

Purdue Weed Science

Trial ID: 18S-TPAC-SOY-18 Protocol ID: 18S-TPAC-SOY-18 Project ID: MKD-H-2018-US-D40-B-02.1	LIBERTY SOYBEAN PROGRAMS CONVENTIONAL TILLAGE Location: TPAC Trial Year: 2018 Investigator: Dr. Bill Johnson Study Director: Dustin Johnson Sponsor Contact: G. Welker - BASF
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General Trial Information

Study Director: Dustin Johnson **Title:** Research Associate
Investigator: Dr. Bill Johnson **Title:** Professor

Discipline: H herbicide
Trial Status: E established
Initiation Date: May-7-2018

Trial Location

City: Lafayette **Country:** USA United States
State/Prov.: Indiana IN
Postal Code: 47909

Latitude of LL Corner °: 40.29176 N
Longitude of LL Corner °: 86.91117 W USAIN 41.7613716 - 37.7717399
-84.7846603 - -88.0978927

Conducted Under GLP: No
Conducted Under GEP: No

Contacts

Study Director: Dustin Johnson **Title:** Research Associate
Organization: Purdue University
Address: 915 W. State Street
City+State/Prov: West Lafayette, IN
Postal Code: 47907 **E-mail:** john1357@purdue.edu
Country: USA United States

Investigator: Dr. Bill Johnson **Title:** Professor
Organization: Purdue University
Address: 915 W. State Street
City+State/Prov: West Lafayette, IN
Postal Code: 47907 **E-mail:** wgj@purdue.edu
Country: USA United States

Cooperator/Landowner

Cooperator: Jay Young **Role:** Superintendent
Organization: Purdue University
Address 1: 8343 US 231 S
City: Lafayette **Phone No.:** 765-538-3422
State/Prov: IN **Fax No.:** 765-538-3423
Postal Code: 47909
Country: USA United States **E-mail:** jayyoung@purdue.edu

Crop Description

Crop 1: GLXMA Glycine max Soybean
Variety: Becks 296L4 **BBCH Scale:** BSOY
Description: Liberty Link

Planting Date: May-7-2018
Planting Method: PLANTD planted
Planting Equipment: PP plot planter
Emergence Date: May-16-2018

Planting Rate, Unit: 155000 S/A
Depth, Unit: 1.5 IN
Row Spacing, Unit: 15 IN
Rows per Plot: 7
Soil Temperature, Unit: 72 F
Soil Moisture: DRY dry

Pest Description

Pest 1 Type: W **Code:** AMBTR Ambrosia trifida
Common Name: Giant ragweed

Pest 2 Type: W **Code:** SETFA Setaria faberi
Common Name: Giant foxtail

Pest 3 Type: W **Code:** ECHSS Echinochloa sp.
Common Name: Barnyardgrass

Site and Design

Treated Plot Width: 6.67 FT
Treated Plot Length: 30 FT
Treated Plot Area: 200.1 FT2 **Treatments:** 10
Replications: 4

Site Type: FIELD field
Experimental Unit: 1 PLOT plot
Tillage Type: CONTIL conventional-till
Study Design: RACOB� Randomized Complete Block (RCB)

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Soil Description

Description Name: TPAC- Field 4B
% OM: 2.9 **Texture:** SIL silt loam
pH: 6.2 **Soil Name:** Toronto-Millbrook
CEC: 13.3

Analyzed By:

Application Description

	A	B	C	D	E
Application Date:	May-7-2018	May-29-2018	Jun-4-2018	Jun-14-2018	Jun-25-2018
Appl. Start Time:	5:50 PM	11:40 AM	7:20 PM	1:00 PM	12:40 PM
Appl. Stop Time:	6:25 PM	11:45 AM	7:25 PM	1:20 PM	12:45 PM
Interval to Prev. Appl., Unit:		22 DAYS	6 DAYS	10 DAYS	11 DAYS
Application Method:	SPRAY	SPRAY	SPRAY	SPRAY	SPRAY
Application Timing:	PREPRE	POSPOS	POSPOS	POSPOS	POSPOS
Application Placement:	BROADC	BROADC	BROADC	BROADC	BROADC
Applied By:	J. HARMAAN	D. JOHNSON	D. JOHNSON	D. JOHNSON	D. JOHNSON
Air Temperature, Unit:	73 F	84 F	78 F	77 F	74 F
% Relative Humidity:	32	61	30	45	70
Wind Velocity, Unit:	8 MPH	7 MPH	4 MPH	3 MPH	6 MPH
Wind Direction:	NE	ENE	NW	ESE	E
Dew Presence (Y/N):	N no	N no	N no	N no	N no
Soil Temperature, Unit:	72 F	78 F	76 F	79 F	72 F
Soil Moisture:	DRY	DRY	DRY	WET	WET
% Cloud Cover:	5	80	80	50	90

Crop Stage At Each Application

	A	B	C	D	E
Crop 1 Code, BBCH Scale:	GLXMA BSOY	GLXMA BSOY	GLXMA BSOY	GLXMA BSOY	GLXMA BSOY
Stage Scale Used:	BBCH	BBCH	BBCH	BBCH	BBCH
Stage Majority, Percent:	00	11	13	15	51
Stage Minimum, Percent:	00	10	12	12	14
Stage Maximum, Percent:	00	10	13	16	51
Height, Unit:		2.5 IN	6 IN	8 IN	15 IN
Height Minimum, Maximum:		0.25 4	4 8	4 10	10 16

