

Ohio State University  
Horticulture and Crop Science

Glyphosate + 2,4-D+ AMS Replacement Adjuvants Study

Title No. 2:  
 Trial ID: 12POC3 Protocol ID: 12POC3  
 Location: WESTERN BRANCH F-7 W Study Director: Anthony F. Dobbels  
 Project ID: Investigator: Dr. Mark M. Loux  
 Sponsor Contact: John Smith, WinField Solutions

General Trial Information

Study Director: Anthony F. Dobbels Title: Research Specialist  
 Investigator: Dr. Mark M. Loux Title: Professor

Planned Completion Date: Sep-14-2012

Trial Location

City: South Charleston Latitude of LL Corner °: 39.86025 N  
 State/Prov.: Ohio Longitude of LL Corner °: 83.67159 W  
 Postal Code: 45368  
 Country: USA

Crop Description

Crop 1: ZEAMX Zea mays Corn  
 Variety: Dekalb 61-21 RIB Description: RR/LL  
 BBCH Scale: BCOR Planting Date: Apr-19-2012  
 Planting Method: SEEDED seeded Rate, Unit: 32097 S/A  
 Depth, Unit: 2 IN  
 Row Spacing, Unit: 30 IN  
 Seed Bed: MEDIUM medium Soil Temperature, Unit: 75 F  
 Soil Moisture: GOOD good Emergence Date: May-4-2012

Pest Description

- Pest 1 Type: W Code: SETFA *Setaria faberi*  
Common Name: Giant foxtail
- Pest 2 Type: W Code: AMBTR *Ambrosia trifida*  
Common Name: Giant ragweed
- Pest 3 Type: W Code: AMBEL *Ambrosia artemisiifolia*  
Common Name: Common ragweed
- Pest 4 Type: W Code: CHEAL *Chenopodium album*  
Common Name: Common lambsquarters
- Pest 5 Type: W Code: ABUTH *Abutilon theophrasti*  
Common Name: velvetleaf
- Pest 6 Type: W Code: AMARE *Amaranthus retroflexus*  
Common Name: Redroot pigweed
- Pest 7 Type: W Code: POLPY *Persicaria pensylvanica*  
Common Name: Pennsylvania smartweed
- Pest 8 Type: W Code: ECHCG *Echinochloa crus-galli*  
Common Name: Common barnyardgrass
- Pest 9 Type: W Code: HIBTR *Hibiscus trionum*  
Common Name: Venice mallow

Site and Design

Plot Width, Unit: 6.67 FT Site Type: FIELD field  
 Plot Length, Unit: 30 FT Experimental Unit: 1 PLOT plot  
 Plot Area, Unit: 200.1 FT<sup>2</sup> Tillage Type: CONTIL conventional-till  
 Replications: 3 Study Design: RACOB� Randomized Complete Block (RCB)  
 Untreated Arrangement: INCLUDED single control randomized in each block

Soil Description

Description Name: F-7 Middle  
 % OM: 1.9 Texture: CL clay loam  
 pH: 6.4 Soil Name: Celina  
 CEC: 13.3 Fert. Level: G good  
 Soil Drainage: G good

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Application Description

A  
 Application Date: May-31-2012  
 Time of Day: 8:30AM  
 Application Method: SPRAY  
 Application Timing: POST  
 Application Placement: BROFOL  
 Air Temperature, Unit: 63 F  
 % Relative Humidity: 66  
 Wind Velocity, Unit: 4 MPH  
 Wind Direction: NNE  
 Dew Presence (Y/N): N no  
 Soil Temperature, Unit: 64 F  
 Soil Moisture: DRY  
 % Cloud Cover: 0  
 Next Rain Occurred On: May-31-2012

Crop Stage At Each Application

A  
 Crop 1 Code, BBCH Scale: ZEAMX BCOR  
 Stage Scale Used: BBCH  
 Stage Majority, Percent: 15 100  
 Height, Unit: 15 IN  
 Height Minimum, Maximum: 14 16

