

MSU Weed Science Research Program

Management of glyphosate-resistant Palmer amaranth in sugarbeet

Trial ID: SB06-14 Study Dir.: Sprague and Powell
 Conducted: Gratiot County Investigator: Christy Sprague

Date Planted: May/29/2014 Row Spacing: 30 IN
 Variety: HM-173 RR No. of Reps: 4
 Population: 47,000 seeds/A % OM: 3.1
 Soil Type: Sandy loam pH: 7.0
 Plot Size: 10 X 30 FT Design: RANDOMIZED COMPLETE BLOCK

Tillage: Fall disk and spring soil finish.

Crop and Weed Description

Weed	Code	Common Name	Scientific Name
1.	AMAPA	AMARANTH, PALMER	AMARANTHUS PALMERI S.WATS.
Crop	Code	Common Name	
1.	BETVU	BEET, SUGAR	

Application Description

	A	B	C	D
Application Timing:	PRE	2-Leaf	6-Leaf	canopy
Date Treated:	May/29/2014	Jun/12/2014	Jun/27/2014	Jul/21/2014
Time Treated:	1:45 PM	12:30 PM	10:00 AM	11:15 AM
% Cloud Cover:	25	100	50	10
Air Temp., Unit:	75 F	76 F	78 F	77 F
% Relative Humidity:	55	68	60	62
Wind Speed/Unit/Dir:	2 mph NE	4 mph SW	3 mph SE	7 mph SW
Soil Temp., Unit:	72 F	71 F	72 F	75 F
Soil/Leaf Surface M:	5 -	2 5	4 5	4 5
Soil Moist (1=w 5=d):	5	2	5	5

Crop Stage at Each Application

	A	B	C	D
Crop Name:	BETVU	BETVU	BETVU	BETVU
Height (In.):	-	1-1.5"	3-6"	10-12"
Stage (L):	-	Cot - 2	6	10

Weed Stage at Each Application

	A	B	C	D
Weed 1 Name:	AMAPA	AMAPA	AMAPA	AMAPA
Height (In.):	-	1"	4"	6-30"
Stage (L):	-	4-6	4	25

Weed Density (plants/sq. ft.)

1
 Date: Jul/29/2014
 Weed Name: AMAPA
 Density: 7

Application Equipment

Appl	Sprayer Type	Speed MPH	Nozzle Type	Nozzle Size	Nozzle Height	Nozzle Spacing	Nozzle Width	Boom Width	GPA	Carrier	PSI
A	Backpack	3.8	AIXR	11003	21"	20"	100"	19	19	Water	30
B	Backpack	3.8	AIXR	11003	21"	20"	100"	19	19	Water	30
C	Backpack	3.5	AIXR	11003	21"	20"	100"	19	19	Water	30
D	Backpack	3.8	AIXR	11003	29"	20"	100"	19	19	Water	30

Comments: There was some mixing issues with treatments 2, 3, 8, and 9 for the 2-leaf application "B". These mixtures would not stay in solution.

Initial emergence was a mixed population of Amaranth species (AMASS) mostly Powell and Palmer amaranth. After the initial evaluation, Palmer amaranth was the only amaranth species present.

