

MSU Weed Science Research Program

Using GDD for Timing Standard-Split Applications I - April Planting

Trial ID: SB12-06EL  
 Conducted: Campus

Study Dir.: Sprague, Powell  
 Investigator: Christy Sprague

**Date Planted:** 4/11/2006  
**Variety:** Crystal 963  
**Population:** 4 3/8"  
**Soil Type:** Loam  
**Plot Size:** 10 X 30 FT  
**Row Spacing:** 30 IN  
**No. of Reps:** 4  
**% OM:** 3.2  
**pH:** 6.7  
**Design:** RANDOMIZED COMPLETE BLOCK

**Tillage:** Fall moldboard plow  
 Soil finish 4/11/06  
**Fertilizer:** 3/27/06- broad cast 200# Urea (90# N)  
 4/11 100# 19-19-19 with planter

**Crop and Weed Description**

Weed	Code	Common Name	Scientific Name
1.	ABUTH	VELVETLEAF	ABUTILON THEOPHRASTI MEDIK.
2.	CHEAL	LAMBSQUARTERS, COMMON	CHENOPODIUM ALBUM L.
3.	SINAR	MUSTARD, WILD	SINAPIS ARVENSIS L.
4.	SOLNI	NIGHTSHADE, BLACK	SOLANUM NIGRUM L.
5.	AMBEL	RAGWEED, COMMON	AMBROSIA ELATIOR L.
6.	SETFA	FOXTAIL, GIANT	SETARIA FABERI HERRM.
7.	DATST	JIMSONWEED	DATURA STRAMONIUM L.
8.	ANGR	Annual grass	mainly foxtail, panicum
9.	SOLPT	NIGHTSHADE, EASTERN BLACK	SOLANUM PTYCANTHUM DUNAL
Crop	Code	Common Name	
1.	BETVU	SUGAR BEET	

**Application Description**

	A	B	C	D	E
<b>Application Timing:</b>	0.5"weeds	400A GDD	425A GDD	450A GDD	350B GDD
<b>Date Treated:</b>	5/1/2006	5/3/2006	5/5/2006	5/8/2006	5/20/2006
<b>Time Treated:</b>	1:30 pm	3:45 pm	8:30 am	7:30PM pm	4:00 pm
<b>% Cloud Cover:</b>	97	30	20	5	5
<b>Air Temp., Unit:</b>	63 F	77 F	55 F	73 F	67 F
<b>% Relative Humidity:</b>	47	46		36	39
<b>Wind Speed/Unit/Dir:</b>	10 mph S	4 mph SW	2 mph S	5 mph S	8 mph NW
<b>Soil Temp., Unit:</b>	59 F	66 F	53 F	72 F	63 F
<b>Soil/Leaf Surface M:</b>	5 5	5 5	5 5	5 5	3 5
<b>Soil Moist (1=w 5=d):</b>	5	5	5	5	2
	F	G	H	I	
<b>Application Timing:</b>	350B GDD	400B GDD	500B GDD	450B GDD	
<b>Date Treated:</b>	5/23/2006	5/25/2006	5/27/2006	5/28/2006	
<b>Time Treated:</b>	9:30 am	10:00 am	7:30 pm	6:30 pm	
<b>% Cloud Cover:</b>	5	100	10	20	
<b>Air Temp., Unit:</b>	74 F	70 F	76 F	85 F	
<b>% Relative Humidity:</b>	33	83	75	54	
<b>Wind Speed/Unit/Dir:</b>	2 mph NE	4 mph SE	2 mph S	2 mph S	
<b>Soil Temp., Unit:</b>	50 F	59 F	76 F	87 F	
<b>Soil/Leaf Surface M:</b>	5 5	3 5	4 5	5 5	
<b>Soil Moist (1=w 5=d):</b>	4	4	4	4	

**Crop Stage at Each Application**

	A	B	C	D	E
<b>Crop Name:</b>	BETVU	BETVU	BETVU	BETVU	BETVU
<b>Height (In.):</b>	1/8"	1/2"	1/2"	0"-3/4"	1/8"
<b>Stage (L):</b>	coty	coty	coty-2	0-2	coty
	F	G	H	I	
<b>Crop Name:</b>	BETVU	BETVU	BETVU	BETVU	
<b>Height (In.):</b>	1/8"-1/4"	1/4"-1/2"	1/2"-1"	1"-2"	
<b>Stage (L):</b>	coty	coty	2	2	

