

The Ohio State University
Evaluation of Tough 5 EC in Common Tank Mixtures Within a No Till Roundup Ready Corn System

Trial ID: 18TOUGHNT Location: Western Branch F-10 W Trial Year: 2018
 Protocol ID: 18TOUGHNT Investigator: Dr. Mark M. Loux
 Project ID: Study Director:
 Sponsor Contact:

General Trial Information

Investigator: Dr. Mark M. Loux

Trial Location

City: South Charleston Country: USA United States
 State/Prov.: Ohio
 Postal Code: 45368 Climate Zone: USWARM US Warm Continental

Latitude of LL Corner °: 39.85866 N
 Longitude of LL Corner °: 83.67163 W
 Altitude of LL Corner, Unit: 1083.00 FT

Conducted Under GLP: No
 Conducted Under GEP: No

Investigator: Dr. Mark M. Loux

Crop Description

Crop 1: ZEAMX Zea mays Corn
 Variety: DKC61-54RIB
 Description: Dekalb RR/LL 111

Planting Date: Apr-29-2018
 Planting Method: PLANTD planted
 Planting Equipment: FPP finger pickup planter

Planting Rate, Unit: 32097 S/A
 Depth, Unit: 2 IN
 Row Spacing, Unit: 30 IN
 Soil Temperature, Unit: 58 F
 Soil Moisture: SLIWET slightly wet, moist
 Seed Bed: MEDTRA medium/trashy

Pest Description

Pest 1 Type: W **Code:** SETFA *Setaria faberi*
Common Name: Giant foxtail

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

Pest 3 Type: W **Code:** AMARE *Amaranthus retroflexus*
Common Name: Redroot pigweed

Pest 4 Type: W **Code:** ABUTH *Abutilon theophrasti*
Common Name: velvetleaf

Pest 5 Type: W **Code:** IPOHE *Ipomoea hederacea*
Common Name: ivy-leaf morning glory

Pest 6 Type: W **Code:** ECHCG *Echinochloa crus-galli*
Common Name: Common barnyard grass

Pest 7 Type: W **Code:** CHEAL *Chenopodium album*
Common Name: common lambsquarters

Pest 8 Type: W **Code:** SIDSP *Sida spinosa*
Common Name: Prickly sida

Site and Design

Treated Plot Width: 6.67 FT
 Treated Plot Length: 30 FT
 Treated Plot Area: 200.1 FT² Treatments: 12
 Replications: 3 Study Design: RAOBL Randomized Complete Block (RCB)

Maintenance

No.	Date	Type	Maintenance Product Name	Form Conc	Form Unit	Form Type	Rate	Tank Unit	Mix
1.	Apr-27-2018	HERB	Roundup Powermax	5.5	LB/GAL	SL	32	OZ/A	yes
2.	Apr-27-2018	HERB	Dual II Magnum	7.674	LBA/GAL	EC	1.6	PT/A	yes

Soil Description

Description Name: F-10 East
 % Sand: 40 % OM: 3.3 Texture: SICL silty clay loam
 % Silt: 43 pH: 6.2 Soil Name: Kokomo
 % Clay: 17 CEC: 16.6 Fert. Level: G good
 Soil Drainage: G good

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Application Description

	A	B
Application Date:	Apr-26-2018	May-24-2018
Appl. Start Time:	1:00 AM	8:17 AM
Appl. Stop Time:	1:15 AM	8:30 AM
Application Method:	SPRAY	SPRAY
Application Timing:	7 EPP	V2-V4
Application Placement:	BROFOL	BROFOL
Applied By:	Dobbels	Ackley,Lamb
Air Temperature, Unit:	66 F	60 F
% Relative Humidity:	51	52
Wind Velocity, Unit:	3 MPH	2 MPH
Wind Direction:	SSE	N
Dew Presence (Y/N):	N no	N no
Soil Temperature, Unit:	72 F	58 F
Soil Moisture:	SLIWET	NORMAL
% Cloud Cover:	55	5
Next Moisture Occurred On:	May-3-2018	May-26-2018
Time to Next Moisture, Unit:	1 WK	2 DAY
Moisture 1 Week after Appl.:	0.13 IN	0.55 IN

