

The Ohio State University

Zone Defense Efficacy and Crop Safety

Trial ID: 20HELMZONE Location: Western Branch F-7 East Trial Year: 2020
 Protocol ID: 2020-H-US23 Investigator: Dr. Mark M. Loux
 Project ID: Study Director:
 Sponsor Contact:

General Trial Information

Study Director: Anthony Dobbels
Investigator: Dr. Mark M. Loux

Trial Status: E established

ARM Trial Created On: Apr-9-2020

Initiation Date: May-13-2020

Trial Location

Address (Location): 7721 South Charleston Pike
City: South Charleston **Country:** USA United States
State/Prov.: Ohio
Postal Code: 45368

Latitude of LL Corner °: 39.86076 N
Longitude of LL Corner °: -83.66998 W
Altitude of LL Corner: 1089.00 FT

Conducted Under GLP: No
Conducted Under GEP: No

Contacts

Study Director: Anthony Dobbels

Investigator: Dr. Mark M. Loux

Crop Description

Crop 1: C GLXMA Glycine max Soybean **BBCH Scale:** BSOY
Entry Date: May-14-2020 **Stage Scale:** BBCH
Variety: Seed Consultants SC7370E
Attributes: 2,4-D Choline, Glyphosate, Glufosinate TOL
Planting Date: May-13-2020 **Planting Rate:** 160000 S/A
Depth: 2 IN
Rows per Plot: 8 **Planting Method:** PLANTD planted
Row Spacing: 15 IN **Planting Equipment:** FE field equipment
Seed Bed: MEDIUM medium
Soil Temperature: 62 F **Soil Moisture:** NORMAL normal, adequate
Emergence Date: May-25-2020

Pest Description

Pest 1 Type: W **Code:** AMBTR *Ambrosia trifida*
Common Name: ragweed, giant **Entry Date:** May-14-2020

Pest 2 Type: W **Code:** SETFA *Setaria faberi*
Common Name: foxtail, giant **Entry Date:** Jul-9-2020

Pest 3 Type: W **Code:** CHEAL *Chenopodium album*
Common Name: lambsquarters, common **Entry Date:** Jul-9-2020

Pest 4 Type: W **Code:** ERICA *Conyza canadensis*
Common Name: horseweed **Entry Date:** Jul-9-2020

Pest 5 Type: W **Code:** SIDSP *Sida spinosa*
Common Name: sida, prickly **Entry Date:** Jul-9-2020

Pest 6 Type: W **Code:** ECHCG *Echinochloa crus-galli*
Common Name: barnyardgrass **Entry Date:** Jul-9-2020

Pest 7 Type: W **Code:** AMARE *Amaranthus retroflexus*
Common Name: pigweed, redroot **Entry Date:** Jul-9-2020

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 **Treatments:** 8 **Tillage Type:** CONTIL conventional-till
Replications: 3 **Study Design:** RAOBL Randomized Complete Block (RCB)

Previous

No. Crop Year
 1. SOYBEAN 2019

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Soil Description

Description Name: F-7 East
% Sand: 37 **% OM:** 2.8 **Texture:** SICL silty clay loam
% Silt: 48 **pH:** 5.7 **Soil Name:** Crosby
% Clay: 15 **CEC:** 11.8 **Fert. Level:** G good
Soil Drainage: G good

Application Description

A
Application Date May-13-2020
Appl. Start Time 3:00 PM
Appl. Stop Time 3:30 PM
Application Method Spray
Application Timing PRE
Application Placement BROSOI
Applied By LOUX
Appl. Entry Date May-14-2020
Air Temperature Start, Stop 64 64 F
% Relative Humidity Start, Stop 32 32
Wind Velocity+Dir. Start 10 MPH SE
Wind Velocity+Dir. Stop 10 MPH SE
Wind Velocity+Dir. Max 11 MPH SE
Wet Leaves (Y/N) N no
Soil Temperature 62 F
Soil Moisture NORMAL
Soil Surface Condition NORMAL
% Cloud Cover 25
Next Moisture Occurred On May-14-2020
Time to Next Moisture 23 HR
Moisture 6 Hours after Appl. 0 IN
Moisture 1 Week after Appl. 2.52 IN

Crop Stage At Each Application

A
Crop 1 Code, BBCH Scale GLXMA BSOY
Days after Emergence -12

Pest Stage At Each Application

A
Pest 1 Code, Type, Scale AMBTR W
Density Average 6 PLA/m2
Density Min, Max 3 9
Pest 2 Code, Type, Scale SETFA W
Density Average 202 PLA/m2
Density Min, Max 114 249
Pest 3 Code, Type, Scale CHEAL W
Density Average 6 PLA/m2
Density Min, Max 0 9
Pest 4 Code, Type, Scale ERICA W
Density Average 4 PLA/m2
Density Min, Max 0 6
Pest 5 Code, Type, Scale SIDSP W
Density Average 3 PLA/m2
Density Min, Max 0 6
Pest 6 Code, Type, Scale ECHCG W
Density Average 0 PLA/m2
Density Min, Max 0 0
Pest 7 Code, Type, Scale AMARE W
Density Average 1 PLA/m2
Density Min, Max 0 3