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Weed Code								AMASS	AMAPA	AMAPA	AMAPA
Crop Code											
Rating Data Type								control	conrol	conrol	conrol
Rating Unit								percent	percent	percent	percent
Rating Date								Jun/27/2014	Jul/09/2014	Jul/21/2014	Aug/04/2014
Trt-Eval Interval								15 DA-B	12 DA-C	24 DA-C	14 DA-D
# Subsamples, Dec.								0	0	0	0
Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Grow Stg	Appl Code				
1	Roundup PowerMax	4.5	SL	32	fl oz/a	2-leaf	B	48	0	0	8
1	AMS		WG	17	lb/100 gal	2-leaf	B				
1	Roundup PowerMax	4.5	SL	22	fl oz/a	6-leaf	C				
1	AMS		WG	17	lb/100 gal	6-leaf	C				
1	Roundup PowerMax	4.5	SL	22	fl oz/a	canopy	D				
1	AMS		WG	17	lb/100 gal	canopy	D				
2	Roundup PowerMax	4.5	SL	32	fl oz/a	2-leaf	B	93	95	95	86
2	Betamix	1.3	L	2	pt/a	2-leaf	B				
2	Warrant	3	L	3	pt/a	2-leaf	B				
2	AMS		WG	17	lb/100 gal	2-leaf	B				
2	Roundup PowerMax	4.5	SL	22	fl oz/a	6-leaf	C				
2	AMS		WG	17	lb/100 gal	6-leaf	C				
2	Roundup PowerMax	4.5	SL	22	fl oz/a	canopy	D				
2	AMS		WG	17	lb/100 gal	canopy	D				
3	Nortron	4	L	3	pt/a	PRE	A	95	99	98	92
3	Roundup PowerMax	4.5	SL	32	fl oz/a	2-leaf	B				
3	Betamix	1.3	L	2	pt/a	2-leaf	B				
3	Warrant	3	L	3	pt/a	2-leaf	B				
3	AMS		WG	17	lb/100 gal	2-leaf	B				
3	Roundup PowerMax	4.5	SL	22	fl oz/a	6-leaf	C				
3	AMS		WG	17	lb/100 gal	6-leaf	C				
3	Roundup PowerMax	4.5	SL	22	fl oz/a	canopy	D				
3	AMS		WG	17	lb/100 gal	canopy	D				
4	Roundup PowerMax	4.5	SL	32	fl oz/a	2-leaf	B	53	94	94	85
4	Betamix	1.3	L	2	pt/a	2-leaf	B				
4	AMS		WG	17	lb/100 gal	2-leaf	B				
4	Roundup PowerMax	4.5	SL	22	fl oz/a	6-leaf	C				
4	Betamix	1.3	L	3	pt/a	6-leaf	C				
4	Warrant	3	L	3	pt/a	6-leaf	C				
4	AMS		WG	17	lb/100 gal	6-leaf	C				
4	Roundup PowerMax	4.5	SL	22	fl oz/a	canopy	D				
4	AMS		WG	17	lb/100 gal	canopy	D				
5	Nortron	4	L	3	pt/a	PRE	A	74	99	98	85
5	Roundup PowerMax	4.5	SL	32	fl oz/a	2-leaf	B				
5	Betamix	1.3	L	2	pt/a	2-leaf	B				
5	AMS		WG	17	lb/100 gal	2-leaf	B				
5	Roundup PowerMax	4.5	SL	22	fl oz/a	6-leaf	C				
5	Betamix	1.3	L	3	pt/a	6-leaf	C				
5	Warrant	3	L	3	pt/a	6-leaf	C				
5	AMS		WG	17	lb/100 gal	6-leaf	C				
5	Roundup PowerMax	4.5	SL	22	fl oz/a	canopy	D				
5	AMS		WG	17	lb/100 gal	canopy	D				
6	Pyramin	65	WG	4.2	lb/a	PRE	A	71	99	99	93
6	Roundup PowerMax	4.5	SL	32	fl oz/a	2-leaf	B				
6	Betamix	1.3	L	2	pt/a	2-leaf	B				
6	AMS		WG	17	lb/100 gal	2-leaf	B				
6	Roundup PowerMax	4.5	SL	22	fl oz/a	6-leaf	C				
6	Betamix	1.3	L	3	pt/a	6-leaf	C				
6	Warrant	3	L	3	pt/a	6-leaf	C				
6	AMS		WG	17	lb/100 gal	6-leaf	C				
6	Roundup PowerMax	4.5	SL	22	fl oz/a	canopy	D				
6	AMS		WG	17	lb/100 gal	canopy	D				

