

Purdue Weed Science

Xtend Soybean System Compared to Competitor

Trial ID: 16S-CORT-SOY-08 Location: CORTLAND Trial Year: 2016
 Protocol ID: 16S-CORT-SOY-08 Investigator: Dr. Bill Johnson
 Project ID: 2016-01-B7-01 Study Director: Dustin Johnson
 Sponsor Contact: Monsanto-Dan Childs

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: Apr-14-2016

Trial Location

City: Cortland **Country:** USA United States
State/Prov.: Indiana
Postal Code: 47228

Latitude of LL Corner °: 38.9849944 N
Longitude of LL Corner °: 85.94536111 W

Conducted Under GLP: No
Conducted Under GEP: No

Objectives:

Show competitive advantages of Xtend and RR+ over LL

Contacts

Study Director: Dustin Johnson **Title:** Research Associate
Organization: Purdue University
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Investigator: Dr. Bill Johnson **Title:** Professor
Organization: Purdue University
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City+State/Prov: West Lafayette, IN
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Country: USA United States

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Crop 1: GLXMA		Glycine max		Soybean	
Variety: AG30X6		BBCH Scale: BSOY			
Description: RR2 Xtend					
Planting Rate, Unit: 140000 S/A		Planting Date: May-30-2016		Planting Method: PLANTD planted	
Depth, Unit: 2 IN		Planting Equipment: PP Plot Planter		Emergence Date: Jun-4-2016	
Row Spacing, Unit: 30 IN		Harvest Date: Oct-26-2016		Harvested Width, Unit: 5 FT	
Soil Temperature, Unit: 70 F		Harvested Length, Unit: 25 FT		Harvest Equipment: HEGE	
Soil Moisture: DRY dry					
Crop 2: GLXMA		Glycine max		Soybean	
Variety: AG2933		BBCH Scale: BSOY			
Description: RR2					
Planting Rate, Unit: 140000 S/A		Planting Date: May-30-2016		Planting Method: PLANTD planted	
Depth, Unit: 2 IN		Planting Equipment: PP Plot Planter		Emergence Date: Jun-4-2016	
Row Spacing, Unit: 30 IN		Harvest Date: Oct-26-2016		Harvested Width, Unit: 5 FT	
Soil Temperature, Unit: 70 F		Harvested Length, Unit: 25 FT		Harvest Equipment: HEGE	
Soil Moisture: DRY dry					
Crop 3: GLXMA		Glycine max		Soybean	
Variety: BECKS 298L4		BBCH Scale: BSOY			
Description: LL					
Planting Rate, Unit: 140000 S/A		Planting Date: May-30-2016		Planting Method: PLANTD planted	
Depth, Unit: 2 IN		Planting Equipment: PP Plot Planter		Emergence Date: Jun-4-2016	
Row Spacing, Unit: 30 IN		Harvest Date: Oct-26-2016		Harvested Width, Unit: 5 FT	
Soil Temperature, Unit: 70 F		Harvested Length, Unit: 25 FT		Harvest Equipment: HEGE	
Soil Moisture: DRY dry					

Pest 1 Type: W		Code: ERICA Erigeron canadensis		Common Name: Canada horseweed		Description: Glyphosate-Resistant	
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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 FT2		Tillage Type: CONTIL conventional-till	
Replications: 4		Study Design: RACOB� Randomized Complete Block (RCB)	

Maintenance							
No.	Date	Maintenance Product Name	Form Conc	Form Unit	Form Type	Rate	Rate Unit
1.	Mar-30-2016	0-0-60 POTASH				119	LB/A
2.	Mar-30-2016	18-46-0 PHOSPHORUS				60	LB/A
3.	May-16-2016	SHREDDER 2,4-D LV-4	3.8	LBAE/GA	SC	1	PT/A
4.	May-16-2016	ROUNDUP POWERMAX	4.5	LBAE	SL	32	FL OZ/A
5.	Jun-24-2016	ROUNDUP POWERMAX	4.5	LBAE	SL	32	FL OZ/A
6.	Jun-24-2016	FIRST RATE	0.84	%	WG	0.3	OZ/A
7.	Jun-24-2016	FLEXSTAR	1.88	LBA/GAL	SL	1	PT/A

Comment: 5/16/16 Burndown was 2 weeks before planting instead of 1 week. Due to ERICA starting to take off. Burndown killed 85/90% of plants but didnot kill the taller marestail.
 6/24/16 Sprayed buffer areas of Roundup Ready beans along with Post treatments.

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Soil Description

Description Name: CORTLAND

% Sand: 46.6

% OM: 1.6

% Silt: 35.6

% Clay: 17.8

pH: 6.6

CEC: 9

Texture: SL sandy loam

Soil Name: Fox-Ockley

Soil Drainage: E excellent

Application Description

	A	B
Application Date:	Jun-1-2016	Jun-24-2016
Appl. Start Time:	9:00 AM	9:10 AM
Appl. Stop Time:	9:30 AM	9:30 AM
Application Method:	SPRAY	SPRAY
Application Timing:	PRE	POST
Application Placement:	BROADC	BROADC
Applied By:	D. JOHNSON	T. CAMPBELL
Air Temperature, Unit:	72 F	78 F
% Relative Humidity:	84	75
Wind Velocity, Unit:	1 MPH	5 MPH
Wind Direction:	E	N
Dew Presence (Y/N):	N no	N no
Soil Temperature, Unit:	70 F	86 F
Soil Moisture:	DRY	SLIWET
% Cloud Cover:	20	15

Crop Stage At Each Application

	A	B
Crop 1 Code, BBCH Scale:	GLXMA BSOY	GLXMA BSOY
Stage Scale Used:	BBCH	BBCH
Stage Majority, Percent:	00	13
Stage Minimum, Percent:	00	12
Stage Maximum, Percent:	00	13
Crop 2 Code, BBCH Scale:	GLXMA BSOY	GLXMA BSOY
Stage Scale Used:	BBCH	BBCH
Stage Majority, Percent:	00	13
Stage Minimum, Percent:	00	12
Stage Maximum, Percent:	00	13
Crop 3 Code, BBCH Scale:	GLXMA BSOY	GLXMA BSOY
Stage Scale Used:	BBCH	BBCH
Stage Majority, Percent:	00	13
Stage Minimum, Percent:	00	12
Stage Maximum, Percent:	00	13