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Application Equipment

A
Appl. Equipment 6' TTI
Equipment Type BACCAI
Operation Pressure 44 PSI
Nozzle Type TTI
Nozzle Size 1110015
Nozzle Spacing 18 IN
Boom Length 6.67 FT
Boom Height 20 IN
Ground Speed 3 MPH
Carrier WATER
Application Amount 15 GAL/AC
Mix Size 1 L
Propellant COMCO2

Context	Date	By	Notes
STATUS	Apr-9-2020	Dr. Mark M. Loux	Automatically added by ARM: Trial Status updated to 'S' during trial creation.
STATUS	Mar-27-2020	Dr. Mark M. Loux	Automatically added by ARM: Trial Status updated to 'S' during trial creation.
STATUS	May-14-2020	Dr. Mark M. Loux	Automatically added by ARM: Trial Status updated to 'E' when Planting Date entered.
STATUS	May-19-2020	Dr. Mark M. Loux	Automatically added by ARM: Trial Status updated to 'E' when Initiation Date entered.

Pest Type	W Weed	W Weed	W Weed	W Weed	W Weed
Pest Code	SETFA	ECHCG	AMBTR	CHEAL	AMARE
Pest Scientific Name	Setaria faberi	Echinochloa cr>	Ambrosia trifi>	Chenopodium al>	Amaranthus ret>
Pest Name	foxtail, giant	barnyardgrass	ragweed, giant	lambsquarters,>	pigweed, redro>

Crop Type, Code	C	GLXMA				
BBCH Scale		BSOY				
Crop Scientific Name		Glycine max				
Crop Name		Soybean				
Rating Date	Jun-8-2020	Jun-8-2020	Jun-8-2020	Jun-8-2020	Jun-8-2020	Jun-8-2020
Rating Type	PHYMAL	CONTRO	CONTRO	CONTRO	CONTRO	CONTRO
Rating Unit	%	%	%	%	%	%
Number of Subsamples	1	1	1	1	1	1
Data Entry Date	Jun-9-2020	Jun-9-2020	Jun-9-2020	Jun-9-2020	Jun-9-2020	Jun-9-2020
Rating Timing						
Days After First/Last Applic.	26 26	26 26	26 26	26 26	26 26	26 26
Trt-Eval Interval	26 DA-A	26 DA-A	26 DA-A	26 DA-A	26 DA-A	26 DA-A
Plant-Eval Interval	26 DP-1	26 DP-1	26 DP-1	26 DP-1	26 DP-1	26 DP-1
Days After Emergence	14 DE-1	14 DE-1	14 DE-1	14 DE-1	14 DE-1	14 DE-1
Number of Decimals	0	0	0	0	0	0

Trt No.	Treatment Name	Other Rate	Other Rate	Appl Unit Code	1*	2*	3*	4*	5*	6*
1	UTC			A	0 -	0 d	0 e	0 e	0 b	0 b
2	Zone Defense	5 oz/a		A	1 -	80 c	80 d	80 d	100 a	100 a
3	Zone Defense	6.68 oz/a		A	2 -	92 b	95 c	96 ab	100 a	100 a
4	Fierce	3 oz/a		A	2 -	97 a	97 bc	94 ab	100 a	100 a
5	Zone Defense	5 oz/a		A	1 -	99 a	99 ab	87 c	100 a	100 a
5	Helmet SPC	1.67 pt/a		A						
6	Fierce XLT	4 oz/a		A	3 -	99 a	100 a	98 a	100 a	100 a
7	Authority Supreme	7.9 oz/a		A	1 -	99 a	99 ab	92 bc	100 a	100 a

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Pest Code	SETFA	ECHCG	AMBTR	CHEAL	AMARE
Pest Scientific Name	Setaria faberi	Echinochloa cr>	Ambrosia trifi>	Chenopodium al>	Amaranthus ret>
Pest Name	foxtail, giant	barnyardgrass	ragweed, giant	lambsquarters,>	pigweed, redro>

