

MSU Weed Science Research Program

Comparison of Different Adjuvants in Microrates

Trial ID: SB04-06BB Adj Study Dir.: Sprague, Powell
 Conducted: Saginaw Bean & Beet Investigator: Christy Sprague

Date Planted: 4/11/2006 **Row Spacing:** 30 IN
Variety: Crystal 963 **No. of Reps:** 4
Population: 4 3/8" seed spacing **% OM:** 3.3
Soil Type: Silty Clay **pH:** 7.8
Plot Size: 10 X 30 FT **Design:** RANDOMIZED COMPLETE BLOCK

Tillage: Fall Chisel Plow. Spring Field Cultivate.
Fertilizer: Broadcast application of 125#/acre N on March 15, 2006

Crop and Weed Description

Weed	Code	Common Name	Scientific Name
1.	CHEAL	LAMBSQUARTERS, COMMON	CHENOPODIUM ALBUM L.
2.	AMBEL	RAGWEED, COMMON	AMBROSIA ELATIOR L.
3.	ABUTH	VELVETLEAF	ABUTILON THEOPHRASTI MEDIK.
4.	THLAR	PENNYCRESS, FIELD	THLASPI ARVENSE L.
5.	POLPY	SMARTWEED, PENNSYLVANIA	POLYGONUM PENNSYLVANICUM L.
6.	AMARE	PIGWEED, REDROOT	AMARANTHUS RETROFLEXUS L.
7.	ARFMI	BURDOCK	ARCTIUM MINUS (HILL) BERNH.
Crop	Code	Common Name	
1.	BETVU	BEEET, SUGAR	

Application Description

	A	B	C	D
Application Timing:	Micro 1	Micro 2	Micro 3	Micro 4
Date Treated:	4/27/2006	5/9/2006	5/22/2006	5/30/2006
Time Treated:	12:30 pm	2:00 pm	2:30 pm	3:00 pm
% Cloud Cover:	0	40	10	35
Air Temp., Unit:	57 F	76 F	53 F	90 F
% Relative Humidity:	29	29	26	40
Wind Speed/Unit/Dir:	8 mph NE	7 mph S	8 mph NW	5 mph S
Soil Temp., Unit:	52 F	66 F	54 F	81 F
Soil/Leaf Surface M:	5	5 5	5 5	5 5
Soil Moist (1=w 5=d):	4	5	3	5

Crop Stage at Each Application

	A	B	C	D
Crop Name:	BETVU	BETVU	BETVU	BETVU
Height (In.):	1/8"-1/4"	3/4-1 1/2	2"-4"	4"-6"
Stage (L):	coty	2-4	4-6	6-8

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Weed Stage at Each Application

	A	B	C	D
Weed 1 Name:	CHEAL	CHEAL	CHEAL	CHEAL
Height (In.):	1/8"-1/4"	3/4-1 1/2	1"-4"	1"-4"
Stage (L):	coty-2	2-6	4-many	4-many
Weed 2 Name:	AMBEL	AMBEL	AMBEL	AMBEL
Height (In.):	1/8"-1/4"	1/2"-1"	1/2"-1"	3/4-1 1/4
Stage (L):	coty-2	2-4	2	2-4
Weed 3 Name:	ABUTH	ABUTH	ABUTH	ABUTH
Height (In.):	-	1/2"-3/4"	1/2"-1"	-
Stage (L):	-	coty-1	coty-2	-
Weed 4 Name:	THLAR	THLAR	THLAR	THLAR
Height (In.):	-	4"	-	3"-6"
Stage (L):	-	-	-	flower
Weed 5 Name:	POLPY	POLPY	POLPY	POLPY
Height (In.):	-	-	1- 1 1/2	-
Stage (L):	-	-	1-2	-
Weed 6 Name:	AMARE	AMARE	AMARE	AMARE
Height (In.):	-	-	-	3/4"
Stage (L):	-	-	-	6
Weed 7 Name:	ARFMI	ARFMI	ARFMI	ARFMI
Height (In.):	-	-	-	1"-2"
Stage (L):	-	-	-	coty-3

Weed Density (plants/sq. ft.)

