

# The Ohio State University

## TOUGH 5 EC Tolpyralate Mixtures for Marestail Burndown in Soybean

Trial ID: 20TOUGH2      Location:      Trial Year: 2020  
 Protocol ID: 20TOUGH2      Investigator: Dr. Mark M. Loux  
 Project ID: 20-129      Study Director: Anthony Dobbels  
 Sponsor Contact: Dennis Long, Belchim

### General Trial Information

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

Trial Status: E      established

ARM Trial Created On: Mar-26-2020

### Trial Location

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

Latitude of LL Corner °: 39.85913      N  
 Longitude of LL Corner °: -83.71836      W  
 Altitude of LL Corner: 1056.00 FT

Conducted Under GLP: No  
 Conducted Under GEP: No

### Contacts

Study Director: Anthony Dobbels

Investigator: Dr. Mark M. Loux

### Pest Description

Pest 1 Type: W      Code: ERICA      Erigeron canadensis  
 Common Name: Canada horseweed      Entry Date: Jun-12-2020

Pest 2 Type: W      Code: STEME      Stellaria media  
 Common Name: Common chickweed      Entry Date: Jun-12-2020

Pest 3 Type: W      Code: POAAN      Poa annua  
 Common Name: Annual bluegrass      Entry Date: Jun-12-2020

Pest 4 Type: W      Code: VERAG      Veronica agrestis  
 Common Name: Field speedwell      Entry Date: Jun-12-2020

### Site and Design

Treated Plot Width: 10 FT      Site Type: FIELD      field  
 Treated Plot Length: 30 FT      Experimental Unit: 1      PLOT      plot  
 Treated Plot Area: 300 FT2      Treatments: 12      Tillage Type: NOTILL      no-till  
 Replications: 3      Study Design: RAOBL Randomized Complete Block (RCB)

### Previous

No.      Crop      Year  
 1.      SOYBEAN      2019

### Application Description

	A
Application Date	Jun-4-2020
Appl. Start Time	9:00 AM
Appl. Stop Time	9:30 AM
Application Method	SPRAY
Application Timing	EPP
Application Placement	BROFOL
Applied By	Dobbels
Appl. Entry Date	Jun-12-2020
Air Temperature Start, Stop	69 69 F
% Relative Humidity Start, Stop	70 70
Wind Velocity+Dir. Start	3 MPH SW
Wind Velocity+Dir. Stop	3 MPH SW
Wind Velocity+Dir. Max	5 MPH SW
Wet Leaves (Y/N)	N no
Soil Temperature	68 F
Soil Moisture	DRY
Soil Surface Condition	NORMAL
% Cloud Cover	50
Next Moisture Occurred On	Jun-4-2020
Time to Next Moisture	2 HR
Moisture 6 Hours after Appl.	0.01 IN
Moisture 1 Week after Appl.	0.31 IN

# The Ohio State University

## TOUGH 5 EC Tolpyralate Mixtures for Marestalk Burndown in Soybean

Trial ID: 20TOUGH2      Location:      Trial Year: 2020  
 Protocol ID: 20TOUGH2      Investigator: Dr. Mark M. Loux  
 Project ID: 20-129      Study Director: Anthony Dobbels  
 Sponsor Contact: Dennis Long, Belchim

### Pest Stage At Each Application

	A	
<b>Pest 1 Code, Type, Scale</b>	ERICA	W
<b>Stage Majority, Percent</b>	19	100
<b>Diameter</b>	2	IN
<b>Height Average</b>	5	IN
<b>Height Minimum, Maximum</b>	2	6
<b>Density Average</b>	10	PLA/m2
<b>Density Min, Max</b>	1	20
<b>Pest 2 Code, Type, Scale</b>	STEME	W
<b>Stage Majority, Percent</b>	65	90
<b>Stage Minimum, Percent</b>	65	90
<b>Stage Maximum, Percent</b>	69	10
<b>Diameter</b>	8	IN
<b>Height Average</b>	2	IN
<b>Height Minimum, Maximum</b>	1	2
<b>Density Average</b>	3	PLA/M2
<b>Density Min, Max</b>	1	5
<b>Pest 3 Code, Type, Scale</b>	POAAN	W
<b>Stage Majority, Percent</b>	63	80
<b>Stage Minimum, Percent</b>	63	80
<b>Stage Maximum, Percent</b>	65	10
<b>Diameter</b>	4	IN
<b>Height Average</b>	4	IN
<b>Height Minimum, Maximum</b>	4	6
<b>Density Average</b>	3	PLA/m2
<b>Density Min, Max</b>	1	6
<b>Pest 4 Code, Type, Scale</b>	VERAG	W
<b>Stage Majority, Percent</b>	65	80
<b>Stage Minimum, Percent</b>	65	80
<b>Stage Maximum, Percent</b>	69	20
<b>Diameter</b>	2	IN
<b>Height Average</b>	5	IN
<b>Height Minimum, Maximum</b>	4	6
<b>Density Average</b>	8	PLA/M2
<b>Density Min, Max</b>	3	15