Crop Type, Code	C	GLXMA				
BBCH Scale		BSOY				
Crop Scientific Name		Glycine max				
Crop Name		Soybean				
Rating Date	Jun-8-2020	Jun-8-2020	Jun-8-2020	Jun-8-2020	Jun-8-2020	Jun-8-2020
Rating Type	PHYMAL	CONTRO	CONTRO	CONTRO	CONTRO	CONTRO
Rating Unit	%	%	%	%	%	%
Number of Subsamples	1	1	1	1	1	1
Data Entry Date	Jun-9-2020	Jun-9-2020	Jun-9-2020	Jun-9-2020	Jun-9-2020	Jun-9-2020
Rating Timing						
Days After First/Last Applic.	26 26	26 26	26 26	26 26	26 26	26 26
Trt-Eval Interval	26 DA-A	26 DA-A	26 DA-A	26 DA-A	26 DA-A	26 DA-A
Plant-Eval Interval	26 DP-1	26 DP-1	26 DP-1	26 DP-1	26 DP-1	26 DP-1
Days After Emergence	14 DE-1	14 DE-1	14 DE-1	14 DE-1	14 DE-1	14 DE-1
Number of Decimals	0	0	0	0	0	0

Trt Treatment No. Name	Other Rate	Other Rate	Appl Unit Code	1*	2*	3*	4*	5*	6*
8 Zone Elite	28.5 oz/a		A	1 -	99 a	99 ab	92 abc	100 a	100 a
LSD P=.05				1.6	4.0	3.0	6.4	.	.
Standard Deviation				0.9	2.3	1.7	3.7	0.0	0.0
CV				68.49	2.74	2.03	4.58	0.0	0.0
Grand Mean				1.4	83.1	83.5	79.9	87.5	87.5
Levene's F				0.448	0.791	0.808	0.68	0.00	0.00
Levene's Prob(F)				0.858	0.605	0.593	0.687	.	.
Rank X2				.	.	.	.	.	.
P(Rank X2)				.	.	.	.	.	.
Skewness				-0.0517	-2.2423*	-2.2564*	-2.2362*	-2.4219*	-2.4219*
Kurtosis				-1.4638	3.6304*	3.6705*	3.6553*	4.2103*	4.2103*
Replicate F				0.141	0.458	0.304	0.676	0.000	0.000
Replicate Prob(F)				0.8698	0.6416	0.7424	0.5245	1.0000	1.0000
Treatment F				2.732	678.153	1232.000	241.330	0.000	0.000
Treatment Prob(F)				0.0520	0.0001	0.0001	0.0001	1.0000	1.0000

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Pest Type	W Weed	W Weed	W Weed	W Weed	W Weed				
Pest Code	POLPY	SOLPT	HIBTR	ABUTH	SETFA				
Pest Scientific Name	Polygonum pens>	Solanum ptycha>	Hibiscus trion>	Abutilon theop>	Setaria faberi				
Pest Name	smartweed, Pen>	nightshade, ea>	mallow, Venice	velvetleaf	foxtail, giant				
Crop Type, Code					C GLXMA				
BBCH Scale					BSOY				
Crop Scientific Name					Glycine max				
Crop Name					Soybean				
Rating Date	Jun-8-2020	Jun-8-2020	Jun-8-2020	Jun-8-2020	Jun-15-2020	Jun-15-2020			
Rating Type	CONTRO	CONTRO	CONTRO	CONTRO	PHYMAL	CONTRO			
Rating Unit	%	%	%	%	%	%			
Number of Subsamples	1	1	1	1	1	1			
Data Entry Date	Jun-9-2020	Jun-9-2020	Jun-9-2020	Jun-9-2020	Jun-22-2020	Jun-22-2020			
Rating Timing					21 DAY EM				
Days After First/Last Applic.	26 26	26 26	26 26	26 26	33 33	33 33			
Trt-Eval Interval	26 DA-A	26 DA-A	26 DA-A	26 DA-A	33 DA-A	33 DA-A			
Plant-Eval Interval	26 DP-1	26 DP-1	26 DP-1	26 DP-1	33 DP-1	33 DP-1			
Days After Emergence	14 DE-1	14 DE-1	14 DE-1	14 DE-1	21 DE-1	21 DE-1			
Number of Decimals	0	0	0	0	0	0			
Trt Treatment No. Name	Other Rate	Other Rate	Appl Unit Code	7*	8*	9*	10*	11*	12*
1 UTC				0 b	0 b	0 b	0 b	0 -	0 d
2 Zone Defense	5 oz/a		A	100 a	100 a	100 a	100 a	1 -	72 c
3 Zone Defense	6.68 oz/a		A	100 a	100 a	100 a	100 a	2 -	83 b
4 Fierce	3 oz/a		A	100 a	100 a	100 a	100 a	2 -	94 a
5 Zone Defense	5 oz/a		A	100 a	100 a	100 a	100 a	2 -	97 a
5 Helmet SPC	1.67 pt/a		A						
6 Fierce XLT	4 oz/a		A	100 a	100 a	100 a	100 a	2 -	98 a
7 Authority Supreme	7.9 oz/a		A	100 a	100 a	100 a	100 a	1 -	97 a