	1	2	3	4	5	6
Date:	7/21/2006	7/21/2006	7/21/2006	7/21/2006	7/21/2006	7/21/2006
Weed Name:	CHEAL	POLPY	AMARE	AMBEL	ABUTH	SOLPT
Density:	2	<1	0	0	<1	<1

Application Equipment

Appl	Sprayer	Speed	Nozzle	Nozzle	Nozzle	Nozzle	Boom			
	Type	MPH	Type	Size	Height	Spacing	Width	GPA	Carrier	PSI
A	Cub	3.8	AirMix	11003	18"	20"	100"	19	H20	27
B	Cub	3.8	AirMix	11003	20"	20"	100"	19	H20	27
C	Cub	3.8	AirMix	11003	20"	20"	100"	19	H20	27
D	Cub	3.8	AirMix	11003	22"	20"	100"	19	H20	27

Comments: Previous Crop: Soybeans. Previous Herbicide: Roundup.

June 12- 3.5 oz/acre Amistar applied
 July 7- 0.5 oz/acre Topsin applied
 July 19- 9.2 oz/acre Headline applied
 July 31- 13 oz/acre Emminent applied
 August 15- 9.2 oz/acre Headline applied

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Weed Code	CHEAL	CHEAL	CHEAL
Crop Code	BETVU	BETVU	BETVU
Rating Data Type	injury	injury	injury
Rating Unit	percent	percent	percent
Rating Date	5/30/2006	6/8/2006	6/15/2006
Trt-Eval Interval	33 DA-A	42 DA-A	49 DA-A

Trt No.	Treatment Name	Form Conc	Rate	Unit	Grow Stg	Appl Code	BETVU injury	CHEAL control	BETVU injury	CHEAL percent	BETVU injury	CHEAL percent
1	Betamix	1.3	8	fl oz/a	micro 1 A	11	88	3	78	0	76	
1	Upbeet	50	0.125	oz/a	micro 1 A							
1	Stinger	3	1	fl oz/a	micro 1 A							
1	Destiny		1.5	% v/v	micro 1 A							
1	Betamix	1.3	8	fl oz/a	micro 2 B							
1	Upbeet	50	0.125	oz/a	micro 2 B							
1	Stinger	3	1	fl oz/a	micro 2 B							
1	Destiny		1.5	% v/v	micro 2 B							
1	Betamix	1.3	8	fl oz/a	micro 3 C							
1	Upbeet	50	0.125	oz/a	micro 3 C							
1	Stinger	3	1	fl oz/a	micro 3 C							
1	Destiny		1.5	% v/v	micro 3 C							
1	Betamix	1.3	8	fl oz/a	micro 4 D							
1	Upbeet	50	0.125	oz/a	micro 4 D							
1	Stinger	3	1	fl oz/a	micro 4 D							
1	Destiny		1.5	% v/v	micro 4 D							
2	Betamix	1.3	8	fl oz/a	micro 1 A	10	96	3	88	1	88	
2	Upbeet	50	0.125	oz/a	micro 1 A							
2	Stinger	3	1	fl oz/a	micro 1 A							
2	AG 05006		1.5	% v/v	micro 1 A							
2	Betamix	1.3	8	fl oz/a	micro 2 B							
2	Upbeet	50	0.125	oz/a	micro 2 B							
2	Stinger	3	1	fl oz/a	micro 2 B							
2	AG 05006		1.5	% v/v	micro 2 B							
2	Betamix	1.3	8	fl oz/a	micro 3 C							
2	Upbeet	50	0.125	oz/a	micro 3 C							
2	Stinger	3	1	fl oz/a	micro 3 C							
2	AG 05006		1.5	% v/v	micro 3 C							
2	Betamix	1.3	8	fl oz/a	micro 4 D							
2	Upbeet	50	0.125	oz/a	micro 4 D							
2	Stinger	3	1	fl oz/a	micro 4 D							
2	AG 05006		1.5	% v/v	micro 4 D							
3	Betamix	1.3	8	fl oz/a	micro 1 A	9	90	4	86	0	84	
3	Upbeet	50	0.125	oz/a	micro 1 A							
3	Stinger	3	1	fl oz/a	micro 1 A							
3	AG 05006		1	% v/v	micro 1 A							
3	Betamix	1.3	8	fl oz/a	micro 2 B							
3	Upbeet	50	0.125	oz/a	micro 2 B							
3	Stinger	3	1	fl oz/a	micro 2 B							
3	AG 05006		1	% v/v	micro 2 B							
3	Betamix	1.3	8	fl oz/a	micro 3 C							
3	Upbeet	50	0.125	oz/a	micro 3 C							
3	Stinger	3	1	fl oz/a	micro 3 C							
3	AG 05006		1	% v/v	micro 3 C							
3	Betamix	1.3	8	fl oz/a	micro 4 D							
3	Upbeet	50	0.125	oz/a	micro 4 D							
3	Stinger	3	1	fl oz/a	micro 4 D							
3	AG 05006		1	% v/v	micro 4 D							

