

# The Ohio State University

## USB Green Planting FY21

Trial ID: USB Green Planting FY21  
 Protocol ID: USB Green Planting FY21  
 Project ID: Project ID 2: Project ID 3:  
 Study Director: Rodrigo Werle  
 Investigator (Creator): Rodrigo Werle

Cooperator Trial ID:  
 Location:  
 Trial Year: 2020  
 Sponsor Contact:

### General Trial Information

Investigator: Rodrigo Werle

Status: E established  
 ARM Trial Created On: Jan-25-2021

### Trial Location

City: South Charleston Country: USA United States  
 State/Prov.: Ohio  
 Postal Code: 45368

Latitude of LL Corner °: 39.86068 N  
 Longitude of LL Corner °: -83.66222 W  
 Altitude of LL Corner: 1099.00 FT

Conducted Under GLP: No  
 Conducted Under GEP: No  
 None

Role: INVEST investigator  
 Investigator: Rodrigo Werle

### Crop Description

Crop 1: C GLXMA Glycine max Soybean  
 Entry Date: May-2-2022 Stage Scale: BBCH  
 Variety: P35T15E  
 Attributes: 2,4-D Choline, Glyphosate, Glufosinate Tol

Planting Date: Apr-28-2022  
 Depth: 1.5 IN  
 Rows per Plot: 4  
 Row Spacing: 30 IN

Seed Size: 2978 S/LB  
 Planting Rate: 155000 S/A

Planting Method: PLANTD planted  
 Planting Equipment: FE field equipment  
 Seed Bed: MEDTRA medium/trashy  
 Soil Moisture: DAMP damp

Emergence Date: May-16-2022  
 Harvest Date: Oct-12-2022  
 Moisture Meter: Harvest Master  
 % Standard Moisture: 13.0  
 Weighing Equipment: Harvest Master HM800

Harvest Equipment: Kincaid 8XP  
 Harvested Width: 5 FT  
 Harvested Length: 30 FT

Crop 2: C GLXMA Glycine max Soybean  
 Entry Date: May-2-2022 Stage Scale: BBCH  
 Variety: P35T15E  
 Attributes: 2,4-D Choline, Glyphosate, Glufosinate Tol

Planting Date: May-24-2022  
 Depth: 1.5 IN  
 Rows per Plot: 4  
 Row Spacing: 30 IN

Seed Size: 2978 S/LB  
 Planting Rate: 155000 S/A

Planting Method: PLANTD planted  
 Planting Equipment: FE field equipment  
 Seed Bed: MEDTRA medium/trashy  
 Soil Moisture: SLIDRY slightly dry

Soil Temperature: 71 F  
 Emergence Date: Jun-7-2022  
 Harvest Date: Oct-12-2022  
 Moisture Meter: Harvest Master  
 % Standard Moisture: 13.0  
 Weighing Equipment: Harvest Master HM800

Harvest Equipment: Kincaid 8XP  
 Harvested Width: 5 FT  
 Harvested Length: 30 FT

Crop 3: C SECCW Secale cereale Winter rye  
 Entry Date: Mar-2-2022 Stage Scale: BBCH  
 Variety: VNS  
 Planting Date: Oct-12-2021  
 Depth: 1.5 IN  
 Rows per Plot: 14  
 Row Spacing: 7.5 IN

Planting Rate: 60 LB/A

Planting Method: DRILLE drilled  
 Planting Equipment: DD disc drill  
 Seed Bed: MEDTRA medium/trashy  
 Soil Moisture: SLIDRY slightly dry

Emergence Date: Oct-26-2021  
 % Standard Moisture: 13

Harvested Width: 5 FT  
 Harvested Length: 30 FT

### Pest Description

Pest 1 Type: W Code: ECHCG Echinochloa crus-galli  
 Common Name: common barnyardgrass