Pest Stage At Each Application

A  
 Pest 1 Code, Type, Scale: SETFA W  
 Stage Majority, Percent: 15 100  
 Height, Unit: 9 IN  
 Height Minimum, Maximum: 8 10  
 Density, Unit: 200 M2  
 Pest 2 Code, Type, Scale: AMBTR W  
 Stage Majority, Percent: 19 100  
 Height, Unit: 13 IN  
 Height Minimum, Maximum: 10 15  
 Density, Unit: 9.1 M2  
 Pest 3 Code, Type, Scale: AMBEL W  
 Stage Majority, Percent: 17 100  
 Height, Unit: 3 IN  
 Height Minimum, Maximum: 2 4  
 Density, Unit: 2.6 M2  
 Pest 4 Code, Type, Scale: CHEAL W  
 Stage Majority, Percent: 19 100  
 Height, Unit: 4 IN  
 Height Minimum, Maximum: 2 5  
 Density, Unit: 41.6 M2  
 Pest 5 Code, Type, Scale: ABUTH W  
 Stage Majority, Percent: 14 100  
 Height, Unit: 4 IN  
 Height Minimum, Maximum: 4 4  
 Density, Unit: 0.33 M2  
 Pest 6 Code, Type, Scale: AMARE W  
 Stage Majority, Percent: 17 100  
 Height, Unit: 3 IN  
 Height Minimum, Maximum: 2 4  
 Density, Unit: 57.3 M2  
 Pest 7 Code, Type, Scale: POLPY W  
 Stage Majority, Percent: 15 100  
 Height, Unit: 4 IN  
 Height Minimum, Maximum: 3 5  
 Density, Unit: 4 M2  
 Pest 8 Code, Type, Scale: ECHCG W  
 Stage Majority, Percent: 15 100  
 Height, Unit: 6 IN  
 Height Minimum, Maximum: 8 10  
 Density, Unit: 15.6 M2  
 Pest 9 Code, Type, Scale: HIBTR W  
 Stage Majority, Percent: 14 100  
 Height, Unit: 3 IN  
 Height Minimum, Maximum: 2 4  
 Density, Unit: 5.3 M2

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## Application Equipment

A  
Appl. Equipment: 6 foot boom  
Equipment Type: SPRBAC  
Operation Pressure, Unit: 46 PSI  
Nozzle Type: AI XR  
Nozzle Size: 110015  
Nozzle Spacing, Unit: 18 IN  
Boom Length, Unit: 6 FT  
Boom Height, Unit: 20 IN  
Ground Speed, Unit: 3 MPH  
Carrier: WATER  
Spray Volume, Unit: 15 GPA  
Mix Size, Unit: 1 Liters  
Propellant: CO2

