

# The Ohio State University

## 23 Long-term cover crop seedbank study

Trial ID: 23 LTCC  
 Protocol ID: 23 LTCC Location: South Charleston, OH Trial Year: 2023  
 Project ID: Project ID 2: Project ID 3:  
 Study Director: Sponsor Contact:  
 Investigator:

Status: E established  
 ARM Trial Created On: Mar-28-2023

### Trial Location

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

Latitude of LL Corner °: 39.85658 N  
 Longitude of LL Corner °: -83.6769 W  
 Altitude of LL Corner: 1084.00 FT

### Regulations

Conducted Under GLP: No  
 Conducted Under GEP: No

### Crop Description

Crop 1: C GLXMA Glycine max Soybean  
 Entry Date: May-24-2023 Stage Scale: BBCH  
 Variety: Seed Consultants SC7332  
 Attributes: 2,4-D Choline, Glyphosate, Glufosinate Tol  
 Planting Date: May-23-2023 Planting Rate: 155000 S/A  
 Depth: 1 IN  
 Rows per Plot: 8 Planting Method: PLANTD planted  
 Row Spacing: 15 IN Planting Equipment: FE field equipment  
 Seed Bed: MEDIUM medium  
 Soil Temperature: 63 F Soil Moisture: NORMAL normal, adequate  
 Emergence Date: Jun-1-2023 Harvest Equipment: Kincaid 8XP  
 Harvest Date: Oct-18-2023 Harvested Width: 6.25 FT  
 Moisture Meter: Harvest Master Harvested Length: 30 FT  
 % Standard Moisture: 13  
 Weighing Equipment: Harvest Master HM800

Crop 2: C SECCE Secale cereale Rye  
 Entry Date: Oct-17-2023 Stage Scale: BBCH  
 Variety: Rymin  
 Planting Date: Nov-4-2022 Planting Rate: 60 LB/A  
 Depth: 1 IN  
 Rows per Plot: 13 Planting Method: DRILLE drilled  
 Row Spacing: 7.5 in Planting Equipment: FE field equipment  
 Seed Bed: MEDIUM medium  
 Soil Moisture: DRY dry  
 Emergence Date: Nov-28-2022

### Site and Design

Treated Plot Width: 10 FT  
 Treated Plot Length: 30 FT  
 Treated Plot Area: 300.0 FT<sup>2</sup>  
 Replications: 4 Treatments: 16 Plots: 64 Study Design: SPLPLO Split-Plot

### Application Description

	A	B	C
Date	May-10-2023	May-24-2023	Jun-28-2023
Start Time	1:45 PM	10:30 AM	1:00 PM
Stop Time	2:05 PM	10:50 AM	1:20 PM
Method	SPRAY	SPRAY	SPRAY
Timing	7 EPP	PRE	POST
Placement	BROFOL	BROFOL	BROFOL
Applied By	dobbels	dobbels	dobbels
Entry Date	May-18-2023	May-24-2023	Jun-29-2023
Air Temperature Start, Stop	71, 71 F	72, 72 F	78, 78 F
% Relative Humidity Start, Stop	36, 36	52, 52	57, 57
Wind Velocity+Dir. Start	7 MPH, E	4 MPH, W	5 MPH, NW
Wind Velocity+Dir. Stop	7 MPH, E	4 MPH, W	5 MPH, NW
Wind Velocity+Dir. Max	7 MPH, E	4 MPH, W	5 MPH, NW
Wet Leaves (Y/N)	N, no	N, no	N, no
Soil Temperature	61 F	65 F	65 F
Soil Moisture	SLIDRY	DRY	SLIDRY
Soil Surface Condition	MEDTRA	MEDTRA	MEDTRA
% Cloud Cover	0	0	90
First Moisture Occurred On	May-12-2023	Jun-6-2023	Jul-1-2023
Time to First Moisture	2.0 DAY	13.0 DAY	3.0 DAY
Moisture 6 Hours after Appl.	0 IN	0 IN	0 IN
Moisture 24 Hours after Appl.	0 IN	0 IN	0 IN
Moisture 1 Week after Appl.	1.01 IN	0 IN	2.56 IN
Problems with Application?	N, no	N, no	N, no

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### Crop Stage At Each Application

	A	B	C
Crop 1 Code, BBCH Scale	GLXMA, BSOY	GLXMA, BSOY	GLXMA, BSOY
Days after Emergence	-22	-8	27
Stage Scale Used	BBCH	BBCH	VR
Stage Majority, Percent			V3, 80
Stage Minimum, Percent			V1, 10
Stage Maximum, Percent			V3, 80
Height Average			4 IN
Height Minimum, Maximum			3, 6
Crop 2 Code, BBCH Scale	SECCE, BCER	SECCE, BCER	SECCE, BCER
Days after Emergence	163	177	212
Stage Scale Used	BBCH	BBCH	BBCH

