

# Purdue Weed Science

Trial ID: 21S-MGS-CORN-05 Protocol ID: 21S-MGS-CORN-05 Project ID:	<b>University-Shieldex Visibility</b> Location: MEIGS Investigator (Creator): Dr. Bill Johnson Study Director: Brent Mansfield Sponsor Contact: Chuck Foresman - Summit Agro	Trial Year: 2021
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**General Trial Information**  
**Study Director:** Brent Mansfield **Title:** Research Associate  
**Investigator:** Dr. Bill Johnson **Title:** Professor

**Trial Status:** E established  
**ARM Trial Created On:** 10/27/2021  
**Initiation Date:** 5/24/2021

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

**Conducted Under GLP:** No  
**Conducted Under GEP:** No

**Contacts**  
**Study Director:** Brent Mansfield **Title:** Research Associate  
**Organization:** Purdue University  
**Address 1:** 915 W. State Street  
**Country:** USA United States **E-mail:** brentmansfield@purdue.edu  
**City:** West Lafayette **State/Prov:** IN **Postal Code:** 47907

**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

**Sponsor:** Chuck Foresman - Summit Agro  
**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:** 47909

**Crop Description**  
**Crop 1:** C ZEAMX Zea mays corn **Stage Scale:** BBCH

**Variety:** DKC 62-52 RIB  
**Attributes:** GLU-R, GLY-R  
**Planting Date:** 5/23/2021 **Planting Rate:** 34000 S/A  
**Depth:** 1.75 IN  
**Rows per Plot:** 4 **Planting Method:** PLANTD planted  
**Row Spacing:** 30 IN **Planting Equipment:** PP plot planter  
**Soil Temperature:** 65 F **Soil Moisture:** NORMAL normal, adequate  
**Emergence Date:** 6/2/2021

**Pest Description**  
**Pest 1 Type:** W **Code:** AMATA **Amaranthus x tamariscinus** **Entry Date:** 12/8/2021  
**Common Name:** common water hemp **Stage Scale:** BBCH

**Site and Design**  
**Treated Plot Width:** 6.67 FT **Site Type:** FIELD field  
**Treated Plot Length:** 25 FT **Experimental Unit:** 1 PLOT plot  
**Treated Plot Area:** 166.75 FT2 **Treatments:** 11 **Tillage Type:** NOTILL no-till  
**Replications:** 4 **Study Design:** RACOB� Randomized Complete Block (RCB)

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

No.	Date	Moisture Total	Unit	Min Temp	Max Temp	Temp Unit
1.	5/1/2021	0	IN	40	63	F
2.	5/2/2021	0	IN	49	74	F
3.	5/3/2021	0.26	IN	56	78	F
4.	5/4/2021	0.01	IN	55	66	F

5.	5/5/2021	0.04	IN	43	59	F
6.	5/6/2021	0	IN	42	61	F
7.	5/7/2021	0.25	IN	38	58	F
8.	5/8/2021	0	IN	32	63	F
9.	5/9/2021	1.43	IN	40	57	F
10.	5/10/2021	0.37	IN	37	47	F
11.	5/11/2021	0.09	IN	39	59	F
12.	5/12/2021	0	IN	36	61	F
13.	5/13/2021	0	IN	38	60	F
14.	5/14/2021	0	IN	41	66	F
15.	5/15/2021	0	IN	46	70	F
16.	5/16/2021	0	IN	53	71	F
17.	5/17/2021	0.35	IN	55	71	F
18.	5/18/2021	0.12	IN	58	63	F
19.	5/19/2021	0	IN	59	72	F
20.	5/20/2021	0	IN	64	75	F
21.	5/21/2021	0	IN	64	84	F
22.	5/22/2021	0	IN	63	83	F
23.	5/23/2021	0	IN	63	85	F
24.	5/24/2021	0	IN	68	85	F
25.	5/25/2021	0	IN	67	88	F
26.	5/26/2021	0.32	IN	66	87	F
27.	5/27/2021	0.19	IN	58	81	F
28.	5/28/2021	0.08	IN	60	80	F
29.	5/29/2021	0.47	IN	43	61	F
30.	5/30/2021	0	IN	41	63	F
31.	5/31/2021	0	IN	43	71	F
32.	6/1/2021	0	IN	57	71	F
33.	6/2/2021	0.04	IN	58	74	F
34.	6/3/2021	0.03	IN	59	87	F
35.	6/4/2021	0	IN	61	82	F
36.	6/5/2021	0	IN	63	88	F
37.	6/6/2021	0	IN	66	86	F
38.	6/7/2021	0.01	IN	69	83	F
39.	6/8/2021	0.1	IN	69	83	F
40.	6/9/2021	0	IN	70	85	F
41.	6/10/2021	0	IN	67	85	F
42.	6/11/2021	0	IN	69	85	F
43.	6/12/2021	0	IN	67	90	F
44.	6/13/2021	0	IN	69	93	F
45.	6/14/2021	0	IN	63	86	F
46.	6/15/2021	0	IN	57	83	F
47.	6/16/2021	0	IN	53	81	F
48.	6/17/2021	0	IN	53	82	F
49.	6/18/2021	0.01	IN	61	86	F
50.	6/19/2021	0.47	IN	67	93	F
51.	6/20/2021	0	IN	67	81	F
52.	6/21/2021	0.1	IN	70	86	F
53.	6/22/2021	0	IN	49	72	F
54.	6/23/2021	0	IN	54	74	F
55.	6/24/2021	0	IN	60	77	F
56.	6/25/2021	1.19	IN	63	79	F
57.	6/26/2021	0.83	IN	70	81	F
58.	6/27/2021	1.05	IN	69	85	F
59.	6/28/2021	0.11	IN	69	86	F
60.	6/29/2021	0	IN	72	90	F
61.	6/30/2021	0	IN	72	89	F
62.	7/1/2021	0.35	IN	70	78	F
63.	7/2/2021	0	IN	55	82	F

