

Purdue Weed Science

Residual Weed Control in Soybean with Xtendimax Herbicide Combinations

Trial ID: 23-MGS-Soy-05
 Protocol ID: 23-MGS-Soy-05 Location: Trial Year: 2023
 Study Director: Dr. Bill Johnson Sponsor Contact: John Schramski

Investigator: Dr. Bill Johnson

General Trial Information

Study Director: Dr. Bill Johnson **Title:** Professor
Investigator: Dr. Bill Johnson **Title:** Professor

Discipline: H herbicide
Status: E established

ARM Trial Created On: Mar-30-2023
Initiation Date: May-5-2023 **Planned Completion Date:** Oct-15-2023

Trial Location

City: Lafayette **Country:** USA United States
State/Prov.: Indiana
Postal Code: 47907

Latitude of LL Corner °: 40.27157 N
Longitude of LL Corner °: -86.8806 W

Regulations

Conducted Under GLP: No
Conducted Under GEP: No

Contacts

Role: STYDIR study director
Study Director: Dr. Bill Johnson **Title:** Professor
Organization: Purdue University
Address 1: 915 W. State Street
Country: USA United States **E-mail:** wgj@purdue.edu
City: West Lafayette **State/Prov:** IN **Postal Code:** 47907

Role: INVEST investigator
Investigator: Dr. Bill Johnson **Title:** Professor
Organization: Purdue University
Address 1: 915 W. State Street
Country: USA United States **E-mail:** wgj@purdue.edu
City: West Lafayette **State/Prov:** IN **Postal Code:** 47907

Role: SPONSR sponsor
Sponsor: John Schramski
Organization: Bayer

Role: COOPER cooperater
Cooperator: Jay Young **Title:** Superintendent
Organization: Purdue University
Address 1: 8343 US 231 S **Phone No.:** (765) 538-3422
Country: USA United States **E-mail:** jayyoung@purdue.edu
City: Lafayette **State/Prov:** IN **Postal Code:** 47907

Crop Description

Crop 1: C GLXMA Glycine max Soybean
Entry Date: May-24-2023 **Stage Scale:** BBCH
Variety: AG29XF1
Attributes: Glyphosate-R, Glufosinate-R, and Dicamba-R
Planting Date: May-5-2023 **Planting Rate:** 140000 S/A
Depth: 1.5 IN
Rows per Plot: 4 **Planting Method:** PLANTD planted
Row Spacing: 30 IN **Planting Equipment:** PP plot planter
Soil Temperature: 78 F **Soil Moisture:** NORMAL normal, adequate
Emergence Date: May-15-2023

Pest Description

Pest 1 Type: W **Code:** AMATU **Amaranthus tuberculatus** **Entry Date:** May-24-2023
Common Name: tall waterhemp **Stage Scale:** BBCH
Attributes: Glyphosate-R and PPO-R

Pest 2 Type: W **Code:** SETFA **Setaria faberi** **Entry Date:** May-24-2023
Common Name: Giant foxtail **Stage Scale:** BBCH

Site and Design

Treated Plot Width: 6.67 FT **Site Type:** FIELD field
Treated Plot Length: 30 FT **Experimental Unit:** 1 PLOT plot
Treated Plot Area: 200.1 FT2 **Tillage Type:** NOTILL no-till
Replications: 4 **Treatments:** 10 **Plots:** 40 **Study Design:** RACOB L Randomized Complete Block (RCB)

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Field Prep./Maintenance:

Roundup PowerMax 3 (30 fl oz/A) + 2,4-D (1 pint/A) applied 04/12/2023.
 Gramoxone (3 pt/A) applied 05/04/2023.

Soil Description

Description Name: MEIGS-S3
 % Sand: 21 % OM: 2.2 **Texture:** SIL silt loam
 % Silt: 54 **Soil Name:** Starks-Fincastle complex
 % Clay: 25 **Fert. Level:** G good
 pH: 6.8 **CEC:** 8.3