Entry Date: Jun-21-2022  
 Stage Scale: BBCH

Pest 2 Type: W Code: AMBTR Ambrosia trifida  
 Common Name: Giant ragweed

Entry Date: Jun-21-2022  
 Stage Scale: BBCH

Pest 3 Type: W Code: AMATA Amaranthus x tamariscinus  
 Common Name: common water hemp

Entry Date: Jun-21-2022  
 Stage Scale: BBCH

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### 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: 12 Plots: 48  
 Site Type: FIELD field  
 Experimental Unit: 1 PLOT plot  
 Tillage Type: NOTILL no-till  
 Study Design: SPLPLO Split-Plot

Previous  
 No. Crop Year  
 1. SOYBEAN2021

### Soil Description

Description Name: A-1 East  
 % Sand: 40 % OM: 3.2 Texture: LOAM  
 % Silt: 35 Soil Name: Kokomo  
 % Clay: 25 Fert. Level: G good  
 pH: 7.0 CEC: 15.1  
 Soil Drainage: G good  
 Comment:

## Spectrum Analytic, Washington Court House, Ohio

### Application Description

	A	B	C	D	E	F
Application Date	Apr-22-2022	Apr-28-2022	May-25-2022	Jun-15-2022	Jun-21-2022	Jun-28-2022
Appl. Start Time	9:00 AM	3:00 PM	8:00 AM	7:45 AM	10:00 AM	8:00 AM
Appl. Stop Time	9:30 AM	3:30 PM	8:30 AM	8:05 AM	10:30 AM	8:15 AM
Application Method	SPRAY	SPRAY	SPRAY	SPRAY	SPRAY	SPRAY
Application Timing	EARLY TERM	AT PLANT	Late Term	POST	POST	POST
Application Placement	BROFOL	BROFOL	BROFOL	BROFOL	BROFOL	BROFOL
Applied By	Dobbels	Dobbels	Dobbels	Dobbels	Dobbels	Dobbels
Appl. Entry Date	May-2-2022	May-2-2022	May-25-2022	Jun-21-2022	Jun-21-2022	Oct-17-2022
Air Temperature Start, Stop	57, 57 F	51, 51 F	64, 64 F	78, 78 F	78, 78 F	51, 51 F
% Relative Humidity Start, Stop	73, 73	39, 39	87, 87	88, 88	52, 52	86, 86
Wind Velocity+Dir. Start	4 MPH, W	7 MPH, E	10 MPH, SE	6 MPH, W	7 MPH, W	3 MPH, NW
Wind Velocity+Dir. Stop	4 MPH, W	7 MPH, E	10 MPH, SE	6 MPH, W	7 MPH, W	3 MPH, NW
Wind Velocity+Dir. Max	4 MPH, W	7 MPH, E	10 MPH, SE	6 MPH, W	7 MPH, W	3 MPH, NW
Wet Leaves (Y/N)	Y, yes	N, no	N, no	N, no	N, no	N, no
Soil Temperature	49 F	50 F	61 F	76 F	76 F	62 F
Soil Moisture	SLIWET	SLIWET	SLIDRY	MOIST	MOIST	dry
Soil Surface Condition	MEDTRA	MEDTRA	MEDTRA	MEDTRA	MEDTRA	MEDTRA
% Cloud Cover	80	65	95	80	0	15
Next Moisture Occurred On	Apr-22-2022	Apr-30-2022	May-25-2022	Jun-26-2022	Jun-26-2022	Jul-1-2022
Time to Next Moisture	4.0 HR	2.0 DAY	8.0 HR	11.0 DAY	5.0 DAY	3.0 DAY
Moisture 6 Hours after Appl.	0.01 IN	0 IN	0 IN	0 IN	0 IN	0 IN
Moisture 1 Week after Appl.	0.04 IN	1.06 IN	1.51 IN	0 IN	0.3 IN	1.52 IN