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Pest Code	POLPY	SOLPT	HIBTR	ABUTH	SETFA				
Pest Scientific Name	Polygonum pens>	Solanum ptycha>	Hibiscus trion>	Abutilon theop>	Setaria faberi				
Pest Name	smartweed, Pen>	nightshade, ea>	mallow, Venice	velvetleaf	foxtail, giant				
Crop Type, Code					C GLXMA				
BBCH Scale					BSOY				
Crop Scientific Name					Glycine max				
Crop Name					Soybean				
Rating Date	Jun-8-2020	Jun-8-2020	Jun-8-2020	Jun-8-2020	Jun-15-2020	Jun-15-2020			
Rating Type	CONTRO	CONTRO	CONTRO	CONTRO	PHYMAL	CONTRO			
Rating Unit	%	%	%	%	%	%			
Number of Subsamples	1	1	1	1	1	1			
Data Entry Date	Jun-9-2020	Jun-9-2020	Jun-9-2020	Jun-9-2020	Jun-22-2020	Jun-22-2020			
Rating Timing					21 DAY EM				
Days After First/Last Applic.	26 26	26 26	26 26	26 26	33 33	33 33			
Trt-Eval Interval	26 DA-A	26 DA-A	26 DA-A	26 DA-A	33 DA-A	33 DA-A			
Plant-Eval Interval	26 DP-1	26 DP-1	26 DP-1	26 DP-1	33 DP-1	33 DP-1			
Days After Emergence	14 DE-1	14 DE-1	14 DE-1	14 DE-1	21 DE-1	21 DE-1			
Number of Decimals	0	0	0	0	0	0			
Trt Treatment No. Name	Other Rate	Other Rate	Appl Unit Code	7*	8*	9*	10*	11*	12*
8 Zone Elite	28.5 oz/a		A	100 a	100 a	100 a	100 a	1 -	97 a
LSD P=.05						0.5		1.3	8.1
Standard Deviation				0.0	0.0	0.3	0.0	0.7	4.6
CV				0.0	0.0	0.34	0.0	59.52	5.76
Grand Mean				87.5	87.5	87.4	87.5	1.3	79.8
Levene's F				0.00	0.00	0.857	0.00	0.857	0.717
Levene's Prob(F)				.	.	0.559	.	0.559	0.66
Rank X2				.	.	.	.	.	.
P(Rank X2)				.	.	.	.	.	.
Skewness				-2.4219*	-2.4219*	-2.4215*	-2.4219*	-0.5424	-2.0444*
Kurtosis				4.2103*	4.2103*	4.2093*	4.2103*	-1.5832	2.9643*
Replicate F				0.000	0.000	0.467	0.000	0.226	0.869
Replicate Prob(F)				1.0000	1.0000	0.6365	1.0000	0.8007	0.4407
Treatment F				0.000	0.000	41920.804	0.000	2.710	159.517
Treatment Prob(F)				1.0000	1.0000	0.0001	1.0000	0.0533	0.0001

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Pest Type	W Weed	W Weed	W Weed	W Weed	W Weed			
Pest Code	ECHCG	AMBTR	CHEAL	AMARE	POLPY			
Pest Scientific Name	Echinochloa cr>	Ambrosia trifi>	Chenopodium al>	Amaranthus ret>	Polygonum pens>			
Pest Name	barnyardgrass	ragweed, giant	lambsquarters,>	pigweed, redro>	smartweed, Pen>			
Crop Type, Code								
BBCH Scale								
Crop Scientific Name								
Crop Name								
Rating Date	Jun-15-2020	Jun-15-2020	Jun-15-2020	Jun-15-2020	Jun-15-2020			
Rating Type	CONTRO	CONTRO	CONTRO	CONTRO	CONTRO			
Rating Unit	%	%	%	%	%			
Number of Subsamples	1	1	1	1	1			
Data Entry Date	Jun-22-2020	Jun-22-2020	Jun-22-2020	Jun-22-2020	Jun-22-2020			
Rating Timing								
Days After First/Last Applic.	33 33	33 33	33 33	33 33	33 33			
Trt-Eval Interval	33 DA-A	33 DA-A	33 DA-A	33 DA-A	33 DA-A			
Plant-Eval Interval	33 DP-1	33 DP-1	33 DP-1	33 DP-1	33 DP-1			
Days After Emergence	21 DE-1	21 DE-1	21 DE-1	21 DE-1	21 DE-1			
Number of Decimals	0	0	0	0	0			
Trt Treatment No. Name	Other Rate	Other Rate	Appl Unit Code	13*	14*	15*	16*	17*
1 UTC				0 d	0 e	0 b	0 b	0 b
2 Zone Defense	5 oz/a	A		73 c	72 d	100 a	100 a	100 a
3 Zone Defense	6.68 oz/a	A		83 b	86 b	100 a	100 a	100 a
4 Fierce	3 oz/a	A		95 a	80 bc	100 a	100 a	100 a
5 Zone Defense	5 oz/a	A		98 a	80 bc	100 a	100 a	100 a
5 Helmet SPC	1.67 pt/a	A						
6 Fierce XLT	4 oz/a	A		98 a	96 a	100 a	100 a	100 a
7 Authority Supreme	7.9 oz/a	A		97 a	73 cd	100 a	100 a	100 a

