

# The Ohio State University

## Tough Burndown Combinations in Soybean

Trial ID: 22TOUGHISOY      Cooperator Trial ID:  
 Protocol ID: 22-145      Location:      Trial Year: 2022  
 Project ID: Project ID 2: Project ID 3:  
 Study Director:      Sponsor Contact:  
 Investigator (Creator): Dr. Mark M. Loux

Status: E      established  
 ARM Trial Created On: Apr-6-2022  
 Initiation Date: May-17-2022

### 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 °: 39.85883      N  
 Longitude of LL Corner °: -83.67268      W  
 Altitude of LL Corner: 1092.00 FT

Conducted Under GLP: No  
 Conducted Under GEP: No  
 None

### Crop Description

Crop 1: C GLXMA Glycine max      Soybean  
 Entry Date: Aug-17-2022      Stage Scale: BBCH  
 Variety: P35T15E  
 Attributes: 2,4-D Choline, Glyphosate, Glufosinate Tol  
 Seed Size: 2978 S/LB  
 Planting Date: May-24-2022      Planting Rate: 165000      S/A  
 Depth: 1.5      IN  
 Rows per Plot: 8  
 Row Spacing: 15      IN  
 Planting Method: PLANTD planted  
 Planting Equipment: PP plot planter  
 Seed Bed: MEDTRA medium/trashy  
 Soil Moisture: SLIDRY slightly dry  
 Soil Temperature: 43      F  
 Emergence Date: Jun-1-2022

### Pest Description

Pest 1 Type: W      Code: ERICA Erigeron canadensis      Entry Date: May-18-2022  
 Common Name: mare's-tail      Stage Scale: BBCH  
 Pest 2 Type: W      Code: BROTE Bromus tectorum      Entry Date: May-18-2022  
 Common Name: Cheatgrass      Stage Scale: BBCH  
 Pest 3 Type: W      Code: STEME Stellaria media      Entry Date: May-18-2022  
 Common Name: chickweed      Stage Scale: BBCH  
 Pest 4 Type: W      Code: AMBTR Ambrosia trifida      Entry Date: May-18-2022  
 Common Name: Giant ragweed      Stage Scale: BBCH  
 Pest 5 Type: W      Code: CHEAL Chenopodium album      Entry Date: May-18-2022  
 Common Name: common lambsquarters      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 FT<sup>2</sup>      Tillage Type: NOTILL      no-till  
 Replications: 3      Treatments: 8      Plots: 24      Study Design: RACOB      Randomized Complete Block (RCB)

Previous  
 No.      Crop      Year  
 1.      SOYBEAN      2021

### Soil Description

Description Name: F-9 West  
 % Sand: 33      % OM: 1.6      Texture: SIL silt loam  
 % Silt: 52      Soil Name: Crosby  
 % Clay: 15      Fert. Level: G      good  
 pH: 6      CEC: 8.6

# The Ohio State University

## Tough Burndown Combinations in Soybean

Trial ID: 22TOUGHISOY      Cooperator Trial ID:  
 Protocol ID: 22-145      Location:      Trial Year: 2022  
 Project ID:      Project ID 2:      Project ID 3:  
 Study Director:      Sponsor Contact:  
 Investigator (Creator): Dr. Mark M. Loux

### Application Description

Application Date	May-17-2022
Appl. Start Time	10:00 AM
Appl. Stop Time	10:15 AM
Application Method	SPRAY
Application Timing	14 EPP
Application Placement	BROFOL
Applied By	Dobbels
Appl. Entry Date	May-18-2022
Air Temperature Start, Stop	67, 67 F
% Relative Humidity Start, Stop	50, 50
Wind Velocity+Dir. Start	6 MPH, NW
Wind Velocity+Dir. Stop	6 MPH, NW
Wind Velocity+Dir. Max	6 MPH, NW
Wet Leaves (Y/N)	N, no
Soil Temperature	58 F
Soil Moisture	DRY
Soil Surface Condition	MEDTRA
% Cloud Cover	0
Next Moisture Occurred On	May-18-2022
Time to Next Moisture	1.0 DAY
Moisture 6 Hours after Appl.	0 IN
Moisture 1 Week after Appl.	1.63 IN