Pest Stage At Each Application

	A	B
Pest 1 Code, Type, Scale:	ERICA W	ERICA W
Height, Unit:	3 IN	5.5 IN
Height Minimum, Maximum:	2 4	3 8
Density, Unit:	54 YD2	68 YD2

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Application Equipment

	A	B
Appl. Equipment:	CO2 BACKPACK	CO2 BACKPACK
Equipment Type:	BACSPR	BACSPR
Operation Pressure, Unit:	32 PSI	17 PSI
Nozzle Type:	TTI	FLAFXR
Nozzle Size:	TTI110015	XR11002
Nozzle Spacing, Unit:	20 IN	20 IN
Nozzles/Row:	4	8
Boom Length, Unit:	6.7 FT	6.7 FT
Boom Height, Unit:	17 IN	17 IN
Ground Speed, Unit:	3 MPH	3 MPH
Carrier:	WATER	WATER
Spray Volume, Unit:	12 GAL/AC	12 GAL/AC
Mix Size, Unit:	910 mL	910 liters
Propellant:	COMCO2	COMCO2

Equipment Comment: Application A&B were the first treatment on 6/1/16. Had two different nozzle types. Application C&D were the first treatment on 6/24/16. Had two different nozzle types.

Date By Notes

Apr-14-2016 D. JOHNSON Setup Trial.
 May-16-2016 M. ZIMMER Sprayed blanket of Roundup Power Max (32 oz/a) and 2, 4-D (1pt/a).
 May-30-2016 B. YOUNG Planted Trial.
 Jun-1-2016 D. JOHNSON Sprayed Pre "A" application. D. Johnson and M. Zimmer sprayed application.
 Jun-7-2016 D. JOHNSON Rated: 7-DAT "A" Crop Injury
 Jun-14-2016 D. JOHNSON Rated: 14-DAT "A". Crop Injury.
 Jun-24-2016 T. CAMPBELL Sprayed Post "B" Application.
 Jul-8-2016 T. CAMPBELL Rated: 14-DAT "B". Crop Injury.
 Jul-26-2016 D. JOHNSON Rated: Weed Efficacy @ Crop Canopy.
 Aug-4-2016 D. JOHNSON Rated: Crop Injury @ Crop Canopy.
 Oct-26-2016 D. JOHNSON Rated: Weed Efficacy @ Harvest. Used 2 row hege combine to harvest soybeans.

Trial Comments

Reps: 4 Appl Code: A Plots: 6.67 by 30 feet
 Spray vol: 12 GAL/AC Mix Size: 910 mL (834.67 mL calculated mix size)

Trt No.	Treatment Name	Form Conc	Form Unit	Form Type	Rate	Rate Unit	Growth Stage	Appl Code	Amt to Measure	Rep 1	Rep 2	Rep 3	Rep 4
7	WARRANT TRICOR	3 LB/GAL	75 %	EC	1.13 lb ai/a	PRE	A	A	28.56 ml/mx 2.835 g/mx	102	304	408	210
2	ROWEL	51 %		WG	0.064 lb ai/a	PRE	A	A	1.14 g/mx	201	411	107	305
12	AUTHORITY MAXX	66 %		WG	0.264 lb ai/a	PRE	A	A	3.635 g/mx	203	306	109	412
3	ROWEL MON 76980	51 %	2.92 LBAE/GAL	WG	0.064 lb ai/a	PRE	A	A	1.14 g/mx 12.98 ml/mx	301	205	207	111
6	ROWEL	51 %		WG	0.064 lb ai/a	PRE	A	A	1.14 g/mx	302	404	110	208
10	VALOR SX	51 %		WG	0.064 lb ai/a	PRE	A	A	1.14 g/mx	303	409	206	112
4	ROWEL MON 76980	51 %	2.92 LBAE/GAL	WG	0.064 lb ai/a	PRE	A	A	1.14 g/mx 12.98 ml/mx	401	311	105	407
8	WARRANT TRICOR	3 LB/GAL	75 %	EC	1.13 lb ai/a	PRE	A	A	28.56 ml/mx 2.835 g/mx	402	204	108	310
11	AUTHORITY MAXX	66 %		WG	0.264 lb ai/a	PRE	A	A	3.635 g/mx	403	106	212	309

Reps: 4 Appl Code: B Plots: 6.67 by 30 feet
 Spray vol: 12 GAL/AC Mix Size: 910 mL (834.67 mL calculated mix size)

Trt No.	Treatment Name	Form Conc	Form Unit	Form Type	Rate	Rate Unit	Growth Stage	Appl Code	Amt to Measure	Rep 1	Rep 2	Rep 3	Rep 4
7	ROUNDUP POWERMAX N-PAK AMS	4.5 LBAE/GAL	3.4 LBA/GAL	SL	1.13 lb ae/a			B	19.04 ml/mx 45.5 ml/mx	102	304	408	210

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Reps: 4 Appl Code: B Plots: 6.67 by 30 feet
 Spray vol: 12 GAL/AC Mix Size: 910 mL (834.67 mL calculated mix size)