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Pest Stage At Each Application					
	A	B	C	D	E
Pest 1 Code, Type, Scale:	AMBTR W	AMBTR W	AMBTR W	AMBTR W	AMBTR W
Stage Majority, Percent:	00	12	16	16	16
Stage Minimum, Percent:	00	10	10	10	10
Stage Maximum, Percent:	00	16	19	19	16
Height, Unit:		2 IN	8 IN	10 IN	12 IN
Height Minimum, Maximum:		0.25 4	0.25 12	0.25 18	2 22
Density, Unit:		3 FT2	6 FT2	6 FT2	3 FT2
Pest 2 Code, Type, Scale:	SETFA W	SETFA W	SETFA W	SETFA W	SETFA W
Stage Majority, Percent:	00	14	16	16	00
Stage Minimum, Percent:	00	12	10	10	00
Stage Maximum, Percent:	00	18	19	19	00
Height, Unit:		3 IN	6 IN	8 IN	
Height Minimum, Maximum:		0.25 6	0.5 8	0.5 10	
Density, Unit:		10 FT2	5 FT2	3 FT2	
Pest 3 Code, Type, Scale:	ECHSS W W	ECHSS W W	ECHSS W	ECHSS W W	ECHSS W W
Stage Majority, Percent:	00	15	14	18	00
Stage Minimum, Percent:	00	12	10	10	00
Stage Maximum, Percent:	00	19	18	19	00
Height, Unit:		3 IN	6 IN	8 IN	
Height Minimum, Maximum:		0.25 6	0.5 8	0.5 10	
Density, Unit:		10 FT2	6 FT2	3 FT2	

Application Equipment					
	A	B	C	D	E
Appl. Equipment:	CO2 BACKPACK	CO2 BACKPACK	CO2 BACKPACK	CO2 BACKPACK	CO2 BACKPACK
Equipment Type:	BACSPR	BACSPR	BACSPR	BACSPR	BACSPR
Operation Pressure, Unit:	24 PSI	43 PSI	43 PSI	43 PSI	43 PSI
Nozzle Type:	FLAFXR	TT	TT	TT	TT
Nozzle Size:	XR11002	110015	110015	110015	110015
Nozzle Spacing, Unit:	20 IN	20 IN	20 IN	20 IN	20 IN
Nozzles/Row:	4	4	4	4	4
Boom Length, Unit:	6.67 FT	6.7 FT	6.7 FT	6.7 FT	6.7 FT
Boom Height, Unit:	17 IN	17 IN	17 IN	17 IN	17 IN
Ground Speed, Unit:	3 MPH	3 MPH	3 MPH	3 MPH	3 MPH
Carrier:	WATER	WATER	WATER	WATER	WATER
Spray Volume, Unit:	15 GAL/AC	15 GAL/AC	15 GAL/AC	15 GAL/AC	15 GAL/AC
Minimum Mix/Treatment:	1043.3 mL	1043.3 mL	1043.3 mL	1043.3 mL	1043.3 mL
Mix Size, Unit:	1119 mL	1119 mL	1119 mL	1119 mL	1119 mL
Propellant:	COMCO2	COMCO2	COMCO2	COMCO2	COMCO2

Trt No Treatment Application Comment
8 Plot 203 sprayed short on C Application.

Date By Notes
Jun-8-2018 D. JOHNSON Evening storm brought hail and damage to crop occurred.

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LIBERTY SOYBEAN PROGRAMS CONVENTIONAL TILLAGE

Trial ID: 18S-TPAC-SOY-18
 Protocol ID: 18S-TPAC-SOY-18
 Project ID: MKD-H-2018-US-D40-B-02.1

Location: TPAC Trial Year: 2018
 Investigator: Dr. Bill Johnson
 Study Director: Dustin Johnson
 Sponsor Contact: G. Welker - BASF

Reps: 4 Plots: 6.67 by 30 feet
 Spray vol: 15 GAL/AC Mix Size: 1119 mL (total for 4 plots; minimum=1043.3 mL)