### Crop Stage At Each Application

	A	B	C	D	E	F
Crop 1 Code, BBCH Scale	GLXMA, BSOY	GLXMA, BSOY	GLXMA, BSOY	GLXMA, BSOY	GLXMA, BSOY	GLXMA, BSOY
Days after Emergence	-24	-18	9	30	36	43
Stage Majority, Percent			11, 100		15, 80	16, 100
Stage Minimum, Percent					15, 10	
Stage Maximum, Percent					16, 10	
Height Average			2 IN		12 IN	13 IN
Height Minimum, Maximum			1.75, 2.25		10, 12	11, 13
Crop 2 Code, BBCH Scale	GLXMA, BSOY	GLXMA, BSOY	GLXMA, BSOY	GLXMA, BSOY	GLXMA, BSOY	GLXMA, BSOY
Days after Emergence	-46	-40	-13	8	14	21
Stage Majority, Percent					13, 100	14, 100
Height Average					5 IN	6 IN
Height Minimum, Maximum					4, 5	5, 8
Crop 3 Code, BBCH Scale	SECCW, BCER	SECCW, BCER	SECCW, BCER	SECCW, BCER	SECCW, BCER	SECCW, BCER
Days after Emergence	178	184	211	232	238	245

### Pest Stage At Each Application

	A	B	C	D	E	F
Pest 1 Code, Type, Scale	ECHCG, W,	BBCHECHCG, W,	BBCHECHCG, W,	BBCHECHCG, W,	BBCHECHCG, W,	BBCHECHCG, W,
Stage Majority, Percent					13, 100	
Height Average					5 IN	
Height Minimum, Maximum					5, 6	
Pest 2 Code, Type, Scale	AMBTR, W,	BBCH AMBTR, W,	BBCH AMBTR, W,	BBCH AMBTR, W,	BBCH AMBTR, W,	BBCH AMBTR, W,
Height Average					10 IN	
Height Minimum, Maximum					9, 12	
Pest 3 Code, Type, Scale	AMATA, W,	BBCH AMATA, W,	BBCH AMATA, W,	BBCH AMATA, W,	BBCH AMATA, W,	BBCH AMATA, W,
Height Average					4 IN	
Height Minimum, Maximum					2, 6	

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### Application Equipment

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

### Notes

Context	Date	By	Notes
STATUS	Jan-25-2021	Rodrigo Werle	Automatically added by ARM: Trial Status updated to 'S' during trial creation.
STATUS	Mar-2-2022	Dr. Mark M. Loux	Automatically added by ARM: Trial Status updated to 'E' when Planting Date entered.

### Pest Type

Pest Name	C, GLXMA	C, GLXMA	C, GLXMA	C, GLXMA
Crop Type, Code	BSOY	BSOY	BSOY	BSOY
BBCH Scale	Glycine max	Glycine max	Glycine max	Glycine max
Crop Scientific Name	Soybean	Soybean	Soybean	Soybean
Crop Name	Oct-12-2022	Oct-12-2022	Oct-12-2022	Oct-12-2022
Rating Date	Yield wgt	Yield moist	YIELD	WEITES
Rating Type	kg, -, -	%, 0, 100	BU, -, -	lbs, -, -
Rating Unit/Min/Max	1	1	1	1
Number of Subsamples	Assessed By			
Assessed By	Oct-13-2022	Oct-13-2022	Oct-13-2022	Oct-13-2022
Data Entry Date	@ harvest	@ harvest	@ harvest	@ harvest
Rating Timing	173, 106	173, 106	173, 106	173, 106
Days After First/Last Applic.	Trt-Eval Interval			
Days After Emergence	149 DE-1	149 DE-1	149 DE-1	149 DE-1
ARM Action Codes			TY1	
Number of Decimals			1	