Trt No.	Treatment Name	Form Conc	Form Unit	Form Type	Rate	Growth Stage	Appl Code	Amt to Measure	Rep 1	Rep 2	Rep 3	Rep 4
2	MON 76981 CLASS ACT RIDION	3 LBAE/GAL 100 %	SL	L	1.5 lb ae/a 1 % v/v	B	B	37.91 ml/mx 9.099 ml/mx	201	411	107	305
12	LIBERTY 280 SL ZIDUA N-PAK AMS	2.34 LB/GAL 85 % 3.4 LBA/GAL	SL	WG SL	0.53 lb ai/a 0.106 lb ai/a 5 % v/v	B	B	17.17 ml/mx 1.133 g/mx 45.5 ml/mx	203	306	109	412
3	MON 76981 CLASS ACT RIDION	3 LBAE/GAL 100 %	SL	L	1.5 lb ae/a 1 % v/v	B	B	37.91 ml/mx 9.099 ml/mx	301	205	207	111
6	ROUNDUP POWERMAX N-PAK AMS	4.5 LBAE/GAL 3.4 LBA/GAL	SL	SL	1.13 lb ae/a 5 % v/v	B	B	19.04 ml/mx 45.5 ml/mx	302	404	110	208
10	LIBERTY 280 SL N-PAK AMS	2.34 LB/GAL 3.4 LBA/GAL	SL	SL	0.53 lb ai/a 5 % v/v	B	B	17.17 ml/mx 45.5 ml/mx	303	409	206	112
4	MON 76981 WARRANT CLASS ACT RIDION	3 LBAE/GAL 3 LB/GAL 100 %	SL	EC L	1.5 lb ae/a 1.13 lb ai/a 1 % v/v	B	B	37.91 ml/mx 28.56 ml/mx 9.099 ml/mx	401	311	105	407
8	ROUNDUP POWERMAX WARRANT ULTRA N-PAK AMS	4.5 LBAE/GAL 3.49 LB/GAL 3.4 LBA/GAL	SL	CS SL	1.13 lb ae/a 1.36 lb ai/a 5 % v/v	B	B	19.04 ml/mx 29.55 ml/mx 45.5 ml/mx	402	204	108	310
11	LIBERTY 280 SL N-PAK AMS	2.34 LB/GAL 3.4 LBA/GAL	SL	SL	0.53 lb ai/a 5 % v/v	B	B	17.17 ml/mx 45.5 ml/mx	403	106	212	309

Reps: 4 Appl Code: _ Plots: 6.67 by 30 feet
 Spray vol: 12 GAL/AC

Trt No.	Treatment Name	Form Conc	Form Unit	Form Type	Rate	Growth Stage	Appl Code	Amt to Measure	Rep 1	Rep 2	Rep 3	Rep 4
1	RR2 Xtend Soy UNTREATED							402 seeds/1 pl=5x25 FT	101	405	211	307
7	RR2 Yield Soy							402 seeds/1 pl=5x25 FT	102	304	408	210
9	LL Soy UNTREATED							402 seeds/1 pl=5x25 FT	103	312	406	209
2	RR2 Xtend Soy							402 seeds/1 pl=5x25 FT	201	411	107	305
5	RR2 Yield Soy UNTREATED							402 seeds/1 pl=5x25 FT	202	104	410	308
12	LL Soy							402 seeds/1 pl=5x25 FT	203	306	109	412
3	RR2 Xtend Soy							402 seeds/1 pl=5x25 FT	301	205	207	111
6	RR2 Yield Soy							402 seeds/1 pl=5x25 FT	302	404	110	208
10	LL Soy							402 seeds/1 pl=5x25 FT	303	409	206	112
4	RR2 Xtend Soy							402 seeds/1 pl=5x25 FT	401	311	105	407
8	RR2 Yield Soy							402 seeds/1 pl=5x25 FT	402	204	108	310
11	LL Soy							402 seeds/1 pl=5x25 FT	403	106	212	309

Sort Order: Application Code, Replicate 1

Product quantities required for listed treatments and applications of trials included in this table:

Amount*	Unit	Treatment Name	Form Conc	Form Unit	Form Type	Lot Code
8,035	seed	RR2 Xtend Soy				
5.702	g	ROWEL	51	%	WG	
142.172	ml	MON 76981	3	LBAE/GAL	SL	
34.121	ml	CLASS ACT RIDION	100	%	L	
32.459	ml	MON 76980	2.92	LBAE/GAL	SL	
107.103	ml	WARRANT	3	LB/GAL	EC	
8,035	seed	RR2 Yield Soy				

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Project ID: 2016-01-B7-01	Study Director: Dustin Johnson
	Sponsor Contact: Monsanto-Dan Childs

Product quantities required for listed treatments and applications of trials included in this table:

Amount*	Unit	Treatment Name	Form Conc	Form Unit	Form Type	Lot Code
71.402	ml	ROUNDUP POWERMAX	4.5	LB/AE/GAL	SL	
341.213	ml	N-PAK AMS	3.4	LBA/GAL	SL	
7.088	g	TRICOR	75	%	WG	
36.935	ml	WARRANT ULTRA	3.49	LB/GAL	CS	
8,035	seed	LL Soy				
1.425	g	VALOR SX	51	%	WG	
64.403	ml	LIBERTY 280 SL	2.34	LB/GAL	SL	
9.087	g	AUTHORITY MAXX	66	%	WG	
1.416	g	ZIDUA	85	%	WG	

* 'Per area' calculations based on 4 replicates of 5 by 25, 6.67 by 30 FT 'Plot' experimental units (area of one treatment).

* 'Per area' calculations based on spray volume= 12 GAL/AC, mix size= 910 mL (mix size basis).

* Product amount calculations increased 25 % for overage adjustment.

* 'Per volume' calculations use spray volume= 12 GAL/AC, mix size= 910 mL.