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								AMASS	AMAPA	AMAPA	AMAPA
Weed Code								control	conrol	conrol	conrol
Crop Code								percent	percent	percent	percent
Rating Data Type								Jun/27/2014	Jul/09/2014	Jul/21/2014	Aug/04/2014
Rating Unit								15 DA-B	12 DA-C	24 DA-C	14 DA-D
Rating Date								0	0	0	0
Trt-Eval Interval											
# Subsamples, Dec.											
Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Grow Stg	Appl Code				
7	Warrant	3	L	3	pt/a	PRE	A	79	86	87	70
7	Roundup PowerMax	4.5	SL	32	fl oz/a	2-leaf	B				
7	Betamix	1.3	L	2	pt/a	2-leaf	B				
7	AMS		WG	17	lb/100 gal	2-leaf	B				
7	Roundup PowerMax	4.5	SL	22	fl oz/a	6-leaf	C				
7	AMS		WG	17	lb/100 gal	6-leaf	C				
7	Roundup PowerMax	4.5	SL	22	fl oz/a	canopy	D				
7	AMS		WG	17	lb/100 gal	canopy	D				
8	Roundup PowerMax	4.5	SL	32	fl oz/a	2-leaf	B	81	88	90	75
8	Warrant	3	L	3	pt/a	2-leaf	B				
8	AMS		WG	17	lb/100 gal	2-leaf	B				
8	Roundup PowerMax	4.5	SL	22	fl oz/a	6-leaf	C				
8	Warrant	3	L	3	pt/a	6-leaf	C				
8	AMS		WG	17	lb/100 gal	6-leaf	C				
8	Roundup PowerMax	4.5	SL	22	fl oz/a	canopy	D				
8	AMS		WG	17	lb/100 gal	canopy	D				
9	Roundup PowerMax	4.5	SL	32	fl oz/a	2-leaf	B	91	99	98	89
9	Betamix	1.3	L	2	pt/a	2-leaf	B				
9	Warrant	3	L	3	pt/a	2-leaf	B				
9	AMS		WG	17	lb/100 gal	2-leaf	B				
9	Roundup PowerMax	4.5	SL	22	fl oz/a	6-leaf	C				
9	Warrant	3	L	3	pt/a	6-leaf	C				
9	AMS		WG	17	lb/100 gal	6-leaf	C				
9	Roundup PowerMax	4.5	SL	22	fl oz/a	canopy	D				
9	AMS		WG	17	lb/100 gal	canopy	D				
10	Roundup PowerMax	4.5	SL	32	fl oz/a	2-leaf	B	54	89	85	51
10	Betamix	1.3	L	2	pt/a	2-leaf	B				
10	AMS		WG	17	lb/100 gal	2-leaf	B				
10	Roundup PowerMax	4.5	SL	22	fl oz/a	6-leaf	C				
10	Betamix	1.3	L	3	pt/a	6-leaf	C				
10	AMS		WG	17	lb/100 gal	6-leaf	C				
10	Roundup PowerMax	4.5	SL	22	fl oz/a	canopy	D				
10	AMS		WG	17	lb/100 gal	canopy	D				
11	Roundup PowerMax	4.5	SL	32	fl oz/a	2-leaf	B	50	86	87	78
11	Betamix	1.3	L	2	pt/a	2-leaf	B				
11	AMS		WG	17	lb/100 gal	2-leaf	B				
11	Roundup PowerMax	4.5	SL	22	fl oz/a	6-leaf	C				
11	Betamix	1.3	L	3	pt/a	6-leaf	C				
11	Dual II Magnum	7.64	L	1.33	pt/a	6-leaf	C				
11	AMS		WG	17	lb/100 gal	6-leaf	C				
11	Roundup PowerMax	4.5	SL	22	fl oz/a	canopy	D				
11	AMS		WG	17	lb/100 gal	canopy	D				
12	Roundup PowerMax	4.5	SL	32	fl oz/a	2-leaf	B	44	91	91	80
12	Betamix	1.3	L	2	pt/a	2-leaf	B				
12	AMS		WG	17	lb/100 gal	2-leaf	B				
12	Roundup PowerMax	4.5	SL	22	fl oz/a	6-leaf	C				
12	Betamix	1.3	L	3	pt/a	6-leaf	C				
12	Outlook	6	L	18	fl oz/a	6-leaf	C				
12	AMS		WG	17	lb/100 gal	6-leaf	C				
12	Roundup PowerMax	4.5	SL	22	fl oz/a	canopy	D				
12	AMS		WG	17	lb/100 gal	canopy	D				