### Crop Stage At Each Application

Crop 1 Code, BBCH Scale	GLXMA, BSOY
Days after Emergence	-15
Stage Scale Used	BBCH

### Pest Stage At Each Application

Pest 1 Code, Type, Scale	ERICA, W, BBCH
Stage Majority, Percent	19, 100
Height Average	7 IN
Height Minimum, Maximum	6, 8
Density Average	3 PLA/M2
Density Minimum, Maximum	1, 5
Pest 2 Code, Type, Scale	BROTE, W, BBCH
Stage Majority, Percent	69, 100
Height Average	13 IN
Height Minimum, Maximum	6, 22
Density Average	3 PLA/M2
Density Minimum, Maximum	1, 8
Pest 3 Code, Type, Scale	STEME, W, BBCH
Stage Majority, Percent	61, 80
Stage Minimum, Percent	55, 10
Stage Maximum, Percent	63, 10
Diameter Average	16 IN
Diameter Minimum, Maximum	12, 17
Height Average	6 IN
Height Minimum, Maximum	4, 6
Density Average	4 PLA/M2
Density Minimum, Maximum	3, 8
Pest 4 Code, Type, Scale	AMBTR, W, BBCH
Stage Majority, Percent	16, 60
Stage Minimum, Percent	16, 20
Stage Maximum, Percent	18, 20
Height Average	8 IN
Height Minimum, Maximum	4, 10
Density Average	8 PLA/M2
Density Minimum, Maximum	4, 9
Pest 5 Code, Type, Scale	CHEAL, W, BBCH
Stage Majority, Percent	19, 80
Stage Minimum, Percent	18, 10
Stage Maximum, Percent	19, 10
Height Average	6 IN
Height Minimum, Maximum	4, 6
Density Average	5 PLA/M2
Density Minimum, Maximum	3, 8

# The Ohio State University

## Tough Burndown Combinations in Soybean

Trial ID: 22TOUGHISOY      Cooperator Trial ID:  
 Protocol ID: 22-145      Location:      Trial Year: 2022  
 Project ID: Project ID 2: Project ID 3:  
 Study Director:      Sponsor Contact:  
 Investigator (Creator): Dr. Mark M. Loux

### Application Equipment

Appl. Equipment      A  
 Equipment Type      6' TT  
 Operation Pressure      BACCAI  
 Nozzle Model      44 PSI  
 Nozzle Type      110015  
 Nozzle Spacing      TT  
 Boom Length      18 IN  
 Boom Height      6.67 FT  
 Ground Speed      20 IN  
 Carrier      3 MPH  
 Water Hardness (ppm CaCO<sub>3</sub>)      WATER  
 Application Amount      250  
 Mix Size      15 GAL/AC  
 Spray pH      1 L  
 Propellant      7.8  
                                  COMCO2

Pest Type	W, Weed	W, Weed	W, Weed	W, Weed	W, Weed	W, Weed
Pest Code	STEME	AMBTR	ERICA	BROTE	STEME	AMBTR
Pest Scientific Name	Stellaria media	Ambrosia trifida	Erigeron canadensis	Bromus tectorum	Stellaria media	Ambrosia trifida
Pest Name	chickweed	Giant ragweed	mare's-tail	Cheatgrass	chickweed	Giant ragweed
Rating Date	May-25-2022	May-25-2022	May-25-2022	May-25-2022	Jun-2-2022	Jun-2-2022
Rating Type	CONTRO	CONTRO		CONTRO	CONTRO	CONTRO
Rating Unit/Min/Max	% , 0, 100	% , 0, 100		% , 0, 100	% , 0, 100	% , 0, 100
Number of Subsamples	1	1	1	1	1	1
Data Entry Date	May-24-2022	May-24-2022	May-24-2022	May-24-2022	Jun-2-2022	Jun-2-2022
Days After First/Last Applic.	8, 8	8, 8	8, 8	8, 8	16, 16	16, 16
Trt-Eval Interval	8 DA-A	8 DA-A	8 DA-A	8 DA-A	16 DA-A	16 DA-A
Days After Emergence	-7 DE-1	-7 DE-1	-7 DE-1	-7 DE-1	1 DE-1	1 DE-1
Number of Decimals	0	0	0	0	0	0