64.	7/3/2021	0	IN	53	75	F
65.	7/4/2021	0	IN	57	78	F
66.	7/5/2021	0	IN	67	85	F
67.	7/6/2021	0	IN	68	86	F
68.	7/7/2021	0	IN	71	86	F
69.	7/8/2021	1.29	IN	67	86	F
70.	7/9/2021	0.05	IN	59	80	F
71.	7/10/2021	0.03	IN	61	73	F
72.	7/11/2021	0.1	IN	65	76	F
73.	7/12/2021	1.3	IN	66	76	F
74.	7/13/2021	0.4	IN	67	82	F
75.	7/14/2021	0.08	IN	65	79	F
76.	7/15/2021	0	IN	66	82	F
77.	7/16/2021	0.16	IN	69	86	F
78.	7/17/2021	0.1	IN	66	78	F
79.	7/18/2021	0.01	IN	66	80	F
80.	7/19/2021	0	IN	61	83	F
81.	7/20/2021	0	IN	61	82	F
82.	7/21/2021	0	IN	64	83	F
83.	7/22/2021	0	IN	64	79	F
84.	7/23/2021	0	IN	67	83	F
85.	7/24/2021	0	IN	71	86	F
86.	7/25/2021	0	IN	69	87	F
87.	7/26/2021	0	IN	65	88	F
88.	7/27/2021	0	IN	62	87	F
89.	7/28/2021	0	IN	66	86	F
90.	7/29/2021	0	IN	70	87	F
91.	7/30/2021	0	IN	65	88	F
92.	7/31/2021	0	IN	62	78	F

#### Application Description

	A	B	C
Application Date	5/24/2021	6/29/2021	6/23/2021
Appl. Start Time	10:35 AM	12:57 PM	11:00 AM
Appl. Stop Time	11:02 AM	1:22 AM	11:15 AM
Application Method	SPRAY	SPRAY	SPRAY
Application Timing	PREPRE	POSPOS	POSPOS
Application Placement	BROFOL	BROFOL	BROFOL
Air Temperature Start, Stop	83, 83 F	90, 90 F	85, 85 F
% Relative Humidity Start, Stop	48, 48	59, 59	46, 46
Wind Velocity+Dir. Start	1.5 MPH, W	4 MPH, SW	2 MPH, SW
Wet Leaves (Y/N)	N, no	N, no	N, no
Soil Temperature	74 F	82 F	83 F
Soil Moisture	NORMAL	NORMAL	NORMAL
% Cloud Cover	20	50	40

#### Crop Stage At Each Application

	A	B	C
Crop 1 Code, BBCH Scale	ZEAMX, BCOR	ZEAMX, BCOR	ZEAMX, BCOR
Days after Emergence	-9	27	21
Stage Majority, Percent	00, -	15, -	13, -
Stage Minimum, Percent	00, -	14, -	13, -
Stage Maximum, Percent	00, -	13, -	13, -
Height Average	0 IN	12 IN	8 IN
Height Minimum, Maximum		10, 13	6, 9