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				GLXMA	GLXMA	GLXMA	GLXMA	W Weed
				BSOY	BSOY	BSOY	BSOY	ERICA
				Glycine max	Glycine max	Glycine max	Glycine max	Erigeron canad>
				Soybean	Soybean	Soybean	Soybean	Canada horsewe>
				Jun-7-2016	Jun-14-2016	Jul-8-2016	Aug-4-2016	GLXMA
				PERCEN	PERCEN	PERCEN	PERCEN	BSOY
				%	%	%	%	Glycine max
								Soybean
				1	1	1	1	Jul-26-2016
								PERCEN
				1	2	3	4	%
				6 6	13 13	37 14	64 41	55 32
				8 DP-1	15 DP-1	39 DP-1	66 DP-1	57 DP-1
				3 DE-1	10 DE-1	34 DE-1	61 DE-1	52 DE-1
Trt Treatment	Rate	Appl						
No. Name	Rate	Unit	Code Plot	1	2	3	4	5
1 RR2 Xtend Soy			101	0.0	0.0	0.0	0.0	0.0
UNTREATED			405	0.0	0.0	0.0	0.0	0.0
			211	0.0	0.0	0.0	0.0	0.0
			307	0.0	0.0	0.0	0.0	0.0
			Mean =	0.0	0.0	0.0	0.0	0.0
2 RR2 Xtend Soy			201	0.0	0.0	0.0	0.0	100.0
ROWEL	0.064 lb ai/a	A	411	0.0	0.0	0.0	0.0	100.0
MON 76981	1.5 lb ae/a	B	107	0.0	0.0	0.0	0.0	100.0
CLASS ACT RIDION	1 % v/v	B	305	0.0	0.0	0.0	0.0	100.0
			Mean =	0.0	0.0	0.0	0.0	100.0
3 RR2 Xtend Soy			301	0.0	0.0	0.0	0.0	100.0
ROWEL	0.064 lb ai/a	A	205	0.0	0.0	0.0	0.0	100.0
MON 76980	0.5 lb ae/a	A	207	0.0	0.0	0.0	0.0	100.0
MON 76981	1.5 lb ae/a	B	111	0.0	0.0	0.0	0.0	100.0
CLASS ACT RIDION	1 % v/v	B						
			Mean =	0.0	0.0	0.0	0.0	100.0
4 RR2 Xtend Soy			401	0.0	0.0	0.0	0.0	100.0
ROWEL	0.064 lb ai/a	A	311	0.0	0.0	0.0	0.0	100.0
MON 76980	0.5 lb ae/a	A	105	0.0	0.0	0.0	0.0	100.0
MON 76981	1.5 lb ae/a	B	407	0.0	0.0	0.0	0.0	95.0
WARRANT	1.13 lb ai/a	B						
CLASS ACT RIDION	1 % v/v	B						
			Mean =	0.0	0.0	0.0	0.0	98.8
5 RR2 Yield Soy			202	0.0	0.0	0.0	0.0	0.0
UNTREATED			104	0.0	0.0	0.0	0.0	0.0
			410	0.0	0.0	0.0	0.0	0.0
			308	0.0	0.0	0.0	0.0	0.0
			Mean =	0.0	0.0	0.0	0.0	0.0
6 RR2 Yield Soy			302	0.0	0.0	5.0	1.0	5.0
ROWEL	0.064 lb ai/a	A	404	1.0	0.0	5.0	0.0	5.0
ROUNDUP POWERMAX	1.13 lb ae/a	B	110	0.0	0.0	20.0	0.0	10.0
N-PAK AMS	5 % v/v	B	208	0.0	0.0	5.0	1.0	5.0
			Mean =	0.3	0.0	8.8	0.5	6.3
7 RR2 Yield Soy			102	0.0	0.0	5.0	0.0	10.0
WARRANT	1.13 lb ai/a	A	304	0.0	0.0	10.0	0.0	85.0
TRICOR	0.234 lb ai/a	A	408	0.0	0.0	0.0	0.0	5.0
ROUNDUP POWERMAX	1.13 lb ae/a	B	210	0.0	0.0	2.0	0.0	90.0
N-PAK AMS	5 % v/v	B						
			Mean =	0.0	0.0	4.3	0.0	47.5

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Pest Type					W Weed			
Pest Code					ERICA			
Pest Scientific Name					Erigeron canad>			
Pest Name					Canada horsewe>			
Crop Code	GLXMA	GLXMA	GLXMA	GLXMA	GLXMA			
BBCH Scale	BSOY	BSOY	BSOY	BSOY	BSOY			
Crop Scientific Name	Glycine max	Glycine max	Glycine max	Glycine max	Glycine max			
Crop Name	Soybean	Soybean	Soybean	Soybean	Soybean			
Rating Date	Jun-7-2016	Jun-14-2016	Jul-8-2016	Aug-4-2016	Jul-26-2016			
Rating Type	PERCEN	PERCEN	PERCEN	PERCEN	PERCEN			
Rating Unit	%	%	%	%	%			
Sample Size, Unit								
Number of Subsamples	1	1	1	1	1			
SE Group No.	1	2	3	4	5			
Days After First/Last Applic.	6 6	13 13	37 14	64 41	55 32			
Plant-Eval Interval	8 DP-1	15 DP-1	39 DP-1	66 DP-1	57 DP-1			
Days After Emergence	3 DE-1	10 DE-1	34 DE-1	61 DE-1	52 DE-1			
ARM Action Codes								
Number of Decimals								
Trt Treatment	Rate	Appl						
No. Name	Rate	Unit	Code	Plot				
				1	2			
				3	4			
				5				
8 RR2 Yield Soy			402	0.0	0.0	10.0	0.0	95.0
WARRANT	1.13 lb ai/a	A	204	0.0	0.0	20.0	1.0	85.0
TRICOR	0.234 lb ai/a	A	108	0.0	0.0	5.0	0.0	85.0
ROUNDUP POWERMAX	1.13 lb ae/a	B	310	0.0	0.0	5.0	0.0	100.0
WARRANT ULTRA	1.36 lb ai/a	B						
N-PAK AMS	5 % v/v	B						
			Mean =	0.0	0.0	10.0	0.3	91.3
9 LL Soy			103	0.0	0.0	0.0	0.0	0.0
UNTREATED			312	0.0	0.0	0.0	0.0	0.0
			406	0.0	0.0	0.0	0.0	0.0
			209	0.0	0.0	0.0	0.0	0.0
			Mean =	0.0	0.0	0.0	0.0	0.0
10 LL Soy			303	2.0	0.0	10.0	2.0	85.0
VALOR SX	0.064 lb ai/a	A	409	2.0	0.0	5.0	0.0	75.0
LIBERTY 280 SL	0.53 lb ai/a	B	206	0.0	0.0	30.0	2.0	75.0
N-PAK AMS	5 % v/v	B	112	2.0	0.0	0.0	0.0	95.0
			Mean =	1.5	0.0	11.3	1.0	82.5
11 LL Soy			403	10.0	0.0	5.0	1.0	95.0
AUTHORITY MAXX	0.264 lb ai/a	A	106	5.0	0.0	5.0	0.0	95.0
LIBERTY 280 SL	0.53 lb ai/a	B	212	5.0	0.0	0.0	0.0	90.0
N-PAK AMS	5 % v/v	B	309	2.0	0.0	5.0	0.0	95.0
			Mean =	5.5	0.0	3.8	0.3	93.8
12 LL Soy			203	2.0	0.0	35.0	2.0	90.0
AUTHORITY MAXX	0.264 lb ai/a	A	306	5.0	0.0	30.0	2.0	95.0
LIBERTY 280 SL	0.53 lb ai/a	B	109	5.0	0.0	20.0	0.0	95.0
ZIDUA	0.106 lb ai/a	B	412	5.0	0.0	10.0	1.0	95.0
N-PAK AMS	5 % v/v	B						
			Mean =	4.3	0.0	23.8	1.3	93.8