Trt Treatment No. Name	Rate	Rate Unit	Appl Code	1*	2*	3*	4*	5*	6*
1 Roundup Powermax	0.77 lb ae/a	A		23 c	43 b	33.3 b	50 b	99 a	50 b
2 Roundup Powermax	0.77 lb ae/a	A		20 c	47 b	30.0 b	50 b	100 a	50 b
2 Tough	0.313 lb ai/a	A							
3 Sharpen	0.0445 lb ai/a	A		60 b	100 a	100.0 a	0 c	33 b	100 a
3 HC MSO	1 % v/v	A							
4 Gramoxone 3	1.01 lb ai/a	A		100 a	100 a	96.7 a	100 a	100 a	83 a
4 NIS	0.25 % v/v	A							
5 Gramoxone 3	1.01 lb ai/a	A		95 a	100 a	96.7 a	99 a	100 a	100 a
5 Tough	0.313 lb ai/a	A							
5 NIS	0.25 % v/v	A							
6 Roundup Powermax	0.56 lb ae/a	A		30 c	43 b	30.0 b	37 b	80 a	43 b
6 Tough	0.313 lb ai/a	A							
7 Gramoxone 3	1.01 lb ai/a	A		100 a	100 a	100.0 a	100 a	100 a	100 a
7 Metribuzin	0.375 lb ai/a	A							
7 NIS	0.25 % v/v	A							
8 Gramoxone 3	1.01 lb ai/a	A		92 a	100 a	100.0 a	92 a	100 a	100 a
8 Metribuzin	0.188 lb ai/a	A							
8 Tough	0.313 lb ai/a	A							
8 NIS	0.25 % v/v	A							
LSD P=.05				21.1	11.4	6.48	12.0	35.7	19.7
Standard Deviation				12.1	6.5	3.70	6.8	20.4	11.3
CV				18.54	8.21	5.05	10.35	22.88	14.37
Grand Mean				65.0	79.2	73.33	66.0	89.0	78.3
Levene's F^				0.452	0.75	0.697	0.967	0.653	0.808
Levene's Prob(F)				0.855	0.635	0.675	0.487	0.707	0.593
Rank X2				.	.	.	.	.	.
P(Rank X2)				.	.	.	.	.	.
Skewness^				-0.0927	-1.2799*	-0.4518	-0.5641	1.7115*	-1.51*
Kurtosis^				-0.5101	2.2463*	1.4104	0.8016	8.0235*	5.691*
Replicate F				1.033	0.099	0.304	0.366	1.035	0.624
Replicate Prob(F)				0.3816	0.9067	0.7424	0.7000	0.3809	0.5498
Treatment F				26.770	58.761	268.522	90.291	4.011	16.000
Treatment Prob(F)				0.0001	0.0001	0.0001	0.0001	0.0130	0.0001

# The Ohio State University

## Tough Burndown Combinations in Soybean

Trial ID: 22TOUGHISOY Cooperator Trial ID:  
 Protocol ID: 22-145 Location: Trial Year: 2022  
 Project ID: Project ID 2: Project ID 3:  
 Study Director: Sponsor Contact:  
 Investigator (Creator): Dr. Mark M. Loux

