

MSU Weed Science Research Program

Programs for control of multiple-resistant Palmer amaranth in corn

Trial ID: C11-14 Study Dir.: Kohrt, Sprague, and Powell
 Conducted: Barry County Investigator: Christy Sprague

Date Planted: May/19/2014 Row Spacing: 30 IN
 Variety: DKC 5204 No. of Reps: 4
 Population: 30,000 seeds/A % OM: 2.5
 Soil Type: Sandy loam pH: 6.5
 Plot Size: 10 X 30 FT Design: RANDOMIZED COMPLETE BLOCK

Tillage: Spring vertical tillage.

Crop and Weed Description

Weed	Code	Common Name	Scientific Name
1.	AMAPA	AMARANTH, PALMER	AMARANTHUS PALMERI S.WATS.
Crop	Code	Common Name	
1.	ZEAMX	CORN, FIELD	

Application Description

	A	B	C
Application Timing:	PRE	EPOS	POST
Date Treated:	May/19/2014	Jun/05/2014	Jun/26/2014
Time Treated:	2:40 pm	12:00 pm	9:30 am
% Cloud Cover:	0	5	60
Air Temp., Unit:	72 F	78 F	74 F
% Relative Humidity:	28	80	60
Wind Speed/Unit/Dir:	5 mph SE	2 mph NW	1 mph W
Soil Temp., Unit:	61 F	72 F	70 F
Soil/Leaf Surface M:	5 -	4 5	2 3
Soil Moist (1=w 5=d):	5	3	2

Crop Stage at Each Application

	A	B	C
Crop Name:	ZEAMX	ZEAMX	ZEAMX
Height (In.):	-	7"	30"
Stage (L):	-	V3	V6

Weed Stage at Each Application

	A	B	C
Weed 1 Name:	AMAPA	AMAPA	AMAPA
Height (In.):	-	1-3"	6"
Stage (L):	-	4-6	12

Weed Density (plants/sq. ft.)

1
 Date: Jul/09/2014
 Weed Name: AMAPA
 Density: 5

Application Equipment

Appl	Sprayer Type	Speed MPH	Nozzle Type	Nozzle Size	Nozzle Height	Nozzle Spacing	Boom Width	GPA	Carrier	PSI
A	Backpack	3.8	AIXR	11003	20"	20"	100"	19	water	30
B	Backpack	3.8	AIXR	11003	23"	20"	100"	19	water	30
C	Backpack	3.8	AIXR	11003	30"	20"	100"	19	water	30

Comments: This Palmer amaranth population is resistant to the Site of Action groups 2,5, and 9.

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								AMAPA		AMAPA	
								ZEAMX	control	ZEAMX	control
								injury	percent	injury	percent
								percent	percent	percent	percent
								Jun/09/2014	Jun/09/2014	Jun/15/2014	Jun/15/2014
								21 DA-A	21 DA-A	10 DA-B	10 DA-B
								0	0	0	0
Trt	Treatment	Form	Form	Rate	Grow	Appl					
No.	Name	Conc	Type	Rate	Stg	Code					
1	Bicep Lite II Magnum	6	L	1.5	qt/a	PRE	A	0	87	0	82
1	Aatrex	4	L	0.6	qt/a	PRE	A				
1	Roundup PowerMax	4.5	L	22	fl oz/a	POST	C				
1	AMS		WG	17	lb/100 gal	POST	C				
2	Bicep Lite II Magnum	6	L	1.5	qt/a	PRE	A	0	92	0	89
2	Aatrex	4	L	0.6	qt/a	PRE	A				
2	Liberty	2.34	L	29	fl oz/a	POST	C				
2	AMS		WG	17	lb/100 gal	POST	C				
3	Zidua	85	WG	2.5	oz/a	EPOST	B			0	99
3	Armezon	2.8	L	0.75	fl oz/a	EPOST	B				
3	AAtrex	4	L	1.5	qt/a	EPOST	B				
3	Roundup PowerMax	4.5	L	22	fl oz/a	EPOST	B				
3	MSO		L	1	% v/v	EPOST	B				
3	AMS		WG	17	lb/100 gal	EPOST	B				
4	Halex GT	4.38	L	3.6	pt/a	EPOST	B			0	99
4	AAtrex	4	L	1	qt/a	EPOST	B				
4	COC		L	1	% v/v	EPOST	B				
4	AMS		WG	17	lb/100 gal	EPOST	B				
5	Capreno	3.45	L	3	fl oz/a	EPOST	B			0	99
5	AAtrex	4	L	1	qt/a	EPOST	B				
5	Roundup PowerMax	4.5	L	22	fl oz/a	EPOST	B				
5	COC		L	1	% v/v	EPOST	B				
5	AMS		WG	17	lb/100 gal	EPOST	B				
6	TripleFLEX	4.16	L	2	pt/a	EPOST	B			0	83
6	Roundup PowerMax	4.5	L	22	fl oz/a	EPOST	B				
6	AMS		WG	17	lb/100 gal	EPOST	B				
7	Harness Xtra	5.6	L	2	qt/a	PRE	A	0	96	0	96
7	Armezon	2.8	L	0.75	fl oz/a	POST	C				
7	AAtrex	4	L	1	pt/a	POST	C				
7	Roundup PowerMax	4.5	L	22	fl oz/a	POST	C				
7	MSO		L	1	% v/v	POST	C				
7	AMS		WG	17	lb/100 gal	POST	C				
8	Bicep Lite II Magnum	6	L	1.5	qt/a	PRE	A	0	96	0	94
8	Aatrex	4	L	0.6	qt/a	PRE	A				
8	Callisto Xtra	3.7	L	24	fl oz/a	POST	C				
8	COC		L	1	% v/v	POST	C				
8	AMS		WG	17	lb/100 gal	POST	C				
9	Bicep Lite II Magnum	6	L	1.5	qt/a	PRE	A	0	93	0	90
9	Aatrex	4	L	0.6	qt/a	PRE	A				
9	Laudis	3.5	L	2	fl oz/a	POST	C				
9	Liberty	2.34	L	29	fl oz/a	POST	C				
9	AMS		WG	17	lb/100 gal	POST	C				
10	Harness	7	L	1.6	pt/a	PRE	A	0	86	0	83
10	Liberty	2.34	L	29	fl oz/a	POST	C				
10	AMS		WG	17	lb/100 gal	POST	C				