Trt No.	Treatment Name	Form Conc	Form Unit	Form Type	Rate	Rate Unit	Appl Code	Appl Description	Amt Product to Measure	Rep 1	Rep 2	Rep 3	Rep 4
1	UNTREATED CHECK									101	404	603	804
2	ZIDUA PRO	4.09	LB/GAL	SC	6.0	fl oz/a	A	PRE	3.497 mL/mx	102	401	601	702
	LIBERTY 280 SL	2.34	LB/GAL	SL	32.0	fl oz/a	D	V5	18.65 mL/mx				
	N-PAK AMS	3.4	LBA/GAL	L	2.5	% v/v	D	V5	27.97 mL/mx				
3	ZIDUA PRO	4.09	LB/GAL	SC	6.0	fl oz/a	A	PRE	3.497 mL/mx	103	402	503	803
	LIBERTY 280 SL	2.34	LB/GAL	SL	32.0	fl oz/a	D	V5	18.65 mL/mx				
	OUTLOOK	6	LB/GAL	EC	10.0	fl oz/a	D	V5	5.828 mL/mx				
	N-PAK AMS	3.4	LBA/GAL	L	2.5	% v/v	D	V5	27.97 mL/mx				
4	ZIDUA PRO	4.09	LB/GAL	SC	4.5	fl oz/a	A	PRE	2.623 mL/mx	104	405	605	704
	LIBERTY 280 SL	2.34	LB/GAL	SL	32.0	fl oz/a	D	V5	18.65 mL/mx				
	N-PAK AMS	3.4	LBA/GAL	L	2.5	% v/v	D	V5	27.97 mL/mx				
5	ZIDUA PRO	4.09	LB/GAL	SC	4.5	fl oz/a	A	PRE	2.623 mL/mx	105	303	502	705
	LIBERTY 280 SL	2.34	LB/GAL	SL	32.0	fl oz/a	D	V5	18.65 mL/mx				
	OUTLOOK	6	LB/GAL	EC	10.0	fl oz/a	D	V5	5.828 mL/mx				
	N-PAK AMS	3.4	LBA/GAL	L	2.5	% v/v	D	V5	27.97 mL/mx				
6	VERDICT	5.57	LB/GAL	EC	5.0	fl oz/a	A	PRE	2.914 mL/mx	201	302	604	703
	TRICOR 75 DF	75	%	DF	5.0	oz/a	A	PRE	2.793 g/mx				
	LIBERTY 280 SL	2.34	LB/GAL	SL	32.0	fl oz/a	D	V5	18.65 mL/mx				
	OUTLOOK	6	LB/GAL	EC	10.0	fl oz/a	D	V5	5.828 mL/mx				
7	VERDICT	5.57	LB/GAL	EC	5.0	fl oz/a	A	PRE	2.914 mL/mx	202	403	501	701
	TRICOR 75 DF	75	%	DF	5.0	oz/a	A	PRE	2.793 g/mx				
	LIBERTY 280 SL	2.34	LB/GAL	SL	32.0	fl oz/a	C	V3	18.65 mL/mx				
	ZIDUA SC	4.17	LB/GAL	SC	2.0	fl oz/a	C	V3	1.166 mL/mx				
8	VERDICT	5.57	LB/GAL	EC	5.0	fl oz/a	A	PRE	2.914 mL/mx	203	301	505	801
	ZIDUA SC	4.17	LB/GAL	SC	2.0	fl oz/a	A	PRE	1.166 mL/mx				
	LIBERTY 280 SL	2.34	LB/GAL	SL	32.0	fl oz/a	C	V3	18.65 mL/mx				
	OUTLOOK	6	LB/GAL	EC	10.0	fl oz/a	C	V3	5.828 mL/mx				
9	VERDICT	5.57	LB/GAL	EC	5.0	fl oz/a	A	PRE	2.914 mL/mx	204	305	602	805
	LIBERTY 280 SL	2.34	LB/GAL	SL	32.0	fl oz/a	B	V1	18.65 mL/mx				
	N-PAK AMS	3.4	LBA/GAL	L	2.5	% v/v	B	V1	27.97 mL/mx				
	LIBERTY 280 SL	2.34	LB/GAL	SL	32.0	fl oz/a	D	V5	18.65 mL/mx				
10	VERDICT	5.57	LB/GAL	EC	5.0	fl oz/a	A	PRE	2.914 mL/mx	205	304	504	802
	LIBERTY 280 SL	2.34	LB/GAL	SL	32.0	fl oz/a	B	V1	18.65 mL/mx				
	N-PAK AMS	3.4	LBA/GAL	L	2.5	% v/v	B	V1	27.97 mL/mx				
	LIBERTY 280 SL	2.34	LB/GAL	SL	32.0	fl oz/a	E	R1	18.65 mL/mx				
	N-PAK AMS	3.4	LBA/GAL	L	2.5	% v/v	E	R1	27.97 mL/mx				

Sort Order: Treatment

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LIBERTY SOYBEAN PROGRAMS CONVENTIONAL TILLAGE

Trial ID: 18S-TPAC-SOY-18
 Protocol ID: 18S-TPAC-SOY-18
 Project ID: MKD-H-2018-US-D40-B-02.1

Location: TPAC Trial Year: 2018
 Investigator: Dr. Bill Johnson
 Study Director: Dustin Johnson
 Sponsor Contact: G. Welker - BASF

Pest Type		W Weed	W Weed		W Weed	W Weed
Pest Code		AMBTR	SETFA		AMBTR	SETFA
Pest Name		Giant ragweed	Giant foxtail		Giant ragweed	Giant foxtail
Crop Code	GLXMA	GLXMA	GLXMA	GLXMA	GLXMA	GLXMA
Crop Name	Soybean	Soybean	Soybean	Soybean	Soybean	Soybean
Part Rated	PLOT -	PLOT -	PLOT -	PLOT -	PLOT -	PLOT -
Rating Date	May-22-2018	May-22-2018	May-22-2018	May-28-2018	May-28-2018	May-28-2018
Rating Type	PHYGEN	CONTROL	CONTROL	PHYGEN	CONTROL	CONTROL
Rating Unit	%	%	%	%	%	%
Number of Subsamples	1	1	1	1	1	1
Assessed By	D. JOHNSON	D. JOHNSON	D. JOHNSON	D. JOHNSON	D. JOHNSON	D. JOHNSON
Rating Timing	A1	A1	A1	A2	A2	A2
Days After First/Last Applic.	15 15	15 15	15 15	21 21	21 21	21 21
Trt-Eval Interval	14 DA-A	14 DA-A	14 DA-A	14 DA-A	14 DA-A	14 DA-A
Days After Emergence	6 DE-1	6 DE-1	6 DE-1	12 DE-1	12 DE-1	12 DE-1
ARM Action Codes	P	P	P	P	P	P
Number of Decimals	0	0	0	0	0	0
Trt No.	Treatment Name	Rate	Appl			
		Rate Unit	Code	1	2	3
1	UNTREATED CHECK			0	0	0
2	ZIDUA PRO LIBERTY 280 SL N-PAK AMS	6.0 fl oz/a A 32.0 fl oz/a D 2.5 % v/v D		1 -	59 -	55 d
3	ZIDUA PRO LIBERTY 280 SL OUTLOOK N-PAK AMS	6.0 fl oz/a A 32.0 fl oz/a D 10.0 fl oz/a D 2.5 % v/v D		1 -	65 -	74 abc
4	ZIDUA PRO LIBERTY 280 SL N-PAK AMS	4.5 fl oz/a A 32.0 fl oz/a D 2.5 % v/v D		0 -	66 -	81 a
5	ZIDUA PRO LIBERTY 280 SL OUTLOOK N-PAK AMS	4.5 fl oz/a A 32.0 fl oz/a D 10.0 fl oz/a D 2.5 % v/v D		2 -	69 -	74 abc
6	VERDICT TRICOR 75 DF LIBERTY 280 SL OUTLOOK N-PAK AMS	5.0 fl oz/a A 5.0 oz/a A 32.0 fl oz/a D 10.0 fl oz/a D 2.5 % v/v D		3 -	68 -	79 ab
7	VERDICT TRICOR 75 DF LIBERTY 280 SL ZIDUA SC N-PAK AMS	5.0 fl oz/a A 5.0 oz/a A 32.0 fl oz/a C 2.0 fl oz/a C 2.5 % v/v C		0 -	66 -	59 cd
8	VERDICT ZIDUA SC LIBERTY 280 SL OUTLOOK N-PAK AMS	5.0 fl oz/a A 2.0 fl oz/a A 32.0 fl oz/a C 10.0 fl oz/a C 2.5 % v/v C		3 -	60 -	73 abc
9	VERDICT LIBERTY 280 SL N-PAK AMS LIBERTY 280 SL OUTLOOK N-PAK AMS	5.0 fl oz/a A 32.0 fl oz/a B 2.5 % v/v B 32.0 fl oz/a D 10.0 fl oz/a D 2.5 % v/v D		1 -	64 -	64 bcd
						0 -
						57 -
						48 -