Pest Type		W, Weed	W, Weed	W, Weed	W, Weed	W, Weed	
Pest Code		ERICA	BROTE	ERICA	SETFA	AMBTR	
Pest Scientific Name		Erigeron canadensis	Bromus tectorum	Erigeron canadensis	Setaria faberii	Ambrosia trifida	
Pest Name		mare's-tail	Cheatgrass	mare's-tail	Giant foxtail	Giant ragweed	
Rating Date		Jun-2-2022	Jun-2-2022	Jun-13-2022	Jun-13-2022	Jun-13-2022	
Rating Type			CONTRO		CONTRO	CONTRO	
Rating Unit/Min/Max			%, 0, 100		%, 0, 100	%, 0, 100	
Number of Subsamples		1	1	1	1	1	
Data Entry Date		Jun-2-2022	Jun-2-2022	Jun-13-2022	Jun-13-2022	Jun-13-2022	
Days After First/Last Applic.		16, 16	16, 16	27, 27	27, 27	27, 27	
Trt-Eval Interval		16 DA-A	16 DA-A	27 DA-A	27 DA-A	27 DA-A	
Days After Emergence		1 DE-1	1 DE-1	12 DE-1	12 DE-1	12 DE-1	
Number of Decimals			0		0	0	
Trt Treatment	Rate	Appl Code	7*	8*	9*	10*	11*
No. Name	Unit						
1 Roundup Powermax	0.77 lb ae/a	A	30.0b	100-	16.7b	23-	27b
2 Roundup Powermax	0.77 lb ae/a	A	30.0b	100-	13.3b	7-	20b
2 Tough	0.313 lb ai/a	A					
3 Sharpen	0.0445 lb ai/a	A	100.0a	0-	100.0a	20-	73a
3 HC MSO	1% v/v	A					
4 Gramoxone 3	1.01 lb ai/a	A	100.0a	100-	100.0a	30-	33ab
4 NIS	0.25% v/v	A					
5 Gramoxone 3	1.01 lb ai/a	A	100.0a	100-	100.0a	33-	40ab
5 Tough	0.313 lb ai/a	A					
5 NIS	0.25% v/v	A					
6 Roundup Powermax	0.56 lb ae/a	A	10.0c	100-	20.0b	27-	10b
6 Tough	0.313 lb ai/a	A					
7 Gramoxone 3	1.01 lb ai/a	A	100.0a	100-	100.0a	57-	47ab
7 Metribuzin	0.375 lb ai/a	A					
7 NIS	0.25% v/v	A					
8 Gramoxone 3	1.01 lb ai/a	A	86.7a	100-	86.7a	30-	50ab
8 Metribuzin	0.188 lb ai/a	A					
8 Tough	0.313 lb ai/a	A					
8 NIS	0.25% v/v	A					
LSD P=.05			14.30	.	20.89	47.0	29.6
Standard Deviation			8.16	0.0	11.93	26.8	16.9
CV			11.73	0.0	17.78	94.68	45.03
Grand Mean			69.58	87.5	67.08	28.3	37.5
Levene's F^			0.643	.	0.432	0.489	0.832
Levene's Prob(F)			0.715	.	0.868	0.829	0.576
Rank X2			.	.	.	.	.
P(Rank X2)			.	.	.	.	.
Skewness^A			-1.7125*	.	-0.7934	0.1002	0.0609
Kurtosis^A			8.0329*	.	0.0972	-0.6277	0.4309
Replicate F			1.000	0.000	1.435	1.430	0.132
Replicate Prob(F)			0.3927	1.0000	0.2710	0.2722	0.8778
Treatment F			68.634	0.000	37.251	0.834	4.100
Treatment Prob(F)			0.0001	1.0000	0.0001	0.5771	0.0119

# The Ohio State University

## Tough Burndown Combinations in Soybean

Trial ID: 22TOUGHSOY      Cooperator Trial ID:  
Protocol ID: 22-145      Location:      Trial Year: 2022  
Project ID:      Project ID 2:      Project ID 3:  
Study Director:      Sponsor Contact:  
Investigator (Creator): Dr. Mark M. Loux

### Pest Type

W, Weed = Weed or volunteer crop

### Pest Code

STEME, Stellaria media, chickweed = US  
AMBTR, Ambrosia trifida, Giant ragweed = US  
ERICA, Erigeron canadensis, mare's-tail = US  
BROTE, Bromus tectorum, Cheatgrass = US  
SETFA, Setaria faberi, Giant foxtail = US

### Rating Type

CONTRO = control / burndown or knockdown

### Rating Unit/Min/Max

%, 0, 100 = percent