Purdue Weed Science

Xtend Soybean System Compared to Competitor

Trial ID: 16S-CORT-SOY-08 Location: CORTLAND Trial Year: 2016
 Protocol ID: 16S-CORT-SOY-08 Investigator: Dr. Bill Johnson
 Project ID: 2016-01-B7-01 Study Director: Dustin Johnson
 Sponsor Contact: Monsanto-Dan Childs

Pest Type	W Weed				
Pest Code	ERICA				
Pest Scientific Name	Erigeron canad>				
Pest Name	Canada horsewe>				
Crop Code	GLXMA	GLXMA	GLXMA	GLXMA	GLXMA
BBCH Scale	BSOY	BSOY	BSOY	BSOY	BSOY
Crop Scientific Name	Glycine max	Glycine max	Glycine max	Glycine max	Glycine max
Crop Name	Soybean	Soybean	Soybean	Soybean	Soybean
Rating Date	Oct-26-2016	Oct-26-2016	Oct-27-2016	Oct-27-2016	Oct-27-2016
Rating Type	PERCEN	YIELD	MOICON	YIELD	WEITES
Rating Unit	%	kg	%	BU	LBS/BU
Sample Size, Unit		1 PLOT		1 A	
Number of Subsamples	1	1	1	1	1
SE Group No.	6	7	8	11	12
Days After First/Last Applic.	147 124	147 124	148 125	148 125	148 125
Plant-Eval Interval	149 DP-1	149 DP-1	150 DP-1	150 DP-1	150 DP-1
Days After Emergence	144 DE-1	144 DE-1	145 DE-1	145 DE-1	145 DE-1
ARM Action Codes				TY2	
Number of Decimals				2	
Trt Treatment	Rate	Appl			
No. Name	Rate	Unit	Code	Plot	
1 RR2 Xtend Soy				101	0.0
UNTREATED				405	0.0
				211	0.0
				307	0.0
Mean =					0.0
2 RR2 Xtend Soy				201	100.0
ROWEL	0.064 lb ai/a	A		411	100.0
MON 76981	1.5 lb ae/a	B		107	100.0
CLASS ACT RIDION	1 % v/v	B		305	100.0
Mean =					100.0
3 RR2 Xtend Soy				301	100.0
ROWEL	0.064 lb ai/a	A		205	100.0
MON 76980	0.5 lb ae/a	A		207	100.0
MON 76981	1.5 lb ae/a	B		111	100.0
CLASS ACT RIDION	1 % v/v	B			
Mean =					100.0
4 RR2 Xtend Soy				401	100.0
ROWEL	0.064 lb ai/a	A		311	100.0
MON 76980	0.5 lb ae/a	A		105	100.0
MON 76981	1.5 lb ae/a	B		407	100.0
WARRANT	1.13 lb ai/a	B			
CLASS ACT RIDION	1 % v/v	B			
Mean =					100.0
5 RR2 Yield Soy				202	0.0
UNTREATED				104	0.0
				410	0.0
				308	0.0
Mean =					0.0
6 RR2 Yield Soy				302	60.0
ROWEL	0.064 lb ai/a	A		404	45.0
ROUNDUP POWERMAX	1.13 lb ae/a	B		110	80.0
N-PAK AMS	5 % v/v	B		208	65.0
Mean =					62.5
7 RR2 Yield Soy				102	95.0
WARRANT	1.13 lb ai/a	A		304	90.0
TRICOR	0.234 lb ai/a	A		408	75.0
ROUNDUP POWERMAX	1.13 lb ae/a	B		210	100.0
N-PAK AMS	5 % v/v	B			
Mean =					90.0

Purdue Weed Science

Xtend Soybean System Compared to Competitor

Trial ID: 16S-CORT-SOY-08 Location: CORTLAND Trial Year: 2016
 Protocol ID: 16S-CORT-SOY-08 Investigator: Dr. Bill Johnson
 Project ID: 2016-01-B7-01 Study Director: Dustin Johnson
 Sponsor Contact: Monsanto-Dan Childs

