

# The Ohio State University

## Waterhemp Control With Overlapping Residuals

Trial ID: 23OLR  
 Protocol ID: 23OLR Location: Trial Year: 2023  
 Project ID: Project ID 2: Project ID 3:  
 Study Director: Sponsor Contact:  
 Investigator:

Status: E established  
 ARM Trial Created On: Mar-31-2023

### Trial Location

City: South Charleston Country: USA United States  
 State/Prov.: Ohio County: Clark  
 Postal Code: 45368 Climate Zone: EPPONE Eppo North East

Latitude of LL Corner °: 39.85611 N  
 Longitude of LL Corner °: -83.66747 W  
 Altitude of LL Corner: 1079.00 FT

### Regulations

Conducted Under GLP: No  
 Conducted Under GEP: No

### Crop Description

Crop 1: C	GLXMA Glycine max	Soybean
	Entry Date: May-15-2023	Stage Scale: BBCH
	Variety: Pioneer P35T15E	
	Attributes: 2,4-D Choline, Glyphosate, Glufosinate Tol	
	Seed Shape: ROUND	Seed Size: 2518 S/LB
	Planting Date: May-12-2023	Planting Rate: 155500 S/A
	Depth: 1 IN	
	Rows per Plot: 4	Planting Method: PLANTD planted
	Row Spacing: 30 IN	Planting Equipment: FE field equipment
		Seed Bed: MEDIUM medium
	Soil Temperature: 57 F	Soil Moisture: NORMAL normal, adequate
	Emergence Date: May-23-2023	
	Harvest Date: Oct-10-2023	Harvest Equipment: Kincaid 8XP
	Moisture Meter: Harvest Master	Harvested Width: 5 FT
	% Standard Moisture: 13	Harvested Length: 30 FT
	Weighing Equipment: Harvest Master HM800	

### Pest Description

Pest 1 Type: W	Code: ECHCG Echinochloa crus-galli	Entry Date: Jun-8-2023
	Common Name: common barnyardgrass	Stage Scale: BBCH
Pest 2 Type: W	Code: SETPU Setaria helvola	Entry Date: Jun-8-2023
	Common Name: yellow foxtail	Stage Scale: BBCH
Pest 3 Type: W	Code: AMBTR Ambrosia trifida	Entry Date: Jun-8-2023
	Common Name: Giant ragweed	Stage Scale: BBCH
Pest 4 Type: W	Code: CHEAL Chenopodium album	Entry Date: Jun-8-2023
	Common Name: common lambsquarters	Stage Scale: BBCH
Pest 5 Type: W	Code: AMATA Amaranthus x tamariscinus	Entry Date: Jun-8-2023
	Common Name: common water hemp	Stage Scale: BBCH
Pest 6 Type: W	Code: SIDSP Sida spinosa	Entry Date: Jun-8-2023
	Common Name: Prickly sida	Stage Scale: BBCH

### Site and Design

Treated Plot Width: 6.67 FT  
 Treated Plot Length: 30 FT  
 Treated Plot Area: 200.1 FT<sup>2</sup>  
 Replications: 4 Treatments: 8 Plots: 32 Study Design: RACOB L Randomized Complete Block (RCB)

### Soil Description

Description Name: Entomology W-1  
 % Sand: 35 % OM: 2.3 Texture: L loam  
 % Silt: 40 Soil Name: Crosby  
 % Clay: 25 Fert. Level: G good  
 pH: 6.6 CEC: 12.7  
 Soil Drainage: G good

