

Purdue University Weed Science

Evaluation of Tough for Enhancing Control of Callisto and BCP1312 for Glyphosate-Resistant Palmer Amaranth Control

Trial ID: 20-WIN-Tough Location: Winamac Trial Year: 2020
 Protocol ID: 20-WIN-Tough Investigator (Creator): Dr. Bryan Young
 Project ID: Study Director: Dr. Bryan Young
 Sponsor Contact: Dennis Long

General Trial Information

Study Director: Dr. Bryan Young
Investigator: Dr. Bryan Young

Discipline: H herbicide
Trial Status: E established

ARM Trial Created On: Apr-16-2020

Initiation Date: May-1-2020

Completion Date: Aug-14-2020

Trial Location

City: Winamac **Country:** USA United States
State/Prov.: Indiana
Postal Code: 46996

Conducted Under GLP: No

Conducted Under GEP: No

Contacts

Role: STYDIR study director

Study Director: Dr. Bryan Young

Organization: Purdue University

Address 1: 915 W. State Street

Country: USA United States **E-mail:** BryanYoung@purdue.edu

City: West Lafayette, IN **Postal Code:** 47907

Role: INVEST investigator

Investigator: Dr. Bryan Young

Role: SPONSR sponsor

Sponsor: Dennis Long

Crop Description

Crop 1: C NNNXX No plants No plants
Entry Date: Aug-4-2020 **Stage Scale:** BBCH

Pest Description

Pest 1 Type: W **Code:** AMAPA *Amaranthus palmeri* **Entry Date:** Jul-13-2020
Common Name: amaranth, Palmer **Stage Scale:** BBCH

Pest 2 Type: W **Code:** SETFA *Setaria faberi* **Entry Date:** Jul-13-2020
Common Name: foxtail, giant **Stage Scale:** BBCH

Pest 3 Type: W **Code:** DIGSA *Digitaria sanguinalis* **Entry Date:** Jul-13-2020
Common Name: crabgrass, large **Stage Scale:** BBCH

Site and Design

Treated Plot Width: 6.67 FT **Site Type:** FIELD field
Treated Plot Length: 25 FT **Experimental Unit:** 1 PLOT plot
Treated Plot Area: 166.75 FT² **Treatments:** 7 **Tillage Type:** NOTILL no-till
Replications: 4 **Study Design:** RAOBL Randomized Complete Block (RCB)

Soil Description

Description Name: Winamac 17
% Sand: 83 **% OM:** 2.8 **Texture:** LS loamy sand
% Silt: 10 **pH:** 6.1
% Clay: 7 **CEC:** 9.4 **Fert. Level:** G good

Weather Conditions

Overall Moisture Conditions: BELNOR below normal
Closest Weather Station: Winamac **Distance:** 0.1 MI

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No.	Date	Moisture Total	Unit
1.	May-28-2020	0.44	IN
2.	Jun-4-2020	0.01	IN
3.	Jun-9-2020	0.23	IN
4.	Jun-13-2020	0.04	IN
5.	Jun-20-2020	0.16	IN
6.	Jun-21-2020	0.05	IN
7.	Jun-22-2020	0.72	IN
8.	Jun-23-2020	0.02	IN
9.	Jun-24-2020	0.2	IN
10.	Jun-25-2020	0.01	IN
11.	Jun-26-2020	0.02	IN
12.	Jun-27-2020	2.29	IN
13.	Jun-30-2020	0.5	IN
14.	Jul-10-2020	0.71	IN
15.	Jul-11-2020	0.01	IN
16.	Jul-12-2020	0.03	IN
17.	Jul-15-2020	0.28	IN
18.	Jul-16-2020	1.12	IN
19.	Jul-19-2020	0.2	IN
20.	Jul-21-2020	0.39	IN
21.	Jul-22-2020	0.03	IN
22.	Jul-28-2020	0.01	IN
23.	Aug-1-2020	0.5	IN
24.	Aug-2-2020	0.68	IN
25.	Aug-3-2020	0.03	IN
26.	Aug-4-2020	0.01	IN
27.	Aug-7-2020	0.04	IN