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Investigator: Christy Sprague

## Weed Stage at Each Application

	<b>A</b>	<b>B</b>	<b>C</b>	<b>D</b>	<b>E</b>
<b>Weed 1 Name:</b>	ABUTH	ABUTH	ABUTH	ABUTH	ABUTH
<b>Height (In.):</b>	1/8-1/2"	1/2"-1"	1/2-1 1/2	1/8"-1"	1"-1 1/2"
<b>Stage (L):</b>	coty-1	coty-1	coty-1	coty-2	coty-4
<b>Weed 2 Name:</b>	CHEAL	CHEAL	CHEAL	CHEAL	CHEAL
<b>Height (In.):</b>	1/8"-1/4"	1/2"-1"	1/2-1 1/4	1/2-1 1/2	1/2-1 1/4
<b>Stage (L):</b>	coty-2	coty-4	coty-4	2-6	2-6
<b>Weed 3 Name:</b>	SINAR	SINAR	SINAR	SINAR	SINAR
<b>Height (In.):</b>	2" dia	1/2"	1/2-1 1/2	-	-
<b>Stage (L):</b>	4	2-4	2-4	-	-
<b>Weed 4 Name:</b>	SOLNI	SOLNI	SOLNI	SOLNI	SOLNI
<b>Height (In.):</b>	1/16-1/8	1/4"-1/2"	1/4"-1/2"	-	1/2"
<b>Stage (L):</b>	coty-2	1	coty-2	-	4
<b>Weed 5 Name:</b>	AMBEL	AMBEL	AMBEL	AMBEL	AMBEL
<b>Height (In.):</b>	-	1 1/2"	-	-	-
<b>Stage (L):</b>	-	4	-	-	-
<b>Weed 6 Name:</b>	SETFA	SETFA	SETFA	SETFA	SETFA
<b>Height (In.):</b>	-	-	-	1/4"-1/2"	2"
<b>Stage (L):</b>	-	-	-	2	3
<b>Weed 7 Name:</b>	DATST	DATST	DATST	DATST	DATST
<b>Height (In.):</b>	-	-	-	1/4"	-
<b>Stage (L):</b>	-	-	-	1	-
<b>Weed 8 Name:</b>	ANGR	ANGR	ANGR	ANGR	ANGR
<b>Height (In.):</b>	-	-	-	-	-
<b>Stage (L):</b>	-	-	-	-	-
<b>Weed 9 Name:</b>	SOLPT	SOLPT	SOLPT	SOLPT	SOLPT
<b>Height (In.):</b>	-	-	-	-	-
<b>Stage (L):</b>	-	-	-	-	-
	<b>F</b>	<b>G</b>	<b>H</b>	<b>I</b>	
<b>Weed 1 Name:</b>	ABUTH	ABUTH	ABUTH	ABUTH	
<b>Height (In.):</b>	1-1.5"	1/2-1 1/2	1/4"-2"	2"-2 1/2"	
<b>Stage (L):</b>	coty-4	coty-3	coty-4	coty-5	
<b>Weed 2 Name:</b>	CHEAL	CHEAL	CHEAL	CHEAL	
<b>Height (In.):</b>	1/2"-1"	1/2-1 1/4	1/4-2	1/8-2 1/2	
<b>Stage (L):</b>	2-6	2-6	coty-8	coty-8	
<b>Weed 3 Name:</b>	SINAR	SINAR	SINAR	SINAR	
<b>Height (In.):</b>	-	-	-	-	
<b>Stage (L):</b>	-	-	-	-	
<b>Weed 4 Name:</b>	SOLNI	SOLNI	SOLNI	SOLNI	
<b>Height (In.):</b>	-	-	-	-	
<b>Stage (L):</b>	-	-	-	-	
<b>Weed 5 Name:</b>	AMBEL	AMBEL	AMBEL	AMBEL	
<b>Height (In.):</b>	-	-	-	-	
<b>Stage (L):</b>	-	-	-	-	
<b>Weed 6 Name:</b>	SETFA	SETFA	SETFA	SETFA	
<b>Height (In.):</b>	-	-	-	-	
<b>Stage (L):</b>	-	-	-	-	
<b>Weed 7 Name:</b>	DATST	DATST	DATST	DATST	
<b>Height (In.):</b>	-	-	-	-	
<b>Stage (L):</b>	-	-	-	-	
<b>Weed 8 Name:</b>	ANGR	ANGR	ANGR	ANGR	
<b>Height (In.):</b>	1/2"	-	-	1/8"	
<b>Stage (L):</b>	3	-	-	1	
<b>Weed 9 Name:</b>	SOLPT	SOLPT	SOLPT	SOLPT	
<b>Height (In.):</b>	-	-	-	1/2"	
<b>Stage (L):</b>	-	-	-	5	