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Pest Type	W Weed	W Weed	W Weed	W Weed	W Weed
Pest Code	ECHCG	AMBTR	CHEAL	AMARE	POLPY
Pest Scientific Name	Echinochloa cr>	Ambrosia trifi>	Chenopodium al>	Amaranthus ret>	Polygonum pens>
Pest Name	barnyardgrass	ragweed, giant	lambsquarters,>	pigweed, redro>	smartweed, Pen>

Crop Type, Code					
BBCH Scale					
Crop Scientific Name					
Crop Name					
Rating Date	Jun-15-2020	Jun-15-2020	Jun-15-2020	Jun-15-2020	Jun-15-2020
Rating Type	CONTRO	CONTRO	CONTRO	CONTRO	CONTRO
Rating Unit	%	%	%	%	%
Number of Subsamples	1	1	1	1	1
Data Entry Date	Jun-22-2020	Jun-22-2020	Jun-22-2020	Jun-22-2020	Jun-22-2020
Rating Timing					
Days After First/Last Applic.	33 33	33 33	33 33	33 33	33 33
Trt-Eval Interval	33 DA-A	33 DA-A	33 DA-A	33 DA-A	33 DA-A
Plant-Eval Interval	33 DP-1	33 DP-1	33 DP-1	33 DP-1	33 DP-1
Days After Emergence	21 DE-1	21 DE-1	21 DE-1	21 DE-1	21 DE-1
Number of Decimals	0	0	0	0	0

Trt No.	Treatment Name	Other Rate	Other Rate	Appl Unit Code	13*	14*	15*	16*	17*
8	Zone Elite	28.5	oz/a	A	98 a	77 cd	100 a	100 a	100 a
LSD P=.05					8.7	7.2	.	.	.
Standard Deviation					5.0	4.1	0.0	0.0	0.0
CV					6.2	5.86	0.0	0.0	0.0
Grand Mean					80.3	70.5	87.5	87.5	87.5
Levene's F					0.624	0.573	0.00	0.00	0.00
Levene's Prob(F)					0.729	0.768	.	.	.
Rank X2					.	.	.	.	.
P(Rank X2)					.	.	.	.	.
Skewness					-2.0604*	-1.9904*	-2.4219*	-2.4219*	-2.4219*
Kurtosis					3.0119*	3.0911*	4.2103*	4.2103*	4.2103*
Replicate F					0.746	3.349	0.000	0.000	0.000
Replicate Prob(F)					0.4920	0.0648	1.0000	1.0000	1.0000
Treatment F					136.925	153.026	0.000	0.000	0.000
Treatment Prob(F)					0.0001	0.0001	1.0000	1.0000	1.0000

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Pest Type	W Weed	W Weed	W Weed	W Weed	W Weed	W Weed
Pest Code	SOLPT	HIBTR	ABUTH	SETFA	ECHCG	AMBTR
Pest Scientific Name	Solanum ptycha>	Hibiscus trion>	Abutilon theop>	Setaria faberi	Echinochloa cr>	Ambrosia trifi>
Pest Name	nightshade, ea>	mallow, Venice	velvetleaf	foxtail, giant	barnyardgrass	ragweed, giant
Crop Type, Code						
BBCH Scale						
Crop Scientific Name						
Crop Name						
Rating Date	Jun-15-2020	Jun-15-2020	Jun-15-2020	Jul-6-2020	Jul-6-2020	Jul-6-2020
Rating Type	CONTRO	CONTRO	CONTRO	CONTRO	CONTRO	CONTRO
Rating Unit	%	%	%	%	%	%
Number of Subsamples	1	1	1	1	1	1
Data Entry Date	Jun-22-2020	Jun-22-2020	Jun-22-2020	Jul-9-2020	Jul-9-2020	Jul-9-2020
Rating Timing						
Days After First/Last Applic.	33 33	33 33	33 33	54 54	54 54	54 54
Trt-Eval Interval	33 DA-A	33 DA-A	33 DA-A	54 DA-A	54 DA-A	54 DA-A
Plant-Eval Interval	33 DP-1	33 DP-1	33 DP-1	54 DP-1	54 DP-1	54 DP-1
Days After Emergence	21 DE-1	21 DE-1	21 DE-1	42 DE-1	42 DE-1	42 DE-1
Number of Decimals	0	0	0			