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.

Untreated treatment(s) 1 excluded from analysis.

Missing data estimates are included in columns: Yates=10,13,14,15,17,18,19,21,22,23

Could not calculate LSD (% mean diff) for columns 4,16,20 because error mean square = 0.

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Pest Type		W Weed AMBTR	W Weed SETFA		W Weed AMBTR	W Weed SETFA
Pest Code		Giant ragweed	Giant foxtail		Giant ragweed	Giant foxtail
Pest Name						
Crop Code	GLXMA	GLXMA	GLXMA	GLXMA	GLXMA	GLXMA
Crop Name	Soybean	Soybean	Soybean	Soybean	Soybean	Soybean
Part Rated	PLOT -	PLOT -	PLOT -	PLOT -	PLOT -	PLOT -
Rating Date	May-22-2018	May-22-2018	May-22-2018	May-28-2018	May-28-2018	May-28-2018
Rating Type	PHYGEN	CONTROL	CONTROL	PHYGEN	CONTROL	CONTROL
Rating Unit	%	%	%	%	%	%
Number of Subsamples	1	1	1	1	1	1
Assessed By	D. JOHNSON	D. JOHNSON	D. JOHNSON	D. JOHNSON	D. JOHNSON	D. JOHNSON
Rating Timing	A1	A1	A1	A2	A2	A2
Days After First/Last Applic.	15 15	15 15	15 15	21 21	21 21	21 21
Trt-Eval Interval	14 DA-A	14 DA-A	14 DA-A	14 DA-A	14 DA-A	14 DA-A
Days After Emergence	6 DE-1	6 DE-1	6 DE-1	12 DE-1	12 DE-1	12 DE-1
ARM Action Codes	P	P	P	P	P	P
Number of Decimals	0	0	0	0	0	0
Trt Treatment	Rate	Appl				
No. Name	Rate Unit	Code	1	2	3	4
10 VERDICT	5.0 fl oz/a	A	2 -	70 -	68 a-d	0 -
LIBERTY 280 SL	32.0 fl oz/a	B				59 -
N-PAK AMS	2.5 % v/v	B				
LIBERTY 280 SL	32.0 fl oz/a	E				
N-PAK AMS	2.5 % v/v	E				59 -
LSD P=.05	2.7	12.1	16.7	.	23.7	25.9
Standard Deviation	1.8	8.3	11.4	0.0	16.2	17.8
CV	133.86	12.76	16.44	0.0	26.21	27.46
Levene's F	0.32	1.545	1.61	0.00	0.875	0.623
Levene's Prob(F)	0.951	0.189	0.168	0.00*	0.549	0.751
Skewness	2.0092*	-0.4705	-1.3541*	.	-1.7682*	-1.5925*
Kurtosis	2.8304*	0.0953	2.366*	.	2.549*	2.0045*
Replicate F	20.092	4.775	2.514	0.000	6.762	3.756
Replicate Prob(F)	0.0001	0.0095	0.0825	1.0000	0.0018	0.0242
Treatment F	1.000	0.865	2.422	0.000	0.898	2.042
Treatment Prob(F)	0.4613	0.5583	0.0448	1.0000	0.5336	0.0843

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 Untreated treatment(s) 1 excluded from analysis.
 Missing data estimates are included in columns:Yates=10,13,14,15,17,18,19,21,22,23
 Could not calculate LSD (% mean diff) for columns 4,16,20 because error mean square = 0.