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Pest Type					W Weed	W Weed	W Weed
Pest Code					SETFA	ECHCG	AMBTR
Pest Scientific Name					Setaria faberi	Echinochloa cr>	Ambrosia trifi>
Pest Name					Giant foxtail	Common barnyar>	Giant ragweed
Crop Code		ZEAMX	ZEAMX	ZEAMX			
BBCH Scale		BCOR	BCOR	BCOR			
Crop Scientific Name		Zea mays	Zea mays	Zea mays			
Crop Name		Corn	Corn	Corn			
Rating Date		Jun-5-2012	Jun-5-2012	Jun-14-2012	Jun-14-2012	Jun-14-2012	Jun-14-2012
Rating Type		PHYLEAN	PHYNEC	PHYLEAN	CONTRO	CONTRO	CONTRO
Rating Unit		%	%	%	%	%	%
Number of Subsamples		1	1	1	1	1	1
Days After First/Last Applic.		5	5	14	14	14	14
Trt-Eval Interval		5 DA-A	5 DA-A	14 DA-A	14 DA-A	14 DA-A	14 DA-A
Plant-Eval Interval		47 DP-1	47 DP-1	56 DP-1	56 DP-1	56 DP-1	56 DP-1
Days After Emergence		32 DE-1	32 DE-1	41 DE-1	41 DE-1	41 DE-1	41 DE-1
Number of Decimals		0	0	0	0	0	0
Trt Treatment	Rate	Other	Other	Appl			
No. Name	Rate Unit	Rate	Rate	Unit Code	1	2	3
					4	5	6
1 Roundup PowerMax	1 lb ae/a	28.4 oz/a		A	0 a	1 c	3 c
					100 a	82 a	81 b
2 Roundup Powermax	1 lb ae/a	28.4 oz/a		A	6 a	2 ab	7 ab
2 E-99	1.33 pt/a	1.33 pt/a			100 a	80 ab	98 a
2 N-PAK AMS	2.5 % v/v	2.5 % v/v					
3 Roundup Powermax	1 lb ae/a	28.4 oz/a		A	5 a	2 abc	6 bc
3 E-99	1.33 pt/a	21.3 oz/a			100 a	67 b-f	95 a
3 AG 08034	2 % v/v	2 % v/v					
4 Roundup Powermax	1 lb ae/a	28.4 oz/a		A	4 a	1 bc	5 bc
4 E-99	1.33 pt/a	21.3 oz/a			100 a	68 a-e	98 a
4 AG08034	1 % v/v	1 %v/v					
5 Roundup Powermax	1 lb ae/a	28.4 oz/a		A	5 a	1 bc	5 bc
5 E-99	1.33 pt/a	21.3 oz/a			100 a	73 a-d	91 a
5 AG08034	0.75 % v/v	0.75 %v/v					
6 Roundup Powermax	1 lb ae/a	28.4 oz/a		A	4 a	2 abc	6 bc
6 E-99	1.33 pt/a	21.3 oz/a			100 a	62 def	92 a
6 AG 07043	1 % v/v	1 % v/v					
7 Roundup Powermax	1 lb ae/a	28.4 oz/a		A	6 a	3 a	9 a
7 E-99	1.33 pt/a	1.33 pt/a			100 a	77 abc	99 a
7 AG11011	1 % v/v	1 % v/v					
8 Roundup Powermax	1 lb ae/a	28.4 oz/a		A	7 a	1 bc	7 ab
8 E-99	1.33 pt/a	1.33 pt/a			100 a	63 c-f	95 a
8 AG 12030	1 % v/v	1 % v/v					
9 Roundup Powermax	1 lb ae/a	28.4 oz/a		A	5 a	2 abc	9 a
9 E-99	1.33 pt/a	1.33 pt/a			100 a	57 ef	98 a
9 AG 12030	0.5 % v/v	0.5 % v/v					
10 Roundup Powermax	1 lb ae/a	28.4 oz/a		A	4 a	3 a	9 a
10 E-99	1.33 pt/a	1.33 pt/a			100 a	53 f	100 a
10 AG 12030	1 % v/v	1 % v/v					
10 Interlock	4 oz/a	4 oz/a					
LSD (P=.05)					3.7	1.4	3.3
Standard Deviation					2.2	0.8	1.9
CV					46.11	46.85	29.42
					0.0	0.0	0.0
					14.7	8.6	9.8
					12.6	6.04	6.04
Replicate F					5.907	2.250	0.106
Replicate Prob(F)					0.0107	0.1342	0.8999
Treatment F					2.003	2.625	3.139
Treatment Prob(F)					0.1002	0.0389	0.0186
					1.0000	0.0000	0.0000
					7.261	3.801	3.051
					0.0077	0.0210	0.0210