Application Description

	A	B
Application Date	May-22-2020	Jun-24-2020
Appl. Start Time	1:15 PM	9:22 AM
Appl. Stop Time	1:35 PM	9:39 AM
Application Method	SPRAY	SPRAY
Application Timing	PRE	B
Application Placement	BROADC	BROADC
Applied By	MO	BW
Appl. Entry Date	Jun-1-2020	Jul-2-2020
Air Temperature Start, Stop	73 74 F	70.1 70.1 F
% Relative Humidity Start, Stop	58 58	74 74
Wind Velocity+Dir. Start	3 MPH W	3.6 MPH S
Wind Velocity+Dir. Stop	2 MPH W	3.1 MPH S
Wind Velocity+Dir. Max	4 MPH W	4.4 MPH S
Wet Leaves (Y/N)	N no	N no
Soil Temperature	68 F	62 F
Soil Moisture	NORMAL	NORMAL
% Cloud Cover	90	0

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Crop Stage At Each Application

	A	B
Crop 1 Code, BBCH Scale	NNNXX	NNNXX
Stage Majority, Percent	00	

Pest Stage At Each Application

	A	B
Pest 1 Code, Type, Scale	AMAPA W BBCH	AMAPA W BBCH
Stage Majority, Percent	00	19
Stage Minimum, Percent		18
Stage Maximum, Percent		19
Height Average		4.5 IN
Height Minimum, Maximum		3 12
Density Average		3 FT2
Density Minimum, Maximum		0 7
Pest 2 Code, Type, Scale	SETFA W BBCH	SETFA W BBCH
Stage Majority, Percent	00	19
Stage Minimum, Percent		19
Stage Maximum, Percent		19
Height Average		8 IN
Height Minimum, Maximum		8 12
Density Average		1 FT2
Density Minimum, Maximum		0 1
Pest 3 Code, Type, Scale	DIGSA W BBCH	DIGSA W BBCH
Stage Majority, Percent	00	19
Stage Minimum, Percent		19
Stage Maximum, Percent		19
Diameter Average		5 IN
Density Average		1 FT2
Density Minimum, Maximum		0 2

Application Equipment

	A	B
Appl. Equipment	XR8002-25FT	XR8002-25FT
Equipment Type	SPRBAC	SPRBAC
Operation Pressure	25 PSI	25 PSI
Nozzle Type	XR	XR
Nozzle Size	8002	8002
Nozzle Spacing	20 IN	20 IN
Boom Length	6.67 FT	6.67 FT
Carrier	WATER	WATER
Application Amount	15 GAL/AC	15 GAL/AC
Mix Size	0.2497 GAL	0.2497 GAL
Propellant	COMCO2	COMCO2

Context	Date	By	Notes
STATUS	Apr-16-2020	Dr. Bryan Young	Automatically added by ARM: Trial Status updated to 'S' during trial creation.
STATUS	Jun-1-2020	Dr. Bryan Young	Automatically added by ARM: Trial Status updated to 'E' when Application Date entered.

Instructions:

