

MSU Weed Science Research Program

Overlapping residual herbicide programs in corn for Palmer amaranth control

Trial ID: C12-14 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
Application Timing:	PRE	POST
Date Treated:	May/19/2014	Jun/26/2014
Time Treated:	3:00 pm	9:30 am
% Cloud Cover:	0	60
Air Temp., Unit:	72 F	74 F
% Relative Humidity:	28	80
Wind Speed/Unit/Dir:	5 mph SE	1 mph W
Soil Temp., Unit:	61 F	70 F
Soil/Leaf Surface M:	5 -	2 3
Soil Moist (1=w 5=d):	5	2

Crop Stage at Each Application

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

Weed Stage at Each Application

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

Weed Density (plants/sq. ft.)

1
 Date: Jul/09/2014
 Weed Name: AMAPA
 Density: 4

Application Equipment

Appl	Sprayer	Speed	Nozzle	Nozzle	Nozzle	Nozzle	Boom			
	Type	MPH	Type	Size	Height	Spacing	Width	GPA	Carrier	PSI
A	Backpack	3.8	AIXR	11003	20"	20"	100"	19	water	30
B	Backpack	3.8	AIXR	11003	40"	20"	100"	19	water	30

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

MSU Weed Science Research Program

Overlapping residual herbicide programs in corn for Palmer amaranth control

Trial ID: C12-14 Study Dir.: Kohrt, Sprague, and Powell
 Conducted: Barry County Investigator: Christy Sprague

								ZEAMX	AMAPA	ZEAMX	AMAPA
								injury	control	injury	control
								percent	percent	percent	percent
								Jun/09/2014	Jun/09/2014	Jun/15/2014	Jun/15/2014
								21 DA-A	21 DA-A	27 DA-A	27 DA-A
								0	0	0	0
Trt	Treatment	Form	Form	Rate	Grow	Appl					
No.	Name	Conc	Type	Unit	Stg	Code					
1	Zidua	85	WG	2 oz/a	PRE	A	0	92	0	89	
1	Sharpen	2.85	L	2 fl oz/a	PRE	A					
1	Roundup PowerMax	4.5	SL	32 fl oz/a	POST	B					
1	Armezon	2.8	L	0.5 fl oz/a	POST	B					
1	AAtrex	4	L	1 pt/a	POST	B					
1	Outlook	6	L	12 fl oz/a	POST	B					
1	MSO		L	1 % v/v	POST	B					
1	AMS		WG	17 lb/100 gal	POST	B					
2	Verdict	5.57	L	14 fl oz/a	PRE	A	0	97	0	95	
2	Roundup PowerMax	4.5	SL	32 fl oz/a	POST	B					
2	Armezon	2.8	L	0.5 fl oz/a	POST	B					
2	AAtrex	4	L	1 pt/a	POST	B					
2	Outlook	6	L	12 fl oz/a	POST	B					
2	MSO		L	1 % v/v	POST	B					
2	AMS		WG	17 lb/100 gal	POST	B					
3	Verdict	5.57	L	18 fl oz/a	PRE	A	0	99	0	98	
3	Roundup PowerMax	4.5	SL	32 fl oz/a	POST	B					
3	Status	56	WG	5 oz/a	POST	B					
3	Zidua	85	WG	2 oz/a	POST	B					
3	Surfactant		L	0.25 % v/v	POST	B					
3	AMS		WG	17 lb/100 gal	POST	B					
4	Verdict	5.57	L	18 fl oz/a	PRE	A	0	98	0	92	
4	Roundup PowerMax	4.5	SL	32 fl oz/a	POST	B					
4	Status	56	WG	5 oz/a	POST	B					
4	Prowl H2O	3.8	L	2 pt/a	POST	B					
4	Surfactant		L	0.25 % v/v	POST	B					
4	AMS		WG	17 lb/100 gal	POST	B					
5	Zidua	85	WG	2 oz/a	PRE	A	0	96	0	94	
5	Sharpen	2.85	L	2 fl oz/a	PRE	A					
5	AAtrex	4	L	1 qt/a	PRE	A					
5	Roundup PowerMax	4.5	SL	32 fl oz/a	POST	B					
5	Status	56	WG	5 oz/a	POST	B					
5	Surfactant		L	0.25 % v/v	POST	B					
5	AMS		WG	17 lb/100 gal	POST	B					
6	Untreated						0	0	0	0	
7	Anthem ATZ	4.5	L	1 qt/a	PRE	A	0	97	0	95	
7	Roundup PowerMax	4.5	SL	32 fl oz/a	POST	B					
7	AMS		WG	17 lb/100 gal	POST	B					
8	Lumax EZ	3.67	L	1.35 qt/a	PRE	A	0	98	0	93	
8	Halex GT	4.38	L	3.6 pt/a	POST	B					
8	Surfactant		L	0.25 % v/v	POST	B					
8	AMS		WG	17 lb/100 gal	POST	B					
9	SureStart	4.16	L	2.5 pt/a	PRE	A	0	98	0	93	
9	Roundup PowerMax	4.5	SL	32 fl oz/a	POST	B					
9	AMS		WG	17 lb/100 gal	POST	B					