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Pest Type	W Weed	W Weed	W Weed	W Weed	W Weed				
Pest Code	CHEAL	AMARE	POLPY	HIBTR	ABUTH				
Pest Scientific Name	Chenopodium al-	Amaranthus ret>	Persicaria pen>	Hibiscus trion>	Abutilon theop>				
Pest Name	Common lambsqu>	Redroot pigweed	Pennsylvania s>	Venice mallow	velvetleaf				
Crop Code									
BBCH Scale									
Crop Scientific Name									
Crop Name									
Rating Date	Jun-14-2012	Jun-14-2012	Jun-14-2012	Jun-14-2012	Jun-14-2012				
Rating Type	CONTRO	CONTRO	CONTRO	CONTRO	CONTRO				
Rating Unit	%	%	%	%	%				
Number of Subsamples	1	1	1	1	1				
Days After First/Last Applic.	14 14	14 14	14 14	14 14	14 14				
Trt-Eval Interval	14 DA-A	14 DA-A	14 DA-A	14 DA-A	14 DA-A				
Plant-Eval Interval	56 DP-1	56 DP-1	56 DP-1	56 DP-1	56 DP-1				
Days After Emergence	41 DE-1	41 DE-1	41 DE-1	41 DE-1	41 DE-1				
Number of Decimals	0	0	0	0	0				
Trt Treatment	Rate	Other	Other	Appl					
No. Name	Rate Unit	Rate	Rate	Unit Code					
					7				
					8				
					9				
					10				
					11				
1 Roundup PowerMax	1 lb ae/a	28.4 oz/a		A	73 a	87 a	57 a	53 a	
2 Roundup Powermax	1 lb ae/a	28.4 oz/a		A	82 a	95 a	68 a	44 a	77 a
2 E-99	1.33 pt/a	1.33 pt/a							
2 N-PAK AMS	2.5 % v/v	2.5 % v/v							
3 Roundup Powermax	1 lb ae/a	28.4 oz/a		A	82 a	97 a	60 a	79 a	
3 E-99	1.33 pt/a	21.3 oz/a							
3 AG 08034	2 % v/v	2 % v/v							
4 Roundup Powermax	1 lb ae/a	28.4 oz/a		A	83 a	97 a	70 a	80 a	53 a
4 E-99	1.33 pt/a	21.3 oz/a							
4 AG08034	1 % v/v	1 %v/v							
5 Roundup Powermax	1 lb ae/a	28.4 oz/a		A	83 a	100 a	68 a	68 a	62 a
5 E-99	1.33 pt/a	21.3 oz/a							
5 AG08034	0.75 % v/v	0.75 %v/v							
6 Roundup Powermax	1 lb ae/a	28.4 oz/a		A	82 a	97 a	68 a	65 a	77 a
6 E-99	1.33 pt/a	21.3 oz/a							
6 AG 07043	1 % v/v	1 % v/v							
7 Roundup Powermax	1 lb ae/a	28.4 oz/a		A	82 a	90 a	70 a	65 a	69 a
7 E-99	1.33 pt/a	1.33 pt/a							
7 AG11011	1 % v/v	1 % v/v							
8 Roundup Powermax	1 lb ae/a	28.4 oz/a		A	82 a	93 a	73 a	79 a	69 a
8 E-99	1.33 pt/a	1.33 pt/a							
8 AG 12030	1 % v/v	1 % v/v							
9 Roundup Powermax	1 lb ae/a	28.4 oz/a		A	83 a	95 a	65 a	69 a	64 a
9 E-99	1.33 pt/a	1.33 pt/a							
9 AG 12030	0.5 % v/v	0.5 % v/v							
10 Roundup Powermax	1 lb ae/a	28.4 oz/a		A	82 a	100 a	67 a		74 a
10 E-99	1.33 pt/a	1.33 pt/a							
10 AG 12030	1 % v/v	1 % v/v							
10 Interlock	4 oz/a	4 oz/a							
LSD (P=.05)					10.4	13.0	11.0	33.4	107.7
Standard Deviation					6.1	7.6	6.3	9.5	10.4
CV					7.45	7.99	9.43	14.2	15.27
Replicate F					0.091	3.424	0.016	2.037	1.472
Replicate Prob(F)					0.9135	0.0549	0.9843	0.3293	0.5036
Treatment F					0.697	0.899	1.874	5.082	1.822
Treatment Prob(F)					0.7037	0.5458	0.1356	0.1748	0.5171