1. Belchim
2. Can be bare-ground or corn
3. Evaluations: ci/wc at 7, 14, 28, and 42 DAT.

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							W Weed AMAPA Palmer amaranth Jul-1-2020 CONTRO %	W Weed DIGSA large crabgrass Jul-1-2020 CONTRO %	W Weed SETFA Giant foxtail Jul-1-2020 CONTRO %		
Pest Type							40	40	40		
Pest Code							7	7	7		
Pest Name											
Rating Date											
Rating Type											
Rating Unit											
Number of Subsamples							1	1	1		
Days After First/Last Applic.							40	40	40		
Trt No.	Treatment Name	Form Conc	Form Unit	Form Type	Rate Rate	Other Rate	Other Rate	Appl Unit	Code		
1	2	3									
1	DUAL II MAGNUM	7.64	LB/GAL	EC	0.64 lb ai/a	0.67 pt/a		A	66.3 c	93.5 a	93.5 a
	ROUNDUP POWERMAX	4.5	LBAE/GAL	SL	1.13 lb ae/a	32 fl oz/a		B			
	TOUGH	5	LB/GAL	EC	0.313 lb ai/a	8 fl oz/a		B			
	AMSOL	3.4	LB/GAL	SL	2.5 % v/v	2.5 % v/v		B			
2	DUAL II MAGNUM	7.64	LB/GAL	EC	0.64 lb ai/a	0.67 pt/a		A	85.0 b	92.5 a	92.0 a
	ROUNDUP POWERMAX	4.5	LBAE/GAL	SL	1.13 lb ae/a	32 fl oz/a		B			
	SHIELDDEX	100	%	L	1.35 fl oz/a	1.35 fl oz/a		B			
	AMSOL	3.4	LB/GAL	SL	2.5 % v/v	2.5 % v/v		B			
3	DUAL II MAGNUM	7.64	LB/GAL	EC	0.64 lb ai/a	0.67 pt/a		A	97.3 a	96.3 a	93.5 a
	ROUNDUP POWERMAX	4.5	LBAE/GAL	SL	1.13 lb ae/a	32 fl oz/a		B			
	SHIELDDEX	100	%	L	1.35 fl oz/a	1.35 fl oz/a		B			
	TOUGH	5	LB/GAL	EC	0.313 lb ai/a	8 fl oz/a		B			
	AMSOL	3.4	LB/GAL	SL	2.5 % v/v	2.5 % v/v		B			
4	DUAL II MAGNUM	7.64	LB/GAL	EC	0.64 lb ai/a	0.67 pt/a		A	71.3 c	96.0 a	91.0 a
	ROUNDUP POWERMAX	4.5	LBAE/GAL	SL	1.13 lb ae/a	32 fl oz/a		B			
	CALLISTO	4	LB/GAL	L	0.094 lb ai/a	3 fl oz/a		B			
	AMSOL	3.4	LB/GAL	SL	2.5 % v/v	2.5 % v/v		B			
5	DUAL II MAGNUM	7.64	LB/GAL	EC	0.64 lb ai/a	0.67 pt/a		A	97.5 a	96.5 a	91.8 a
	ROUNDUP POWERMAX	4.5	LBAE/GAL	SL	1.13 lb ae/a	32 fl oz/a		B			
	CALLISTO	4	LB/GAL	L	0.094 lb ai/a	3 fl oz/a		B			
	TOUGH	5	LB/GAL	EC	0.313 lb ai/a	8 fl oz/a		B			
	AMSOL	3.4	LB/GAL	SL	2.5 % v/v	2.5 % v/v		B			
6	DUAL II MAGNUM	7.64	LB/GAL	EC	0.64 lb ai/a	0.67 pt/a		A	96.8 a	95.0 a	94.3 a
	ROUNDUP POWERMAX	4.5	LBAE/GAL	SL	1.13 lb ae/a	32 fl oz/a		B			
	BCP1016H	100	%	L	16 fl oz/a	16 fl oz/a		B			
	AMSOL	3.4	LB/GAL	SL	2.5 % v/v	2.5 % v/v		B			
7	DUAL II MAGNUM	7.64	LB/GAL	EC	0.64 lb ai/a	0.67 pt/a		A	20.0 d	18.8 b	21.3 b
	NO POST							B			
LSD P=.05							7.72	4.23	8.45		
Standard Deviation							5.20	2.85	5.69		
CV							6.81	3.39	6.89		
Grand Mean							76.29	84.07	82.46		
Levene's F							10.556	1.212	0.37		
Levene's Prob(F)							0.001*	0.339	0.89		
Rank X2							.	.	.		
P(Rank X2)							.	.	.		
Skewness							-1.2774*	-2.1446*	-1.9808*		
Kurtosis							0.5197	2.9362*	2.3755*		
Replicate F							0.667	4.700	2.335		
Replicate Prob(F)							0.5834	0.0136	0.1082		
Treatment F							115.517	410.046	90.325		
Treatment Prob(F)							0.0001	0.0001	0.0001		

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.