MSU Weed Science Research Program

Overlapping residual herbicide programs in corn for Palmer amaranth control

Trial ID: C12-14 Study Dir.: Kohrt, Sprague, and Powell
 Conducted: Barry County Investigator: Christy Sprague

								ZEAMX	AMAPA	ZEAMX	AMAPA
								injury	control	injury	control
								percent	percent	percent	percent
								Jun/09/2014	Jun/09/2014	Jun/15/2014	Jun/15/2014
								21 DA-A	21 DA-A	27 DA-A	27 DA-A
								0	0	0	0
Trt	Treatment	Form	Form	Rate	Grow	Appl					
No.	Name	Conc	Type	Unit	Stg	Code					
10	Corvus	2.63	L	5.6	fl oz/a	PRE A	0	98	0	98	
10	AAtrex	4	L	1	qt/a	PRE A					
10	Roundup PowerMax	4.5	SL	32	fl oz/a	POST B					
10	Laudis	3.5	L	3	fl oz/a	POST B					
10	AAtrex	4	L	1	pt/a	POST B					
10	MSO		L	1	% v/v	POST B					
10	AMS		WG	17	lb/100 gal	POST B					
LSD (P=.05)								0.0	4.6	0.0	7.5
CV								0.0	3.61	0.0	6.08

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

MSU Weed Science Research Program

Overlapping residual herbicide programs in corn for Palmer amaranth control

Trial ID: C12-14 Study Dir.: Kohrt, Sprague, and Powell
 Conducted: Barry County Investigator: Christy Sprague