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Trt-Eval Interval								15 DA-B	12 DA-C	24 DA-C	14 DA-D
# Subsamples, Dec.								0	0	0	0
Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Grow Stg	Appl Code				
13	Roundup PowerMax	4.5	SL	32	fl oz/a	2-leaf	B	59	74	71	49
13	Betamix	1.3	L	2	pt/a	2-leaf	B				
13	Stinger	3	L	2	fl oz/a	2-leaf	B				
13	AMS		WG	17	lb/100 gal	2-leaf	B				
13	Roundup PowerMax	4.5	SL	22	fl oz/a	6-leaf	C				
13	Betamix	1.3	L	3	pt/a	6-leaf	C				
13	Stinger	3	L	4	fl oz/a	6-leaf	C				
13	AMS		WG	17	lb/100 gal	6-leaf	C				
13	Roundup PowerMax	4.5	SL	22	fl oz/a	canopy	D				
13	AMS		WG	17	lb/100 gal	canopy	D				
14	Roundup PowerMax	4.5	SL	32	fl oz/a	2-leaf	B	86	99	99	96
14	Betamix	1.3	L	2	pt/a	2-leaf	B				
14	Stinger	3	L	2	fl oz/a	2-leaf	B				
14	AMS		WG	17	lb/100 gal	2-leaf	B				
14	Roundup PowerMax	4.5	SL	22	fl oz/a	6-leaf	C				
14	Betamix	1.3	L	3	pt/a	6-leaf	C				
14	Stinger	3	L	4	fl oz/a	6-leaf	C				
14	Warrant	3	L	3	pt/a	6-leaf	C				
14	AMS		WG	17	lb/100 gal	6-leaf	C				
14	Roundup PowerMax	4.5	SL	22	fl oz/a	canopy	D				
14	AMS		WG	17	lb/100 gal	canopy	D				
15	Roundup PowerMax	4.5	SL	32	fl oz/a	2-leaf	B	83	89	89	86
15	Betamix	1.3	L	2	pt/a	2-leaf	B				
15	AMS		WG	17	lb/100 gal	2-leaf	B				
15	Roundup PowerMax	4.5	SL	22	fl oz/a	6-leaf	C				
15	Betamix	1.3	L	3	pt/a	6-leaf	C				
15	AMS		WG	17	lb/100 gal	6-leaf	C				
15	Roundup PowerMax	4.5	SL	22	fl oz/a	canopy	D				
15	Betamix	1.3	L	3	pt/a	canopy	D				
15	AMS		WG	17	lb/100 gal	canopy	D				
16	Roundup PowerMax	4.5	SL	32	fl oz/a	2-leaf	B	59	20	5	11
16	Stinger	3	L	2	fl oz/a	2-leaf	B				
16	AMS		WG	17	lb/100 gal	2-leaf	B				
16	Roundup PowerMax	4.5	SL	22	fl oz/a	6-leaf	C				
16	Stinger	3	L	4	fl oz/a	6-leaf	C				
16	AMS		WG	17	lb/100 gal	6-leaf	C				
16	Roundup PowerMax	4.5	SL	22	fl oz/a	canopy	D				
16	Stinger	3	L	4	fl oz/a	canopy	D				
16	AMS		WG	17	lb/100 gal	canopy	D				
17	Roundup PowerMax	4.5	SL	32	fl oz/a	2-leaf	B	65	64	58	59
17	Betamix	1.3	L	2	pt/a	2-leaf	B				
17	Stinger	3	L	2	fl oz/a	2-leaf	B				
17	AMS		WG	17	lb/100 gal	2-leaf	B				
17	Roundup PowerMax	4.5	SL	22	fl oz/a	6-leaf	C				
17	Betamix	1.3	L	3	pt/a	6-leaf	C				
17	Stinger	3	L	4	fl oz/a	6-leaf	C				
17	AMS		WG	17	lb/100 gal	6-leaf	C				
17	Roundup PowerMax	4.5	SL	22	fl oz/a	canopy	D				
17	Betamix	1.3	L	3	pt/a	canopy	D				
17	Stinger	3	L	4	fl oz/a	canopy	D				
17	AMS		WG	17	lb/100 gal	canopy	D				