### Application Equipment

	A	
<b>Appl. Equipment</b>	10'	AIXR
<b>Equipment Type</b>	BACCAI	
<b>Operation Pressure</b>	44	PSI
<b>Nozzle Type</b>	AIXR	
<b>Nozzle Size</b>	110015	
<b>Nozzle Spacing</b>	18	IN
<b>Boom Length</b>	6.67 FT	
<b>Boom Height</b>	20	IN
<b>Ground Speed</b>	3	MPH
<b>Carrier</b>	WATER	
<b>Application Amount</b>	15	GAL/AC
<b>Mix Size</b>	2	L
<b>Propellant</b>	COMCO2	

Context	Date	By	Notes
STATUS	Mar-26-2020	Dr. Mark M. Loux	Automatically added by ARM: Trial Status updated to 'S' during trial creation.
STATUS	Mar-26-2020	Dr. Mark M. Loux	Automatically added by ARM: Trial Status updated to 'S' during trial creation.
STATUS	Jun-10-2020	Dr. Mark M. Loux	Automatically added by ARM: Trial Status updated to 'E' when Application Date entered.
STATUS	Jun-12-2020	Dr. Mark M. Loux	Automatically added by ARM: Trial Status updated to 'E' when Rating Date entered.

# The Ohio State University

## TOUGH 5 EC Tolpyralate Mixtures for Marestalk Burndown in Soybean

Trial ID: 20TOUGH2  
 Protocol ID: 20TOUGH2  
 Project ID: 20-129

Location: Trial Year: 2020  
 Investigator: Dr. Mark M. Loux  
 Study Director: Anthony Dobbels  
 Sponsor Contact: Dennis Long, Belchim

Pest Type	W Weed	W Weed	W Weed	W Weed	W Weed
Pest Code	ERICA	STEME	VERAG	ERICA	ERICA
Pest Name	Canada horsewe>	Common chickwe>	Field speedwell	Canada horsewe>	Canada horsewe>
Rating Date	Jun-11-2020	Jun-11-2020	Jun-11-2020	Jun-18-2020	Jul-2-2020
Rating Type	CONTRO	CONTRO	CONTRO	CONTRO	CONTRO
Rating Unit	%	%	%	%	%
Number of Subsamples	1	1	1	1	1
Data Entry Date	Jun-12-2020	Jun-12-2020	Jun-12-2020	Jun-22-2020	Jul-2-2020
Days After First/Last Applic.	7 7	7 7	7 7	14 14	28 28
Trt-Eval Interval	7 DA-A	7 DA-A	7 DA-A	14 DA-A	28 DA-A
Number of Decimals	0	0	0	0	0

Trt No.	Treatment Name	Rate	Unit	Other Rate	Other Unit	Appl Code	1*	2*	3*	4*	5*
1	UTC						0 d	0 f	0 f	0 e	0 d
2	Gramoxone 2	0.75 lb ai/a		3 pt/a		A	97 a	100 a	100 a	99 a	80 ab
	2,2,4-D Ester	0.5 lb ai/a		1 pt/a		A					
	2 COC	1 % v/v		1 % v/v		A					
3	Gramoxone 2	0.75 lb ai/a		3 pt/a		A	98 a	100 a	100 a	99 a	78 abc
	3,2,4-D Ester	0.5 lb ai/a		1 pt/a		A					
	3 Metribuzin	0.248 lb ai/a		5.3 oz/a		A					
	3 COC	1 % v/v		1 % v/v		A					
4	Gramoxone 2	0.75 lb ai/a		3 pt/a		A	98 a	100 e	100 e	96 ab	80 ab
	4,2,4-D Ester	0.5 lb ai/a		1 pt/a		A					
	4 Metribuzin	0.248 lb ai/a		5.3 oz/a		A					
	4 Tough	0.235 lb ai/a		6 oz/a		A					
	4 COC	1 % v/v		1 % v/v		A					
5	Gramoxone 2	0.75 lb ai/a		3 pt/a		A	93 ab	100 d	100 d	98 a	73 abc
	5 BCP1312	0.0177 lb ai/a		0.68 oz/a		A					
	5 COC	1 % v/v		1 % v/v		A					
6	Gramoxone 2	0.75 lb ai/a		3 pt/a		A	95 a	100	100	97 ab	88 a
	6 BCP1312	0.0177 lb ai/a		0.68 oz/a		A					
	6 Tough	0.156 lb ai/a		4 oz/a		A					
	6 COC	1 % v/v		1 % v/v		A					
7	Gramoxone 2	0.75 lb ai/a		3 pt/a		A	96 a	100 c	100 c	99 a	83 a
	7 BCP1312	0.0177 lb ai/a		0.68 oz/a		A					
	7 Tough	0.234 lb ai/a		6 oz/a		A					
	7 COC	1 % v/v		1 % v/v		A					
8	Gramoxone 2	0.75 lb ai/a		3 pt/a		A	85 c	100	100	87 cd	67 bc
	8 BCP1312	0.0177 lb ai/a		0.68 oz/a		A					
	8 Tough	0.313 lb ai/a		8 oz/a		A					
	8 COC	1 % v/v		1 % v/v		A					
9	Gramoxone 2	0.75 lb ai/a		3 pt/a		A	96 a	100	100	92 abc	83 a
	9 BCP1312	0.026 lb ai/a		1 oz/a		A					
	9 COC	1 % v/v		1 % v/v		A					
10	Gramoxone 2	0.75 lb ai/a		3 pt/a		A	88 bc	100	100	83 d	63 c
	10 BCP1312	0.026 lb ai/a		1 oz/a		A					
	10 Tough	0.156 lb ai/a		4 oz/a		A					
	10 COC	1 % v/v		1 % v/v		A					
11	Gramoxone 2	0.75 lb ai/a		3 pt/a		A	95 ab	100 a	100 a	88 bcd	75 abc
	11 BCP1312	0.026 lb ai/a		1 oz/a		A					
	11 Tough	0.234 lb ai/a		6 oz/a		A					
	11 COC	1 % v/v		1 % v/v		A					