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Weed Code								ZEAMX	AMAPA	ZEAMX	AMAPA
Crop Code								injury	control	injury	control
Rating Data Type								percent	percent	percent	percent
Rating Unit								Jun/09/2014	Jun/09/2014	Jun/15/2014	Jun/15/2014
Rating Date								21 DA-A	21 DA-A	10 DA-B	10 DA-B
Trt-Eval Interval								0	0	0	0
# Subsamples, Dec.											
Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Grow Stg	Appl Code				
11	Balance Flexx	2	L	4	fl oz/a	PRE	A	0	81	0	77
11	AAtrex	4	L	1	qt/a	PRE	A				
11	Warrant	3	L	3	pt/a	POST	C				
11	Liberty	2.34	L	29	fl oz/a	POST	C				
11	AMS		WG	17	lb/100 gal	POST	C				
12	Verdict	5.57	L	15	fl oz/a	PRE	A	0	97	0	91
12	Status	56	WG	5	oz/a	POST	C				
12	Roundup PowerMax	4.5	L	22	fl oz/a	POST	C				
12	AMS		WG	17	lb/100 gal	POST	C				
13	Verdict	5.57	L	15	fl oz/a	PRE	A	0	98	0	90
13	Laudis	3.5	L	2	fl oz/a	POST	C				
13	Status	56	WG	5	oz/a	POST	C				
13	Roundup PowerMax	4.5	L	22	fl oz/a	POST	C				
13	AMS		WG	17	lb/100 gal	POST	C				
14	Verdict	5.57	L	15	fl oz/a	PRE	A	0	95	0	90
14	Laudis	3.5	L	2	fl oz/a	POST	C				
14	Status	56	WG	5	oz/a	POST	C				
14	Liberty	2.34	L	29	fl oz/a	POST	C				
14	AMS		WG	17	lb/100 gal	POST	C				
15	Lexar EZ	3.7	L	3	qt/a	PRE	A	0	99	0	97
15	Liberty	2.34	L	29	fl oz/a	POST	C				
15	Warrant	3	L	3	pt/a	POST	C				
15	AMS		WG	17	lb/100 gal	POST	C				
16	Lexar EZ	3.7	L	3	qt/a	PRE	A	0	99	0	98
16	Laudis	3.5	L	3	fl oz/a	POST	C				
16	AAtrex	4	L	1	pt/a	POST	C				
16	COC		L	1	% v/v	POST	C				
16	AMS		WG	17	lb/100 gal	POST	C				
17	Lexar EZ	3.7	L	1.5	qt/a	PRE	A	0	95	0	90
17	Halex GT	4.38	L	3.6	pt/a	POST	C				
17	Surfactant		L	0.25	% v/v	POST	C				
17	AMS		WG	17	lb/100 gal	POST	C				
18	Untreated							0	0	0	0
LSD (P=.05)								0.0	11.4	0.0	14.0
CV								0.0	9.2	0.0	11.49