### Application Equipment

	A	B	C
Equipment Name	10' AIXR	10' AIXR	10' AIXR
Equipment Type	BACCAI	BACCAI	BACCAI
Operation Pressure	44 PSI	44 PSI	44 PSI
Nozzle Model	110015	110015	110015
Nozzle Type	AI XR	AI XR	AI XR
Nozzle TradeName	TeeJet	TeeJet	TeeJet
Nozzle Tip Size, Color	015, green	015, green	015, green
Nozzle Spacing	18 IN	18 IN	18 IN
Boom Length	10 FT	10 FT	10 FT
Boom Height	20 IN	20 IN	20 IN
Ground Speed	3 MPH	3 MPH	3 MPH
Carrier	WATER	WATER	WATER
Water Hardness (ppm CaCO3)	250	250	250
Application Amount	15 GAL/AC	15 GAL/AC	15 GAL/AC
Mix Overage	25 mL	25 mL	25 mL
Mix Size	2 L	2 L	2 L
Spray pH	7.8	7.8	7.8
Propellant	COMCO2	COMCO2	COMCO2
Tank Mix (Y/N)	Y, yes	Y, yes	Y, yes

### Notes

Context	Date	By	Notes
STATUS	Mar-28-2023	Dr. Mark M. Loux	Automatically added by ARM: Trial Status updated to 'S' during trial creation.
STATUS	May-18-2023	Dr. Mark M. Loux	Automatically added by ARM: Status changed to: E: changed by (EOHLOM).
STATUS	May-18-2023	Dr. Mark M. Loux	Automatically added by ARM: Trial Status updated to 'E' when Rating Date entered.

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Rating Date	Oct-18-2023	Oct-18-2023	Oct-18-2023	Oct-18-2023	
Part Rated	grain, C	grain, C	grain, C	grain, C	
Rating Type	weight	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 qt		1 qt	
Reporting Basis	1 plot	1 plot	1 a	1 BU	
Number of Subsamples	1	1	1	1	
Crop Type, Code					
Crop Scientific Name					
Crop Name					
Pest Type					
Pest Code					
Pest Scientific Name					
Pest Name					
Days After First/Last Applic.	161, 112	161, 112	161, 112	161, 112	
Trt-Eval Interval					
Plant-Eval Interval	148 DP-1	148 DP-1	148 DP-1	148 DP-1	
Days After Emergence	139 DE-1	139 DE-1	139 DE-1	139 DE-1	
ARM Action Codes			TY1		
Number of Decimals			1		
Data Entry Date	Oct-19-2023	Oct-19-2023		Oct-19-2023	
Trt Treatment	10*	11*	12*	13*	
No. Name	Rate Appl				
	Rate Unit Code				
1 Rye		5.038bc	7.550-	19.3bc	27.220-
1 Fierce MTZ	1 pt/a A				
1 7 DBP					
2 Rye		10.038abc	13.190-	38.0abc	42.020-
2 Fierce MTZ	1 pt/a A				
2 14 DAP					
3 Rye		17.840a	15.825-	66.9a	56.850-
3 Fierce MTZ	1 pt/a A				
3 Enlist DUO	4.75 pt/a B				
3 7 DBP					
4 Rye		10.933abc	12.020-	41.1abc	41.863-
4 Fierce MTZ	1 pt/a A				
4 Enlist DUO	4.75 pt/a B				
4 14 DAP					
5 Rye		17.058a	15.800-	64.0a	55.850-
5 Fierce MTZ	1 pt/a A				
5 Zidua	3oz/a B				
5 Enlist DUO	4.75 pt/a B				
5 7 DBP					
6 Rye		12.450abc	15.250-	46.9abc	57.050-
6 Fierce MTZ	1 pt/a A				
6 Zidua	3oz/a B				
6 Enlist DUO	4.75 pt/a B				
6 14 DAP					
7 Rye		7.423abc	18.325-	27.1abc	35.400-
7 none					
7 7 DBP					
8 Rye		7.475abc	15.375-	28.2abc	36.175-
8 none					
8 14 DAP					
9 None		5.755bc	11.390-	21.7bc	38.315-
9 Fierce MTZ	1 pt/a A				
9 7 DBP					