**Pest Stage At Each Application**

	<b>A</b>	<b>B</b>	<b>C</b>
<b>Pest 1 Code, Type, Scale</b>	AMATA, W, BBCH	AMATA, W, BBCH	AMATA, W, BBCH
<b>Stage Majority, Percent</b>	00, -	14, -	18, -
<b>Stage Minimum, Percent</b>	00, -	11, -	11, -
<b>Stage Maximum, Percent</b>	00, -	16, -	19, -
<b>Height Average</b>	0 IN	2 IN	4 IN
<b>Height Minimum, Maximum</b>			0.5, 6
<b>Density Average</b>		0.5 FT2	6 FT2

**Application Equipment**

	<b>A</b>	<b>B</b>	<b>C</b>
<b>Appl. Equipment</b>	CO2 BACKPACK	CO2 BACKPACK	CO2 BACKPACK
<b>Equipment Type</b>	BACSPR	BACSPR	BACSPR
<b>Operation Pressure</b>	24 PSI	38 PSI	38 PSI
<b>Nozzle Model</b>	XR	TT	TT
<b>Nozzle Type</b>	FLAFXR	TEEJTU	TEEJTU
<b>Nozzle TradeName</b>	TEEJET	TEEJET	TEEJET
<b>Nozzle Tip Size, Color</b>	8002, YELLOW	110015, GREEN	110015, GREEN
<b>Nozzle Spacing</b>	20.0 IN	20.0 IN	20.0 IN
<b>Nozzles/Row</b>	4.0	4.0	4.0
<b>Boom Length</b>	6.67 FT	6.67 FT	6.67 FT
<b>Boom Height</b>	17.0 IN	19.0 IN	24.0 IN
<b>Ground Speed</b>	3 MPH	3 MPH	3 MPH
<b>Carrier</b>	WATER	WATER	WATER
<b>Application Amount</b>	15 GAL/AC	15 GAL/AC	15 GAL/AC
<b>Mix Size</b>	945.0 mL	945.0 mL	945.0 mL
<b>Propellant</b>	COMCO2	COMCO2	COMCO2

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Trial ID: 21S-MGS-CORN-05_extratreatments Protocol ID: 21S-MGS-CORN-05_extratreatments Project ID:	<b>University-Shieldex Visibility</b> Location: MEIGS Investigator (Creator): Dr. Bill Johnson Study Director: Brent Mansfield Sponsor Contact: Chuck Foresman - Summit Agro	Trial Year: 2021
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Pest Type					W, Weed AMATA	W, Weed AMATA
Pest Code					common water he>	common water he>
Pest Name						
Crop Type, Code	C, ZEAMX	C, ZEAMX	C, ZEAMX	C, ZEAMX		
Crop Name	Corn	Corn	Corn	Corn		
Rating Date	6/30/2021	7/6/2021	7/13/2021	7/27/2021	7/13/2021	7/27/2021
Part Rated					-, C	-, C
Rating Type	PHYGEN	PHYGEN	PHYGEN	PHYGEN	CONTRO	CONTRO
Rating Unit/Min/Max	%, 0, 100	%, 0, 100	%, 0, 100	%, 0, 100	%, 0, 100	%, 0, 100
Number of Subsamples	1	1	1	1	1	1
Data Entry Date	12/8/2021	12/8/2021	12/8/2021	12/8/2021	12/8/2021	12/8/2021
Rating Timing	7 DA-C	7 DA-B	14 DA-B	28 DA-B	14 DA-B	28 DA-B
Days After First/Last Applic.	37, 1	43, 7	50, 14	64, 28	50, 14	64, 28
Days After Emergence	28 DE-1	34 DE-1	41 DE-1	55 DE-1	41 DE-1	55 DE-1
Trt No.	1	2	3	4	5	6
Treatment Name						
Rate						
Rate Unit						
Appl Code						
1 NONTREATED	0.0	0.0	0.0	0.0	0.0	0.0
2 BICEP II MAGNUM	1.67 QT/A	0.0 c	0.0 -	0.0 -	76.3 e	70.0 d
3 BICEP II MAGNUM	1.67 QT/A	1.0 bc	0.0 -	0.0 -	99.0 a	100.0 a
AMSOL	2.5 % V/V					
SHIELDDEX	1 FL OZ/A					
AATREX	1 QT/A					
PRIME OIL	1 % V/V					
4 BICEP II MAGNUM	1.67 QT/A	2.5 a	0.0 -	0.0 -	98.5 a	100.0 a
AMSOL	2.5 % V/V					
IMPACT	0.75 FL OZ/A					
AATREX	1 QT/A					
PRIME OIL	1 % V/V					
5 BICEP II MAGNUM	1.67 QT/A	1.5 ab	0.0 -	0.0 -	98.5 a	100.0 a
AMSOL	2.5 % V/V					
LAUDIS	3 FL OZ/A					
AATREX	1 QT/A					
PRIME OIL	1 % V/V					
6 BICEP II MAGNUM	1.67 QT/A	1.5 ab	0.0 -	0.0 -	100.0 a	100.0 a
AMSOL	2.5 % V/V					
SHIELDDEX	1 FL OZ/A					
AATREX	1 QT/A					
ROUNDUP POWERMAX	32 FL OZ/A					
7 BICEP II MAGNUM	1.67 QT/A	0.5 bc	0.0 -	0.0 -	99.8 a	100.0 a
AMSOL	2.5 % V/V					
SHIELDDEX	1 FL OZ/A					
AATREX	1 QT/A					
LIBERTY	32 FL OZ/A					
PRIME OIL	1 % V/V					
8 SHIELDDEX	1 FL OZ/A	1.8 -	0.0 c	0.0 -	0.0 -	80.0 d
AMSOL	2.5 % V/V					
MSO ULTRA	1 % V/V					
9 CALLISTO	3 FL OZ/A	0.3 -	0.0 c	0.0 -	0.0 -	87.5 c
AMSOL	2.5 % V/V					
PRIME OIL	1 % V/V					
10 LAUDIS	3 FL OZ/A	1.5 -	0.0 c	0.0 -	0.0 -	92.5 b
AMSOL	2.5 % V/V					
MSO ULTRA	1 % V/V					