W Weed	GLXMA	GLXMA	GLXMA	GLXMA
ERICA	BSOY	BSOY	BSOY	BSOY
Erigeron canad>	Glycine max	Glycine max	Glycine max	Glycine max
Canada horsewe>	Soybean	Soybean	Soybean	Soybean
	Oct-26-2016	Oct-26-2016	Oct-27-2016	Oct-27-2016
	PERCEN	YIELD	MOICON	YIELD
	%	kg	%	BU
	1 PLOT	1	1	1
	6	7	8	11
	147 124	147 124	148 125	148 125
	149 DP-1	149 DP-1	150 DP-1	150 DP-1
	144 DE-1	144 DE-1	145 DE-1	145 DE-1
			TY2	
			2	
Pest Type				
Pest Code				
Pest Scientific Name				
Pest Name				
Crop Code				
BBCH Scale				
Crop Scientific Name				
Crop Name				
Rating Date				
Rating Type				
Rating Unit				
Sample Size, Unit				
Number of Subsamples				
SE Group No.				
Days After First/Last Applic.				
Plant-Eval Interval				
Days After Emergence				
ARM Action Codes				
Number of Decimals				
Trt Treatment	Rate	Appl		
No. Name	Rate Unit	Code Plot	6	7
8 RR2 Yield Soy		402		
WARRANT	1.13 lb ai/a A	204	100.0	5.4700
TRICOR	0.234 lb ai/a A	108	95.0	5.6450
ROUNDUP POWERMAX	1.13 lb ae/a B	310	100.0	4.5450
WARRANT ULTRA	1.36 lb ai/a B			13.30
N-PAK AMS	5 % v/v B			13.20
		Mean =	98.8	5.0950
				13.50
				64.85
				53.28
9 LL Soy		103	0.0	2.6600
UNTREATED		312	0.0	1.7300
		406	0.0	1.9900
		209	0.0	2.8100
		Mean =	0.0	2.2975
				14.40
				13.70
				13.80
				14.00
				13.98
				29.07
				53.35
10 LL Soy		303	80.0	4.7750
VALOR SX	0.064 lb ai/a A	409	75.0	5.4250
LIBERTY 280 SL	0.53 lb ai/a B	206	70.0	4.6050
N-PAK AMS	5 % v/v B	112	90.0	5.3700
		Mean =	78.8	5.0438
				13.70
				13.70
				13.50
				13.40
				13.58
				64.16
				53.90
11 LL Soy		403	90.0	5.3500
AUTHORITY MAXX	0.264 lb ai/a A	106	100.0	4.6600
LIBERTY 280 SL	0.53 lb ai/a B	212	70.0	4.6450
N-PAK AMS	5 % v/v B	309	95.0	4.8900
		Mean =	88.8	4.8863
				13.70
				13.70
				13.50
				13.60
				13.63
				62.11
				54.18
12 LL Soy		203	85.0	4.6550
AUTHORITY MAXX	0.264 lb ai/a A	306	90.0	4.7500
LIBERTY 280 SL	0.53 lb ai/a B	109	100.0	4.8250
ZIDUA	0.106 lb ai/a B	412	85.0	4.4100
N-PAK AMS	5 % v/v B			
		Mean =	90.0	4.6600
				13.90
				13.50
				13.50
				13.40
				13.58
				59.27
				54.53

Purdue Weed Science

Xtend Soybean System Compared to Competitor

Trial ID: 16S-CORT-SOY-08 Location: CORTLAND Trial Year: 2016
 Protocol ID: 16S-CORT-SOY-08 Investigator: Dr. Bill Johnson
 Project ID: 2016-01-B7-01 Study Director: Dustin Johnson
 Sponsor Contact: Monsanto-Dan Childs

Pest Type
 W, Weed, G-BYRW7, G-WedStg = Weed or volunteer crop
Pest Code
 ERICA, Erigeron canadensis, = US
Crop Code
 GLXMA, BSOY, Glycine max, = US
Rating Type
 PERCEN = percent
 YIELD = yield
 MOICON = moisture content
 WEITES = weight - test
Rating Unit
 % = percent
 kg = kilogram
 BU = bushel

PLOT = total plot
 A = acre
Plant-Eval Interval
 8 DP-1 = 1 GLXMA May-30-2016
 15 DP-1 = 1 GLXMA May-30-2016
 39 DP-1 = 1 GLXMA May-30-2016
 66 DP-1 = 1 GLXMA May-30-2016
 57 DP-1 = 1 GLXMA May-30-2016
 149 DP-1 = 1 GLXMA May-30-2016
 150 DP-1 = 1 GLXMA May-30-2016
ARM Action Codes
 TY2 = 12.80451*[C7]*(100-[C8])/87

Pest Type					W Weed	W Weed			
Pest Code					ERICA	ERICA			
Pest Scientific Name					Erigeron canad>	Erigeron canad>			
Pest Name					Canada horsewe>	Canada horsewe>			
Crop Code	GLXMA	GLXMA	GLXMA	GLXMA	GLXMA	GLXMA			
BBCH Scale	BSOY	BSOY	BSOY	BSOY	BSOY	BSOY			
Crop Scientific Name	Glycine max	Glycine max	Glycine max	Glycine max	Glycine max	Glycine max			
Crop Name	Soybean	Soybean	Soybean	Soybean	Soybean	Soybean			
Rating Date	Jun-7-2016	Jun-14-2016	Jul-8-2016	Aug-4-2016	Jul-26-2016	Oct-26-2016			
Rating Type	PERCEN	PERCEN	PERCEN	PERCEN	PERCEN	PERCEN			
Rating Unit	%	%	%	%	%	%			
Sample Size, Unit									
Number of Subsamples	1	1	1	1	1	1			
SE Group No.	1	2	3	4	5	6			
Days After First/Last Applic.	6 6	13 13	37 14	64 41	55 32	147 124			
Plant-Eval Interval	8 DP-1	15 DP-1	39 DP-1	66 DP-1	57 DP-1	149 DP-1			
Days After Emergence	3 DE-1	10 DE-1	34 DE-1	61 DE-1	52 DE-1	144 DE-1			
ARM Action Codes									
Number of Decimals									
Trt Treatment	Rate	Appl							
No. Name	Rate	Unit	Code	1	2	3	4	5	6
1 RR2 Xtend Soy UNTREATED				0.0 b	0.0 -	0.0 b	0.0 b	0.0 c	0.0 d
2 RR2 Xtend Soy ROWEL MON 76981 CLASS ACT RIDION	0.064 lb ai/a 1.5 lb ae/a 1 % v/v	A B B		0.0 b	0.0 -	0.0 b	0.0 b	100.0 a	100.0 a
3 RR2 Xtend Soy ROWEL MON 76980 MON 76981 CLASS ACT RIDION	0.064 lb ai/a 0.5 lb ae/a 1.5 lb ae/a 1 % v/v	A A B B		0.0 b	0.0 -	0.0 b	0.0 b	100.0 a	100.0 a
4 RR2 Xtend Soy ROWEL MON 76980 MON 76981 WARRANT CLASS ACT RIDION	0.064 lb ai/a 0.5 lb ae/a 1.5 lb ae/a 1.13 lb ai/a 1 % v/v	A A B B B		0.0 b	0.0 -	0.0 b	0.0 b	98.8 a	100.0 a
5 RR2 Yield Soy UNTREATED				0.0 b	0.0 -	0.0 b	0.0 b	0.0 c	0.0 d