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Pest Type		W Weed	W Weed	W Weed	W Weed
Pest Code		SETFA	ECHCG	AMBTR	CHEAL
Pest Scientific Name		Setaria faberi	Echinochloa cr>	Ambrosia trifi>	Chenopodium al>
Pest Name		Giant foxtail	Common barnyar>	Giant ragweed	Common lambsqu>
Crop Code		GLXMA			
BBCH Scale		BSOY			
Crop Scientific Name		Glycine max			
Crop Name		Soybean			
Rating Date		Jun-27-2012	Jun-27-2012	Jun-27-2012	Jun-27-2012
Rating Type		PHYLEAN	CONTRO	CONTRO	CONTRO
Rating Unit		%	%	%	%
Number of Subsamples		1	1	1	1
Days After First/Last Applic.		27 27	27 27	27 27	27 27
Trt-Eval Interval		27 DA-A	27 DA-A	27 DA-A	27 DA-A
Plant-Eval Interval		69 DP-1	69 DP-1	69 DP-1	69 DP-1
Days After Emergence		54 DE-1	54 DE-1	54 DE-1	54 DE-1
Number of Decimals		0	0	0	0
Trt Treatment	Rate	Other	Other	Appl	
No. Name	Rate Unit	Rate	Rate	Unit Code	
					12 13 14 15 16
1 Roundup PowerMax	1 lb ae/a	28.4 oz/a		A	1 a 88 a 63 a 78 b 43 b
2 Roundup Powermax	1 lb ae/a	28.4 oz/a		A	2 a 85 a 60 ab 100 a 100 a
2 E-99	1.33 pt/a	1.33 pt/a			
2 N-PAK AMS	2.5 % v/v	2.5 % v/v			
3 Roundup Powermax	1 lb ae/a	28.4 oz/a		A	3 a 73 a 37 c 100 a 100 a
3 E-99	1.33 pt/a	21.3 oz/a			
3 AG 08034	2 % v/v	2 % v/v			
4 Roundup Powermax	1 lb ae/a	28.4 oz/a		A	4 a 83 a 33 c 100 a 100 a
4 E-99	1.33 pt/a	21.3 oz/a			
4 AG08034	1 % v/v	1 %v/v			
5 Roundup Powermax	1 lb ae/a	28.4 oz/a		A	4 a 83 a 33 c 100 a 99 a
5 E-99	1.33 pt/a	21.3 oz/a			
5 AG08034	0.75 % v/v	0.75 %v/v			
6 Roundup Powermax	1 lb ae/a	28.4 oz/a		A	6 a 78 a 33 c 100 a 100 a
6 E-99	1.33 pt/a	21.3 oz/a			
6 AG 07043	1 % v/v	1 % v/v			
7 Roundup Powermax	1 lb ae/a	28.4 oz/a		A	8 a 92 a 72 a 100 a 100 a
7 E-99	1.33 pt/a	1.33 pt/a			
7 AG11011	1 % v/v	1 % v/v			
8 Roundup Powermax	1 lb ae/a	28.4 oz/a		A	6 a 83 a 40 bc 100 a 100 a
8 E-99	1.33 pt/a	1.33 pt/a			
8 AG 12030	1 % v/v	1 % v/v			
9 Roundup Powermax	1 lb ae/a	28.4 oz/a		A	8 a 85 a 40 bc 100 a 100 a
9 E-99	1.33 pt/a	1.33 pt/a			
9 AG 12030	0.5 % v/v	0.5 % v/v			
10 Roundup Powermax	1 lb ae/a	28.4 oz/a		A	5 a 80 a 33 c 100 a 100 a
10 E-99	1.33 pt/a	1.33 pt/a			
10 AG 12030	1 % v/v	1 % v/v			
10 Interlock	4 oz/a	4 oz/a			
LSD (P=.05)					4.7 14.4 21.1 1.6 6.4
Standard Deviation					2.7 8.4 12.3 0.9 3.7
CV					57.38 10.08 27.68 0.93 3.95
Replicate F					1.782 1.079 1.598 1.000 0.840
Replicate Prob(F)					0.1967 0.3609 0.2297 0.3874 0.4481
Treatment F					2.406 1.119 4.247 169.000 69.276
Treatment Prob(F)					0.0539 0.3989 0.0044 0.0001 0.0001