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### Application Description

	A	B
Date	May-11-2023	Jun-7-2023
Start Time	4:59 PM	11:55 AM
Stop Time	5:15 PM	12:04 PM
Method	SPRAY	SPRAY
Timing	PRE	POST
Placement	BROSI	BROFOL
Applied By	Dobbels	ESSMAN
Entry Date	Jun-27-2023	Jun-8-2023
Air Temperature Start, Stop	80, 80 F	67, 67 F
% Relative Humidity Start, Stop	32, 32	35, 35
Wind Velocity+Dir. Start	7 MPH, SE	9 MPH, NNE
Wind Velocity+Dir. Stop	7 MPH, SE	9 MPH, NNE
Wind Velocity+Dir. Max	8 MPH, SE	9 MPH, NNE
Wet Leaves (Y/N)	N, no	N, no
Soil Temperature	72 F	72 F
Soil Moisture	DRY	DRY
Soil Surface Condition	MEDIUM	MEDIUM
% Cloud Cover	0	0
First Moisture Occurred On	May-12-2023	Jun-11-2023
Time to First Moisture	1.0 DAY	4.0 DAY
Moisture 6 Hours after Appl.	0 IN	0 IN
Moisture 24 Hours after Appl.	0.88 IN	0 IN
Moisture 1 Week after Appl.	1.01 IN	2.09 IN
Problems with Application?	N, no	N, no

### Crop Stage At Each Application

	A	B
Crop 1 Code, BBCH Scale	GLXMA, BSOY	GLXMA, BSOY
Days after Emergence	-12	15
Stage Majority, Percent		11, 80
Stage Minimum, Percent		11, 80
Stage Maximum, Percent		12, 20
Height Average		4 IN
Height Minimum, Maximum		4, 6

### Pest Stage At Each Application

	A	B
Pest 1 Code, Type, Scale	ECHCG, W, BBCH	ECHCG, W, BBCH
Stage Majority, Percent		16, 70
Stage Minimum, Percent		12, 10
Stage Maximum, Percent		18, 10
Height Average		4 IN
Height Minimum, Maximum		3, 6
Pest 2 Code, Type, Scale	SETPU, W, BBCH	SETPU, W, BBCH
Stage Majority, Percent		16, 70
Stage Minimum, Percent		12, 10
Stage Maximum, Percent		18, 10
Height Average		4 IN
Height Minimum, Maximum		3, 6
Pest 3 Code, Type, Scale	AMBTR, W, BBCH	AMBTR, W, BBCH
Stage Majority, Percent		19, 80
Stage Minimum, Percent		14, 10
Stage Maximum, Percent		19, 80
Height Average		15 IN
Height Minimum, Maximum		12, 17
Pest 4 Code, Type, Scale	CHEAL, W, BBCH	CHEAL, W, BBCH
Stage Majority, Percent		16, 70
Stage Minimum, Percent		12, 10
Stage Maximum, Percent		18, 10
Height Average		2 IN
Height Minimum, Maximum		1, 2
Pest 5 Code, Type, Scale	AMATA, W, BBCH	AMATA, W, BBCH
Stage Majority, Percent		14, 80
Stage Minimum, Percent		14, 80
Stage Maximum, Percent		16, 20
Height Average		1 IN
Height Minimum, Maximum		0.5, 1
Pest 6 Code, Type, Scale	SIDSP, W, BBCH	SIDSP, W, BBCH
Stage Majority, Percent		16, 70
Stage Minimum, Percent		16, 70
Stage Maximum, Percent		18, 10
Height Average		0.5 IN
Height Minimum, Maximum		0.5, 1

### Notes

Context	Date	By	Notes
STATUS	Mar-31-2023	Dr. Mark M. Loux	Automatically added by ARM: Trial Status updated to 'S' during trial creation.
STATUS	May-15-2023	Dr. Mark M. Loux	Automatically added by ARM: Status changed to: E: changed by (EOHLOM).
STATUS	May-15-2023	Dr. Mark M. Loux	Automatically added by ARM: Trial Status updated to 'E' when Planting Date entered.