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							W Weed AMAPA Palmer amaranth Jul-8-2020 CONTRO %	W Weed DIGSA large crabgrass Jul-8-2020 CONTRO %	W Weed SETFA Giant foxtail Jul-8-2020 CONTRO %
Pest Type							47	47	47
Pest Code							14	14	14
Pest Name									
Rating Date									
Rating Type									
Rating Unit									
Number of Subsamples									
Days After First/Last Applic.									
Trt No.	Treatment Name	Form Conc	Form Unit	Type	Rate Rate	Unit	Other Rate	Other Rate	Appl Unit Code
1	DUAL II MAGNUM	7.64	LB/GAL	EC	0.64	lb ai/a	0.67	pt/a	A
	ROUNDUP POWERMAX	4.5	LBAE/GAL	SL	1.13	lb ae/a	32	fl oz/a	B
	TOUGH	5	LB/GAL	EC	0.313	lb ai/a	8	fl oz/a	B
	AMSOL	3.4	LB/GAL	SL	2.5	% v/v	2.5	% v/v	B
2	DUAL II MAGNUM	7.64	LB/GAL	EC	0.64	lb ai/a	0.67	pt/a	A
	ROUNDUP POWERMAX	4.5	LBAE/GAL	SL	1.13	lb ae/a	32	fl oz/a	B
	SHIELDDEX	100	%	L	1.35	fl oz/a	1.35	fl oz/a	B
	AMSOL	3.4	LB/GAL	SL	2.5	% v/v	2.5	% v/v	B
3	DUAL II MAGNUM	7.64	LB/GAL	EC	0.64	lb ai/a	0.67	pt/a	A
	ROUNDUP POWERMAX	4.5	LBAE/GAL	SL	1.13	lb ae/a	32	fl oz/a	B
	SHIELDDEX	100	%	L	1.35	fl oz/a	1.35	fl oz/a	B
	TOUGH	5	LB/GAL	EC	0.313	lb ai/a	8	fl oz/a	B
	AMSOL	3.4	LB/GAL	SL	2.5	% v/v	2.5	% v/v	B
4	DUAL II MAGNUM	7.64	LB/GAL	EC	0.64	lb ai/a	0.67	pt/a	A
	ROUNDUP POWERMAX	4.5	LBAE/GAL	SL	1.13	lb ae/a	32	fl oz/a	B
	CALLISTO	4	LB/GAL	L	0.094	lb ai/a	3	fl oz/a	B
	AMSOL	3.4	LB/GAL	SL	2.5	% v/v	2.5	% v/v	B
5	DUAL II MAGNUM	7.64	LB/GAL	EC	0.64	lb ai/a	0.67	pt/a	A
	ROUNDUP POWERMAX	4.5	LBAE/GAL	SL	1.13	lb ae/a	32	fl oz/a	B
	CALLISTO	4	LB/GAL	L	0.094	lb ai/a	3	fl oz/a	B
	TOUGH	5	LB/GAL	EC	0.313	lb ai/a	8	fl oz/a	B
	AMSOL	3.4	LB/GAL	SL	2.5	% v/v	2.5	% v/v	B
6	DUAL II MAGNUM	7.64	LB/GAL	EC	0.64	lb ai/a	0.67	pt/a	A
	ROUNDUP POWERMAX	4.5	LBAE/GAL	SL	1.13	lb ae/a	32	fl oz/a	B
	BCP1016H	100	%	L	16	fl oz/a	16	fl oz/a	B
	AMSOL	3.4	LB/GAL	SL	2.5	% v/v	2.5	% v/v	B
7	DUAL II MAGNUM	7.64	LB/GAL	EC	0.64	lb ai/a	0.67	pt/a	A
	NO POST								B
LSD P=.05							7.34	3.91	3.72
Standard Deviation							4.94	2.63	2.51
CV							6.67	3.07	2.91
Grand Mean							74.14	85.64	86.18
Levene's F							4.188	1.362	2.476
Levene's Prob(F)							0.006*	0.275	0.057
Rank X2							.	.	.
P(Rank X2)							.	.	.
Skewness							-1.2456*	-2.1665*	-2.1839*
Kurtosis							0.4753	2.9929*	3.0518*
Replicate F							1.840	3.045	3.252
Replicate Prob(F)							0.1760	0.0555	0.0460
Treatment F							145.297	502.760	542.704
Treatment Prob(F)							0.0001	0.0001	0.0001

