17 lb/100 gal		6-8 leaf	C					
2	Dual II Magnum	7.64	L	1 pt/a		2 leaf	B	100	189	15.3	24.5	218
2	Roundup PowerMax	4.5	SL	32 fl oz/a		2 leaf	B					
2	AMS		WG	17 lb/100 gal		2 leaf	B					
2	Dual II Magnum	7.64	L	1 pt/a		6-8 leaf	C					
2	Roundup PowerMax	4.5	SL	22 fl oz/a		6-8 leaf	C					
2	AMS		WG	17 lb/100 gal		6-8 leaf	C					
3	Warrant	3	L	3 pt/a		2 leaf	B	100	207	15.3	23.7	217
3	Roundup PowerMax	4.5	SL	32 fl oz/a		2 leaf	B					
3	AMS		WG	17 lb/100 gal		2 leaf	B					
3	Warrant	3	L	3 pt/a		6-8 leaf	C					
3	Roundup PowerMax	4.5	SL	22 fl oz/a		6-8 leaf	C					
3	AMS		WG	17 lb/100 gal		6-8 leaf	C					
4	Outlook	6	L	12 fl oz/a		2 leaf	B	100	188	15.3	23.3	216
4	Roundup PowerMax	4.5	SL	32 fl oz/a		2 leaf	B					
4	AMS		WG	17 lb/100 gal		2 leaf	B					
4	Outlook	6	L	12 fl oz/a		6-8 leaf	C					
4	Roundup PowerMax	4.5	SL	22 fl oz/a		6-8 leaf	C					
4	AMS		WG	17 lb/100 gal		6-8 leaf	C					
5	Ethofumesate	4	L	2 pt/a		PRE	A	100	206	15.6	24.9	223
5	Dual II Magnum	7.64	L	1 pt/a		2 leaf	B					
5	Roundup PowerMax	4.5	SL	32 fl oz/a		2 leaf	B					
5	AMS		WG	17 lb/100 gal		2 leaf	B					
5	Dual II Magnum	7.64	L	1 pt/a		6-8 leaf	C					
5	Roundup PowerMax	4.5	SL	22 fl oz/a		6-8 leaf	C					
5	AMS		WG	17 lb/100 gal		6-8 leaf	C					
6	Ethofumesate	4	L	2 pt/a		PRE	A	100	180	15.4	21.9	220
6	Warrant	3	L	3 pt/a		2 leaf	B					
6	Roundup PowerMax	4.5	SL	32 fl oz/a		2 leaf	B					
6	AMS		WG	17 lb/100 gal		2 leaf	B					
6	Warrant	3	L	3 pt/a		6-8 leaf	C					
6	Roundup PowerMax	4.5	SL	22 fl oz/a		6-8 leaf	C					
6	AMS		WG	17 lb/100 gal		6-8 leaf	C					
7	Ethofumesate	4	L	2 pt/a		PRE	A	99	180	15.1	23.9	214
7	Outlook	6	L	12 fl oz/a		2 leaf	B					
7	Roundup PowerMax	4.5	SL	32 fl oz/a		2 leaf	B					
7	AMS		WG	17 lb/100 gal		2 leaf	B					
7	Outlook	6	L	12 fl oz/a		6-8 leaf	C					
7	Roundup PowerMax	4.5	SL	22 fl oz/a		6-8 leaf	C					
7	AMS		WG	17 lb/100 gal		6-8 leaf	C					



**Sugarbeet tolerance of overlapping residuals for control of herbicide-resistant waterhemp**

Trial ID: SB02-18

Location: SVREC

Investigator: Christy Sprague

Study Director: Sprague, Powell, Stiles

Pest Code	AMAPO	BETVU	BETVU	BETVU	BETVU
Crop Code	Jul-3-2018	Sep-18-2018	Sep-18-2018	Sep-18-2018	Sep-18-2018
Rating Date	control	stand count	% sugar	yield	RWST
Rating Type	percent	100' row		ton/acre	#/ton
Rating Unit	14 DA-C	148 DA-A	148 DA-A	148 DA-A	148 DA-A
Trt-Eval Interval	0	0	1	1	0
Number of Decimals					

Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Growth Stage	Appl Code					
8	Ethofumesate	4	L	2	pt/a	PRE	A	100	197	15.1	25.5	214
8	Ethofumesate	4	L	2	pt/a	2 leaf	B					
8	Roundup PowerMax	4.5	SL	32	fl oz/a	2 leaf	B					
8	Destiny HC		L	1.5	pt/a	2 leaf	B					
8	AMS		WG	17	lb/100 gal	2 leaf	B					
8	Ethofumesate	4	L	2	pt/a	6-8 leaf	C					
8	Roundup PowerMax	4.5	SL	22	fl oz/a	6-8 leaf	C					
8	Destiny HC		L	1.5	pt/a	6-8 leaf	C					
8	AMS		WG	17	lb/100 gal	6-8 leaf	C					
9	Dual II Magnum	7.64	L	0.5	pt/a	PRE	A	100	213	15.4	26.5	219
9	Dual II Magnum	7.64	L	1	pt/a	2 leaf	B					
9	Roundup PowerMax	4.5	SL	32	fl oz/a	2 leaf	B					
9	AMS		WG	17	lb/100 gal	2 leaf	B					
9	Dual II Magnum	7.64	L	1	pt/a	6-8 leaf	C					
9	Roundup PowerMax	4.5	SL	22	fl oz/a	6-8 leaf	C					
9	AMS		WG	17	lb/100 gal	6-8 leaf	C					
10	Dual II Magnum	7.64	L	0.5	pt/a	PRE	A	100	192	15.1	21.5	213
10	Warrant	3	L	3	pt/a	2 leaf	B					
10	Roundup PowerMax	4.5	SL	32	fl oz/a	2 leaf	B					
10	AMS		WG	17	lb/100 gal	2 leaf	B					
10	Warrant	3	L	3	pt/a	6-8 leaf	C					
10	Roundup PowerMax	4.5	SL	22	fl oz/a	6-8 leaf	C					
10	AMS		WG	17	lb/100 gal	6-8 leaf	C					
11	Dual II Magnum	7.64	L	0.5	pt/a	PRE	A	100	206	15.4	26.2	218
11	Outlook	6	L	12	fl oz/a	2 leaf	B					
11	Roundup PowerMax	4.5	SL	32	fl oz/a	2 leaf	B					
11	AMS		WG	17	lb/100 gal	2 leaf	B					
11	Outlook	6	L	12	fl oz/a	6-8 leaf	C					
11	Roundup PowerMax	4.5	SL	22	fl oz/a	6-8 leaf	C					
11	AMS		WG	17	lb/100 gal	6-8 leaf	C					
12	Dual II Magnum	7.64	L	0.5	pt/a	PRE	A	100	193	15.2	25.3	214
12	Ethofumesate	4	L	2	pt/a	2 leaf	B					
12	Roundup PowerMax	4.5	SL	32	fl oz/a	2 leaf	B					
12	Destiny HC		L	1.5	pt/a	2 leaf	B					
12	AMS		WG	17	lb/100 gal	2 leaf	B					
12	Ethofumesate	4	L	2	pt/a	6-8 leaf	C					
12	Roundup PowerMax	4.5	SL	22	fl oz/a	6-8 leaf	C					
12	Destiny HC		L	1.5	pt/a	6-8 leaf	C					
12	AMS		WG	17	lb/100 gal	6-8 leaf	C					
13	Ethofumesate	4	L	2	pt/a	PRE	A	100	209	15.3	27.1	217
13	Betamix	1.3	L	2	pt/a	2 leaf	B					
13	Roundup PowerMax	4.5	SL	32	fl oz/a	2 leaf	B					
13	AMS		WG	17	lb/100 gal	2 leaf	B					
13	Betamix	1.3	L	3	pt/a	6-8 leaf	C					
13	Roundup PowerMax	4.5	SL	22	fl oz/a	6-8 leaf	C					
13	AMS		WG	17	lb/100 gal	6-8 leaf	C					

**Sugarbeet tolerance of overlapping residuals for control of herbicide-resistant waterhemp**

Trial ID: SB02-18

Location: SVREC

Investigator: Christy Sprague

Study Director: Sprague, Powell, Stiles

Pest Code	AMAPO				
Crop Code		BETVU	BETVU	BETVU	BETVU
Rating Date	Jul-3-2018	Sep-18-2018	Sep-18-2018	Sep-18-2018	Sep-18-2018
Rating Type	control	stand count	% sugar	yield	RWST
Rating Unit	percent	100' row		ton/acre	#/ton
Trt-Eval Interval	14 DA-C	148 DA-A	148 DA-A	148 DA-A	148 DA-A
Number of Decimals	0	0	1	1	0

Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Growth Stage	Appl Code					
14	Ethofumesate	4	L	2	pt/a	PRE	A	100	200	15.3	24.5	217
14	Betamix	1.3	L	2	pt/a	2 leaf	B					
14	Roundup PowerMax	4.5	SL	32	fl oz/a	2 leaf	B					
14	AMS		WG	17	lb/100 gal	2 leaf	B					
14	Dual II Magnum	7.64	L	1.33	pt/a	6-8 leaf	C					
14	Betamix	1.3	L	3	pt/a	6-8 leaf	C					
14	Roundup PowerMax	4.5	SL	22	fl oz/a	6-8 leaf	C					
14	AMS		WG	17	lb/100 gal	6-8 leaf	C					
15	Ethofumesate	4	L	2	pt/a	PRE	A	100	211	15.5	24.7	221
15	Betamix	1.3	L	2	pt/a	2 leaf	B					
15	Roundup PowerMax	4.5	SL	32	fl oz/a	2 leaf	B					
15	AMS		WG	17	lb/100 gal	2 leaf	B					
15	Warrant	3	L	3	pt/a	6-8 leaf	C					
15	Betamix	1.3	L	3	pt/a	6-8 leaf	C					
15	Roundup PowerMax	4.5	SL	22	fl oz/a	6-8 leaf	C					
15	AMS		WG	17	lb/100 gal	6-8 leaf	C					
16	Ethofumesate	4	L	2	pt/a	PRE	A	100	172	15.1	20.8	214
16	Betamix	1.3	L	2	pt/a	2 leaf	B					
16	Roundup PowerMax	4.5	SL	32	fl oz/a	2 leaf	B					
16	AMS		WG	17	lb/100 gal	2 leaf	B					
16	Outlook	6	L	21	fl oz/a	6-8 leaf	C					
16	Betamix	1.3	L	3	pt/a	6-8 leaf	C					
16	Roundup PowerMax	4.5	SL	22	fl oz/a	6-8 leaf	C					
16	AMS		WG	17	lb/100 gal	6-8 leaf	C					
	LSD P=.05							2.2	30.9	0.54	4.62	9.4
	Standard Deviation							1.6	21.6	0.38	3.24	6.6
	CV							1.58	11.02	2.47	13.24	3.03

**Sugarbeet tolerance of overlapping residuals for control of herbicide-resistant waterhemp**

Trial ID: SB02-18

Location: SVREC

Investigator: Christy Sprague

Study Director: Sprague, Powell, Stiles

Pest Code	
Crop Code	BETVU
Rating Date	Sep-18-2018
Rating Type	RWSA
Rating Unit	#/acre
Trt-Eval Interval	148 DA-A
Number of Decimals	0

Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Growth Stage	Appl Code	
1	Roundup PowerMax	4.5	SL	32 fl oz/a		2 leaf	B	5799
1	AMS		WG	17 lb/100 gal		2 leaf	B	
1	Roundup PowerMax	4.5	SL	22 fl oz/a		6-8 leaf	C	
1	AMS		WG	17 lb/100 gal		6-8 leaf	C	
2	Dual II Magnum	7.64	L	1 pt/a		2 leaf	B	5392
2	Roundup PowerMax	4.5	SL	32 fl oz/a		2 leaf	B	
2	AMS		WG	17 lb/100 gal		2 leaf	B	
2	Dual II Magnum	7.64	L	1 pt/a		6-8 leaf	C	
2	Roundup PowerMax	4.5	SL	22 fl oz/a		6-8 leaf	C	
2	AMS		WG	17 lb/100 gal		6-8 leaf	C	
3	Warrant	3	L	3 pt/a		2 leaf	B	5143
3	Roundup PowerMax	4.5	SL	32 fl oz/a		2 leaf	B	
3	AMS		WG	17 lb/100 gal		2 leaf	B	
3	Warrant	3	L	3 pt/a		6-8 leaf	C	
3	Roundup PowerMax	4.5	SL	22 fl oz/a		6-8 leaf	C	
3	AMS		WG	17 lb/100 gal		6-8 leaf	C	
4	Outlook	6	L	12 fl oz/a		2 leaf	B	5039
4	Roundup PowerMax	4.5	SL	32 fl oz/a		2 leaf	B	
4	AMS		WG	17 lb/100 gal		2 leaf	B	
4	Outlook	6	L	12 fl oz/a		6-8 leaf	C	
4	Roundup PowerMax	4.5	SL	22 fl oz/a		6-8 leaf	C	
4	AMS		WG	17 lb/100 gal		6-8 leaf	C	
5	Ethofumesate	4	L	2 pt/a		PRE	A	5562
5	Dual II Magnum	7.64	L	1 pt/a		2 leaf	B	
5	Roundup PowerMax	4.5	SL	32 fl oz/a		2 leaf	B	
5	AMS		WG	17 lb/100 gal		2 leaf	B	
5	Dual II Magnum	7.64	L	1 pt/a		6-8 leaf	C	
5	Roundup PowerMax	4.5	SL	22 fl oz/a		6-8 leaf	C	
5	AMS		WG	17 lb/100 gal		6-8 leaf	C	
6	Ethofumesate	4	L	2 pt/a		PRE	A	4811
6	Warrant	3	L	3 pt/a		2 leaf	B	
6	Roundup PowerMax	4.5	SL	32 fl oz/a		2 leaf	B	
6	AMS		WG	17 lb/100 gal		2 leaf	B	
6	Warrant	3	L	3 pt/a		6-8 leaf	C	
6	Roundup PowerMax	4.5	SL	22 fl oz/a		6-8 leaf	C	
6	AMS		WG	17 lb/100 gal		6-8 leaf	C	
7	Ethofumesate	4	L	2 pt/a		PRE	A	5010
7	Outlook	6	L	12 fl oz/a		2 leaf	B	
7	Roundup PowerMax	4.5	SL	32 fl oz/a		2 leaf	B	
7	AMS		WG	17 lb/100 gal		2 leaf	B	
7	Outlook	6	L	12 fl oz/a		6-8 leaf	C	
7	Roundup PowerMax	4.5	SL	22 fl oz/a		6-8 leaf	C	
7	AMS		WG	17 lb/100 gal		6-8 leaf	C	

**Sugarbeet tolerance of overlapping residuals for control of herbicide-resistant waterhemp**

Trial ID: SB02-18

Location: SVREC

Investigator: Christy Sprague

Study Director: Sprague, Powell, Stiles

Pest Code	
Crop Code	BETVU
Rating Date	Sep-18-2018
Rating Type	RWSA
Rating Unit	#/acre
Trt-Eval Interval	148 DA-A
Number of Decimals	0

Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Growth Stage	Appl Code	
8	Ethofumesate	4	L	2	pt/a	PRE	A	5466
8	Ethofumesate	4	L	2	pt/a	2 leaf	B	
8	Roundup PowerMax	4.5	SL	32	fl oz/a	2 leaf	B	
8	Destiny HC		L	1.5	pt/a	2 leaf	B	
8	AMS		WG	17	lb/100 gal	2 leaf	B	
8	Ethofumesate	4	L	2	pt/a	6-8 leaf	C	
8	Roundup PowerMax	4.5	SL	22	fl oz/a	6-8 leaf	C	
8	Destiny HC		L	1.5	pt/a	6-8 leaf	C	
8	AMS		WG	17	lb/100 gal	6-8 leaf	C	
9	Dual II Magnum	7.64	L	0.5	pt/a	PRE	A	5768
9	Dual II Magnum	7.64	L	1	pt/a	2 leaf	B	
9	Roundup PowerMax	4.5	SL	32	fl oz/a	2 leaf	B	
9	AMS		WG	17	lb/100 gal	2 leaf	B	
9	Dual II Magnum	7.64	L	1	pt/a	6-8 leaf	C	
9	Roundup PowerMax	4.5	SL	22	fl oz/a	6-8 leaf	C	
9	AMS		WG	17	lb/100 gal	6-8 leaf	C	
10	Dual II Magnum	7.64	L	0.5	pt/a	PRE	A	4583
10	Warrant	3	L	3	pt/a	2 leaf	B	
10	Roundup PowerMax	4.5	SL	32	fl oz/a	2 leaf	B	
10	AMS		WG	17	lb/100 gal	2 leaf	B	
10	Warrant	3	L	3	pt/a	6-8 leaf	C	
10	Roundup PowerMax	4.5	SL	22	fl oz/a	6-8 leaf	C	
10	AMS		WG	17	lb/100 gal	6-8 leaf	C	
11	Dual II Magnum	7.64	L	0.5	pt/a	PRE	A	5725
11	Outlook	6	L	12	fl oz/a	2 leaf	B	
11	Roundup PowerMax	4.5	SL	32	fl oz/a	2 leaf	B	
11	AMS		WG	17	lb/100 gal	2 leaf	B	
11	Outlook	6	L	12	fl oz/a	6-8 leaf	C	
11	Roundup PowerMax	4.5	SL	22	fl oz/a	6-8 leaf	C	
11	AMS		WG	17	lb/100 gal	6-8 leaf	C	
12	Dual II Magnum	7.64	L	0.5	pt/a	PRE	A	5429
12	Ethofumesate	4	L	2	pt/a	2 leaf	B	
12	Roundup PowerMax	4.5	SL	32	fl oz/a	2 leaf	B	
12	Destiny HC		L	1.5	pt/a	2 leaf	B	
12	AMS		WG	17	lb/100 gal	2 leaf	B	
12	Ethofumesate	4	L	2	pt/a	6-8 leaf	C	
12	Roundup PowerMax	4.5	SL	22	fl oz/a	6-8 leaf	C	
12	Destiny HC		L	1.5	pt/a	6-8 leaf	C	
12	AMS		WG	17	lb/100 gal	6-8 leaf	C	
13	Ethofumesate	4	L	2	pt/a	PRE	A	5885
13	Betamix	1.3	L	2	pt/a	2 leaf	B	
13	Roundup PowerMax	4.5	SL	32	fl oz/a	2 leaf	B	
13	AMS		WG	17	lb/100 gal	2 leaf	B	
13	Betamix	1.3	L	3	pt/a	6-8 leaf	C	
13	Roundup PowerMax	4.5	SL	22	fl oz/a	6-8 leaf	C	
13	AMS		WG	17	lb/100 gal	6-8 leaf	C	