Crop Stage At Each Application

	A	B
Crop 1 Code, BBCH Scale:	ZEAMX BCOR	ZEAMX BCOR
Stage Scale Used:		BBCH
Stage Majority, Percent:		14 100
Height, Unit:		10 IN
Height Minimum, Maximum:		9 11

Pest Stage At Each Application

	A	B
Pest 1 Code, Type, Scale:	SETFA W	SETFA W
Stage Majority, Percent:		14 100
Height, Unit:		2 IN
Height Minimum, Maximum:		2 3
Density, Unit:		11 m2
Pest 2 Code, Type, Scale:	AMBTR W	AMBTR W
Stage Majority, Percent:		16 100
Height, Unit:		4 IN
Height Minimum, Maximum:		1 5
Density, Unit:		41 m2
Pest 3 Code, Type, Scale:	AMARE W	AMARE W
Stage Majority, Percent:		14 100
Height, Unit:		1 IN
Density, Unit:		4 m2
Pest 4 Code, Type, Scale:	ABUTH W	ABUTH W
Stage Majority, Percent:		14 100
Height, Unit:		2 IN
Height Minimum, Maximum:		1 3
Density, Unit:		24 m2
Pest 5 Code, Type, Scale:	IPOHE W	IPOHE W
Stage Majority, Percent:		10 100
Height, Unit:		1 IN
Pest 6 Code, Type, Scale:	ECHCG W	ECHCG W
Density, Unit:		24 m2
Pest 7 Code, Type, Scale:	CHEAL W	CHEAL W
Density, Unit:		1 m2
Pest 8 Code, Type, Scale:	SIDSP W	SIDSP W
Density, Unit:		5 m2

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Pest Type	W Weed	W Weed	W Weed	W Weed	W Weed						
Pest Code	AMBTR	ABUTH	SIDSP	IPHOE	AMBTR						
Pest Name	Giant ragweed	velvetleaf	Prickly sida	ivy-leaf morri>	Giant ragweed						
Crop Code	ZEAMX	ZEAMX									
Crop Name	Corn	Corn									
Rating Date	May-30-201	Jun-7-201	Jun-7-2018	Jun-7-2018	Jun-20-2018						
Rating Type	PHYCHL	PHYGEN	CONTRO	CONTRO	CONTRO						
Rating Unit	%	%	%	%	%						
Number of Subsamples	1	1	1	1	1						
Days After First/Last Applic.	34 6	42 14	42 14	42 14	55 27						
Trt-Eval Interval	6 DA-A	14 DA-B	14 DA-B	14 DA-B	27 DA-B						
Number of Decimals	0	0	0	0	0						
Trt No.	Treatment Name	Rate	Unit	Appl Code	1*	2*	3*	4*	5*	6*	7*
10	Dual II Magnum	1.27 lb	ai/a	A	1 -	0 -	70 -	93 a	100 -	85 -	73 a
	Roundup PowerMax	1.13 lb	ae/a	B							
	Callisto	0.094 lb	ai/a	B							
	Aatrex	1.2 lb	ai/a	B							
	N Pak AMS	2.5 %	v/v	B							
11	Dual II Magnum	1.27 lb	ai/a	A	0 -	0 -	73 -	100 a	100 -	85 -	78 a
	Roundup PowerMax	1.13 lb	ae/a	B							
	Tough	0.313 lb	ai/a	B							
	Callisto	0.094 lb	ai/a	B							
	Aatrex	1.2 lb	ai/a	B							
	N Pak AMS	2.5 %	v/v	B							
12	Dual II Magnum	1.27 lb	ai/a	A	0 -	0 -	80 -	100 a	100 -	67 -	80 a
	Roundup PowerMax	1.13 lb	ae/a	B							
	Tough	0.39 lb	ai/a	B							
	Callisto	0.094 lb	ai/a	B							
	Aatrex	1.2 lb	ai/a	B							
	N Pak AMS	2.5 %	v/v	B							
LSD P=.05					2.2	.	17.9	17.5	.	28.4	15.3
Standard Deviation					1.0	0.0	10.5	10.3	0.0	16.7	9.0
CV					119.09	0.0	15.74	11.78	0.0	21.25	14.03
Levene's F						0.00	0.305	0.988	0.00	0.63	0.65
Levene's Prob(F)						.	0.972	0.486	.	0.773	0.769
Skewness					0.941	.	0.0783	-2.4563*	-3.094*	-0.3802	-1.9791*
Kurtosis					-0.9641	.	-1.5785	4.9012*	8.0291*	-0.6971	3.8247*
Replicate F					0.169	0.000	2.156	3.054	0.000	0.011	4.463
Replicate Prob(F)					0.6887	1.0000	0.1420	0.0696	1.0000	0.9892	0.0236
Treatment F					2.246	0.000	2.744	22.772	0.000	0.974	16.803
Treatment Prob(F)					0.0977	1.0000	0.0262	0.0001	1.0000	0.4944	0.0001