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

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Conducted: Barry County

Investigator: Christy Sprague

Weed Code								ZEAMX		AMAPA		AMAPA	
Crop Code								injury		injury		control	
Rating Data Type								percent		percent		percent	
Rating Unit								Jun/26/2014		Jun/26/2014		Jul/09/2014	
Rating Date								21 DA-B		21 DA-B		13 DA-C	
Trt-Eval Interval								0		0		0	
# Subsamples, Dec.								0		0		0	
Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Grow Stg	Appl Code						
1	Bicep Lite II Magnum	6	L	1.5	qt/a	PRE	A	0	81	0	62		
1	Aatrex	4	L	0.6	qt/a	PRE	A						
1	Roundup PowerMax	4.5	L	22	fl oz/a	POST	C						
1	AMS		WG	17	lb/100 gal	POST	C						
2	Bicep Lite II Magnum	6	L	1.5	qt/a	PRE	A	0	81		97		
2	Aatrex	4	L	0.6	qt/a	PRE	A						
2	Liberty	2.34	L	29	fl oz/a	POST	C						
2	AMS		WG	17	lb/100 gal	POST	C						
3	Zidua	85	WG	2.5	oz/a	EPOST	B	0	99	0	99		
3	Armezon	2.8	L	0.75	fl oz/a	EPOST	B						
3	AAatrex	4	L	1.5	qt/a	EPOST	B						
3	Roundup PowerMax	4.5	L	22	fl oz/a	EPOST	B						
3	MSO		L	1	% v/v	EPOST	B						
3	AMS		WG	17	lb/100 gal	EPOST	B						
4	Halex GT	4.38	L	3.6	pt/a	EPOST	B	0	99	0	99		
4	AAatrex	4	L	1	qt/a	EPOST	B						
4	COC		L	1	% v/v	EPOST	B						
4	AMS		WG	17	lb/100 gal	EPOST	B						
5	Capreno	3.45	L	3	fl oz/a	EPOST	B	0	98	0	96		
5	AAatrex	4	L	1	qt/a	EPOST	B						
5	Roundup PowerMax	4.5	L	22	fl oz/a	EPOST	B						
5	COC		L	1	% v/v	EPOST	B						
5	AMS		WG	17	lb/100 gal	EPOST	B						
6	TripleFLEX	4.16	L	2	pt/a	EPOST	B	0	77	0	82		
6	Roundup PowerMax	4.5	L	22	fl oz/a	EPOST	B						
6	AMS		WG	17	lb/100 gal	EPOST	B						
7	Harness Xtra	5.6	L	2	qt/a	PRE	A	0	92	0	96		
7	Armezon	2.8	L	0.75	fl oz/a	POST	C						
7	AAatrex	4	L	1	pt/a	POST	C						
7	Roundup PowerMax	4.5	L	22	fl oz/a	POST	C						
7	MSO		L	1	% v/v	POST	C						
7	AMS		WG	17	lb/100 gal	POST	C						
8	Bicep Lite II Magnum	6	L	1.5	qt/a	PRE	A	0	90	0	98		
8	Aatrex	4	L	0.6	qt/a	PRE	A						
8	Callisto Xtra	3.7	L	24	fl oz/a	POST	C						
8	COC		L	1	% v/v	POST	C						
8	AMS		WG	17	lb/100 gal	POST	C						
9	Bicep Lite II Magnum	6	L	1.5	qt/a	PRE	A	0	81		95		
9	Aatrex	4	L	0.6	qt/a	PRE	A						
9	Laudis	3.5	L	2	fl oz/a	POST	C						
9	Liberty	2.34	L	29	fl oz/a	POST	C						
9	AMS		WG	17	lb/100 gal	POST	C						
10	Harness	7	L	1.6	pt/a	PRE	A	0	78		90		
10	Liberty	2.34	L	29	fl oz/a	POST	C						
10	AMS		WG	17	lb/100 gal	POST	C						