Means followed by same letter or symbol do not significantly differ (P=0.05, LSD).  
 Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.  
 \* Adjusted means  
 Could not calculate LSD (% mean diff) for columns 2,3 because error mean square = 0.

# The Ohio State University

## TOUGH 5 EC Tolpyralate Mixtures for Marestalk Burndown in Soybean

Trial ID: 20TOUGH2  
 Protocol ID: 20TOUGH2  
 Project ID: 20-129

Location: Trial Year: 2020  
 Investigator: Dr. Mark M. Loux  
 Study Director: Anthony Dobbels  
 Sponsor Contact: Dennis Long, Belchim

Pest Type	W Weed	W Weed	W Weed	W Weed	W Weed						
Pest Code	ERICA	STEME	VERAG	ERICA	ERICA						
Pest Name	Canada horsewe>	Common chickwe>	Field speedwell	Canada horsewe>	Canada horsewe>						
Rating Date	Jun-11-2020	Jun-11-2020	Jun-11-2020	Jun-18-2020	Jul-2-2020						
Rating Type	CONTRO	CONTRO	CONTRO	CONTRO	CONTRO						
Rating Unit	%	%	%	%	%						
Number of Subsamples	1	1	1	1	1						
Data Entry Date	Jun-12-2020	Jun-12-2020	Jun-12-2020	Jun-22-2020	Jul-2-2020						
Days After First/Last Applic.	7 7	7 7	7 7	14 14	28 28						
Trt-Eval Interval	7 DA-A	7 DA-A	7 DA-A	14 DA-A	28 DA-A						
Number of Decimals	0	0	0	0	0						
Trt No.	Treatment Name	Rate	Unit	Other Rate	Other Unit	Appl Code	1*	2*	3*	4*	5*
12	Gramoxone 2	0.75 lb ai/a		3 pt/a		A	99 a	100 a	100 a	100 a	85 a
12	BCP1312	0.026 lb ai/a		1 oz/a		A					
12	Tough	0.313 lb ai/a		8 oz/a		A					
12	COC	1 % v/v		1 % v/v		A					
LSD P=.05							7.5	.	.	8.9	16.3
Standard Deviation							4.4	0.0	0.0	5.2	9.6
CV							5.12	0.0	0.0	6.05	13.49
Grand Mean							86.8	91.7	91.7	86.6	71.4
Levene's F							0.611	0.00	0.00	1.207	0.54
Levene's Prob(F)							0.801	.	.	0.334	0.856
Rank X2							.	.	.	.	.
P(Rank X2)							.	.	.	.	.
Skewness							-2.92*	-3.1478*	-3.1478*	-2.7935*	-2.0305*
Kurtosis							7.4181*	8.3714*	8.3714*	6.8649*	4.1033*
Replicate F							1.443	0.000	0.000	3.120	4.186
Replicate Prob(F)							0.2578	1.0000	1.0000	0.0641	0.0288
Treatment F							116.507	0.000	0.000	84.786	18.099
Treatment Prob(F)							0.0001	1.0000	1.0000	0.0001	0.0001

Pest Type

W, Weed = Weed or volunteer crop

Pest Code

ERICA, Erigeron canadensis, Canada horseweed = US

STEME, Stellaria media, Common chickweed = US

VERAG, Veronica agrestis, Field speedwell = US

Rating Type

CONTRO = control / burndown or knockdown

Rating Unit

% = percent

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.

\* Adjusted means

Could not calculate LSD (% mean diff) for columns 2,3 because error mean square = 0.