Trt No.	Treatment Name	Rate	Appl Unit	Code	16*	17*	18*	19*
1	No CC				8.1285128 ab	10.83 abc	88.9 ab	56.500 -
1	Early soy							
1	No PRE							
1	Liberty	32 fl	oz/a	B				
1	Roundup PowerMAX	32 fl	oz/a	B				
1	Ammonium Sulfate			B				
2	No CC				8.4244868 a	10.38 c	92.6 a	56.600 -
2	Early soy							
2	Fierce EZ	6 fl	oz/a	B				
2	Liberty	32 fl	oz/a	B				
2	Roundup PowerMAX	32 fl	oz/a	B				
2	Ammonium Sulfate			B				
3	No CC				6.5964787 cd	11.10 abc	71.9 cd	56.425 -
3	Late Soy							
3	No PRE							
3	Liberty	32 fl	oz/a	B				
3	Roundup PowerMAX	32 fl	oz/a	B				
3	Ammonium Sulfate			B				
4	No CC				6.8720407 bcd	11.15 abc	74.9 bcd	57.300 -
4	Late Soy							
4	Fierce EZ	6 fl	oz/a	B				
4	Liberty	32 fl	oz/a	B				
4	Roundup PowerMAX	32 fl	oz/a	B				
4	Ammonium Sulfate			B				

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Cooperator Trial ID:  
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 Trial Year: 2020

Sponsor Contact:

Pest Type				
Pest Name				
Crop Type, Code	C, GLXMA	C, GLXMA	C, GLXMA	C, GLXMA
BBCH Scale	BSOY	BSOY	BSOY	BSOY
Crop Scientific Name	Glycine max	Glycine max	Glycine max	Glycine max
Crop Name	Soybean	Soybean	Soybean	Soybean
Rating Date	Oct-12-2022	Oct-12-2022	Oct-12-2022	Oct-12-2022
Rating Type	Yield wgt	Yield moist	YIELD	WEITES
Rating Unit/Min/Max	kg, -, -	%, 0, 100	BU, -, -	lbs, -, -
Number of Subsamples	1	1	1	1
Assessed By				
Data Entry Date	Oct-13-2022	Oct-13-2022		Oct-13-2022
Rating Timing	@ harvest	@ harvest	@ harvest	@ harvest
Days After First/Last Applic.	173, 106	173, 106	173, 106	173, 106
Trt-Eval Interval				
Days After Emergence	149 DE-1	149 DE-1	149 DE-1	149 DE-1
ARM Action Codes			TY1	
Number of Decimals			1	

Trt No.	Treatment Name	Rate	Appl Code	16*	17*	18*	19*
5	CC Early Term	60 lb/a		8.0060408 ab	10.38 c	88.0 ab	57.125-
	5 Roundup PowerMAX	32 fl oz/a	A				
	5 Ammonium Sulfate		A				
	5 Early soy						
	5 No PRE						
	5 Liberty	32 fl oz/a	B				
	5 Roundup PowerMAX	32 fl oz/a	B				
	5 Ammonium Sulfate		B				
6	CC Early Term	60 lb/a		8.0797508 ab	10.40 c	88.8 ab	57.025-
	6 Roundup PowerMAX	32 fl oz/a	A				
	6 Ammonium Sulfate		A				
	6 Early soy						
	6 Fierce EZ	6 fl oz/a	B				
	6 Liberty	32 fl oz/a	B				
	6 Roundup PowerMAX	32 fl oz/a	B				
	6 Ammonium Sulfate		B				
7	CC Early Term	60 lb/a		6.5409127 cd	12.03 a	70.6 cd	57.425-
	7 Roundup PowerMAX	32 fl oz/a	A				
	7 Ammonium Sulfate		A				
	7 Late Soy						
	7 No PRE						
	7 Liberty	32 fl oz/a	B				
	7 Roundup PowerMAX	32 fl oz/a	B				
	7 Ammonium Sulfate		B				
8	CC Early Term	60 lb/a		7.7735708 abc	11.68 abc	84.2 abc	58.525-
	8 Roundup PowerMAX	32 fl oz/a	A				
	8 Ammonium Sulfate		A				
	8 Late Soy						
	8 Fierce EZ	6 fl oz/a	B				
	8 Liberty	32 fl oz/a	B				
	8 Roundup PowerMAX	32 fl oz/a	B				
	8 Ammonium Sulfate		B				
9	CC Late Term	60 lb/a		7.6802901 abc	10.68 bc	84.1 abc	28.525-
	9 Early soy						
	9 No PRE						
	9 Liberty	32 fl oz/a	B				
	9 Roundup PowerMAX	32 fl oz/a	B				
	9 Ammonium Sulfate		B				
10	CC Late Term	60 lb/a		6.5465827 cd	10.78 abc	71.7 cd	56.725-
	10 Early soy						
	10 Fierce EZ	6 fl oz/a	B				
	10 Liberty	32 fl oz/a	B				
	10 Roundup PowerMAX	32 fl oz/a	B				
	10 Ammonium Sulfate		B				