Purdue Weed Science

Xtend Soybean System Compared to Competitor

Trial ID: 16S-CORT-SOY-08
 Protocol ID: 16S-CORT-SOY-08
 Project ID: 2016-01-B7-01

Location: CORTLAND Trial Year: 2016
 Investigator: Dr. Bill Johnson
 Study Director: Dustin Johnson
 Sponsor Contact: Monsanto-Dan Childs

Pest Type					W Weed ERICA Erigeron canad> Canada horsewe>	W Weed ERICA Erigeron canad> Canada horsewe>		
Pest Code								
Pest Scientific Name								
Pest Name								
Crop Code	GLXMA	GLXMA	GLXMA	GLXMA	GLXMA	GLXMA		
BBCH Scale	BSOY	BSOY	BSOY	BSOY	BSOY	BSOY		
Crop Scientific Name	Glycine max	Glycine max	Glycine max	Glycine max	Glycine max	Glycine max		
Crop Name	Soybean	Soybean	Soybean	Soybean	Soybean	Soybean		
Rating Date	Jun-7-2016	Jun-14-2016	Jul-8-2016	Aug-4-2016	Jul-26-2016	Oct-26-2016		
Rating Type	PERCEN	PERCEN	PERCEN	PERCEN	PERCEN	PERCEN		
Rating Unit	%	%	%	%	%	%		
Sample Size, Unit								
Number of Subsamples	1	1	1	1	1	1		
SE Group No.	1	2	3	4	5	6		
Days After First/Last Applic.	6 6	13 13	37 14	64 41	55 32	147 124		
Plant-Eval Interval	8 DP-1	15 DP-1	39 DP-1	66 DP-1	57 DP-1	149 DP-1		
Days After Emergence	3 DE-1	10 DE-1	34 DE-1	61 DE-1	52 DE-1	144 DE-1		
ARM Action Codes								
Number of Decimals								
Trt Treatment No. Name	Rate	Rate	Rate	Rate	Rate	Rate		
	Unit	Unit	Unit	Unit	Unit	Unit		
	Appl Code	Appl Code	Appl Code	Appl Code	Appl Code	Appl Code		
	1	2	3	4	5	6		
6 RR2 Yield Soy ROWEL ROUNDUP POWERMAX N-PAK AMS	0.064 lb ai/a 1.13 lb ae/a 5 % v/v	A B B	0.3 b	0.0 -	8.8 b	0.5 ab	6.3 c	62.5 c
7 RR2 Yield Soy WARRANT TRICOR ROUNDUP POWERMAX N-PAK AMS	1.13 lb ai/a 0.234 lb ai/a 1.13 lb ae/a 5 % v/v	A A B B	0.0 b	0.0 -	4.3 b	0.0 b	47.5 b	90.0 ab
8 RR2 Yield Soy WARRANT TRICOR ROUNDUP POWERMAX WARRANT ULTRA N-PAK AMS	1.13 lb ai/a 0.234 lb ai/a 1.13 lb ae/a 1.36 lb ai/a 5 % v/v	A A B B B	0.0 b	0.0 -	10.0 b	0.3 ab	91.3 a	98.8 a
9 LL Soy UNTREATED			0.0 b	0.0 -	0.0 b	0.0 b	0.0 c	0.0 d
10 LL Soy VALOR SX LIBERTY 280 SL N-PAK AMS	0.064 lb ai/a 0.53 lb ai/a 5 % v/v	A B B	1.5 b	0.0 -	11.3 b	1.0 ab	82.5 a	78.8 b
11 LL Soy AUTHORITY MAXX LIBERTY 280 SL N-PAK AMS	0.264 lb ai/a 0.53 lb ai/a 5 % v/v	A B B	5.5 a	0.0 -	3.8 b	0.3 ab	93.8 a	88.8 ab
12 LL Soy AUTHORITY MAXX LIBERTY 280 SL ZIDUA N-PAK AMS	0.264 lb ai/a 0.53 lb ai/a 0.106 lb ai/a 5 % v/v	A B B B	4.3 a	0.0 -	23.8 a	1.3 a	93.8 a	90.0 ab
LSD P=.05	1.62	.	8.48	0.72	19.78	10.60		
Standard Deviation	1.13	0.00	5.89	0.50	13.75	7.37		
CV	117.84	0.0	114.53	185.78	23.12	10.93		
Bartlett's X2	9.652	0.0	8.297	3.6	48.124	7.431		
P(Bartlett's X2)	0.022*	.	0.141	0.463	0.001*	0.191		
Skewness	2.6011*	.	2.1091*	2.1384*	-0.4925	-0.9353*		
Kurtosis	7.3478*	.	3.8746*	3.333*	-1.7663*	-0.9156		
Replicate F	0.370	0.000	1.301	1.180	1.244	0.547		
Replicate Prob(F)	0.7749	1.0000	0.2905	0.3324	0.3094	0.6539		
Treatment F	11.293	0.000	6.089	2.955	42.907	130.095		
Treatment Prob(F)	0.0001	1.0000	0.0001	0.0078	0.0001	0.0001		