Weed Code								AMAPA		AMAPA		ZEAMX	
Crop Code								ZEAMX		ZEAMX		ZEAMX	
Rating Data Type								injury		injury		injury	
Rating Unit								percent		percent		percent	
Rating Date								Jun/26/2014		Jun/26/2014		Jul/09/2014	
Trt-Eval Interval								38 DA-A		38 DA-A		13 DA-B	
# Subsamples, Dec.								0		0		0	
Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Grow Stg	Appl Code						
1	Zidua	85	WG	2	oz/a	PRE	A	0	92	2	99	0	
1	Sharpen	2.85	L	2	fl oz/a	PRE	A						
1	Roundup PowerMax	4.5	SL	32	fl oz/a	POST	B						
1	Armezon	2.8	L	0.5	fl oz/a	POST	B						
1	AAtrex	4	L	1	pt/a	POST	B						
1	Outlook	6	L	12	fl oz/a	POST	B						
1	MSO		L	1	% v/v	POST	B						
1	AMS		WG	17	lb/100 gal	POST	B						
2	Verdict	5.57	L	14	fl oz/a	PRE	A	0	98	2	99	0	
2	Roundup PowerMax	4.5	SL	32	fl oz/a	POST	B						
2	Armezon	2.8	L	0.5	fl oz/a	POST	B						
2	AAtrex	4	L	1	pt/a	POST	B						
2	Outlook	6	L	12	fl oz/a	POST	B						
2	MSO		L	1	% v/v	POST	B						
2	AMS		WG	17	lb/100 gal	POST	B						
3	Verdict	5.57	L	18	fl oz/a	PRE	A	0	98	8	96	0	
3	Roundup PowerMax	4.5	SL	32	fl oz/a	POST	B						
3	Status	56	WG	5	oz/a	POST	B						
3	Zidua	85	WG	2	oz/a	POST	B						
3	Surfactant		L	0.25	% v/v	POST	B						
3	AMS		WG	17	lb/100 gal	POST	B						
4	Verdict	5.57	L	18	fl oz/a	PRE	A	0	98	3	99	2	
4	Roundup PowerMax	4.5	SL	32	fl oz/a	POST	B						
4	Status	56	WG	5	oz/a	POST	B						
4	Prowl H2O	3.8	L	2	pt/a	POST	B						
4	Surfactant		L	0.25	% v/v	POST	B						
4	AMS		WG	17	lb/100 gal	POST	B						
5	Zidua	85	WG	2	oz/a	PRE	A	0	97	0	98	2	
5	Sharpen	2.85	L	2	fl oz/a	PRE	A						
5	AAtrex	4	L	1	qt/a	PRE	A						
5	Roundup PowerMax	4.5	SL	32	fl oz/a	POST	B						
5	Status	56	WG	5	oz/a	POST	B						
5	Surfactant		L	0.25	% v/v	POST	B						
5	AMS		WG	17	lb/100 gal	POST	B						
6	Untreated							0	0	0	0	0	
7	Anthem ATZ	4.5	L	1	qt/a	PRE	A	0	93	1	89	0	
7	Roundup PowerMax	4.5	SL	32	fl oz/a	POST	B						
7	AMS		WG	17	lb/100 gal	POST	B						
8	Lumax EZ	3.67	L	1.35	qt/a	PRE	A	0	98	0	93	0	
8	Halex GT	4.38	L	3.6	pt/a	POST	B						
8	Surfactant		L	0.25	% v/v	POST	B						
8	AMS		WG	17	lb/100 gal	POST	B						
9	SureStart	4.16	L	2.5	pt/a	PRE	A	0	98	0	87	0	
9	Roundup PowerMax	4.5	SL	32	fl oz/a	POST	B						
9	AMS		WG	17	lb/100 gal	POST	B						

MSU Weed Science Research Program

Overlapping residual herbicide programs in corn for Palmer amaranth control

Trial ID: C12-14 Study Dir.: Kohrt, Sprague, and Powell
 Conducted: Barry County Investigator: Christy Sprague

Weed Code	Crop Code	Rating Data Type	Rating Unit	Rating Date	Trt-Eval Interval	# Subsamples, Dec.	ZEAMX injury percent Jun/26/2014 38 DA-A 0	AMAPA control percent Jun/26/2014 38 DA-A 0	ZEAMX injury percent Jul/09/2014 13 DA-B 0	AMAPA control percent Jul/09/2014 13 DA-B 0	ZEAMX injury percent Jul/17/2014 21 DA-B 0
-----------	-----------	------------------	-------------	-------------	-------------------	--------------------	---	--	---	--	---

Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Grow Stg	Appl Code					
10	Corvus	2.63	L	5.6	fl oz/a	PRE	A	0	98	1	97	0
10	AAtrex	4	L	1	qt/a	PRE	A					
10	Roundup PowerMax	4.5	SL	32	fl oz/a	POST	B					
10	Laudis	3.5	L	3	fl oz/a	POST	B					
10	AAtrex	4	L	1	pt/a	POST	B					
10	MSO		L	1	% v/v	POST	B					
10	AMS		WG	17	lb/100 gal	POST	B					
LSD (P=.05)								0.0	5.1	4.3	12.8	2.3
CV								0.0	4.04	189.81	10.29	455.42

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

MSU Weed Science Research Program

Overlapping residual herbicide programs in corn for Palmer amaranth control

Trial ID: C12-14 Study Dir.: Kohrt, Sprague, and Powell
 Conducted: Barry County Investigator: Christy Sprague

Weed Code	AMAPA		AMAPA
Crop Code			
Rating Data Type	control	ZEAMX	control
Rating Unit	percent	injury	percent
Rating Date	Jul/17/2014	Jul/30/2014	Jul/30/2014
Trt-Eval Interval	21 DA-B	34 DA-B	34 DA-B
# Subsamples, Dec.	0	0	0

Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Grow Stg	Appl Code			
1	Zidua	85	WG	2	oz/a	PRE	A	99	0	99
1	Sharpen	2.85	L	2	fl oz/a	PRE	A			
1	Roundup PowerMax	4.5	SL	32	fl oz/a	POST	B			
1	Armezon	2.8	L	0.5	fl oz/a	POST	B			
1	AAtrex	4	L	1	pt/a	POST	B			
1	Outlook	6	L	12	fl oz/a	POST	B			
1	MSO		L	1	% v/v	POST	B			
1	AMS		WG	17	lb/100 gal	POST	B			
2	Verdict	5.57	L	14	fl oz/a	PRE	A	99	0	99
2	Roundup PowerMax	4.5	SL	32	fl oz/a	POST	B			
2	Armezon	2.8	L	0.5	fl oz/a	POST	B			
2	AAtrex	4	L	1	pt/a	POST	B			
2	Outlook	6	L	12	fl oz/a	POST	B			
2	MSO		L	1	% v/v	POST	B			
2	AMS		WG	17	lb/100 gal	POST	B			
3	Verdict	5.57	L	18	fl oz/a	PRE	A	99	0	99
3	Roundup PowerMax	4.5	SL	32	fl oz/a	POST	B			
3	Status	56	WG	5	oz/a	POST	B			
3	Zidua	85	WG	2	oz/a	POST	B			
3	Surfactant		L	0.25	% v/v	POST	B			
3	AMS		WG	17	lb/100 gal	POST	B			
4	Verdict	5.57	L	18	fl oz/a	PRE	A	99	0	99
4	Roundup PowerMax	4.5	SL	32	fl oz/a	POST	B			
4	Status	56	WG	5	oz/a	POST	B			
4	Prowl H2O	3.8	L	2	pt/a	POST	B			
4	Surfactant		L	0.25	% v/v	POST	B			
4	AMS		WG	17	lb/100 gal	POST	B			
5	Zidua	85	WG	2	oz/a	PRE	A	98	0	99
5	Sharpen	2.85	L	2	fl oz/a	PRE	A			
5	AAtrex	4	L	1	qt/a	PRE	A			
5	Roundup PowerMax	4.5	SL	32	fl oz/a	POST	B			
5	Status	56	WG	5	oz/a	POST	B			
5	Surfactant		L	0.25	% v/v	POST	B			
5	AMS		WG	17	lb/100 gal	POST	B			
6	Untreated							0	0	0
7	Anthem ATZ	4.5	L	1	qt/a	PRE	A	89	0	91
7	Roundup PowerMax	4.5	SL	32	fl oz/a	POST	B			
7	AMS		WG	17	lb/100 gal	POST	B			
8	Lumax EZ	3.67	L	1.35	qt/a	PRE	A	93	0	92
8	Halex GT	4.38	L	3.6	pt/a	POST	B			
8	Surfactant		L	0.25	% v/v	POST	B			
8	AMS		WG	17	lb/100 gal	POST	B			
9	SureStart	4.16	L	2.5	pt/a	PRE	A	84	0	90
9	Roundup PowerMax	4.5	SL	32	fl oz/a	POST	B			
9	AMS		WG	17	lb/100 gal	POST	B			

MSU Weed Science Research Program

Overlapping residual herbicide programs in corn for Palmer amaranth control

Trial ID: C12-14 Study Dir.: Kohrt, Sprague, and Powell
 Conducted: Barry County Investigator: Christy Sprague

Weed Code	AMAPA		AMAPA
Crop Code		ZEAMX	
Rating Data Type	control	injury	control
Rating Unit	percent	percent	percent
Rating Date	Jul/17/2014	Jul/30/2014	Jul/30/2014
Trt-Eval Interval	21 DA-B	34 DA-B	34 DA-B
# Subsamples, Dec.	0	0	0

Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Grow Stg	Appl Code	AMAPA control percent	ZEAMX injury percent	AMAPA control percent
10	Corvus	2.63	L	5.6	fl oz/a	PRE	A	98	0	99
10	AAtrex	4	L	1	qt/a	PRE	A			
10	Roundup PowerMax	4.5	SL	32	fl oz/a	POST	B			
10	Laudis	3.5	L	3	fl oz/a	POST	B			
10	AAtrex	4	L	1	pt/a	POST	B			
10	MSO		L	1	% v/v	POST	B			
10	AMS		WG	17	lb/100 gal	POST	B			
LSD (P=.05)								12.3	0.0	11.6
CV								9.88	0.0	9.25

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