Means followed by same letter or symbol do not significantly differ (P=0.05, Student-Newman-Keuls).  
 Mean separations are based on the complete error term.  
 Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.  
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Rating Type	weight	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 qt		1 qt	
Reporting Basis	1 plot	1 plot	1 a	1 BU	
Number of Subsamples	1	1	1	1	
Crop Type, Code					
Crop Scientific Name					
Crop Name					
Pest Type					
Pest Code					
Pest Scientific Name					
Pest Name					
Days After First/Last Applic.	161, 112	161, 112	161, 112	161, 112	
Trt-Eval Interval					
Plant-Eval Interval	148 DP-1	148 DP-1	148 DP-1	148 DP-1	
Days After Emergence	139 DE-1	139 DE-1	139 DE-1	139 DE-1	
ARM Action Codes			TY1		
Number of Decimals			1		
Data Entry Date	Oct-19-2023	Oct-19-2023		Oct-19-2023	
Trt Treatment	Rate Appl	10*	11*	12*	13*
No. Name	Rate Unit Code				
10 None		11.218abc	16.375-	41.8abc	53.975-
10 Fierce MTZ	1 pt/a A				
10 14 DAP					
11 None		15.333ab	16.100-	57.3ab	53.850-
11 Fierce MTZ	1 pt/a A				
11 Enlist DUO	4.75 pt/a B				
11 7 DBP					
12 None		12.368abc	16.275-	46.2abc	54.100-
12 Fierce MTZ	1 pt/a A				
12 Enlist DUO	4.75 pt/a B				
12 14 DAP					
13 None		16.143ab	15.950-	60.4ab	56.350-
13 Fierce MTZ	1 pt/a A				
13 Zidua	3 oz/a B				
13 Enlist DUO	4.75 pt/a B				
13 7 DBP					
14 None		13.315abc	17.025-	49.2abc	53.875-
14 Fierce MTZ	1 pt/a A				
14 Zidua	3 oz/a B				
14 Enlist DUO	4.75 pt/a B				
14 14 DAP					
15 None		3.783c	12.450-	13.9c	30.180-
15 none					
15 7 DBP					

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Rating Unit/Min/Max	lb, -, -	%, 0, 100	BU, -, -	lb, -, -
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Reporting Basis	1 plot	1 plot	1 a	1 BU
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Crop Type, Code				
Crop Scientific Name				
Crop Name				
Pest Type				
Pest Code				
Pest Scientific Name				
Pest Name				
Days After First/Last Applic.	161, 112	161, 112	161, 112	161, 112
Trt-Eval Interval				
Plant-Eval Interval	148 DP-1	148 DP-1	148 DP-1	148 DP-1
Days After Emergence	139 DE-1	139 DE-1	139 DE-1	139 DE-1
ARM Action Codes			TY1	
Number of Decimals			1	
Data Entry Date	Oct-19-2023	Oct-19-2023		Oct-19-2023
Trt Treatment	Rate Appl	10*	11*	12*
No. Name	Rate Unit Code			13*
16 None		9.583 abc	16.250 -	35.7 abc
16 none				52.525 -
16 14 DAP				
LSD P=.05	6.4199	5.6800	24.05	21.8882
Standard Deviation	4.5078	3.9883	16.89	15.3689
CV	41.04	27.14	41.09	32.98
Grand Mean	10.9842	14.6969	41.09	46.5998
Levene's F^	0.716	1.351	0.728	1.111
Levene's Prob(F)	0.756	0.211	0.744	0.373
Rank X2	.	.	.	.
P(Rank X2)	.	.	.	.
Shapiro-Wilk^	0.9881	0.9142*	0.9878	0.9509*
P(Shapiro-Wilk)^	0.7989	0.0003*	0.7834	0.0127*
Skewness^	-0.1644	-1.046*	-0.1535	-0.6197*
P(Skewness)^	0.5934	0.0011*	0.618	0.0473*
Kurtosis^	0.066	2.2395*	0.0458	0.6135
P(Kurtosis)^	0.9133	0.0004*	0.9398	0.3138
Analyzed as	RCB	RCB	RCB	RCB
Replicate F	0.549	2.088	0.575	3.538
Replicate Prob(F)	0.6512	0.1152	0.6347	0.0220
Treatment F	3.693	1.837	3.683	1.849
Treatment Prob(F)	0.0003	0.0587	0.0003	0.0569

C = Crop is Part Rated

### 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

qt = quart

plot = total plot

a = acre

BU = bushel

### Plant-Eval Interval

148 DP-1 = 1 GLXMA May-23-2023

### ARM Action Codes

Means followed by same letter or symbol do not significantly differ (P=.05, Student-Newman-Keuls).

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TY1 =  $3.872 * [C10] * (100 - [C11]) / 87$

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