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Crop Code								injury	control	injury	control
Rating Data Type								percent	percent	percent	percent
Rating Unit								Jun/26/2014	Jun/26/2014	Jul/09/2014	Jul/09/2014
Rating Date								21 DA-B	21 DA-B	13 DA-C	13 DA-C
Trt-Eval Interval								0	0	0	0
# Subsamples, Dec.											
Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Grow Stg	Appl Code				
11	Balance Flexx	2	L	4	fl oz/a	PRE	A	0	77		86
11	AAtrex	4	L	1	qt/a	PRE	A				
11	Warrant	3	L	3	pt/a	POST	C				
11	Liberty	2.34	L	29	fl oz/a	POST	C				
11	AMS		WG	17	lb/100 gal	POST	C				
12	Verdict	5.57	L	15	fl oz/a	PRE	A	0	88	0	92
12	Status	56	WG	5	oz/a	POST	C				
12	Roundup PowerMax	4.5	L	22	fl oz/a	POST	C				
12	AMS		WG	17	lb/100 gal	POST	C				
13	Verdict	5.57	L	15	fl oz/a	PRE	A	0	87	0	96
13	Laudis	3.5	L	2	fl oz/a	POST	C				
13	Status	56	WG	5	oz/a	POST	C				
13	Roundup PowerMax	4.5	L	22	fl oz/a	POST	C				
13	AMS		WG	17	lb/100 gal	POST	C				
14	Verdict	5.57	L	15	fl oz/a	PRE	A	0	88		99
14	Laudis	3.5	L	2	fl oz/a	POST	C				
14	Status	56	WG	5	oz/a	POST	C				
14	Liberty	2.34	L	29	fl oz/a	POST	C				
14	AMS		WG	17	lb/100 gal	POST	C				
15	Lexar EZ	3.7	L	3	qt/a	PRE	A	0	94		99
15	Liberty	2.34	L	29	fl oz/a	POST	C				
15	Warrant	3	L	3	pt/a	POST	C				
15	AMS		WG	17	lb/100 gal	POST	C				
16	Lexar EZ	3.7	L	3	qt/a	PRE	A	0	88	0	99
16	Laudis	3.5	L	3	fl oz/a	POST	C				
16	AAtrex	4	L	1	pt/a	POST	C				
16	COC		L	1	% v/v	POST	C				
16	AMS		WG	17	lb/100 gal	POST	C				
17	Lexar EZ	3.7	L	1.5	qt/a	PRE	A	0	86	0	94
17	Halex GT	4.38	L	3.6	pt/a	POST	C				
17	Surfactant		L	0.25	% v/v	POST	C				
17	AMS		WG	17	lb/100 gal	POST	C				
18	Untreated							0	0	0	0
LSD (P=.05)								0.0	19.5	0.0	14.0
CV								0.0	16.75	0.0	11.27

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

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Crop Code								injury	control	injury	control	control
Rating Data Type								percent	percent	percent	percent	percent
Rating Unit								Jul/17/2014	Jul/17/2014	Jul/30/2014	Jul/30/2014	Oct/27/2014
Rating Date								21 DA-C	21 DA-C	34 DA-C	34 DA-C	123 DA-C
Trt-Eval Interval								0	0	0	0	0
# Subsamples, Dec.												
Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Grow Stg	Appl Code					
1	Bicep Lite II Magnum	6	L	1.5	qt/a	PRE	A	0	72	0	70	70
1	Aatrex	4	L	0.6	qt/a	PRE	A					
1	Roundup PowerMax	4.5	L	22	fl oz/a	POST	C					
1	AMS		WG	17	lb/100 gal	POST	C					
2	Bicep Lite II Magnum	6	L	1.5	qt/a	PRE	A		92			
2	Aatrex	4	L	0.6	qt/a	PRE	A					
2	Liberty	2.34	L	29	fl oz/a	POST	C					
2	AMS		WG	17	lb/100 gal	POST	C					
3	Zidua	85	WG	2.5	oz/a	EPOST	B	0	99	0	99	99
3	Armezon	2.8	L	0.75	fl oz/a	EPOST	B					
3	AAatrex	4	L	1.5	qt/a	EPOST	B					
3	Roundup PowerMax	4.5	L	22	fl oz/a	EPOST	B					
3	MSO		L	1	% v/v	EPOST	B					
3	AMS		WG	17	lb/100 gal	EPOST	B					
4	Halex GT	4.38	L	3.6	pt/a	EPOST	B	0	99	0	99	99
4	AAatrex	4	L	1	qt/a	EPOST	B					
4	COC		L	1	% v/v	EPOST	B					
4	AMS		WG	17	lb/100 gal	EPOST	B					
5	Capreno	3.45	L	3	fl oz/a	EPOST	B	0	97	0	97	98
5	AAatrex	4	L	1	qt/a	EPOST	B					
5	Roundup PowerMax	4.5	L	22	fl oz/a	EPOST	B					
5	COC		L	1	% v/v	EPOST	B					
5	AMS		WG	17	lb/100 gal	EPOST	B					
6	TripleFLEX	4.16	L	2	pt/a	EPOST	B	0	86	0	79	78
6	Roundup PowerMax	4.5	L	22	fl oz/a	EPOST	B					
6	AMS		WG	17	lb/100 gal	EPOST	B					
7	Harness Xtra	5.6	L	2	qt/a	PRE	A	0	94	0	94	99
7	Armezon	2.8	L	0.75	fl oz/a	POST	C					
7	AAatrex	4	L	1	pt/a	POST	C					
7	Roundup PowerMax	4.5	L	22	fl oz/a	POST	C					
7	MSO		L	1	% v/v	POST	C					
7	AMS		WG	17	lb/100 gal	POST	C					
8	Bicep Lite II Magnum	6	L	1.5	qt/a	PRE	A	0	99	0	99	95
8	Aatrex	4	L	0.6	qt/a	PRE	A					
8	Callisto Xtra	3.7	L	24	fl oz/a	POST	C					
8	COC		L	1	% v/v	POST	C					
8	AMS		WG	17	lb/100 gal	POST	C					
9	Bicep Lite II Magnum	6	L	1.5	qt/a	PRE	A		87			
9	Aatrex	4	L	0.6	qt/a	PRE	A					
9	Laudis	3.5	L	2	fl oz/a	POST	C					
9	Liberty	2.34	L	29	fl oz/a	POST	C					
9	AMS		WG	17	lb/100 gal	POST	C					
10	Harness	7	L	1.6	pt/a	PRE	A		85			
10	Liberty	2.34	L	29	fl oz/a	POST	C					
10	AMS		WG	17	lb/100 gal	POST	C					