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).
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							W Weed AMAPA Palmer amaranth Jul-22-2020 CONTRO %	W Weed DIGSA large crabgrass Jul-22-2020 CONTRO %	W Weed SETFA Giant foxtail Jul-22-2020 CONTRO %
							61	61	61
							28	28	28
Trt No.	Treatment Name	Form Conc	Form Unit	Type	Rate Rate	Unit	Other Rate	Other Rate	Unit Code
							7	8	9
1	DUAL II MAGNUM	7.64	LB/GAL	EC	0.64	lb ai/a	0.67	pt/a	A
	ROUNDUP POWERMAX	4.5	LBAE/GAL	SL	1.13	lb ae/a	32	fl oz/a	B
	TOUGH	5	LB/GAL	EC	0.313	lb ai/a	8	fl oz/a	B
	AMSOL	3.4	LB/GAL	SL	2.5	% v/v	2.5	% v/v	B
							36.3	e	
2	DUAL II MAGNUM	7.64	LB/GAL	EC	0.64	lb ai/a	0.67	pt/a	A
	ROUNDUP POWERMAX	4.5	LBAE/GAL	SL	1.13	lb ae/a	32	fl oz/a	B
	SHIELDDEX	100	%	L	1.35	fl oz/a	1.35	fl oz/a	B
	AMSOL	3.4	LB/GAL	SL	2.5	% v/v	2.5	% v/v	B
							64.8	c	
3	DUAL II MAGNUM	7.64	LB/GAL	EC	0.64	lb ai/a	0.67	pt/a	A
	ROUNDUP POWERMAX	4.5	LBAE/GAL	SL	1.13	lb ae/a	32	fl oz/a	B
	SHIELDDEX	100	%	L	1.35	fl oz/a	1.35	fl oz/a	B
	TOUGH	5	LB/GAL	EC	0.313	lb ai/a	8	fl oz/a	B
	AMSOL	3.4	LB/GAL	SL	2.5	% v/v	2.5	% v/v	B
							68.8	bc	
4	DUAL II MAGNUM	7.64	LB/GAL	EC	0.64	lb ai/a	0.67	pt/a	A
	ROUNDUP POWERMAX	4.5	LBAE/GAL	SL	1.13	lb ae/a	32	fl oz/a	B
	CALLISTO	4	LB/GAL	L	0.094	lb ai/a	3	fl oz/a	B
	AMSOL	3.4	LB/GAL	SL	2.5	% v/v	2.5	% v/v	B
							48.8	d	
5	DUAL II MAGNUM	7.64	LB/GAL	EC	0.64	lb ai/a	0.67	pt/a	A
	ROUNDUP POWERMAX	4.5	LBAE/GAL	SL	1.13	lb ae/a	32	fl oz/a	B
	CALLISTO	4	LB/GAL	L	0.094	lb ai/a	3	fl oz/a	B
	TOUGH	5	LB/GAL	EC	0.313	lb ai/a	8	fl oz/a	B
	AMSOL	3.4	LB/GAL	SL	2.5	% v/v	2.5	% v/v	B
							88.0	a	
6	DUAL II MAGNUM	7.64	LB/GAL	EC	0.64	lb ai/a	0.67	pt/a	A
	ROUNDUP POWERMAX	4.5	LBAE/GAL	SL	1.13	lb ae/a	32	fl oz/a	B
	BCP1016H	100	%	L	16	fl oz/a	16	fl oz/a	B
	AMSOL	3.4	LB/GAL	SL	2.5	% v/v	2.5	% v/v	B
							75.5	b	
7	DUAL II MAGNUM	7.64	LB/GAL	EC	0.64	lb ai/a	0.67	pt/a	A
	NO POST								B
							6.3	f	
LSD P=.05							9.08	2.44	1.55
Standard Deviation							6.11	1.64	1.04
CV							11.02	1.97	1.24
Grand Mean							55.46	83.43	84.54
Levene's F							1.933	1.304	0.697
Levene's Prob(F)							0.122	0.299	0.655
Rank X2							.	.	.
P(Rank X2)							.	.	.
Skewness							-0.6926	-2.1447*	-2.1604*
Kurtosis							-0.407	2.8373*	2.8777*
Replicate F							1.214	0.319	1.865
Replicate Prob(F)							0.3332	0.8118	0.1716
Treatment F							81.334	1510.009	3828.142
Treatment Prob(F)							0.0001	0.0001	0.0001

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).