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Crop Code	BETVU	BETVU	BETVU
Rating Data Type	injury	injury	injury
Rating Unit	percent	percent	percent
Rating Date	5/30/2006	6/8/2006	6/15/2006
Trt-Eval Interval	33 DA-A	42 DA-A	49 DA-A

Trt No.	Treatment Name	Form Conc	Rate	Unit	Grow Stg	Appl Code					
4	Betamix	1.3	8	fl oz/a	micro 1 A	9	86	1	86	0	85
4	Upbeet	50	0.125	oz/a	micro 1 A						
4	Stinger	3	1	fl oz/a	micro 1 A						
4	AG 05006		0.75	% v/v	micro 1 A						
4	Betamix	1.3	8	fl oz/a	micro 2 B						
4	Upbeet	50	0.125	oz/a	micro 2 B						
4	Stinger	3	1	fl oz/a	micro 2 B						
4	AG 05006		0.75	% v/v	micro 2 B						
4	Betamix	1.3	8	fl oz/a	micro 3 C						
4	Upbeet	50	0.125	oz/a	micro 3 C						
4	Stinger	3	1	fl oz/a	micro 3 C						
4	AG 05006		0.75	% v/v	micro 3 C						
4	Betamix	1.3	8	fl oz/a	micro 4 D						
4	Upbeet	50	0.125	oz/a	micro 4 D						
4	Stinger	3	1	fl oz/a	micro 4 D						
4	AG 05006		0.75	% v/v	micro 4 D						
5	Untreated					ABCD 0	0	0	0	0	0
6	Betamix	1.3	8	fl oz/a	micro 1 A	9	91	2	76	0	78
6	Upbeet	50	0.125	oz/a	micro 1 A						
6	Stinger	3	1	fl oz/a	micro 1 A						
6	AG 05006		0.75	% v/v	micro 1 A						
6	AG 02013		4	fl oz/a	micro 1 A						
6	Betamix	1.3	8	fl oz/a	micro 2 B						
6	Upbeet	50	0.125	oz/a	micro 2 B						
6	Stinger	3	1	fl oz/a	micro 2 B						
6	AG 05006		0.75	% v/v	micro 2 B						
6	AG 02013		4	fl oz/a	micro 2 B						
6	Betamix	1.3	8	fl oz/a	micro 3 C						
6	Upbeet	50	0.125	oz/a	micro 3 C						
6	Stinger	3	1	fl oz/a	micro 3 C						
6	AG 05006		0.75	% v/v	micro 3 C						
6	AG 02013		4	fl oz/a	micro 3 C						
6	Betamix	1.3	8	fl oz/a	micro 4 D						
6	Upbeet	50	0.125	oz/a	micro 4 D						
6	Stinger	3	1	fl oz/a	micro 4 D						
6	AG 05006		0.75	% v/v	micro 4 D						
6	AG 02013		4	fl oz/a	micro 4 D						
7	Betamix	1.3	8	fl oz/a	micro 1 A	10	97	2	86	4	88
7	Upbeet	50	0.125	oz/a	micro 1 A						
7	Stinger	3	1	fl oz/a	micro 1 A						
7	AG 05055		2.5	% v/v	micro 1 A						
7	Betamix	1.3	8	fl oz/a	micro 2 B						
7	Upbeet	50	0.125	oz/a	micro 2 B						
7	Stinger	3	1	fl oz/a	micro 2 B						
7	AG 05055		2.5	% v/v	micro 2 B						
7	Betamix	1.3	8	fl oz/a	micro 3 C						
7	Upbeet	50	0.125	oz/a	micro 3 C						
7	Stinger	3	1	fl oz/a	micro 3 C						
7	AG 03002		2.5	% v/v	micro 3 C						
7	Betamix	1.3	8	fl oz/a	micro 4 D						
7	Upbeet	50	0.125	oz/a	micro 4 D						
7	Stinger	3	1	fl oz/a	micro 4 D						
7	AG 03002		2.5	% v/v	micro 4 D						