Trt No.	Treatment Name	Other Rate	Other Rate Unit	Appl Code	18*	19*	20*	21*	22*	23*
1	UTC				0 b	0 b	0 b	0.0 c	0.0 d	0.0 d
2	Zone Defense	5 oz/a	A		100 a	100 a	100 a	63.3 b	63.3 c	63.3 bc
3	Zone Defense	6.68 oz/a	A		100 a	100 a	100 a	66.7 ab	66.7 bc	73.3 ab
4	Fierce	3 oz/a	A		100 a	100 a	100 a	71.7 ab	78.3 ab	70.0 ab
5	Zone Defense	5 oz/a	A		100 a	100 a	100 a	78.3 a	80.0 ab	63.3 bc
5	Helmet SPC	1.67 pt/a	A							
6	Fierce XLT	4 oz/a	A		100 a	100 a	100 a	75.0 ab	80.0 ab	78.3 a
7	Authority Supreme	7.9 oz/a	A		100 a	100 a	100 a	73.3 ab	76.7 abc	61.7 bc

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Pest Type	W Weed	W Weed	W Weed	W Weed	W Weed	W Weed			
Pest Code	SOLPT	HIBTR	ABUTH	SETFA	ECHCG	AMBTR			
Pest Scientific Name	Solanum ptycha>	Hibiscus trion>	Abutilon theop>	Setaria faberi	Echinochloa cr>	Ambrosia trifi>			
Pest Name	nightshade, ea>	mallow, Venice	velvetleaf	foxtail, giant	barnyardgrass	ragweed, giant			
Crop Type, Code									
BBCH Scale									
Crop Scientific Name									
Crop Name									
Rating Date	Jun-15-2020	Jun-15-2020	Jun-15-2020	Jul-6-2020	Jul-6-2020	Jul-6-2020			
Rating Type	CONTRO	CONTRO	CONTRO	CONTRO	CONTRO	CONTRO			
Rating Unit	%	%	%	%	%	%			
Number of Subsamples	1	1	1	1	1	1			
Data Entry Date	Jun-22-2020	Jun-22-2020	Jun-22-2020	Jul-9-2020	Jul-9-2020	Jul-9-2020			
Rating Timing									
Days After First/Last Applic.	33 33	33 33	33 33	54 54	54 54	54 54			
Trt-Eval Interval	33 DA-A	33 DA-A	33 DA-A	54 DA-A	54 DA-A	54 DA-A			
Plant-Eval Interval	33 DP-1	33 DP-1	33 DP-1	54 DP-1	54 DP-1	54 DP-1			
Days After Emergence	21 DE-1	21 DE-1	21 DE-1	42 DE-1	42 DE-1	42 DE-1			
Number of Decimals	0	0	0						
Trt Treatment	Other	Other	Appl	18*	19*	20*	21*	22*	23*
No. Name	Rate	Rate	Unit Code						
8 Zone Elite	28.5 oz/a		A	100 a	100 a	100 a	78.3 a	83.3 a	56.7 c
LSD P=.05					0.5		13.63	13.70	12.69
Standard Deviation				0.0	0.3	0.0	7.78	7.82	7.25
CV				0.0	0.34	0.0	12.29	11.84	12.42
Grand Mean				87.5	87.4	87.5	63.33	66.04	58.33
Levene's F				0.00	0.857	0.00	0.97	1.015	0.466
Levene's Prob(F)					0.559		0.485	0.457	0.845
Rank X2									
P(Rank X2)									
Skewness				-2.4219*	-2.4215*	-2.4219*	-2.0343*	-1.9671*	-1.7515*
Kurtosis				4.2103*	4.2093*	4.2103*	2.9032*	2.6708*	2.1862*
Replicate F				0.000	0.467	0.000	0.017	0.221	3.470
Replicate Prob(F)				1.0000	0.6365	1.0000	0.9830	0.8041	0.0597
Treatment F				0.000	41920.804	0.000	33.808	37.292	34.493
Treatment Prob(F)				1.0000	0.0001	1.0000	0.0001	0.0001	0.0001

The Ohio State University

Zone Defense Efficacy and Crop Safety

Trial ID: 20HELMZONE
 Protocol ID: 2020-H-US23
 Project ID:

Location: Western Branch F-7 East Trial Year: 2020
 Investigator: Dr. Mark M. Loux
 Study Director:
 Sponsor Contact:

Pest Type	W Weed	W Weed	W Weed	W Weed	W Weed
Pest Code	CHEAL	AMARE	POLPY	SOLPT	HIBTR
Pest Scientific Name	Chenopodium al>	Amaranthus ret>	Polygonum pens>	Solanum ptycha>	Hibiscus trion>
Pest Name	lambsquarters,>	pigweed, redro>	smartweed, Pen>	nightshade, ea>	mallow, Venice
Crop Type, Code					
BBCH Scale					
Crop Scientific Name					
Crop Name					
Rating Date	Jul-6-2020	Jul-6-2020	Jul-6-2020	Jul-6-2020	Jul-6-2020
Rating Type	CONTRO	CONTRO	CONTRO	CONTRO	CONTRO
Rating Unit	%	%	%	%	%
Number of Subsamples	1	1	1	1	1
Data Entry Date	Jul-9-2020	Jul-9-2020	Jul-9-2020	Jul-9-2020	Jul-9-2020
Rating Timing					
Days After First/Last Applic.	54 54	54 54	54 54	54 54	54 54
Trt-Eval Interval	54 DA-A	54 DA-A	54 DA-A	54 DA-A	54 DA-A
Plant-Eval Interval	54 DP-1	54 DP-1	54 DP-1	54 DP-1	54 DP-1
Days After Emergence	42 DE-1	42 DE-1	42 DE-1	42 DE-1	42 DE-1
Number of Decimals				0	

Trt No.	Treatment Name	Other Rate	Other Rate Unit	Appl Code	24*	25*	26*	27*	28*
1	UTC				0.0 b	0.0 b	0.0 b	0 b	0.0 b
2	Zone Defense	5 oz/a	A		100.0 a	100.0 a	100.0 a	100 a	100.0 a
3	Zone Defense	6.68 oz/a	A		100.0 a	100.0 a	100.0 a	100 a	100.0 a
4	Fierce	3 oz/a	A		100.0 a	100.0 a	100.0 a	100 a	100.0 a
5	Zone Defense	5 oz/a	A		100.0 a	100.0 a	100.0 a	100 a	99.7 a
5	Helmet SPC	1.67 pt/a	A						
6	Fierce XLT	4 oz/a	A		100.0 a	100.0 a	100.0 a	100 a	100.0 a
7	Authority Supreme	7.9 oz/a	A		100.0 a	100.0 a	100.0 a	100 a	100.0 a

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Trial ID: 20HELMZONE
 Protocol ID: 2020-H-US23
 Project ID:

Location: Western Branch F-7 East Trial Year: 2020
 Investigator: Dr. Mark M. Loux
 Study Director:
 Sponsor Contact:

Pest Type	W Weed	W Weed	W Weed	W Weed	W Weed			
Pest Code	CHEAL	AMARE	POLPY	SOLPT	HIBTR			
Pest Scientific Name	Chenopodium al-	Amaranthus ret>	Polygonum pens>	Solanum ptycha>	Hibiscus trion>			
Pest Name	lambsquarters,>	pigweed, redro>	smartweed, Pen>	nightshade, ea>	mallow, Venice			
Crop Type, Code								
BBCH Scale								
Crop Scientific Name								
Crop Name								
Rating Date	Jul-6-2020	Jul-6-2020	Jul-6-2020	Jul-6-2020	Jul-6-2020			
Rating Type	CONTRO	CONTRO	CONTRO	CONTRO	CONTRO			
Rating Unit	%	%	%	%	%			
Number of Subsamples	1	1	1	1	1			
Data Entry Date	Jul-9-2020	Jul-9-2020	Jul-9-2020	Jul-9-2020	Jul-9-2020			
Rating Timing								
Days After First/Last Applic.	54 54	54 54	54 54	54 54	54 54			
Trt-Eval Interval	54 DA-A	54 DA-A	54 DA-A	54 DA-A	54 DA-A			
Plant-Eval Interval	54 DP-1	54 DP-1	54 DP-1	54 DP-1	54 DP-1			
Days After Emergence	42 DE-1	42 DE-1	42 DE-1	42 DE-1	42 DE-1			
Number of Decimals				0				
Trt Treatment	Other	Other	Appl					
No. Name	Rate	Rate	Unit Code	24*	25*	26*	27*	28*
8 Zone Elite	28.5 oz/a		A	100.0 a	100.0 a	100.0 a	100 a	99.7 a
LSD P=.05				0.52
Standard Deviation				0.00	0.00	0.00	0.0	0.30
CV				0.0	0.0	0.0	0.0	0.34
Grand Mean				87.50	87.50	87.50	87.5	87.42
Levene's F				0.00	0.00	0.00	0.00	0.857
Levene's Prob(F)				0.559
Rank X2			
P(Rank X2)			
Skewness				-2.4219*	-2.4219*	-2.4219*	-2.4219*	-2.4215*
Kurtosis				4.2103*	4.2103*	4.2103*	4.2103*	4.2093*
Replicate F				0.000	0.000	0.000	0.000	0.467
Replicate Prob(F)				1.0000	1.0000	1.0000	1.0000	0.6365
Treatment F				0.000	0.000	0.000	0.000	41920.804
Treatment Prob(F)				1.0000	1.0000	1.0000	1.0000	0.0001