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							W Weed AMAPA Palmer amaranth Aug-5-2020 CONTRO %	W Weed DIGSA large crabgrass Aug-5-2020 CONTRO %	W Weed SETFA Giant foxtail Aug-5-2020 CONTRO %			
							75 42	75 42	75 42			
Trt No.	Treatment Name	Form Conc	Form Unit	Type Rate	Rate Unit	Other Rate	Other Rate	Appl Unit	Code	10	11	12
1	DUAL II MAGNUM	7.64	LB/GAL	EC	0.64 lb ai/a	0.67 pt/a		A		25.0 e	95.3 ab	95.5 a
	ROUNDUP POWERMAX	4.5	LBAE/GAL	SL	1.13 lb ae/a	32 fl oz/a		B				
	TOUGH	5	LB/GAL	EC	0.313 lb ai/a	8 fl oz/a		B				
	AMSOL	3.4	LB/GAL	SL	2.5 % v/v	2.5 % v/v		B				
2	DUAL II MAGNUM	7.64	LB/GAL	EC	0.64 lb ai/a	0.67 pt/a		A		53.3 cd	91.3 c	95.5 a
	ROUNDUP POWERMAX	4.5	LBAE/GAL	SL	1.13 lb ae/a	32 fl oz/a		B				
	SHIELDDEX	100	%	L	1.35 fl oz/a	1.35 fl oz/a		B				
	AMSOL	3.4	LB/GAL	SL	2.5 % v/v	2.5 % v/v		B				
3	DUAL II MAGNUM	7.64	LB/GAL	EC	0.64 lb ai/a	0.67 pt/a		A		59.5 bc	92.3 bc	94.3 a
	ROUNDUP POWERMAX	4.5	LBAE/GAL	SL	1.13 lb ae/a	32 fl oz/a		B				
	SHIELDDEX	100	%	L	1.35 fl oz/a	1.35 fl oz/a		B				
	TOUGH	5	LB/GAL	EC	0.313 lb ai/a	8 fl oz/a		B				
	AMSOL	3.4	LB/GAL	SL	2.5 % v/v	2.5 % v/v		B				
4	DUAL II MAGNUM	7.64	LB/GAL	EC	0.64 lb ai/a	0.67 pt/a		A		45.0 d	96.5 a	96.5 a
	ROUNDUP POWERMAX	4.5	LBAE/GAL	SL	1.13 lb ae/a	32 fl oz/a		B				
	CALLISTO	4	LB/GAL	L	0.094 lb ai/a	3 fl oz/a		B				
	AMSOL	3.4	LB/GAL	SL	2.5 % v/v	2.5 % v/v		B				
5	DUAL II MAGNUM	7.64	LB/GAL	EC	0.64 lb ai/a	0.67 pt/a		A		81.3 a	94.5 abc	95.8 a
	ROUNDUP POWERMAX	4.5	LBAE/GAL	SL	1.13 lb ae/a	32 fl oz/a		B				
	CALLISTO	4	LB/GAL	L	0.094 lb ai/a	3 fl oz/a		B				
	TOUGH	5	LB/GAL	EC	0.313 lb ai/a	8 fl oz/a		B				
	AMSOL	3.4	LB/GAL	SL	2.5 % v/v	2.5 % v/v		B				
6	DUAL II MAGNUM	7.64	LB/GAL	EC	0.64 lb ai/a	0.67 pt/a		A		66.3 b	85.8 d	94.8 a
	ROUNDUP POWERMAX	4.5	LBAE/GAL	SL	1.13 lb ae/a	32 fl oz/a		B				
	BCP1016H	100	%	L	16 fl oz/a	16 fl oz/a		B				
	AMSOL	3.4	LB/GAL	SL	2.5 % v/v	2.5 % v/v		B				
7	DUAL II MAGNUM	7.64	LB/GAL	EC	0.64 lb ai/a	0.67 pt/a		A		2.5 f	8.8 e	6.3 b
	NO POST							B				
LSD P=.05							9.19	3.38	3.15			
Standard Deviation							6.19	2.28	2.12			
CV							13.02	2.83	2.56			
Grand Mean							47.54	80.61	82.64			
Levene's F							0.906	0.381	0.625			
Levene's Prob(F)							0.509	0.883	0.708			
Rank X2							.	.	.			
P(Rank X2)							.	.	.			
Skewness							-0.4833	-2.0884*	-2.1475*			
Kurtosis							-0.5978	2.6902*	2.8432*			
Replicate F							2.623	2.725	0.988			
Replicate Prob(F)							0.0821	0.0746	0.4208			
Treatment F							73.240	783.923	1012.699			
Treatment Prob(F)							0.0001	0.0001	0.0001			

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.

Purdue University Weed Science

Evaluation of Tough for Enhancing Control of Callisto and BCP1312 for Glyphosate-Resistant Palmer Amaranth Control

Trial ID: 20-WIN-Tough Location: Winamac Trial Year: 2020
Protocol ID: 20-WIN-Tough Investigator (Creator): Dr. Bryan Young
Project ID: Study Director: Dr. Bryan Young
Sponsor Contact: Dennis Long

Pest Type

W, Weed = Weed or volunteer crop

Pest Code

AMAPA, Amaranthus palmeri, Palmer amaranth = US

DIGSA, Digitaria sanguinalis, large crabgrass = US

SETFA, Setaria faberi, Giant foxtail = US

Rating Type

CONTRO = control / burndown or knockdown

Rating Unit

% = percent