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Pest Type	W Weed	W Weed	W Weed	W Weed					
Pest Code	AMARE	POLPY	HIBTR	ABUTH					
Pest Scientific Name	Amaranthus ret>	Persicaria pen>	Hibiscus trion>	Abutilon theop>					
Pest Name	Redroot pigweed	Pennsylvania s>	Venice mallow	velvetleaf					
Crop Code									
BBCH Scale									
Crop Scientific Name									
Crop Name									
Rating Date	Jun-27-2012	Jun-27-2012	Jun-27-2012	Jun-27-2012					
Rating Type	CONTRO	CONTRO	CONTRO	CONTRO					
Rating Unit	%	%	%	%					
Number of Subsamples	1	1	1	1					
Days After First/Last Applic.	27 27	27 27	27 27	27 27					
Trt-Eval Interval	27 DA-A	27 DA-A	27 DA-A	27 DA-A					
Plant-Eval Interval	69 DP-1	69 DP-1	69 DP-1	69 DP-1					
Days After Emergence	54 DE-1	54 DE-1	54 DE-1	54 DE-1					
Number of Decimals	0	0	0	0					
Trt Treatment	Rate	Other	Other	Appl	17	18	19	20	21
No. Name	Rate Unit	Rate	Rate	Unit Code					
1 Roundup PowerMax	1 lb ae/a	28.4 oz/a		A	47 a	50 a	50 a	100 a	
2 Roundup Powermax	1 lb ae/a	28.4 oz/a		A	60 a	70 a	77 a	100 a	
2 E-99	1.33 pt/a	1.33 pt/a							
2 N-PAK AMS	2.5 % v/v	2.5 % v/v							
3 Roundup Powermax	1 lb ae/a	28.4 oz/a		A	53 a	70 a	63 a	92 a	
3 E-99	1.33 pt/a	21.3 oz/a							
3 AG 08034	2 % v/v	2 % v/v							
4 Roundup Powermax	1 lb ae/a	28.4 oz/a		A	60 a	55 a	80 a	100 a	
4 E-99	1.33 pt/a	21.3 oz/a							
4 AG08034	1 % v/v	1 %v/v							
5 Roundup Powermax	1 lb ae/a	28.4 oz/a		A	63 a	77 a	78 a	83 a	
5 E-99	1.33 pt/a	21.3 oz/a							
5 AG08034	0.75 % v/v	0.75 %v/v							
6 Roundup Powermax	1 lb ae/a	28.4 oz/a		A	60 a	58 a	62 a	100 a	
6 E-99	1.33 pt/a	21.3 oz/a							
6 AG 07043	1 % v/v	1 % v/v							
7 Roundup Powermax	1 lb ae/a	28.4 oz/a		A	60 a	78 a	83 a	93 a	
7 E-99	1.33 pt/a	1.33 pt/a							
7 AG11011	1 % v/v	1 % v/v							
8 Roundup Powermax	1 lb ae/a	28.4 oz/a		A	63 a	67 a	77 a	93 a	
8 E-99	1.33 pt/a	1.33 pt/a							
8 AG 12030	1 % v/v	1 % v/v							
9 Roundup Powermax	1 lb ae/a	28.4 oz/a		A	70 a	72 a	77 a	93 a	
9 E-99	1.33 pt/a	1.33 pt/a							
9 AG 12030	0.5 % v/v	0.5 % v/v							
10 Roundup Powermax	1 lb ae/a	28.4 oz/a		A	63 a	60 a	87 a	87 a	
10 E-99	1.33 pt/a	1.33 pt/a							
10 AG 12030	1 % v/v	1 % v/v							
10 Interlock	4 oz/a	4 oz/a							
LSD (P=.05)					19.3	18.9	25.3	20.3	.
Standard Deviation					11.2	10.9	14.7	11.8	.
CV					18.73	16.63	20.1	12.56	.
Replicate F					10.531	1.350	6.492	0.828	
Replicate Prob(F)					0.0009	0.2871	0.0075	0.4529	
Treatment F					0.938	2.217	1.781	0.758	
Treatment Prob(F)					0.5170	0.0790	0.1421	0.6549	