

Southern Illinois University

Influence of Application Timing and Herbicide Rate on the Efficacy of Soil

Trial ID: 12-DSO-ISA-PPRateTime

Location: DeSoto, IL

Investigator: Bryan Young

General Trial Information

Study Director: Bryan Young
Investigator: Bryan Young **Title:** Professor

Trial Status: F - one-year/final
Initiation Date: 4-2-12

Trial Location

City: De Soto
State/Prov.: IL
Postal Code: 62924
Country: USA

Objectives:

Evaluate the application rate and timing of soil residual herbicides in Roundup Ready soybeans.

Personnel

Study Director: Bryan Young
Investigator: Bryan Young **Title:** Professor
Affiliation: Southern Illinois University
Address: 1205 Lincoln Drive - AG 176 - MC 4415
Location: Carbondale IL
Postal Code: 62901 **E-mail:** bgyoung@siu.edu
Phone No.: 618-453-7679 **Mobile No.:** 618-713-6471

Crop Description

Crop 1: GLXMA Glycine max Soybean
Variety: AG 4005 **Description:** RR
BBCH Scale: BSOY **Planting Date:** 4-29-12
Planting Method: SEEDED **Rate, Unit:** 165000 S/A
Depth, Unit: 2 IN
Row Spacing, Unit: 30 IN

Pest Description

Pest 1 Type: W **Code:** AMATA - Amaranthus rudis Sauer
Common Name: waterhemp, common
Description: glyphosate-resistant waterhemp

Pest 2 Type: W **Code:** GGGAN
Common Name: grasses, annual
Description: Mixture of PANDI and ECHCG

Site and Design

Plot Width, Unit: 10 FT **Site Type:** FIELD field
Plot Length, Unit: 30 FT
Plot Area, Unit: 300 FT² **Tillage Type:** NOTILL no-till
Replications: 3 **Study Design:** RACOB Randomized Complete Block (RCB)

No.	Previous Crop	Year
1.	ZEAMD	2011

Maintenance

No.	Maintenance Treatment Name
1.	N 27 LB/A, P205 69 LB/A, K20 90 LB/A

Soil Description

% Sand: 14 **% OM:** 2.12 **Texture:** SIL SILT LOAM
% Silt: 67 **pH:** 6.9 **Soil Name:** OKAW
% Clay: 19 **CEC:** 12.7

Additional Measured Elements

Element	Quantity	Unit
P1	112	LB/A
K	386	LB/A

Moisture and Weather Conditions

Overall Moisture Conditions: BELNOR below normal
Closest Weather Station: SOUTHERN IL AIRPORT (93810) **Distance, Unit:** 1.5 MI

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Application Description

	A	B	C
Application Date:	4-2-12	4-17-12	4-29-12
Time of Day:	13:00	11:00	14:15
Application Method:	Spray	Spray	Spray
Application Timing:	28DBP	14DBP	0DBP
Application Placement:	BROS0I	BROS0I	BROS0I
Applied By:	LAH	RJW	JRK
Air Temperature, Unit:	89 F	70 F	84 F
% Relative Humidity:	45	52	59
Wind Velocity, Unit:	2 MPH	2 MPH	2 MPH
Wind Direction:	S	NE	N
Dew Presence (Y/N):	N no	N no	N no
Soil Temperature, Unit:	72 F	63 F	70 F
Soil Moisture:	NORMAL	ABONOR	NORMAL
% Cloud Cover:	5	25	100
Next Rain Occurred On:	4-4-12	4-20-12	4-30-12

Crop Stage At Each Application

	A	B	C
Crop 1 Code, BBCH Scale:	GLXMA BSOY	GLXMA BSOY	GLXMA BSOY
Stage Scale Used:	DESC	DESC	DESC
Stage Majority, Percent:	NA	NA	NA

Pest Stage At Each Application

	A	B	C
Pest 1 Code, Type, Scale:	AMATA W DESC	AMATA W DESC	AMATA W DESC
Stage Majority, Percent:	NA	NA	NA
Pest 2 Code, Type, Scale:	GGGAN W DESC	GGGAN W DESC	GGGAN W DESC
Stage Majority, Percent:	NA	NA	NA