No.	Date	Moisture Total	Unit	Min Temp	Max Temp	Avg Temp	Temp Unit	Max Wind	Avg Wind	Unit
1.	May-1-2023	0.011	IN	39.7	46.4	42.6	F	29.3	10.7	MPH
2.	May-2-2023	0	IN	41	57.9	47.1	F	25.1	7.8	MPH
3.	May-3-2023	0	IN	39.2	62.4	49.3	F	19.7	5.4	MPH
4.	May-4-2023	0	IN	36.3	71.4	55.6	F	12.5	2	MPH
5.	May-5-2023	0	IN	49.1	78.1	64.2	F	25.1	7.2	MPH
6.	May-6-2023	0.002	IN	57.7	77.5	67.1	F	31.5	9.2	MPH
7.	May-7-2023	0.03	IN	60.8	79.7	69.1	F	35.1	9.2	MPH
8.	May-8-2023	0.003	IN	58.3	75.9	66.9	F	20.8	6.7	MPH
9.	May-9-2023	0	IN	54	75.2	64	F	16.8	5.4	MPH
10.	May-10-2023	0	IN	52.9	78.3	65.8	F	17.2	3.1	MPH
11.	May-11-2023	0	IN	53	81.4	67.94	F	16.1	1.8	MPH
12.	May-12-2023	0.001	IN	63.4	79	70.76	F	17	0.9	MPH
13.	May-13-2023	0.007	IN	66.5	80	72.06	F	12	1.2	MPH
14.	May-14-2023	0.023	IN	58.7	72.8	65.19	F	16	4.8	MPH
15.	May-15-2023	0.002	IN	54.3	71.8	61.5	F	13	2.1	MPH
16.	May-16-2023	0.001	IN	53.9	71.4	62.06	F	12	0.9	MPH
17.	May-17-2023	0	IN	49.9	70.2	60.7	F	14	2.3	MPH
18.	May-18-2023	0	IN	44	74	59.75	F	11	2.2	MPH
19.	May-19-2023	0.045	IN	57.1	79.6	64.84	F	25	1.5	MPH
20.	May-20-2023	0	IN	47.6	66.3	57.57	F	11	0	MPH
21.	May-21-2023	0	IN	44.3	78	62.38	F	8	0.3	MPH
22.	May-22-2023	0	IN	51.1	80	67.15	F	9	0.2	MPH
23.	May-23-2023	0	IN	56.7	82	70.38	F	9	0.3	MPH
24.	May-24-2023	0	IN	54.4	82.9	70.73	F	15	1	MPH
25.	May-25-2023	0	IN	48.4	68.3	59.7	F	17	5.9	MPH
26.	May-26-2023	0	IN	46.8	75	61.24	F	17	4	MPH
27.	May-27-2023	0	IN	47.2	77	64.85	F	16	2.5	MPH
28.	May-28-2023	0	IN	57.6	79.6	68.81	F	13	0.5	MPH
29.	May-29-2023	0	IN	56.4	84.6	71.88	F	11	0.6	MPH
30.	May-30-2023	0	IN	58.7	87.1	75.14	F	14	1.3	MPH
31.	May-31-2023	0	IN	65.4	87.7	77.14	F	11	0.6	MPH
32.	Jun-1-2023	0	IN	64.6	89.2	77.42	F	17	1.6	MPH
33.	Jun-2-2023	0	IN	61	89.9	76.83	F	15	1.3	MPH
34.	Jun-3-2023	0	IN	63.1	89.9	78.15	F	11	1.2	MPH
35.	Jun-4-2023	0	IN	63.5	82	73.54	F	12	2.5	MPH
36.	Jun-5-2023	0	IN	54.1	78.8	67.66	F	12	1.6	MPH
37.	Jun-6-2023	0	IN	53.7	85.5	69.23	F	17	0.1	MPH
38.	Jun-7-2023	0	IN	59.1	76.2	67.27	F	14	1	MPH
39.	Jun-8-2023	0	IN	45.9	76.6	62.87	F	10	0.6	MPH
40.	Jun-9-2023	0	IN	44.6	79.3	64.11	F	11	0.2	MPH
41.	Jun-10-2023	0	IN	56.5	84.1	71.38	F	15	1.3	MPH

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Residual Weed Control in Soybean with Xtendimax Herbicide Combinations

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Investigator: Dr. Bill Johnson

Application Description

	A
Date	May-5-2023
Start Time	5:39 PM
Stop Time	6:13 PM
Method	SPRAY
Timing	PRE
Placement	BROSOI
Applied By	M. ZIMMER
Entry Date	May-24-2023
Air Temperature Start, Stop	82, 82 F
% Relative Humidity Start, Stop	32, 32
Wind Velocity+Dir. Start	3 MPH, S
Wind Velocity+Dir. Stop	4.2 MPH, SW
Wind Velocity+Dir. Max	6.1 MPH, S
Wet Leaves (Y/N)	N, no
Soil Temperature	75 F
Soil Moisture	NORMAL
% Cloud Cover	10

Crop Stage At Each Application

	A
Crop 1 Code, BBCH Scale	GLXMA, BSOY
Days after Emergence	-10
Stage Majority, Percent	0, -
Stage Minimum, Percent	0, -
Stage Maximum, Percent	0, -
Height Average	0 IN
Height Minimum, Maximum	0, 0