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Weed Density (plants/sq. ft.)

	1	2	3	4	5
Date:	7/21/2006	7/21/2006	7/21/2006	7/21/2006	7/21/2006
Weed Name:	CHEAL	ABUTH	ANGR	AMARE	SOLPT
Density:	2	1	2	1	<1

Application Equipment

Appl	Sprayer	Speed	Nozzle	Nozzle	Nozzle	Nozzle	Boom	GPA	Carrier	PSI
	Type	MPH	Type	Size	Height	Spacing	Width			
A	CUB	3.8	AirMix	11003	20"	20"	100"	19	water	27
B	CUB	3.8	AirMix	11003	20"	20"	100"	19	water	27
C	CUB	3.8	AirMix	11003	20"	20"	100"	19	water	27
D	CUB	3.8	AirMix	11003	20"	20"	100"	19	water	27
E	CUB	3.8	AirMix	11003	20"	20"	100"	19	water	27
F	CUB	3.8	AirMix	11003	20"	20"	100"	19	water	27
G	CUB	3.8	AirMix	11003	20"	20"	100"	19	water	27
H	CUB	3.8	AirMix	11003	20"	20"	100"	19	water	27
I	CUB	3.8	AirMix	11003	20"	20"	100"	19	water	27

Comments: 5/8/06- Due to poor stand <50 beets/100 ft. of row, sugarbeets were replanted with crystal 963 at 4 3/8 spacing.

5/10/06- Liberty (32 oz) + AMS (2 lb) applied to all treatments.

Previous Crop: Corn. Previous Herbicides: Roundup, Distinct.