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Zone Defense Efficacy and Crop Safety

Trial ID: 20HELMZONE
 Protocol ID: 2020-H-US23
 Project ID:

Location: Western Branch F-7 East Trial Year: 2020
 Investigator: Dr. Mark M. Loux
 Study Director:
 Sponsor Contact:

Pest Type W Weed
 Pest Code ABUTH
 Pest Scientific Name Abutilon theop>
 Pest Name velvetleaf
 Crop Type, Code
 BBCH Scale
 Crop Scientific Name
 Crop Name
 Rating Date Jul-6-2020
 Rating Type CONTRO
 Rating Unit %
 Number of Subsamples 1
 Data Entry Date Jul-9-2020
 Rating Timing
 Days After First/Last Applic. 54 54
 Trt-Eval Interval 54 DA-A
 Plant-Eval Interval 54 DP-1
 Days After Emergence 42 DE-1
 Number of Decimals

Trt No.	Treatment Name	Other Rate	Other Rate Unit	Appl Code	29*
1	UTC				0.0 b
2	Zone Defense	5 oz/a	A		100.0 a
3	Zone Defense	6.68 oz/a	A		100.0 a
4	Fierce	3 oz/a	A		100.0 a
5	Zone Defense	5 oz/a	A		100.0 a
5	Helmet SPC	1.67 pt/a	A		
6	Fierce XLT	4 oz/a	A		100.0 a
7	Authority Supreme	7.9 oz/a	A		100.0 a

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Trial ID: 20HELMZONE
 Protocol ID: 2020-H-US23
 Project ID:

Location: Western Branch F-7 East Trial Year: 2020
 Investigator: Dr. Mark M. Loux
 Study Director:
 Sponsor Contact:

Pest Type W Weed
 Pest Code ABUTH
 Pest Scientific Name Abutilon theop>
 Pest Name velvetleaf
 Crop Type, Code
 BBCH Scale
 Crop Scientific Name
 Crop Name
 Rating Date Jul-6-2020
 Rating Type CONTRO
 Rating Unit %
 Number of Subsamples 1
 Data Entry Date Jul-9-2020
 Rating Timing
 Days After First/Last Applic. 54 54
 Trt-Eval Interval 54 DA-A
 Plant-Eval Interval 54 DP-1
 Days After Emergence 42 DE-1
 Number of Decimals

Trt	Treatment	Other	Other	Appl	
No.	Name	Rate	Rate	Unit	Code
8	Zone Elite	28.5	oz/a	A	100.0 a

LSD P=.05 .
 Standard Deviation 0.00
 CV 0.0
 Grand Mean 87.50
 Levene's F 0.00
 Levene's Prob(F) .
 Rank X2 .
 P(Rank X2) .
 Skewness -2.4219*
 Kurtosis 4.2103*

Replicate F 0.000
 Replicate Prob(F) 1.0000
 Treatment F 0.000
 Treatment Prob(F) 1.0000

The Ohio State University

Zone Defense Efficacy and Crop Safety

Trial ID: 20HELMZONE Location: Western Branch F-7 East Trial Year: 2020
Protocol ID: 2020-H-US23 Investigator: Dr. Mark M. Loux
Project ID: Study Director:
Sponsor Contact:

Pest Type

W, Weed = Weed or volunteer crop

Pest Code

SETFA, Setaria faberi, foxtail, giant = US
ECHCG, Echinochloa crus-galli, barnyardgrass = US
AMBTR, Ambrosia trifida, ragweed, giant = US
CHEAL, Chenopodium album, lambsquarters, common = US
AMARE, Amaranthus retroflexus, pigweed, redroot = US
POLPY, Polygonum pensylvanicum, smartweed, Pennsylvania = US
SOLPT, Solanum ptychanthum, nightshade, eastern black = US
HIBTR, Hibiscus trionum, mallow, Venice = US
ABUTH, Abutilon theophrasti, velvetleaf = US

Crop Type, Code

C = EPPO species (Bayer) codes
GLXMA, BSOY, Glycine max, Soybean = US

Rating Type

CONTRO = control / burndown or knockdown

Rating Unit

% = percent

Plant-Eval Interval

26 DP-1 = 1 GLXMA May-13-2020
33 DP-1 = 1 GLXMA May-13-2020
54 DP-1 = 1 GLXMA May-13-2020