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Rating Unit	percent	percent	percent
Rating Date	5/30/2006	6/8/2006	6/15/2006
Trt-Eval Interval	33 DA-A	42 DA-A	49 DA-A

Trt No.	Treatment Name	Form Conc	Rate	Unit	Grow Stg	Appl Code					
8	Betamix	1.3	8	fl oz/a	micro 1 A	9	93	3	82	0	78
8	Upbeet	50	0.125	oz/a	micro 1 A						
8	Stinger	3	1	fl oz/a	micro 1 A						
8	Dynamic		2	qt/100 gal	micro 1 A						
8	Betamix	1.3	8	fl oz/a	micro 2 B						
8	Upbeet	50	0.125	oz/a	micro 2 B						
8	Stinger	3	1	fl oz/a	micro 2 B						
8	Dynamic		2	qt/100 gal	micro 2 B						
8	Betamix	1.3	8	fl oz/a	micro 3 C						
8	Upbeet	50	0.125	oz/a	micro 3 C						
8	Stinger	3	1	fl oz/a	micro 3 C						
8	Dynamic		2	qt/100 gal	micro 3 C						
8	Betamix	1.3	8	fl oz/a	micro 4 D						
8	Upbeet	50	0.125	oz/a	micro 4 D						
8	Stinger	3	1	fl oz/a	micro 4 D						
8	Dynamic		2	qt/100 gal	micro 4 D						
9	Betamix	1.3	12	fl oz/a	micro 1 A	16	94	7	89	1	88
9	Upbeet	50	0.125	oz/a	micro 1 A						
9	Stinger	3	1	fl oz/a	micro 1 A						
9	Destiny		1.5	% v/v	micro 1 A						
9	Betamix	1.3	12	fl oz/a	micro 2 B						
9	Upbeet	50	0.125	oz/a	micro 2 B						
9	Stinger	3	1	fl oz/a	micro 2 B						
9	Destiny		1.5	% v/v	micro 2 B						
9	Betamix	1.3	16	fl oz/a	micro 3 C						
9	Upbeet	50	0.125	oz/a	micro 3 C						
9	Stinger	3	1	fl oz/a	micro 3 C						
9	Destiny		1.5	% v/v	micro 3 C						
9	Betamix	1.3	22	fl oz/a	micro 4 D						
9	Upbeet	50	0.125	oz/a	micro 4 D						
9	Stinger	3	1	fl oz/a	micro 4 D						
9	Destiny		1.5	% v/v	micro 4 D						
10	Betamix	1.3	12	fl oz/a	micro 1 A	13	97	5	92	3	93
10	Upbeet	50	0.125	oz/a	micro 1 A						
10	Stinger	3	1	fl oz/a	micro 1 A						
10	AG 05006		1.5	% v/v	micro 1 A						
10	Betamix	1.3	12	fl oz/a	micro 2 B						
10	Upbeet	50	0.125	oz/a	micro 2 B						
10	Stinger	3	1	fl oz/a	micro 2 B						
10	AG 05006		1.5	% v/v	micro 2 B						
10	Betamix	1.3	16	fl oz/a	micro 3 C						
10	Upbeet	50	0.125	oz/a	micro 3 C						
10	Stinger	3	1	fl oz/a	micro 3 C						
10	AG 05006		1.5	% v/v	micro 3 C						
10	Betamix	1.3	22	fl oz/a	micro 4 D						
10	Upbeet	50	0.125	oz/a	micro 4 D						
10	Stinger	3	1	fl oz/a	micro 4 D						
10	AG 05006		1.5	% v/v	micro 4 D						