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Pest Type Pest Code Pest Name	W Weed ECHSS Barnyardgrass	GLXMA Soybean PLOT -	GLXMA Soybean PLOT -	W Weed AMBTR Giant ragweed	GLXMA Soybean PLOT -	W Weed SETFA Giant foxtail	GLXMA Soybean PLOT -	W Weed ECHSS Barnyardgrass	GLXMA Soybean PLOT -
Crop Code	GLXMA	GLXMA	GLXMA	GLXMA	GLXMA	GLXMA	GLXMA	GLXMA	GLXMA
Crop Name	Soybean	Soybean	Soybean	Soybean	Soybean	Soybean	Soybean	Soybean	Soybean
Part Rated	PLOT -	PLOT -	PLOT -	PLOT -	PLOT -	PLOT -	PLOT -	PLOT -	PLOT -
Rating Date	May-28-2018	Jun-4-2018	Jun-4-2018	Jun-4-2018	Jun-4-2018	Jun-4-2018	Jun-4-2018	Jun-4-2018	Jun-14-2018
Rating Type	CONTROL	PHYGEN	CONTROL	CONTROL	CONTROL	CONTROL	CONTROL	CONTROL	PHYGEN
Rating Unit	%	%	%	%	%	%	%	%	%
Number of Subsamples	1	1	1	1	1	1	1	1	1
Assessed By	D. JOHNSON	D. JOHNSON	D. JOHNSON	D. JOHNSON	D. JOHNSON	D. JOHNSON	D. JOHNSON	D. JOHNSON	D. JOHNSON
Rating Timing	A2	A3	A3	A3	A3	A3	A4	A4	A4
Days After First/Last Applic.	21 21	28 6	28 6	28 6	28 6	28 6	28 6	28 6	38 10
Trt-Eval Interval	14 DA-A	14 DA-A	14 DA-A	14 DA-A	14 DA-A	14 DA-A	14 DA-A	14 DA-A	14 DA-A
Days After Emergence	12 DE-1	19 DE-1	19 DE-1	19 DE-1	19 DE-1	19 DE-1	19 DE-1	19 DE-1	29 DE-1
ARM Action Codes	P	P	P	P	P	P	P	P	P
Number of Decimals	0	0	0	0	0	0	0	0	0
Trt Treatment No. Name	Rate Rate Unit	Appl Code	7	8	9	10	11	12	
1 UNTREATED CHECK			0	0	0	0	0	0	0
2 ZIDUA PRO LIBERTY 280 SL N-PAK AMS	6.0 fl oz/a A 32.0 fl oz/a D 2.5 % v/v D		49 -	2 b	29 b	47 bcd	24 cd	0 b	
3 ZIDUA PRO LIBERTY 280 SL OUTLOOK N-PAK AMS	6.0 fl oz/a A 32.0 fl oz/a D 10.0 fl oz/a D 2.5 % v/v D		71 -	2 b	35 b	53 bcd	46 b	0 b	
4 ZIDUA PRO LIBERTY 280 SL N-PAK AMS	4.5 fl oz/a A 32.0 fl oz/a D 2.5 % v/v D		73 -	1 b	26 b	58 bc	46 b	0 b	
5 ZIDUA PRO LIBERTY 280 SL OUTLOOK N-PAK AMS	4.5 fl oz/a A 32.0 fl oz/a D 10.0 fl oz/a D 2.5 % v/v D		71 -	2 b	25 b	64 b	40 bc	0 b	
6 VERDICT TRICOR 75 DF LIBERTY 280 SL OUTLOOK N-PAK AMS	5.0 fl oz/a A 5.0 oz/a A 32.0 fl oz/a D 10.0 fl oz/a D 2.5 % v/v D		76 -	3 b	25 b	38 d	36 bc	0 b	
7 VERDICT TRICOR 75 DF LIBERTY 280 SL ZIDUA SC N-PAK AMS	5.0 fl oz/a A 5.0 oz/a A 32.0 fl oz/a C 2.0 fl oz/a C 2.5 % v/v C		53 -	2 b	24 b	18 e	8 d	4 a	
8 VERDICT ZIDUA SC LIBERTY 280 SL OUTLOOK N-PAK AMS	5.0 fl oz/a A 2.0 fl oz/a A 32.0 fl oz/a C 10.0 fl oz/a C 2.5 % v/v C		65 -	2 b	26 b	41 cd	38 bc	5 a	
9 VERDICT LIBERTY 280 SL N-PAK AMS LIBERTY 280 SL OUTLOOK N-PAK AMS	5.0 fl oz/a A 32.0 fl oz/a B 2.5 % v/v B 32.0 fl oz/a D 10.0 fl oz/a D 2.5 % v/v D		45 -	3 b	90 a	99 a	83 a	3 ab	

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Pest Type	W Weed	W Weed	W Weed	W Weed	W Weed
Pest Code	ECHSS	AMBTR	SETFA	ECHSS	
Pest Name	Barnyardgrass	Giant ragweed	Giant foxtail	Barnyardgrass	
Crop Code	GLXMA	GLXMA	GLXMA	GLXMA	GLXMA
Crop Name	Soybean	Soybean	Soybean	Soybean	Soybean
Part Rated	PLOT -	PLOT -	PLOT -	PLOT -	PLOT -
Rating Date	May-28-2018	Jun-4-2018	Jun-4-2018	Jun-4-2018	Jun-14-2018
Rating Type	CONTROL	PHYGEN	CONTROL	CONTROL	PHYGEN
Rating Unit	%	%	%	%	%
Number of Subsamples	1	1	1	1	1
Assessed By	D. JOHNSON	D. JOHNSON	D. JOHNSON	D. JOHNSON	D. JOHNSON
Rating Timing	A2	A3	A3	A3	A4
Days After First/Last Applic.	21 21	28 6	28 6	28 6	28 6
Trt-Eval Interval	14 DA-A	14 DA-A	14 DA-A	14 DA-A	14 DA-A
Days After Emergence	12 DE-1	19 DE-1	19 DE-1	19 DE-1	19 DE-1
ARM Action Codes	P	P	P	P	P
Number of Decimals	0	0	0	0	0
Trt Treatment	Rate	Appl			
No. Name	Rate Unit	Code	7	8	9
10 VERDICT	5.0 fl oz/a A		54 -	5 a	91 a
LIBERTY 280 SL	32.0 fl oz/a B				99 a
N-PAK AMS	2.5 % v/v B				87 a
LIBERTY 280 SL	32.0 fl oz/a E				0 b
N-PAK AMS	2.5 % v/v E				
LSD P=.05	25.7	1.6	23.1	19.4	21.4
Standard Deviation	17.6	1.1	15.8	13.2	14.7
CV	28.49	50.44	38.35	23.11	32.44
Levene's F	1.031	0.435	2.307	1.829	4.107
Levene's Prob(F)	0.438	0.889	0.05*	0.117	0.003*
Skewness	-1.4255*	0.1422	0.5588	-0.0536	0.1696
Kurtosis	1.5794*	-0.1994	-1.1352	-0.9083	-0.9056
Replicate F	3.657	4.558	4.830	5.001	0.117
Replicate Prob(F)	0.0266	0.0115	0.0091	0.0082	0.9495
Treatment F	1.800	3.349	12.639	16.827	12.042
Treatment Prob(F)	0.1268	0.0102	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.
 Untreated treatment(s) 1 excluded from analysis.
 Missing data estimates are included in columns: Yates=10,13,14,15,17,18,19,21,22,23
 Could not calculate LSD (% mean diff) for columns 4,16,20 because error mean square = 0.