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							CHEAL	ABUTH	SOLPT			CHEAL	ABUTH	DATST
							BETVU				BETVU			
							injury	control	control	control	injury	control	control	control
							percent	percent	percent	percent	percent	percent	percent	percent
							6/2/2006	6/2/2006	6/2/2006	6/2/2006	6/10/2006	6/10/2006	6/10/2006	6/10/2006
							32 DA-A	32 DA-A	32 DA-A	32 DA-A	40 DA-A	40 DA-A	40 DA-A	40 DA-A
Trt	Treatment	Form	Rate	Grow	Appl									
No.	Name	Conc	Rate	Stg	Code									
1	Betamix	1.3	2	pt/a	1/2" wds	A	15	80	79	97	11	58	56	99
1	Upbeet	50	0.5	oz/a	1/2" wds	A								
1	Stinger	3	0.25	pt/a	1/2" wds	A								
1	Betamix	1.3	3	pt/a	7 day	D								
1	Upbeet	50	0.5	oz/a	7 day	D								
1	Stinger	3	0.25	pt/a	7 day	D								
1	Activator 90 NIS		0.25	% v/v	7 day	D								
2	Betamix	1.3	2	pt/a	350A GDD	A	14	82	79	99	9	76	68	99
2	Upbeet	50	0.5	oz/a	350A GDD	A								
2	Stinger	3	0.25	pt/a	350A GDD	A								
2	Betamix	1.3	3	pt/a	350B GDD	E								
2	Upbeet	50	0.5	oz/a	350B GDD	E								
2	Stinger	3	0.25	pt/a	350B GDD	E								
2	Activator 90 NIS		0.25	% v/v	350B GDD	E								
3	Betamix	1.3	2	pt/a	400A GDD	B	24	93	87	99	9	88	85	99
3	Upbeet	50	0.5	oz/a	400A GDD	B								
3	Stinger	3	0.25	pt/a	400A GDD	B								
3	Betamix	1.3	3	pt/a	350B GDD	F								
3	Upbeet	50	0.5	oz/a	350B GDD	F								
3	Stinger	3	0.25	pt/a	350B GDD	F								
3	Activator 90 NIS		0.25	% v/v	350B GDD	F								
4	Untreated						0	0	0	0	0	0	0	0
5	Betamix	1.3	2	pt/a	400A GDD	B	21	93	89	99	13	83	84	99
5	Upbeet	50	0.5	oz/a	400A GDD	B								
5	Stinger	3	0.25	pt/a	400A GDD	B								
5	Betamix	1.3	3	pt/a	400B GDD	G								
5	Upbeet	50	0.5	oz/a	400B GDD	G								
5	Stinger	3	0.25	pt/a	400B GDD	G								
5	Activator 90 NIS		0.25	% v/v	400B GDD	G								
6	Betamix	1.3	2	pt/a	400A GDD	B	31	95	88	99	20	96	86	99
6	Upbeet	50	0.5	oz/a	400A GDD	B								
6	Stinger	3	0.25	pt/a	400A GDD	B								
6	Betamix	1.3	3	pt/a	500B GDD	H								
6	Upbeet	50	0.5	oz/a	500B GDD	H								
6	Stinger	3	0.25	pt/a	500B GDD	H								
6	Activator 90 NIS		0.25	% v/v	500B GDD	H								
7	Betamix	1.3	2	pt/a	425A GDD	C	33	96	74	99	26	95	76	99
7	Upbeet	50	0.5	oz/a	425A GDD	C								
7	Stinger	3	0.25	pt/a	425A GDD	C								
7	Betamix	1.3	3	pt/a	425B GDD	H								
7	Upbeet	50	0.5	oz/a	425B GDD	H								
7	Stinger	3	0.25	pt/a	425B GDD	H								
7	Activator 90 NIS		0.25	% v/v	425B GDD	H								
8	Betamix	1.3	2	pt/a	450A GDD	D	14	64	43	83	11	55	53	87
8	Upbeet	50	0.5	oz/a	450A GDD	D								
8	Stinger	3	0.25	pt/a	450A GDD	D								
8	Betamix	1.3	3	pt/a	450B GDD	I								
8	Upbeet	50	0.5	oz/a	450B GDD	I								
8	Stinger	3	0.25	pt/a	450B GDD	I								
8	Activator 90 NIS		0.25	% v/v	450B GDD	I								
LSD (P=.05)							10.0	8.6	13.5	5.2	9.9	14.7	15.4	12.7
Standard Deviation							6.8	5.9	9.2	3.6	6.7	10.0	10.5	8.7
CV							36.0	7.8	13.69	4.23	53.9	14.56	16.56	10.18

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Weed Code	SOLPT	DIGSA	BETVU	CHEAL	ABUTH	DATST	SOLPT	ANGR
Crop Code								
Rating Data Type	control	control	injury	control	control	control	control	control
Rating Unit	percent	percent	percent	percent	percent	percent	percent	percent
Rating Date	6/10/2006	6/10/2006	10/5/2006	10/5/2006	10/5/2006	10/5/2006	10/5/2006	10/5/2006
Trt-Eval Interval	40 DA-A	40 DA-A	157 DA-A	157 DA-A	157 DA-A	157 DA-A	157 DA-A	157 DA-A