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.  
 Untreated treatment(s) 1 excluded from analysis.  
 Could not calculate LSD (% mean diff) for columns 3,4 because error mean square = 0.  
 ^Calculated from residual.

Pest Type					W, Weed AMATA	W, Weed AMATA		
Pest Code					common water he>	common water he>		
Pest Name								
Crop Type, Code	C, ZEAMX	C, ZEAMX	C, ZEAMX	C, ZEAMX				
Crop Name	Corn	Corn	Corn	Corn				
Rating Date	6/30/2021	7/6/2021	7/13/2021	7/27/2021	7/13/2021	7/27/2021		
Part Rated					-, C	-, C		
Rating Type	PHYGEN	PHYGEN	PHYGEN	PHYGEN	CONTRO	CONTRO		
Rating Unit/Min/Max	%, 0, 100	%, 0, 100	%, 0, 100	%, 0, 100	%, 0, 100	%, 0, 100		
Number of Subsamples	1	1	1	1	1	1		
Data Entry Date	12/8/2021	12/8/2021	12/8/2021	12/8/2021	12/8/2021	12/8/2021		
Rating Timing	7 DA-C	7 DA-B	14 DA-B	28 DA-B	14 DA-B	28 DA-B		
Days After First/Last Applic.	37, 1	43, 7	50, 14	64, 28	50, 14	64, 28		
Days After Emergence	28 DE-1	34 DE-1	41 DE-1	55 DE-1	41 DE-1	55 DE-1		
Trt Treatment No. Name	Rate	Appl Code	1	2	3	4	5	6
11 IMPACT	0.75 FL OZ/A	C	2.0 -	0.3 bc	0.0 -	0.0 -	93.8 b	99.3 a
AMSOL	2.5 % V/V	C						
MSO ULTRA	1 % V/V	C						
LSD P=.05			2.34	1.26	.	.	3.45	2.69
Standard Deviation			1.46	0.87	0.00	0.00	2.38	1.85
CV			106.36	119.53	0.0	0.0	2.57	1.94
Grand Mean			1.38	0.73	0.00	0.00	92.58	95.33
Levene's F^			0.606	3.925	.	.	1.18	0.969
Levene's Prob(F)			0.624	0.002*	.	.	0.343	0.484
Rank X2			.	.	.	.	.	.
P(Rank X2)			.	.	.	.	.	.
Skewness^			1.3554*	0.2484	.	.	0.0286	0.2397
Kurtosis^			1.5609	0.751	.	.	0.0258	1.7759*
Replicate F			0.506	1.099	0.000	0.000	0.583	1.816
Replicate Prob(F)			0.6874	0.3667	1.0000	1.0000	0.6311	0.1681
Treatment F			1.130	4.028	0.000	0.000	52.755	102.907
Treatment Prob(F)			0.3877	0.0023	1.0000	1.0000	0.0001	0.0001

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Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.  
Untreated treatment(s) 1 excluded from analysis.  
Could not calculate LSD (% mean diff) for columns 3,4 because error mean square = 0.  
^Calculated from residual.