Purdue Weed Science

Pest Type Pest Code Pest Name	W Weed AMBTR Giant ragweed	W Weed SETFA Giant foxtail	W Weed ECHSS Barnyardgrass		W Weed AMBTR Giant ragweed	W Weed SETFA Giant foxtail
Crop Code	GLXMA	GLXMA	GLXMA	GLXMA	GLXMA	GLXMA
Crop Name	Soybean	Soybean	Soybean	Soybean	Soybean	Soybean
Part Rated	PLOT -	PLOT -	PLOT -	PLOT -	PLOT -	PLOT -
Rating Date	Jun-14-2018	Jun-14-2018	Jun-14-2018	Jun-25-2018	Jun-25-2018	Jun-25-2018
Rating Type	CONTROL	CONTROL	CONTROL	PHYGEN	CONTROL	CONTROL
Rating Unit	%	%	%	%	%	%
Number of Subsamples	1	1	1	1	1	1
Assessed By	D. JOHNSON	D. JOHNSON	D. JOHNSON	D. JOHNSON	D. JOHNSON	D. JOHNSON
Rating Timing	A4	A4	A5	A5	A5	A5
Days After First/Last Applic.	38 10	38 10	38 10	49 11	49 11	49 11
Trt-Eval Interval	14 DA-A	14 DA-A	14 DA-A	14 DA-A	14 DA-A	14 DA-A
Days After Emergence	29 DE-1	29 DE-1	29 DE-1	40 DE-1	40 DE-1	40 DE-1
ARM Action Codes	P	P	P	P	P	P
Number of Decimals	0	0	0	0	0	0
Trt Treatment No. Name	Rate Rate Unit	Appl Code				
			13	14	15	16
			17	18		
1 UNTREATED CHECK			0	0	0	0
2 ZIDUA PRO LIBERTY 280 SL N-PAK AMS	6.0 fl oz/a A 32.0 fl oz/a D 2.5 % v/v D		13 d	18 c	10 c	0 -
						95 ab
						97 b
3 ZIDUA PRO LIBERTY 280 SL OUTLOOK N-PAK AMS	6.0 fl oz/a A 32.0 fl oz/a D 10.0 fl oz/a D 2.5 % v/v D		35 c	58 b	41 b	0 -
						97 ab
						100 a
4 ZIDUA PRO LIBERTY 280 SL N-PAK AMS	4.5 fl oz/a A 32.0 fl oz/a D 2.5 % v/v D		25 cd	50 b	35 b	0 -
						97 ab
						99 ab
5 ZIDUA PRO LIBERTY 280 SL OUTLOOK N-PAK AMS	4.5 fl oz/a A 32.0 fl oz/a D 10.0 fl oz/a D 2.5 % v/v D		21 cd	45 b	30 b	0 -
						100 a
						100 a
6 VERDICT TRICOR 75 DF LIBERTY 280 SL OUTLOOK N-PAK AMS	5.0 fl oz/a A 5.0 oz/a A 32.0 fl oz/a D 10.0 fl oz/a D 2.5 % v/v D		10 d	18 c	8 c	0 -
						99 a
						100 a
7 VERDICT TRICOR 75 DF LIBERTY 280 SL ZIDUA SC N-PAK AMS	5.0 fl oz/a A 5.0 oz/a A 32.0 fl oz/a C 2.0 fl oz/a C 2.5 % v/v C		97 a	100 a	94 a	0 -
						85 c
						100 a
8 VERDICT ZIDUA SC LIBERTY 280 SL OUTLOOK N-PAK AMS	5.0 fl oz/a A 2.0 fl oz/a A 32.0 fl oz/a C 10.0 fl oz/a C 2.5 % v/v C		98 a	100 a	97 a	0 -
						91 b
						100 a
9 VERDICT LIBERTY 280 SL N-PAK AMS LIBERTY 280 SL OUTLOOK N-PAK AMS	5.0 fl oz/a A 32.0 fl oz/a B 2.5 % v/v B 32.0 fl oz/a D 10.0 fl oz/a D 2.5 % v/v D		80 ab	94 a	86 a	0 -
						98 a
						100 a

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 Untreated treatment(s) 1 excluded from analysis.
 Missing data estimates are included in columns: Yates=10,13,14,15,17,18,19,21,22,23
 Could not calculate LSD (% mean diff) for columns 4,16,20 because error mean square = 0.