Pest Stage At Each Application

	A
Pest 1 Code, Type, Scale	AMATU, W, BBCH
Height Average	0 IN
Height Minimum, Maximum	0, 0
Density Average	0 FT2
Density Minimum, Maximum	0, 0
Pest 2 Code, Type, Scale	SETFA, W, BBCH
Height Average	0 IN
Height Minimum, Maximum	0, 0
Density Average	0 FT2
Density Minimum, Maximum	0, 0

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Application Equipment

	A
Equipment Name	CO2 BACKPACK
Equipment Type	BACSPR
Operation Pressure	34 PSI
Nozzle Model	TTI
Nozzle Type	TEEJAI
Nozzle TradeName	TEEJET
Nozzle Tip Size, Color	110015, GREEN
Nozzle Spacing	20 IN
Boom Length	6.67 FT
Ground Speed	3 MPH
Carrier	WATER
Application Amount	15 GAL/AC
Mix Overage	75.6 mL
Mix Size	1119.0 mL
Propellant	COMCO2

Notes

No.	Context	Date	By	Notes
1.	STATUS	Mar-30-2023	Dr. Bill Johnson	Automatically added by ARM: Trial Status updated to 'S' during trial creation.
2.	STATUS	May-23-2023	Dr. Bryan Young	Automatically added by ARM: Status changed to: E: changed by (EINYOB).
3.	STATUS	May-23-2023	Dr. Bryan Young	Automatically added by ARM: Trial Status updated to 'E' when Rating Date entered.

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Investigator: Dr. Bill Johnson

Assessed By			Marcelo Zimmer	Marcelo Zimmer	Marcelo Zimmer	Marcelo Zimmer	
Rating Date			May-19-2023	May-19-2023	May-26-2023	Jun-10-2023	
Part Rated			PLOT, P	PLOT, P	PLOT, P	PLOT, P	
Rating Type			PHYGEN	CONTRO	CONTRO	CONTRO	
Rating Unit			%	%	%	%	
Rating Min/Max/Interval			0, 100, -	0, 100, -	0, 100, -	0, 100, -	
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			W, Weed	W, Weed	W, Weed	W, Weed	
Pest Code			AMATA	AMATA	AMATA	AMATA	
Pest Scientific Name			Amaranthus x ta>	Amaranthus x ta>	Amaranthus x ta>	Amaranthus x ta>	
Pest Name			common water he>	common water he>	common water he>	common water he>	
Rating Timing			14 DA-A	14 DA-A	21 DA-A	35 DA-A	
ARM Action Codes			EC	EC	EC	EC	
Trt No.	Treatment Name	Rate Rate Unit	Appl Code	1*	2*	4*	6*
1	NONTREATED			0.0	0.0	0.0	0.0
2	WARRANT MAULER	48 fl oz/a A 8 fl oz/a A		2.5 cd	100.0 a	100.0 a	91.3 abc
3	WARRANT	48 fl oz/a A		1.3 cd	72.5 b	81.3 b	77.5 d
4	WARRANT ULTRA	50 fl oz/a A		8.8 b	100.0 a	100.0 a	87.5 bc
5	WARRANT MAULER XTENDIMAX VAPORGRIP XTRA AGENT	48 fl oz/a A 8 fl oz/a A 22 fl oz/a A 20 fl oz/a A		3.8 cd	100.0 a	100.0 a	90.0 abc
6	WARRANT XTENDIMAX VAPORGRIP XTRA AGENT	48 fl oz/a A 22 fl oz/a A 20 fl oz/a A		5.0 bc	98.8 a	99.5 a	86.3 c
7	WARRANT ULTRA INTACT XTENDIMAX VAPORGRIP XTRA AGENT	50 fl oz/a A 0.5 % v/v A 22 fl oz/a A 20 fl oz/a A		3.8 cd	100.0 a	100.0 a	92.5 abc
8	XTENDIMAX VAPORGRIP XTRA AGENT	22 fl oz/a A 20 fl oz/a A		0.0 d	62.5 c	53.8 c	40.0 e
9	FIERCE XLT	4.5 oz/a A		17.5 a	100.0 a	100.0 a	94.5 a
10	FIERCE XLT XTENDIMAX VAPORGRIP XTRA AGENT	4.5 oz/a A 22 fl oz/a A 20 fl oz/a A		15.0 a	100.0 a	100.0 a	94.0 ab
LSD P=.05				4.92	7.46	3.87	6.83
Standard Deviation				3.37	5.11	2.65	4.68
CV				52.71	5.52	2.86	5.59
Levene's Prob(F)				0.465	0.00*	0.064	0.968
P(Shapiro-Wilk)^				0.7743	0.0004*	0.0*	0.7725
P(Skewness)^				0.805	0.3534	0.0013*	0.6926
P(Kurtosis)^				0.7633	0.0*	0.0*	0.6648
Replicate F				0.082	1.796	1.015	1.273
Replicate Prob(F)				0.9694	0.1748	0.4034	0.3061
Treatment F				13.286	32.044	142.972	53.993
Treatment Prob(F)				0.0001	0.0001	0.0001	0.0001

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).
 Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.
 * Adjusted means
 ^Calculated from residual.