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Rating Date								Jun/27/2014	Jul/09/2014	Jul/21/2014	Aug/04/2014
Trt-Eval Interval								15 DA-B	12 DA-C	24 DA-C	14 DA-D
# Subsamples, Dec.								0	0	0	0
Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Grow Stg	Appl Code				
18	Roundup PowerMax	4.5	SL	32	fl oz/a	2-leaf	B	83	95	93	92
18	Betamix	1.3	L	2	pt/a	2-leaf	B				
18	AMS		WG	17	lb/100 gal	2-leaf	B				
18	Roundup PowerMax	4.5	SL	22	fl oz/a	6-leaf	C				
18	Betamix	1.3	L	4	pt/a	6-leaf	C				
18	AMS		WG	17	lb/100 gal	6-leaf	C				
18	Roundup PowerMax	4.5	SL	22	fl oz/a	canopy	D				
18	Betamix	1.3	L	6	pt/a	canopy	D				
18	AMS		WG	17	lb/100 gal	canopy	D				
19	Roundup PowerMax	4.5	SL	32	fl oz/a	2-leaf	B	83	97	99	99
19	Betamix	1.3	L	2	pt/a	2-leaf	B				
19	AMS		WG	17	lb/100 gal	2-leaf	B				
19	Roundup PowerMax	4.5	SL	22	fl oz/a	6-leaf	C				
19	Betamix	1.3	L	4	pt/a	6-leaf	C				
19	Warrant	3	L	3	pt/a	6-leaf	C				
19	AMS		WG	17	lb/100 gal	6-leaf	C				
19	Roundup PowerMax	4.5	SL	22	fl oz/a	canopy	D				
19	Betamix	1.3	L	6	pt/a	canopy	D				
19	AMS		WG	17	lb/100 gal	canopy	D				
20	Roundup PowerMax	4.5	SL	32	fl oz/a	2-leaf	B	71	99	97	98
20	Betamix	1.3	L	2	pt/a	2-leaf	B				
20	Stinger	3	L	2	fl oz/a	2-leaf	B				
20	AMS		WG	17	lb/100 gal	2-leaf	B				
20	Roundup PowerMax	4.5	SL	22	fl oz/a	6-leaf	C				
20	Betamix	1.3	L	4	pt/a	6-leaf	C				
20	Stinger	3	L	4	fl oz/a	6-leaf	C				
20	Warrant	3	L	3	pt/a	6-leaf	C				
20	AMS		WG	17	lb/100 gal	6-leaf	C				
20	Roundup PowerMax	4.5	SL	22	fl oz/a	canopy	D				
20	Betamix	1.3	L	6	pt/a	canopy	D				
20	Stinger	3	L	4	fl oz/a	canopy	D				
20	AMS		WG	17	lb/100 gal	canopy	D				
LSD (P=.05)								18.2	13.9	9.9	15.1
CV								18.13	11.85	8.59	14.45

Means followed by same letter do not significantly differ (P=.05, LSD)