Purdue Weed Science

Pest Type	W Weed	W Weed	W Weed		W Weed	W Weed		
Pest Code	AMBTR	SETFA	ECHSS		AMBTR	SETFA		
Pest Name	Giant ragweed	Giant foxtail	Barnyardgrass		Giant ragweed	Giant foxtail		
Crop Code	GLXMA	GLXMA	GLXMA	GLXMA	GLXMA	GLXMA		
Crop Name	Soybean	Soybean	Soybean	Soybean	Soybean	Soybean		
Part Rated	PLOT -	PLOT -	PLOT -	PLOT -	PLOT -	PLOT -		
Rating Date	Jun-14-2018	Jun-14-2018	Jun-14-2018	Jun-25-2018	Jun-25-2018	Jun-25-2018		
Rating Type	CONTROL	CONTROL	CONTROL	PHYGEN	CONTROL	CONTROL		
Rating Unit	%	%	%	%	%	%		
Number of Subsamples	1	1	1	1	1	1		
Assessed By	D. JOHNSON	D. JOHNSON	D. JOHNSON	D. JOHNSON	D. JOHNSON	D. JOHNSON		
Rating Timing	A4	A4	A5	A5	A5	A5		
Days After First/Last Applic.	38 10	38 10	38 10	49 11	49 11	49 11		
Trt-Eval Interval	14 DA-A	14 DA-A	14 DA-A	14 DA-A	14 DA-A	14 DA-A		
Days After Emergence	29 DE-1	29 DE-1	29 DE-1	40 DE-1	40 DE-1	40 DE-1		
ARM Action Codes	P	P	P	P	P	P		
Number of Decimals	0	0	0	0	0	0		
Trt Treatment	Rate	Appl						
No. Name	Rate Unit	Code	13	14	15	16	17	18
10 VERDICT	5.0 fl oz/a A		77 b	97 a	85 a	0 -	98 a	100 a
LIBERTY 280 SL	32.0 fl oz/a B							
N-PAK AMS	2.5 % v/v B							
LIBERTY 280 SL	32.0 fl oz/a E							
N-PAK AMS	2.5 % v/v E							
LSD P=.05	19.9	20.1	18.2	.	5.9	1.8		
Standard Deviation	13.6	13.7	12.5	0.0	4.1	1.2		
CV	26.91	21.31	23.14	0.0	4.26	1.26		
Levene's F	5.704	1.465	0.968	0.00	1.423	2.063		
Levene's Prob(F)	0.001*	0.22	0.481	0.00*	0.234	0.078		
Skewness	-0.017	-0.5434	-0.0656	.	-1.5873*	-2.6115*		
Kurtosis	-1.5939*	-0.8599	-1.541	.	1.749*	5.6927*		
Replicate F	3.672	0.528	0.301	0.000	2.212	1.114		
Replicate Prob(F)	0.0269	0.6678	0.8240	1.0000	0.1140	0.3636		
Treatment F	29.153	25.241	34.013	0.000	5.248	2.538		
Treatment Prob(F)	0.0001	0.0001	0.0001	1.0000	0.0008	0.0384		

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 Untreated treatment(s) 1 excluded from analysis.
 Missing data estimates are included in columns:Yates=10,13,14,15,17,18,19,21,22,23
 Could not calculate LSD (% mean diff) for columns 4,16,20 because error mean square = 0.

Purdue Weed Science

Pest Type Pest Code Pest Name	W Weed ECHSS Barnyardgrass	GLXMA Soybean PLOT -	GLXMA Soybean PLOT -	W Weed AMBTR Giant ragweed	GLXMA Soybean PLOT -	W Weed SETFA Giant foxtail	GLXMA Soybean PLOT -	W Weed ECHSS Barnyardgrass	GLXMA Soybean PLOT -
Crop Code	GLXMA	GLXMA	GLXMA	GLXMA	GLXMA	GLXMA	GLXMA	GLXMA	GLXMA
Crop Name	Soybean	Soybean	Soybean	Soybean	Soybean	Soybean	Soybean	Soybean	Soybean
Part Rated	PLOT -	PLOT -	PLOT -	PLOT -	PLOT -	PLOT -	PLOT -	PLOT -	PLOT -
Rating Date	Jun-25-2018	Jul-9-2018	Jul-9-2018	Jul-9-2018	Jul-9-2018	Jul-9-2018	Jul-9-2018	Jul-9-2018	Jul-9-2018
Rating Type	CONTROL	PHYGEN	CONTROL	CONTROL	CONTROL	CONTROL	CONTROL	CONTROL	CONTROL
Rating Unit	%	%	%	%	%	%	%	%	%
Number of Subsamples	1	1	1	1	1	1	1	1	1
Assessed By	D. JOHNSON	D. JOHNSON	D. JOHNSON	D. JOHNSON	D. JOHNSON	D. JOHNSON	D. JOHNSON	D. JOHNSON	D. JOHNSON
Rating Timing	A5	A6	A6	A6	A6	A6	A6	A6	A6
Days After First/Last Applic.	49 11	63 14	63 14	63 14	63 14	63 14	63 14	63 14	63 14
Trt-Eval Interval	14 DA-A	14 DA-A	14 DA-A	14 DA-A	14 DA-A	14 DA-A	14 DA-A	14 DA-A	14 DA-A
Days After Emergence	40 DE-1	54 DE-1	54 DE-1	54 DE-1	54 DE-1	54 DE-1	54 DE-1	54 DE-1	54 DE-1
ARM Action Codes	P	P	P	P	P	P	P	P	P
Number of Decimals	0	0	0	0	0	0	0	0	0
Trt Treatment No. Name	Rate Rate	Appl Unit	Code	19	20	21	22	23	
1 UNTREATED CHECK				0	0	0	0	0	
2 ZIDUA PRO LIBERTY 280 SL N-PAK AMS	6.0 fl oz/a A 32.0 fl oz/a D 2.5 % v/v D			98 -	0 -	95 ab	97 a	95 a	
3 ZIDUA PRO LIBERTY 280 SL OUTLOOK N-PAK AMS	6.0 fl oz/a A 32.0 fl oz/a D 10.0 fl oz/a D 2.5 % v/v D			100 -	0 -	95 ab	100 a	98 a	
4 ZIDUA PRO LIBERTY 280 SL N-PAK AMS	4.5 fl oz/a A 32.0 fl oz/a D 2.5 % v/v D			98 -	0 -	94 ab	99 a	96 a	
5 ZIDUA PRO LIBERTY 280 SL OUTLOOK N-PAK AMS	4.5 fl oz/a A 32.0 fl oz/a D 10.0 fl oz/a D 2.5 % v/v D			100 -	0 -	97 a	99 a	96 a	
6 VERDICT TRICOR 75 DF LIBERTY 280 SL OUTLOOK N-PAK AMS	5.0 fl oz/a A 5.0 oz/a A 32.0 fl oz/a D 10.0 fl oz/a D 2.5 % v/v D			99 -	0 -	96 a	99 a	96 a	
7 VERDICT TRICOR 75 DF LIBERTY 280 SL ZIDUA SC N-PAK AMS	5.0 fl oz/a A 5.0 oz/a A 32.0 fl oz/a C 2.0 fl oz/a C 2.5 % v/v C			100 -	0 -	86 c	100 a	97 a	
8 VERDICT ZIDUA SC LIBERTY 280 SL OUTLOOK N-PAK AMS	5.0 fl oz/a A 2.0 fl oz/a A 32.0 fl oz/a C 10.0 fl oz/a C 2.5 % v/v C			100 -	0 -	91 b	100 a	94 a	
9 VERDICT LIBERTY 280 SL N-PAK AMS LIBERTY 280 SL OUTLOOK N-PAK AMS	5.0 fl oz/a A 32.0 fl oz/a B 2.5 % v/v B 32.0 fl oz/a D 10.0 fl oz/a D 2.5 % v/v D			100 -	0 -	97 a	100 a	100 a	