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Investigator: Dr. Bill Johnson

Assessed By			Marcelo Zimmer	Marcelo Zimmer	Marcelo Zimmer	
Rating Date			May-19-2023	May-26-2023	Jun-10-2023	
Part Rated			PLOT, P	PLOT, P	PLOT, P	
Rating Type			CONTRO	CONTRO	CONTRO	
Rating Unit			%	%	%	
Rating Min/Max/Interval			0, 100, -	0, 100, -	0, 100, -	
Crop Type, Code			C, GLXMA	C, GLXMA	C, GLXMA	
Crop Scientific Name			Glycine max	Glycine max	Glycine max	
Crop Name			Soybean	Soybean	Soybean	
Pest Type			W, Weed	W, Weed	W, Weed	
Pest Code			SETFA	SETFA	SETFA	
Pest Scientific Name			Setaria faberi	Setaria faberi	Setaria faberi	
Pest Name			Giant foxtail	Giant foxtail	Giant foxtail	
Rating Timing			14 DA-A	21 DA-A	35 DA-A	
ARM Action Codes			EC	EC	EC	
Trt No.	Treatment Name	Rate Rate Unit	Appl Code	3*	5*	7*
1	NONTREATED			0.0	0.0	0.0
2	WARRANT MAULER	48 fl oz/a A 8 fl oz/a A		95.0 a	93.8 ab	73.8 bc
3	WARRANT	48 fl oz/a A		75.0 b	81.3 c	62.5 c
4	WARRANT ULTRA	50 fl oz/a A		100.0 a	100.0 a	83.8 ab
5	WARRANT MAULER XTENDIMAX VAPORGRIP XTRA AGENT	48 fl oz/a A 8 fl oz/a A 22 fl oz/a A 20 fl oz/a A		100.0 a	98.8 a	84.5 ab
6	WARRANT XTENDIMAX VAPORGRIP XTRA AGENT	48 fl oz/a A 22 fl oz/a A 20 fl oz/a A		91.3 ab	90.0 b	78.8 b
7	WARRANT ULTRA INTACT XTENDIMAX VAPORGRIP XTRA AGENT	50 fl oz/a A 0.5 % v/v A 22 fl oz/a A 20 fl oz/a A		100.0 a	98.8 a	85.8 ab
8	XTENDIMAX VAPORGRIP XTRA AGENT	22 fl oz/a A 20 fl oz/a A		15.0 c	0.0 d	0.0 d
9	FIERCE XLT	4.5 oz/a A		100.0 a	100.0 a	96.0 a
10	FIERCE XLT XTENDIMAX VAPORGRIP XTRA AGENT	4.5 oz/a A 22 fl oz/a A 20 fl oz/a A		100.0 a	100.0 a	96.0 a
LSD P=.05				17.85	8.43	14.58
Standard Deviation				12.23	5.77	9.99
CV				14.18	6.81	13.61
Levene's Prob(F)				0.749	0.137	0.642
P(Shapiro-Wilk)^				0.0048*	0.0011*	0.0373*
P(Skewness)^				0.0075*	0.0399*	0.0325*
P(Kurtosis)^				0.0*	0.0021*	0.0069*
Replicate F				1.961	0.750	3.806
Replicate Prob(F)				0.1467	0.5331	0.0231
Treatment F				20.898	125.896	34.744
Treatment Prob(F)				0.0001	0.0001	0.0001

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

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

* Adjusted means

^Calculated from residual.

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Assessed By

Marcelo Zimmer = MZ

Part Rated

PLOT = plot

P = Pest is Part Rated

Rating Type

PHYGEN = phytotoxicity - general / injury

CONTRO = control / burndown or knockdown

Rating Unit

%, 0, 100, = percent

Crop Type Code

C = EPPO species (Bayer) codes

GLXMA, BSOY, Glycine max, Soybean = US

Pest Type

W, Weed = Weed or volunteer crop

Pest Code

AMATA, Amaranthus x tamariscinus, common water hemp = US

SETFA, Setaria faberi, Giant foxtail = US

Rating Timing

14 DA-A = 14 Days After Application A

ARM Action Codes

EC = Do not analyze untreated check, while still reporting treatment mean on AOV Means Table