Pest Type				W, Weed
Pest Code				AMATA
Pest Name				common water he>
Crop Type, Code				
Crop Name				
Rating Date				8/10/2021
Part Rated				-, C
Rating Type				CONTRO
Rating Unit/Min/Max				%, 0, 100
Number of Subsamples				1
Data Entry Date				12/8/2021
Rating Timing				42 DA-B
Days After First/Last Applic.				78, 42
Days After Emergence				69 DE-1
Trt No.	Treatment Name	Rate	Appl Code	7
		Rate Unit		
1	NONTREATED			0.0
2	BICEP II MAGNUM	1.67 QT/A	A	51.3 d
3	BICEP II MAGNUM	1.67 QT/A	A	100.0 a
	AMSOL	2.5 % V/V	B	
	SHIELDEX	1 FL OZ/A	B	
	AATREX	1 QT/A	B	
	PRIME OIL	1 % V/V	B	
4	BICEP II MAGNUM	1.67 QT/A	A	100.0 a
	AMSOL	2.5 % V/V	B	
	IMPACT	0.75 FL OZ/A	B	
	AATREX	1 QT/A	B	
	PRIME OIL	1 % V/V	B	
5	BICEP II MAGNUM	1.67 QT/A	A	100.0 a
	AMSOL	2.5 % V/V	B	
	LAUDIS	3 FL OZ/A	B	
	AATREX	1 QT/A	B	
	PRIME OIL	1 % V/V	B	
6	BICEP II MAGNUM	1.67 QT/A	A	100.0 a
	AMSOL	2.5 % V/V	B	
	SHIELDEX	1 FL OZ/A	B	
	AATREX	1 QT/A	B	
	ROUNDUP POWERMAX	32 FL OZ/A	B	
7	BICEP II MAGNUM	1.67 QT/A	A	100.0 a
	AMSOL	2.5 % V/V	B	
	SHIELDEX	1 FL OZ/A	B	
	AATREX	1 QT/A	B	
	LIBERTY	32 FL OZ/A	B	
	PRIME OIL	1 % V/V	B	
8	SHIELDEX	1 FL OZ/A	C	93.8 c
	AMSOL	2.5 % V/V	C	
	MSO ULTRA	1 % V/V	C	
9	CALLISTO	3 FL OZ/A	C	95.8 bc
	AMSOL	2.5 % V/V	C	
	PRIME OIL	1 % V/V	C	
10	LAUDIS	3 FL OZ/A	C	98.0 ab
	AMSOL	2.5 % V/V	C	
	MSO ULTRA	1 % V/V	C	

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Untreated treatment(s) 1 excluded from analysis.  
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Pest Type	W, Weed		
Pest Code	AMATA		
Pest Name	common water he>		
Crop Type, Code			
Crop Name			
Rating Date	8/10/2021		
Part Rated	-, C		
Rating Type	CONTRO		
Rating Unit/Min/Max	%, 0, 100		
Number of Subsamples	1		
Data Entry Date	12/8/2021		
Rating Timing	42 DA-B		
Days After First/Last Applic.	78, 42		
Days After Emergence	69 DE-1		
Trt No.	Treatment Name	Rate	Appl Code
		Rate Unit	
7			
11	IMPACT	0.75 FL OZ/A	C
	AMSOL	2.5 % V/V	C
	MSO ULTRA	1 % V/V	C
			99.8 a
LSD P=.05	3.64		
Standard Deviation	2.51		
CV	2.67		
Grand Mean	93.85		
Levene's F^	1.435		
Levene's Prob(F)	0.218		
Rank X2	.		
P(Rank X2)	.		
Skewness^	1.1617*		
Kurtosis^	4.8624*		
Replicate F	1.106		
Replicate Prob(F)	0.3639		
Treatment F	145.293		
Treatment Prob(F)	0.0001		

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Protocol ID: 21S-MGS-CORN-05_extratreatments	Investigator (Creator): Dr. Bill Johnson	Study Director: Brent Mansfield	
Project ID: H-ShldexVis2021	Sponsor Contact: Chuck Foresman - Summit Agro		

<p><u>Pest Type</u> W, Weed = Weed or volunteer crop</p> <p><u>Pest Code</u> AMATA, Amaranthus x tamariscinus, common water hemp = US</p> <p><u>Crop Type Code</u> C = EPPO species (Bayer) codes ZEAMX, BCOR, Zea mays, Corn = US</p> <p>C = Crop is Part Rated</p> <p><u>Rating Type</u> PHYGEN = phytotoxicity - general / injury CONTRO = control / burndown or knockdown</p> <p><u>Rating Unit/Min/Max</u> %, 0, 100 = percent</p>
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