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Pest Code	ABUTH	SIDSP	IPHOE	AMBTR	ABUTH	SIDSP	IPHOE
Pest Name	velvetleaf	Prickly sida	ivy-leaf morni>	Giant ragweed	velvetleaf	Prickly sida	ivy-leaf morni>
Crop Code							
Crop Name							
Rating Date	Jun-20-2018	Jun-20-2018	Jun-20-2018	Jul-7-2018	Jul-7-2018	Jul-7-2018	Jul-7-2018
Rating Type	CONTRO	CONTRO	CONTRO	CONTRO	CONTRO	CONTRO	CONTRO
Rating Unit	%	%	%	%	%	%	%
Number of Subsamples	1	1	1	1	1	1	1
Days After First/Last Applic.	55 27	55 27	55 27	72 44	72 44	72 44	72 44
Trt-Eval Interval	27 DA-B	27 DA-B	27 DA-B	44 DA-B	44 DA-B	44 DA-B	44 DA-B
Number of Decimals	0	0	0	0	0	0	0

Trt Treatment	Rate	Appl	8*	9*	10*	11*	12*	13*	14*
No. Name	Rate Unit	Code							
1 UTC			0 b	0 b	0 b	0	0 b	0 b	0 c
2 Dual II Magnum	1.27 lb ai/a	A	100 a	100 a	73 a	65 -	100 a	100 a	80 ab
Roundup PowerMax	1.13 lb ae/a	B							
Aatrex	1.2 lb ai/a	B							
N Pak AMS	2.5 % v/v	B							
3 Dual II Magnum	1.27 lb ai/a	A	80 a	100 a	47 a	75 -	87 a	100 a	67 ab
Tough	0.312 lb ai/a	B							
Aatrex	1.2 lb ai/a	B							
N Pak AMS	2.5 % v/v	B							
4 Dual II Magnum	1.27 lb ai/a	A	83 a	83 a	53 a	63 -	70 a	93 a	67 ab
Tough	0.39 lb ai/a	B							
Aatrex	1.2 lb ai/a	B							
N Pak AMS	2.5 % v/v	B							
5 Dual II Magnum	1.27 lb ai/a	A	93 a	87 a	50 a	75 -	100 a	87 a	68 ab
Roundup PowerMax	1.13 lb ae/a	B							
Tough	0.312 lb ai/a	B							
Aatrex	1.2 lb ai/a	B							
N Pak AMS	2.5 % v/v	B							
6 Dual II Magnum	1.27 lb ai/a	A	93 a	100 a	80 a	88 -	98 a	97 a	95 a
Roundup PowerMax	1.13 lb ae/a	B							
Tough	0.39 lb ai/a	B							
Aatrex	1.2 lb ai/a	B							
N Pak AMS	2.5 % v/v	B							
7 Dual II Magnum	1.27 lb ai/a	A	100 a	80 a	63 a	72 -	100 a	87 a	70 ab
Roundup PowerMax	1.13 lb ae/a	B							
Callisto	0.094 lb ai/a	B							
N Pak AMS	2.5 % v/v	B							
8 Dual II Magnum	1.27 lb ai/a	A	100 a	93 a	40 a	68 -	100 a	90 a	60 b
Roundup PowerMax	1.13 lb ae/a	B							
Tough	0.313 lb ai/a	B							
Callisto	0.094 lb ai/a	B							
N Pak AMS	2.5 % v/v	B							
9 Dual II Magnum	1.27 lb ai/a	A	100 a	67 a	60 a	63 -	93 a	93 a	67 ab
Roundup PowerMax	1.13 lb ae/a	B							
Tough	0.39 lb ai/a	B							
Callisto	0.094 lb ai/a	B							
N Pak AMS	2.5 % v/v	B							