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.

Untreated treatment(s) 1 excluded from analysis.

Missing data estimates are included in columns: Yates=10,13,14,15,17,18,19,21,22,23

Could not calculate LSD (% mean diff) for columns 4,16,20 because error mean square = 0.

Purdue Weed Science

Pest Type	W Weed		W Weed	W Weed	W Weed
Pest Code	ECHSS		AMBTR	SETFA	ECHSS
Pest Name	Barnyardgrass		Giant ragweed	Giant foxtail	Barnyardgrass
Crop Code	GLXMA	GLXMA	GLXMA	GLXMA	GLXMA
Crop Name	Soybean	Soybean	Soybean	Soybean	Soybean
Part Rated	PLOT -	PLOT -	PLOT -	PLOT -	PLOT -
Rating Date	Jun-25-2018	Jul-9-2018	Jul-9-2018	Jul-9-2018	Jul-9-2018
Rating Type	CONTROL	PHYGEN	CONTROL	CONTROL	CONTROL
Rating Unit	%	%	%	%	%
Number of Subsamples	1	1	1	1	1
Assessed By	D. JOHNSON	D. JOHNSON	D. JOHNSON	D. JOHNSON	D. JOHNSON
Rating Timing	A5	A6	A6	A6	A6
Days After First/Last Applic.	49 11	63 14	63 14	63 14	63 14
Trt-Eval Interval	14 DA-A	14 DA-A	14 DA-A	14 DA-A	14 DA-A
Days After Emergence	40 DE-1	54 DE-1	54 DE-1	54 DE-1	54 DE-1
ARM Action Codes	P	P	P	P	P
Number of Decimals	0	0	0	0	0
Trt No.	Treatment Name	Rate	Appl Unit	Code	
19					
20					
21					
22					
23					
10	VERDICT	5.0 fl oz/a	A		
	LIBERTY 280 SL	32.0 fl oz/a	B		
	N-PAK AMS	2.5 % v/v	B		
	LIBERTY 280 SL	32.0 fl oz/a	E		
	N-PAK AMS	2.5 % v/v	E		
LSD P=.05	2.1	.	4.6	3.0	6.2
Standard Deviation	1.4	0.0	3.2	2.1	4.2
CV	1.44	0.0	3.47	2.11	4.46
Levene's F	4.13	0.00	1.465	3.933	2.182
Levene's Prob(F)	0.003*	0.00*	0.218	0.004*	0.063
Skewness	-2.0898*	.	-1.8686*	-2.0689*	-2.454*
Kurtosis	3.564*	.	2.805*	3.7295*	6.1595*
Replicate F	1.358	0.000	3.272	1.354	2.244
Replicate Prob(F)	0.2804	1.0000	0.0394	0.2816	0.1102
Treatment F	1.302	0.000	31.371	3.992	7.294
Treatment Prob(F)	0.2913	1.0000	0.0001	0.0043	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.

Untreated treatment(s) 1 excluded from analysis.

Missing data estimates are included in columns: Yates=10,13,14,15,17,18,19,21,22,23

Could not calculate LSD (% mean diff) for columns 4,16,20 because error mean square = 0.

Purdue Weed Science

LIBERTY SOYBEAN PROGRAMS CONVENTIONAL TILLAGE

Trial ID: 18S-TPAC-SOY-18
Protocol ID: 18S-TPAC-SOY-18
Project ID: MKD-H-2018-US-D40-B-02.1

Location: TPAC Trial Year: 2018
Investigator: Dr. Bill Johnson
Study Director: Dustin Johnson
Sponsor Contact: G. Welker - BASF

Pest Type

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

Pest Code

AMBTR, Ambrosia trifida, Giant ragweed = US

SETFA, Setaria faberi, Giant foxtail = US

ECHSS, Echinochloa sp., Barnyardgrass = US

Crop Code

GLXMA, BSOY, Glycine max, Soybean = US

Part Rated

PLOT = plot

Rating Type

PHYGEN = phytotoxicity - general / injury

Rating Unit

% = percent

Rating Timing

A1 = 1st Assessment According to Trial Schedule

A2 = 2nd Assessment According to trial Schedule

A3 = 3rd Assessment According to Trial Schedule

A4 = 4th Assessment According to Trial Schedule

A5 = 5th Assessment According to Trial Schedule

A6 = 6th Assessment according to Trial Schedule

ARM Action Codes

P = Rating scale of 0 to 100 (e.g. % control or injury)