Trt No.	Treatment Name	Form Conc	Rate	Grow Stg	Appl Code								
1	Betamix	1.3	2 pt/a	1/2" wds	A	99	38	3	81	63	100	100	15
1	Upbeet	50	0.5 oz/a	1/2" wds	A								
1	Stinger	3	0.25 pt/a	1/2" wds	A								
1	Betamix	1.3	3 pt/a	7 day	D								
1	Upbeet	50	0.5 oz/a	7 day	D								
1	Stinger	3	0.25 pt/a	7 day	D								
1	Activator 90 NIS		0.25 % v/v	7 day	D								
2	Betamix	1.3	2 pt/a	350A GDD	A	84	87	1	90	74	100	100	73
2	Upbeet	50	0.5 oz/a	350A GDD	A								
2	Stinger	3	0.25 pt/a	350A GDD	A								
2	Betamix	1.3	3 pt/a	350B GDD	E								
2	Upbeet	50	0.5 oz/a	350B GDD	E								
2	Stinger	3	0.25 pt/a	350B GDD	E								
2	Activator 90 NIS		0.25 % v/v	350B GDD	E								
3	Betamix	1.3	2 pt/a	400A GDD	B	99	95	1	94	85	100	100	79
3	Upbeet	50	0.5 oz/a	400A GDD	B								
3	Stinger	3	0.25 pt/a	400A GDD	B								
3	Betamix	1.3	3 pt/a	350B GDD	F								
3	Upbeet	50	0.5 oz/a	350B GDD	F								
3	Stinger	3	0.25 pt/a	350B GDD	F								
3	Activator 90 NIS		0.25 % v/v	350B GDD	F								
4	Untreated					0	0	0	0	0	0	0	0
5	Betamix	1.3	2 pt/a	400A GDD	B	99	92	0	96	68	100	100	73
5	Upbeet	50	0.5 oz/a	400A GDD	B								
5	Stinger	3	0.25 pt/a	400A GDD	B								
5	Betamix	1.3	3 pt/a	400B GDD	G								
5	Upbeet	50	0.5 oz/a	400B GDD	G								
5	Stinger	3	0.25 pt/a	400B GDD	G								
5	Activator 90 NIS		0.25 % v/v	400B GDD	G								
6	Betamix	1.3	2 pt/a	400A GDD	B	99	97	5	95	81	100	100	75
6	Upbeet	50	0.5 oz/a	400A GDD	B								
6	Stinger	3	0.25 pt/a	400A GDD	B								
6	Betamix	1.3	3 pt/a	500B GDD	H								
6	Upbeet	50	0.5 oz/a	500B GDD	H								
6	Stinger	3	0.25 pt/a	500B GDD	H								
6	Activator 90 NIS		0.25 % v/v	500B GDD	H								
7	Betamix	1.3	2 pt/a	425A GDD	C	99	97	1	95	59	100	100	79
7	Upbeet	50	0.5 oz/a	425A GDD	C								
7	Stinger	3	0.25 pt/a	425A GDD	C								
7	Betamix	1.3	3 pt/a	425B GDD	H								
7	Upbeet	50	0.5 oz/a	425B GDD	H								
7	Stinger	3	0.25 pt/a	425B GDD	H								
7	Activator 90 NIS		0.25 % v/v	425B GDD	H								
8	Betamix	1.3	2 pt/a	450A GDD	D	65	70	0	75	38	100	96	71
8	Upbeet	50	0.5 oz/a	450A GDD	D								
8	Stinger	3	0.25 pt/a	450A GDD	D								
8	Betamix	1.3	3 pt/a	450B GDD	I								
8	Upbeet	50	0.5 oz/a	450B GDD	I								
8	Stinger	3	0.25 pt/a	450B GDD	I								
8	Activator 90 NIS		0.25 % v/v	450B GDD	I								

LSD (P=.05)	20.8	17.4	4.6	13.7	21.8	0.0	3.9	35.3
Standard Deviation	14.2	11.8	3.1	9.3	14.8	0.0	2.7	24.0
CV	17.6	16.43	221.59	11.93	25.41	0.0	3.05	41.41

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Weed Code	BETVU	BETVU	BETVU	BETVU	BETVU
Crop Code	stand count	% sugar	yield	RWST	RWSA
Rating Data Type	100' row	ton/acre	# / ton	# / acre	
Rating Unit	10/5/2006	10/5/2006	10/5/2006	10/5/2006	10/5/2006
Rating Date	157 DA-A	157 DA-A	157 DA-A	157 DA-A	157 DA-A
Trt-Eval Interval					