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Crop Code							injury	control	injury	control	control	
Rating Data Type							percent	percent	percent	percent	percent	
Rating Unit							Jul/17/2014	Jul/17/2014	Jul/30/2014	Jul/30/2014	Oct/27/2014	
Rating Date							21 DA-C	21 DA-C	34 DA-C	34 DA-C	123 DA-C	
Trt-Eval Interval							0	0	0	0	0	
# Subsamples, Dec.												
Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Grow Stg	Appl Code					
11	Balance Flexx	2	L	4	fl oz/a	PRE	A		82			
11	AAtrex	4	L	1	qt/a	PRE	A					
11	Warrant	3	L	3	pt/a	POST	C					
11	Liberty	2.34	L	29	fl oz/a	POST	C					
11	AMS		WG	17	lb/100 gal	POST	C					
12	Verdict	5.57	L	15	fl oz/a	PRE	A	0	98	0	96	99
12	Status	56	WG	5	oz/a	POST	C					
12	Roundup PowerMax	4.5	L	22	fl oz/a	POST	C					
12	AMS		WG	17	lb/100 gal	POST	C					
13	Verdict	5.57	L	15	fl oz/a	PRE	A	0	97	0	97	99
13	Laudis	3.5	L	2	fl oz/a	POST	C					
13	Status	56	WG	5	oz/a	POST	C					
13	Roundup PowerMax	4.5	L	22	fl oz/a	POST	C					
13	AMS		WG	17	lb/100 gal	POST	C					
14	Verdict	5.57	L	15	fl oz/a	PRE	A		95			
14	Laudis	3.5	L	2	fl oz/a	POST	C					
14	Status	56	WG	5	oz/a	POST	C					
14	Liberty	2.34	L	29	fl oz/a	POST	C					
14	AMS		WG	17	lb/100 gal	POST	C					
15	Lexar EZ	3.7	L	3	qt/a	PRE	A		97			
15	Liberty	2.34	L	29	fl oz/a	POST	C					
15	Warrant	3	L	3	pt/a	POST	C					
15	AMS		WG	17	lb/100 gal	POST	C					
16	Lexar EZ	3.7	L	3	qt/a	PRE	A	0	99	0	99	99
16	Laudis	3.5	L	3	fl oz/a	POST	C					
16	AAtrex	4	L	1	pt/a	POST	C					
16	COC		L	1	% v/v	POST	C					
16	AMS		WG	17	lb/100 gal	POST	C					
17	Lexar EZ	3.7	L	1.5	qt/a	PRE	A	0	99	0	99	90
17	Halex GT	4.38	L	3.6	pt/a	POST	C					
17	Surfactant		L	0.25	% v/v	POST	C					
17	AMS		WG	17	lb/100 gal	POST	C					
18	Untreated							0	0	0	0	0
LSD (P=.05)								0.0	13.3	0.0	18.7	18.8
CV								0.0	10.73	0.0	15.1	15.25

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