Application Equipment

	A	B	C
Appl. Equipment:	CO2 sprayer	CO2 sprayer	CO2 sprayer
Equipment Type:	BACSPR	BACSPR	BACSPR
Operation Pressure, Unit:	30 PSI	30 PSI	30 PSI
Nozzle Type:	XR	XR	XR
Nozzle Size:	8002	8002	8002
Boom Length, Unit:	6.67 FT	6.67 FT	6.67 FT
Spray Volume, Unit:	15 GPA	15 GPA	15 GPA

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Pest Code Crop Code Rating Date Rating Type Rating Unit Rating Timing Trt-Eval Interval							GLXMA 5-20-12 Injury Percent	GLXMA 6-10-12 Injury Percent	GLXMA 7-1-12 Injury Percent
							3 WAP	6 WAP	9 WAP
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Other Rate	Other Unit	Growth Stage	Appl Code	
1	NO RESIDUAL HERB						28DBP A		
2	VALOR XLT	40.3 WG		0.0756 lb ai/a	3.0 oz/a		28DBP A		
3	VALOR XLT	40.3 WG		0.101 lb ai/a	4.0 oz/a		28DBP A		
4	SONIC	70 WG		0.14 lb ai/a	3.2 oz/a		28DBP A		
5	SONIC	70 WG		0.282 lb ai/a	6.45 oz/a		28DBP A		
6	AUTHORITY XL	70 WG		0.175 lb ai/a	4.0 oz/a		28DBP A		
7	AUTHORITY XL	70 WG		0.328 lb ai/a	7.5 oz/a		28DBP A		
8	PREFIX	5.29 EC		1.65 lb ai/a	2.5 pt/a		28DBP A		
9	SHARPEN PROWL H2O	2.85 SC 3.8 CS		0.0223 lb ai/a 1.19 lb ai/a	1.0 fl oz/a 2.5 pt/a		28DBP A 28DBP A		
10	KIH-485	85 WG		0.133 lb ai/a	2.5 oz/a		28DBP A		
11	NO RESIDUAL HERB						14DBP B		
12	VALOR XLT	40.3 WG		0.0756 lb ai/a	3.0 oz/a		14DBP B		
13	VALOR XLT	40.3 WG		0.101 lb ai/a	4.0 oz/a		14DBP B		
14	SONIC	70 WG		0.14 lb ai/a	3.2 oz/a		14DBP B		
15	SONIC	70 WG		0.282 lb ai/a	6.45 oz/a		14DBP B		
16	AUTHORITY XL	70 WG		0.175 lb ai/a	4.0 oz/a		14DBP B		
17	AUTHORITY XL	70 WG		0.328 lb ai/a	7.5 oz/a		14DBP B		
18	PREFIX	5.29 EC		1.65 lb ai/a	2.5 pt/a		14DBP B		
19	SHARPEN PROWL H2O	2.85 SC 3.8 CS		0.0223 lb ai/a 1.19 lb ai/a	1.0 fl oz/a 2.5 pt/a		14DBP B 14DBP B		
20	KIH-485	85 WG		0.133 lb ai/a	2.5 oz/a		14DBP B		
21	NO RESIDUAL HERB						0DBP C		
22	VALOR XLT	40.3 WG		0.0756 lb ai/a	3.0 oz/a		0DBP C		
23	VALOR XLT	40.3 WG		0.101 lb ai/a	4.0 oz/a		0DBP C		
24	SONIC	70 WG		0.14 lb ai/a	3.2 oz/a		0DBP C		
25	SONIC	70 WG		0.282 lb ai/a	6.45 oz/a		0DBP C		
26	AUTHORITY XL	70 WG		0.175 lb ai/a	4.0 oz/a		0DBP C		