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Pest Code	ABUTH	SIDSP	IPHOE	AMBTR	ABUTH	SIDSP	IPHOE		
Pest Name	velvetleaf	Prickly sida	ivy-leaf morni>	Giant ragweed	velvetleaf	Prickly sida	ivy-leaf morni>		
Crop Code									
Crop Name									
Rating Date	Jun-20-2018	Jun-20-2018	Jun-20-2018	Jul-7-2018	Jul-7-2018	Jul-7-2018	Jul-7-2018		
Rating Type	CONTRO	CONTRO	CONTRO	CONTRO	CONTRO	CONTRO	CONTRO		
Rating Unit	%	%	%	%	%	%	%		
Number of Subsamples	1	1	1	1	1	1	1		
Days After First/Last Applic.	55 27	55 27	55 27	72 44	72 44	72 44	72 44		
Trt-Eval Interval	27 DA-B	27 DA-B	27 DA-B	44 DA-B	44 DA-B	44 DA-B	44 DA-B		
Number of Decimals	0	0	0	0	0	0	0		
Trt Treatment	Rate	Appl	8*	9*	10*	11*	12*	13*	14*
No. Name	Rate Unit	Code							
10 Dual II Magnum	1.27 lb ai/a	A	100 a	100 a	73 a	80 -	100 a	100 a	73 ab
Roundup PowerMax	1.13 lb ae/a	B							
Callisto	0.094 lb ai/a	B							
Aatrex	1.2 lb ai/a	B							
N Pak AMS	2.5 % v/v	B							
11 Dual II Magnum	1.27 lb ai/a	A	100 a	100 a	53 a	84 -	100 a	100 a	60 b
Roundup PowerMax	1.13 lb ae/a	B							
Tough	0.313 lb ai/a	B							
Callisto	0.094 lb ai/a	B							
Aatrex	1.2 lb ai/a	B							
N Pak AMS	2.5 % v/v	B							
12 Dual II Magnum	1.27 lb ai/a	A	100 a	100 a	73 a	80 -	100 a	100 a	53 b
Roundup PowerMax	1.13 lb ae/a	B							
Tough	0.39 lb ai/a	B							
Callisto	0.094 lb ai/a	B							
Aatrex	1.2 lb ai/a	B							
N Pak AMS	2.5 % v/v	B							
LSD P=.05			18.0	23.0	33.7	15.9	18.3	16.6	19.6
Standard Deviation			10.6	13.5	19.9	9.3	10.8	9.8	11.5
CV			12.14	16.17	35.79	12.6	12.34	11.23	18.23
Levene's F			1.029	0.794	0.571	0.487	1.123	0.682	0.441
Levene's Prob(F)			0.452	0.645	0.833	0.881	0.387	0.742	0.921
Skewness			-2.4874*	-1.9984*	-0.4088	-0.2691	-2.4101*	-2.6402*	-1.4219*
Kurtosis			5.1752*	3.1912*	-0.1592	-1.1956	4.765*	6.0465*	2.3724*
Replicate F			2.289	0.594	0.529	5.272	0.831	0.116	0.250
Replicate Prob(F)			0.1250	0.5610	0.5967	0.0145	0.4490	0.8912	0.7810
Treatment F			21.483	13.269	3.500	2.536	21.607	24.432	11.489
Treatment Prob(F)			0.0001	0.0001	0.0060	0.0367	0.0001	0.0001	0.0001

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Pest Type

W, Weed, G-BYRW7, G-WedStg = Weed or volunteer crop

Pest Code

AMBTR, Ambrosia trifida, Giant ragweed = US

ABUTH, Abutilon theophrasti, velvetleaf = US

SIDSP, Sida spinosa, Prickly sida = US

IPOHE, Ipomoea hederacea, ivy-leaf morning glory = US

Crop Code

ZEAMX, BCOR, Zea mays, Corn = US

Rating Type

PHYCHL = phytotoxicity - chlorosis

PHYGEN = phytotoxicity - general / injury

CONTRO = control / burndown or knockdown

Rating Unit

% = percent