Purdue Weed Science

Xtend Soybean System Compared to Competitor

Trial ID: 16S-CORT-SOY-08 Location: CORTLAND Trial Year: 2016
 Protocol ID: 16S-CORT-SOY-08 Investigator: Dr. Bill Johnson
 Project ID: 2016-01-B7-01 Study Director: Dustin Johnson
 Sponsor Contact: Monsanto-Dan Childs

Trt No.	Treatment Name	Rate	Unit	Appl Code	7	8	9	10
1	RR2 Xtend Soy UNTREATED				4.0988 b	13.85 ab	52.01 b	53.98 ab
2	RR2 Xtend Soy ROWEL MON 76981 CLASS ACT RIDION	0.064 lb ai/a 1.5 lb ae/a 1 % v/v	A B B		5.2563 a	13.33 bc	67.06 a	53.48 ab
3	RR2 Xtend Soy ROWEL MON 76980 MON 76981 CLASS ACT RIDION	0.064 lb ai/a 0.5 lb ae/a 1.5 lb ae/a 1 % v/v	A A B B		5.3625 a	13.38 bc	68.37 a	54.10 ab
4	RR2 Xtend Soy ROWEL MON 76980 MON 76981 WARRANT CLASS ACT RIDION	0.064 lb ai/a 0.5 lb ae/a 1.5 lb ae/a 1.13 lb ai/a 1 % v/v	A A B B B		5.1425 a	13.58 abc	65.41 a	53.98 ab
5	RR2 Yield Soy UNTREATED				3.2550 c	13.65 abc	41.37 c	52.18 b

Purdue Weed Science

Xtend Soybean System Compared to Competitor

Trial ID: 16S-CORT-SOY-08
 Protocol ID: 16S-CORT-SOY-08
 Project ID: 2016-01-B7-01

Location: CORTLAND Trial Year: 2016
 Investigator: Dr. Bill Johnson
 Study Director: Dustin Johnson
 Sponsor Contact: Monsanto-Dan Childs

Trt Treatment No. Name	Rate	Unit	Appl Code	7	8	9	10
6 RR2 Yield Soy ROWEL ROUNDUP POWERMAX N-PAK AMS	0.064 lb ai/a 1.13 lb ae/a 5 % v/v	A B B	A	4.5088 ab	13.33 bc	57.52 ab	53.50 ab
7 RR2 Yield Soy WARRANT TRICOR ROUNDUP POWERMAX N-PAK AMS	1.13 lb ai/a 0.234 lb ai/a 1.13 lb ae/a 5 % v/v	A A B B	A	5.1038 a	13.23 c	65.19 a	53.63 ab
8 RR2 Yield Soy WARRANT TRICOR ROUNDUP POWERMAX WARRANT ULTRA N-PAK AMS	1.13 lb ai/a 0.234 lb ai/a 1.13 lb ae/a 1.36 lb ai/a 5 % v/v	A A B B B	A	5.0950 a	13.50 abc	64.85 a	53.28 ab
9 LL Soy UNTREATED				2.2975 d	13.98 a	29.07 d	53.35 ab
10 LL Soy VALOR SX LIBERTY 280 SL N-PAK AMS	0.064 lb ai/a 0.53 lb ai/a 5 % v/v	A B B	A	5.0438 a	13.58 abc	64.16 a	53.90 ab
11 LL Soy AUTHORITY MAXX LIBERTY 280 SL N-PAK AMS	0.264 lb ai/a 0.53 lb ai/a 5 % v/v	A B B	A	4.8863 a	13.63 abc	62.11 a	54.18 a
12 LL Soy AUTHORITY MAXX LIBERTY 280 SL ZIDUA N-PAK AMS	0.264 lb ai/a 0.53 lb ai/a 0.106 lb ai/a 5 % v/v	A B B B	A	4.6600 ab	13.58 abc	59.27 ab	54.53 a
LSD P=.05				0.57782	0.339	7.371	1.170
Standard Deviation				0.40165	0.236	5.124	0.813
CV				8.81	1.74	8.83	1.52
Bartlett's X2				13.353	17.814	13.25	26.419
P(Bartlett's X2)				0.271	0.086	0.277	0.006*
Skewness				-1.3408*	1.4286*	-1.3343*	-0.8944*
Kurtosis				1.2905	3.9602*	1.2551	0.2401
Replicate F				1.876	10.983	1.960	0.207
Replicate Prob(F)				0.1528	0.0001	0.1392	0.8907
Treatment F				21.274	3.453	21.457	2.185
Treatment Prob(F)				0.0001	0.0028	0.0001	0.0410

Purdue Weed Science

Xtend Soybean System Compared to Competitor

Trial ID: 16S-CORT-SOY-08	Location: CORTLAND Trial Year: 2016
Protocol ID: 16S-CORT-SOY-08	Investigator: Dr. Bill Johnson
Project ID: 2016-01-B7-01	Study Director: Dustin Johnson
	Sponsor Contact: Monsanto-Dan Childs

Pest Type

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

Pest Code

ERICA, Erigeron canadensis, = US

Crop Code

GLXMA, BSOY, Glycine max, = US

Rating Type

PERCEN = percent

YIELD = yield

MOICON = moisture content

WEITES = weight - test

Rating Unit

% = percent

kg = kilogram

BU = bushel

PLOT = total plot

A = acre

Plant-Eval Interval

8 DP-1 = 1 GLXMA May-30-2016

15 DP-1 = 1 GLXMA May-30-2016

39 DP-1 = 1 GLXMA May-30-2016

66 DP-1 = 1 GLXMA May-30-2016

57 DP-1 = 1 GLXMA May-30-2016

149 DP-1 = 1 GLXMA May-30-2016

150 DP-1 = 1 GLXMA May-30-2016

ARM Action Codes

TY2 = $12.80451 * [C7] * (100 - [C8]) / 87$