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Rating Data Type	injury	injury	injury
Rating Unit	percent	percent	percent
Rating Date	5/30/2006	6/8/2006	6/15/2006
Trt-Eval Interval	33 DA-A	42 DA-A	49 DA-A

Trt No.	Treatment Name	Form Conc	Rate	Unit	Grow Stg	Appl Code					
11	Betamix	1.3	12	fl oz/a	micro 1 A	11	93	6	90	5	87
11	Upbeet	50	0.125	oz/a	micro 1 A						
11	Stinger	3	1	fl oz/a	micro 1 A						
11	AG 05006		1	% v/v	micro 1 A						
11	Betamix	1.3	12	fl oz/a	micro 2 B						
11	Upbeet	50	0.125	oz/a	micro 2 B						
11	Stinger	3	1	fl oz/a	micro 2 B						
11	AG 05006		1	% v/v	micro 2 B						
11	Betamix	1.3	16	fl oz/a	micro 3 C						
11	Upbeet	50	0.125	oz/a	micro 3 C						
11	Stinger	3	1	fl oz/a	micro 3 C						
11	AG 05006		1	% v/v	micro 3 C						
11	Betamix	1.3	22	fl oz/a	micro 4 D						
11	Upbeet	50	0.125	oz/a	micro 4 D						
11	Stinger	3	1	fl oz/a	micro 4 D						
11	AG 05006		1	% v/v	micro 4 D						
12	Betamix	1.3	12	fl oz/a	micro 1 A	9	95	3	85	1	86
12	Upbeet	50	0.125	oz/a	micro 1 A						
12	Stinger	3	1	fl oz/a	micro 1 A						
12	AG 05006		0.75	% v/v	micro 1 A						
12	Betamix	1.3	12	fl oz/a	micro 2 B						
12	Upbeet	50	0.125	oz/a	micro 2 B						
12	Stinger	3	1	fl oz/a	micro 2 B						
12	AG 05006		0.75	% v/v	micro 2 B						
12	Betamix	1.3	16	fl oz/a	micro 3 C						
12	Upbeet	50	0.125	oz/a	micro 3 C						
12	Stinger	3	1	fl oz/a	micro 3 C						
12	AG 05006		0.75	% v/v	micro 3 C						
12	Betamix	1.3	22	fl oz/a	micro 4 D						
12	Upbeet	50	0.125	oz/a	micro 4 D						
12	Stinger	3	1	fl oz/a	micro 4 D						
12	AG 05006		0.75	% v/v	micro 4 D						
13	Betamix	1.3	12	fl oz/a	micro 1 A	10	96	4	91	1	89
13	Upbeet	50	0.125	oz/a	micro 1 A						
13	Stinger	3	1	fl oz/a	micro 1 A						
13	AG 05006		0.75	% v/v	micro 1 A						
13	AG 02013		4	fl oz/a	micro 1 A						
13	Betamix	1.3	12	fl oz/a	micro 2 B						
13	Upbeet	50	0.125	oz/a	micro 2 B						
13	Stinger	3	1	fl oz/a	micro 2 B						
13	AG 05006		0.75	% v/v	micro 2 B						
13	AG 02013		4	fl oz/a	micro 2 B						
13	Betamix	1.3	16	fl oz/a	micro 3 C						
13	Upbeet	50	0.125	oz/a	micro 3 C						
13	Stinger	3	1	fl oz/a	micro 3 C						
13	AG 05006		0.75	% v/v	micro 3 C						
13	AG 02013		4	fl oz/a	micro 3 C						
13	Betamix	1.3	22	fl oz/a	micro 4 D						
13	Upbeet	50	0.125	oz/a	micro 4 D						
13	Stinger	3	1	fl oz/a	micro 4 D						
13	AG 05006		0.75	% v/v	micro 4 D						
13	AG 02013		4	fl oz/a	micro 4 D						