**Sugarbeet tolerance of overlapping residuals for control of herbicide-resistant waterhemp**

Trial ID: SB02-18

Location: SVREC

Investigator: Christy Sprague

Study Director: Sprague, Powell, Stiles

Pest Code	
Crop Code	BETVU
Rating Date	Sep-18-2018
Rating Type	RWSA
Rating Unit	#/acre
Trt-Eval Interval	148 DA-A
Number of Decimals	0

Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Growth Stage	Appl Code	
14	Ethofumesate	4	L	2	pt/a	PRE	A	5325
14	Betamix	1.3	L	2	pt/a	2 leaf	B	
14	Roundup PowerMax	4.5	SL	32	fl oz/a	2 leaf	B	
14	AMS		WG	17	lb/100 gal	2 leaf	B	
14	Dual II Magnum	7.64	L	1.33	pt/a	6-8 leaf	C	
14	Betamix	1.3	L	3	pt/a	6-8 leaf	C	
14	Roundup PowerMax	4.5	SL	22	fl oz/a	6-8 leaf	C	
14	AMS		WG	17	lb/100 gal	6-8 leaf	C	
15	Ethofumesate	4	L	2	pt/a	PRE	A	5473
15	Betamix	1.3	L	2	pt/a	2 leaf	B	
15	Roundup PowerMax	4.5	SL	32	fl oz/a	2 leaf	B	
15	AMS		WG	17	lb/100 gal	2 leaf	B	
15	Warrant	3	L	3	pt/a	6-8 leaf	C	
15	Betamix	1.3	L	3	pt/a	6-8 leaf	C	
15	Roundup PowerMax	4.5	SL	22	fl oz/a	6-8 leaf	C	
15	AMS		WG	17	lb/100 gal	6-8 leaf	C	
16	Ethofumesate	4	L	2	pt/a	PRE	A	4458
16	Betamix	1.3	L	2	pt/a	2 leaf	B	
16	Roundup PowerMax	4.5	SL	32	fl oz/a	2 leaf	B	
16	AMS		WG	17	lb/100 gal	2 leaf	B	
16	Outlook	6	L	21	fl oz/a	6-8 leaf	C	
16	Betamix	1.3	L	3	pt/a	6-8 leaf	C	
16	Roundup PowerMax	4.5	SL	22	fl oz/a	6-8 leaf	C	
16	AMS		WG	17	lb/100 gal	6-8 leaf	C	
	LSD P=.05							1150.1
	Standard Deviation							805.4
	CV							15.18