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Pest Type	C, GLXMA	C, GLXMA	C, GLXMA	C, GLXMA
Pest Name	BSOY	BSOY	BSOY	BSOY
Crop Type, Code	Glycine max	Glycine max	Glycine max	Glycine max
BBCH Scale	Soybean	Soybean	Soybean	Soybean
Crop Scientific Name	Oct-12-2022	Oct-12-2022	Oct-12-2022	Oct-12-2022
Crop Name	Yield wgt	Yield moist	YIELD	WEITES
Rating Date	kg, -, -	%, 0, 100	BU, -, -	lbs, -, -
Rating Type	1	1	1	1
Rating Unit/Min/Max				
Number of Subsamples				
Assessed By				
Data Entry Date	Oct-13-2022	Oct-13-2022		Oct-13-2022
Rating Timing	@ harvest	@ harvest	@ harvest	@ harvest
Days After First/Last Applic.	173, 106	173, 106	173, 106	173, 106
Trt-Eval Interval				
Days After Emergence	149 DE-1	149 DE-1	149 DE-1	149 DE-1
ARM Action Codes			TY1	
Number of Decimals			1	

Trt	Treatment	Rate	Appl	16*	17*	18*	19*
No.	Name	Rate Unit	Code				
11	CC Late Term	60 lb/a		5.8685616 d	11.89 ab	63.4 d	40.370-
	11 Late Soy						
	11 No PRE						
	11 Liberty	32 fl oz/a	B				
	11 Roundup PowerMAX	32 fl oz/a	B				
	11 Ammonium Sulfate		B				
12	CC Late Term	60 lb/a		6.5500566 cd	11.16 abc	71.4 cd	42.650-
	12 Late Soy						
	12 Fierce EZ	6 fl oz/a	B				
	12 Liberty	32 fl oz/a	B				
	12 Roundup PowerMAX	32 fl oz/a	B				
	12 Ammonium Sulfate		B				
LSD P=.05				0.82065476	0.761	9.16	20.2800
Standard Deviation				0.56745759	0.527	6.33	14.0968
CV				7.8	4.77	7.98	27.06
Grand Mean				7.27100255	11.041	79.38	52.0996
Levene's F^				1.162	1.032	1.058	2.642
Levene's Prob(F)				0.35	0.443	0.423	0.014*
Rank X2				.	.	.	.
P(Rank X2)				.	.	.	.
Skewness^				-0.5017	0.0531	-0.462	-0.975*
Kurtosis^				1.2475	-0.3468	1.2731	2.8858*
Analyzed as				RCB	RCB	RCB	RCB
Replicate F				1.346	2.294	1.327	1.729
Replicate Prob(F)				0.2787	0.0988	0.2847	0.1800
Treatment F				8.188	4.432	8.418	1.846
Treatment Prob(F)				0.0001	0.0006	0.0001	0.0856

Crop Type, Code

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

Rating Type

YIELD = yield  
 WEITES = weight - test

Rating Unit/Min/Max

kg, , = kilogram  
 %, 0, 100 = percent  
 BU, , = bushel

ARM Action Codes

TY1 = 10.67037349\*[16]\*(100-[17])/87