Trt No.	Treatment Name	Form Conc	Rate	Unit	Grow Stg	Appl Code					
1	Betamix	1.3	2	pt/a	1/2" wds	A	210	16.6	21.5	240.2	5139
1	Upbeet	50	0.5	oz/a	1/2" wds	A					
1	Stinger	3	0.25	pt/a	1/2" wds	A					
1	Betamix	1.3	3	pt/a	7 day	D					
1	Upbeet	50	0.5	oz/a	7 day	D					
1	Stinger	3	0.25	pt/a	7 day	D					
1	Activator 90 NIS		0.25	% v/v	7 day	D					
2	Betamix	1.3	2	pt/a	350A GDD	A	183	16.6	22.3	239.7	5334
2	Upbeet	50	0.5	oz/a	350A GDD	A					
2	Stinger	3	0.25	pt/a	350A GDD	A					
2	Betamix	1.3	3	pt/a	350B GDD	E					
2	Upbeet	50	0.5	oz/a	350B GDD	E					
2	Stinger	3	0.25	pt/a	350B GDD	E					
2	Activator 90 NIS		0.25	% v/v	350B GDD	E					
3	Betamix	1.3	2	pt/a	400A GDD	B	189	16.4	23.3	236.1	5501
3	Upbeet	50	0.5	oz/a	400A GDD	B					
3	Stinger	3	0.25	pt/a	400A GDD	B					
3	Betamix	1.3	3	pt/a	350B GDD	F					
3	Upbeet	50	0.5	oz/a	350B GDD	F					
3	Stinger	3	0.25	pt/a	350B GDD	F					
3	Activator 90 NIS		0.25	% v/v	350B GDD	F					
4	Untreated						179	16.3	3.3	234.7	783
5	Betamix	1.3	2	pt/a	400A GDD	B	181	16.4	24.4	234.4	5698
5	Upbeet	50	0.5	oz/a	400A GDD	B					
5	Stinger	3	0.25	pt/a	400A GDD	B					
5	Betamix	1.3	3	pt/a	400B GDD	G					
5	Upbeet	50	0.5	oz/a	400B GDD	G					
5	Stinger	3	0.25	pt/a	400B GDD	G					
5	Activator 90 NIS		0.25	% v/v	400B GDD	G					
6	Betamix	1.3	2	pt/a	400A GDD	B	168	16.9	25.0	240.6	5996
6	Upbeet	50	0.5	oz/a	400A GDD	B					
6	Stinger	3	0.25	pt/a	400A GDD	B					
6	Betamix	1.3	3	pt/a	500B GDD	H					
6	Upbeet	50	0.5	oz/a	500B GDD	H					
6	Stinger	3	0.25	pt/a	500B GDD	H					
6	Activator 90 NIS		0.25	% v/v	500B GDD	H					
7	Betamix	1.3	2	pt/a	425A GDD	C	167	16.5	23.1	233.8	5400
7	Upbeet	50	0.5	oz/a	425A GDD	C					
7	Stinger	3	0.25	pt/a	425A GDD	C					
7	Betamix	1.3	3	pt/a	425B GDD	H					
7	Upbeet	50	0.5	oz/a	425B GDD	H					
7	Stinger	3	0.25	pt/a	425B GDD	H					
7	Activator 90 NIS		0.25	% v/v	425B GDD	H					
8	Betamix	1.3	2	pt/a	450A GDD	D	183	16.4	22.2	232.8	5142
8	Upbeet	50	0.5	oz/a	450A GDD	D					
8	Stinger	3	0.25	pt/a	450A GDD	D					
8	Betamix	1.3	3	pt/a	450B GDD	I					
8	Upbeet	50	0.5	oz/a	450B GDD	I					
8	Stinger	3	0.25	pt/a	450B GDD	I					
8	Activator 90 NIS		0.25	% v/v	450B GDD	I					

LSD (P=.05)	45.9	0.84	5.43	15.49	1165.6
Standard Deviation	31.2	0.57	3.69	10.53	792.5
CV	17.1	3.47	17.87	4.45	16.26