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Rating Unit	percent	percent	percent
Rating Date	5/30/2006	6/8/2006	6/15/2006
Trt-Eval Interval	33 DA-A	42 DA-A	49 DA-A

Trt No.	Treatment Name	Form Conc	Rate	Unit	Grow Stg	Appl Code	BETVU injury	CHEAL control	BETVU injury	CHEAL percent	BETVU injury	CHEAL control
14	Betamix	1.3	12	fl oz/a	micro 1	A	11	97	3	93	1	93
14	Upbeet	50	0.125	oz/a	micro 1	A						
14	Stinger	3	1	fl oz/a	micro 1	A						
14	AG 05055		2.5	% v/v	micro 1	A						
14	Betamix	1.3	12	fl oz/a	micro 2	B						
14	Upbeet	50	0.125	oz/a	micro 2	B						
14	Stinger	3	1	fl oz/a	micro 2	B						
14	Destiny		1.5	% v/v	micro 2	B						
14	Betamix	1.3	16	fl oz/a	micro 3	C						
14	Upbeet	50	0.125	oz/a	micro 3	C						
14	Stinger	3	1	fl oz/a	micro 3	C						
14	AG 03002		2.5	% v/v	micro 3	C						
14	Betamix	1.3	22	fl oz/a	micro 4	D						
14	Upbeet	50	0.125	oz/a	micro 4	D						
14	Stinger	3	1	fl oz/a	micro 4	D						
14	AG 03002		2.5	% v/v	micro 4	D						
15	Betamix	1.3	12	fl oz/a	micro 1	A	13	93	4	92	4	88
15	Upbeet	50	0.125	oz/a	micro 1	A						
15	Stinger	3	1	fl oz/a	micro 1	A						
15	Dynamic		2	qt/100 gal	micro 1	A						
15	Betamix	1.3	12	fl oz/a	micro 2	B						
15	Upbeet	50	0.125	oz/a	micro 2	B						
15	Stinger	3	1	fl oz/a	micro 2	B						
15	Dynamic		2	qt/100 gal	micro 2	B						
15	Betamix	1.3	16	fl oz/a	micro 3	C						
15	Upbeet	50	0.125	oz/a	micro 3	C						
15	Stinger	3	1	fl oz/a	micro 3	C						
15	Dynamic		2	qt/100 gal	micro 3	C						
15	Betamix	1.3	22	fl oz/a	micro 4	D						
15	Upbeet	50	0.125	oz/a	micro 4	D						
15	Stinger	3	1	fl oz/a	micro 4	D						
15	Dynamic		2	qt/100 gal	micro 4	D						
16	Betamix	1.3	12	fl oz/a	micro 1	A	21	94	4	91	4	91
16	Upbeet	50	0.125	oz/a	micro 1	A						
16	Stinger	3	1	fl oz/a	micro 1	A						
16	MSO		1.5	% v/v	micro 1	A						
16	Betamix	1.3	12	fl oz/a	micro 2	B						
16	Upbeet	50	0.125	oz/a	micro 2	B						
16	Stinger	3	1	fl oz/a	micro 2	B						
16	MSO		1.5	% v/v	micro 2	B						
16	Betamix	1.3	16	fl oz/a	micro 3	C						
16	Upbeet	50	0.125	oz/a	micro 3	C						
16	Stinger	3	1	fl oz/a	micro 3	C						
16	MSO		1.5	% v/v	micro 3	C						
16	Betamix	1.3	22	fl oz/a	micro 4	D						
16	Upbeet	50	0.125	oz/a	micro 4	D						
16	Stinger	3	1	fl oz/a	micro 4	D						
16	MSO		1.5	% v/v	micro 4	D						
LSD (P=.05)							8.6	8.0	5.2	10.5	3.9	10.2
Standard Deviation							6.0	5.6	3.7	7.3	2.7	7.1
CV							56.61	6.41	113.14	9.0	174.46	8.83