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Rating Date		Oct-10-2023		Oct-10-2023		Oct-10-2023		Oct-10-2023	
Part Rated									
Rating Type		weigh		moicon		YIELD		WEITES	
Rating Unit/Min/Max		LB, -, -		%, 0, 100		BU, -, -		LB, -, -	
Sample Size		1 plot		1 QT		1 A		1 QT	
Collection Basis				1 PLOT				1 PLOT	
Reporting Basis				1 PLOT				1 BU	
Number of Subsamples		1		1		1		1	
Crop Type, Code		C, GLXMA		C, GLXMA		C, GLXMA		C, GLXMA	
Crop Scientific Name		Glycine max		Glycine max		Glycine max		Glycine max	
Crop Name		Soybean		Soybean		Soybean		Soybean	
Pest Type									
Pest Code									
Pest Scientific Name									
Pest Name									
Rating Timing		harvest				harvest			
Days After First/Last Applic.		152, 125		152, 125		152, 125		152, 125	
Trt-Eval Interval									
Plant-Eval Interval		151 DP-1		151 DP-1		151 DP-1		151 DP-1	
Days After Emergence		140 DE-1		140 DE-1		140 DE-1		140 DE-1	
EDC App									
ARM Action Codes						TY1			
Number of Decimals						1			
Data Entry Date		Oct-16-2023		Oct-16-2023		Oct-16-2023		Oct-16-2023	
Trt	Treatment	Rate	Other	Other	Appl	17*	18*	19*	20*
No.	Name	Rate Unit	Rate	Rate	Unit Code				
1	Dual II Magnum	1 pt/a	0.955 lb ai/a		A	8.4133b	14.78a	39.9b	45.05b
2	Dual II Magnum	1 pt/a	0.955 lb ai/a		A	14.1750a	13.15ab	68.5a	54.58a
2	Enlist One	32 oz/a	0.95 lb ai/a		B				
2	Roundup Powermax 3	30 oz/a	1.12 lb ae/a		B				
2	AMSOL	2.5% v/v	1.5 qt/a		B				
3	Dual II Magnum	1 pt/a	0.955 lb ai/a		A	14.5005a	13.18ab	70.0a	53.13a
3	Dual II Magnum	1.3 pt/a	1.24 lb ai/a		B				
3	Enlist One	32 oz/a	0.95 lb ai/a		B				
3	Roundup Powermax 3	30 oz/a	1.12 lb ae/a		B				
3	AMSOL	2.5% v/v	1.5 qt/a		B				
4	Dual II Magnum	1 pt/a	0.955 lb ai/a		A	14.3775a	11.53b	70.7a	54.05a
4	Warrant	48 oz/a	1.13 lb ai/a		B				
4	Enlist One	32 oz/a	0.95 lb ai/a		B				
4	Roundup Powermax 3	30 oz/a	1.12 lb ae/a		B				
4	AMSOL	2.5% v/v	1.5 qt/a		B				
5	Dual II Magnum	1 pt/a	0.955 lb ai/a		A	14.4815a	11.78b	71.1a	55.15a
5	Zidua SC	3.5 oz/a	0.114 lb ai/a		B				
5	Enlist One	32 oz/a	0.95 lb ai/a		B				
5	Roundup Powermax 3	30 oz/a	1.12 lb ae/a		B				
5	AMSOL	2.5% v/v	1.5 qt/a		B				
6	Dual II Magnum	1 pt/a	0.955 lb ai/a		A	14.4100a	12.63b	69.9a	54.65a
6	Outlook	14 oz/a	0.656 lb ai/a		B				
6	Enlist One	32 oz/a	0.95 lb ai/a		B				
6	Roundup Powermax 3	30 oz/a	1.12 lb ae/a		B				
6	AMSOL	2.5% v/v	1.5 qt/a		B				
7	Dual II Magnum	1 pt/a	0.955 lb ai/a		A	13.8203a	13.48ab	66.5a	54.65a
7	Prefix	1 qt/a	1.32 lb ai/a		B				
7	Enlist One	32 oz/a	0.95 lb ai/a		B				
7	Roundup Powermax 3	30 oz/a	1.12 lb ae/a		B				
7	AMSOL	2.5% v/v	1.5 qt/a		B				

Means followed by same letter or symbol do not significantly differ (P=0.05, Student-Newman-Keuls).  
 Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.  
 \* Adjusted means  
 ^Calculated from residual.

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Rating Date	Oct-10-2023	Oct-10-2023	Oct-10-2023	Oct-10-2023
Part Rated				
Rating Type	weigh	moicon	YIELD	WEITES
Rating Unit/Min/Max	LB, -, -	%, 0, 100	BU, -, -	LB, -, -
Sample Size	1 plot	1 QT	1 A	1 QT
Collection Basis		1 PLOT		1 PLOT
Reporting Basis		1 PLOT		1 BU
Number of Subsamples	1	1	1	1
Crop Type, Code	C, GLXMA	C, GLXMA	C, GLXMA	C, GLXMA
Crop Scientific Name	Glycine max	Glycine max	Glycine max	Glycine max
Crop Name	Soybean	Soybean	Soybean	Soybean
Pest Type				
Pest Code				
Pest Scientific Name				
Pest Name				
Rating Timing	harvest		harvest	
Days After First/Last Applic.	152, 125	152, 125	152, 125	152, 125
Trt-Eval Interval				
Plant-Eval Interval	151 DP-1	151 DP-1	151 DP-1	151 DP-1
Days After Emergence	140 DE-1	140 DE-1	140 DE-1	140 DE-1
EDC App				
ARM Action Codes			TY1	
Number of Decimals			1	
Data Entry Date	Oct-16-2023	Oct-16-2023		Oct-16-2023

Trt Treatment No. Name	Rate Rate Unit	Other Rate	Other Rate Unit	Appl Code	17*	18*	19*	20*
8 Dual II Magnum	1pt/a	0.955lb ai/a		A	13.2138 a	12.35 b	64.4 a	53.55 a
8 Reflex	1pt/a	0.25lb ai/a		B				
8 Enlist One	32oz/a	0.95lb ai/a		B				
8 Roundup Powermax 3	30oz/a	1.12lb ae/a		B				
8 AMSOL	2.5% v/v	1.5qt/a		B				
LSD P=.05					2.28921	1.489	10.99	2.385
Standard Deviation					1.55675	1.012	7.48	1.622
CV					11.6	7.87	11.48	3.05
Grand Mean					13.42397	12.856	65.14	53.100
Levene's F^					1.551	1.635	1.539	3.609*
Levene's Prob(F)					0.198	0.174	0.202	0.009*
Rank X2					.	.	.	.
P(Rank X2)					.	.	.	.
Shapiro-Wilk^					0.9794	0.9339	0.9787	0.9612
P(Shapiro-Wilk)^					0.7829	0.0505	0.7619	0.2959
Skewness^					-0.1136	0.2292	-0.127	-0.2885
P(Skewness)^					0.7951	0.6009	0.7716	0.5108
Kurtosis^					-0.542	-1.1163	-0.5704	0.0248
P(Kurtosis)^					0.5268	0.1971	0.5055	0.9768
Replicate F					3.238	0.627	3.052	1.116
Replicate Prob(F)					0.0427	0.6058	0.0510	0.3648
Treatment F					7.081	4.184	7.810	16.751
Treatment Prob(F)					0.0002	0.0050	0.0001	0.0001

Rating Type  
 moicon = moisture content  
 YIELD = yield  
 WEITES = weight - test  
Rating Unit/Min/Max  
 LB, , = pound  
 %, 0, 100 = percent  
 BU, , = bushel

plot = total plot  
 QT = quart  
 A = acre

PLOT = total plot

PLOT = total plot  
 BU = bushel

Crop Type, Code  
 C = EPP0 species (Bayer) codes  
 GLXMA, BSOY, Glycine max, Soybean = US

Plant-Eval Interval  
 151 DP-1 = 1 GLXMA May-12-2023

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### ARM Action Codes

TY1 =  $4.84 * [C17] * (100 - [C18]) / 87$

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