Means followed by same letter 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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Pest Code								GLXMA	GLXMA	GLXMA
Crop Code								5-20-12	6-10-12	7-1-12
Rating Date								Injury	Injury	Injury
Rating Type								Percent	Percent	Percent
Rating Unit										
Rating Timing										
Trt-Eval Interval								3 WAP	6 WAP	9 WAP
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Unit Unit	Other Rate	Other Rate	Growth Stage	Appl Code	
27	AUTHORITY XL	70	WG	0.328	lb ai/a	7.5	oz/a	0DBP	C	2 b
28	PREFIX	5.29	EC	1.65	lb ai/a	2.5	pt/a	0DBP	C	3 a
29	SHARPEN	2.85	SC	0.0223	lb ai/a	1.0	fl oz/a	0DBP	C	0 c
	PROWL H2O	3.8	CS	1.19	lb ai/a	2.5	pt/a	0DBP	C	0 a
30	KIH-485	85	WG	0.133	lb ai/a	2.5	oz/a	0DBP	C	0 c
LSD (P=.05)								1.5	0.0	0.0
Standard Deviation								0.9	0.0	0.0
CV								401.24	0.0	0.0
Replicate F								2.446	0.000	0.000
Replicate Prob(F)								0.0956	1.0000	1.0000
Treatment F								1.976	0.000	0.000
Treatment Prob(F)								0.0138	1.0000	1.0000

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Pest Code Crop Code Rating Date Rating Type Rating Unit Rating Timing Trt-Eval Interval							GGGAN	GGGAN	GGGAN	GGGAN
							4-29-12 Control Percent	5-20-12 Control Percent	6-10-12 Control Percent	7-1-12 Control Percent
							0 WAP	3 WAP	6 WAP	9 WAP
Trt No.	Treatment Name	Form Conc	Form Type	Rate	Other Rate	Other Rate Unit	Growth Stage	Appl Code		
1	NO RESIDUAL HERB						28DBP A		0 c	0 g
2	VALOR XLT	40.3 WG		0.0756 lb ai/a	3.0 oz/a		28DBP A		99 a	94 ab
3	VALOR XLT	40.3 WG		0.101 lb ai/a	4.0 oz/a		28DBP A		97 ab	97 a
4	SONIC	70 WG		0.14 lb ai/a	3.2 oz/a		28DBP A		89 b	82 cd
5	SONIC	70 WG		0.282 lb ai/a	6.45 oz/a		28DBP A		94 ab	92 ab
6	AUTHORITY XL	70 WG		0.175 lb ai/a	4.0 oz/a		28DBP A		90 b	95 a
7	AUTHORITY XL	70 WG		0.328 lb ai/a	7.5 oz/a		28DBP A		99 a	97 a
8	PREFIX	5.29 EC		1.65 lb ai/a	2.5 pt/a		28DBP A		96 ab	63 f
9	SHARPEN PROWL H2O	2.85 SC 3.8 CS		0.0223 lb ai/a 1.19 lb ai/a	1.0 fl oz/a 2.5 pt/a		28DBP A 28DBP A		98 a	73 de
10	KIH-485	85 WG		0.133 lb ai/a	2.5 oz/a		28DBP A		99 a	72 ef
11	NO RESIDUAL HERB						14DBP B		0 c	0 g
12	VALOR XLT	40.3 WG		0.0756 lb ai/a	3.0 oz/a		14DBP B		99 a	96 a
13	VALOR XLT	40.3 WG		0.101 lb ai/a	4.0 oz/a		14DBP B		99 a	94 ab
14	SONIC	70 WG		0.14 lb ai/a	3.2 oz/a		14DBP B		99 a	89 abc
15	SONIC	70 WG		0.282 lb ai/a	6.45 oz/a		14DBP B		98 a	92 ab
16	AUTHORITY XL	70 WG		0.175 lb ai/a	4.0 oz/a		14DBP B		98 a	96 a
17	AUTHORITY XL	70 WG		0.328 lb ai/a	7.5 oz/a		14DBP B		99 a	97 a
18	PREFIX	5.29 EC		1.65 lb ai/a	2.5 pt/a		14DBP B		99 a	90 abc
19	SHARPEN PROWL H2O	2.85 SC 3.8 CS		0.0223 lb ai/a 1.19 lb ai/a	1.0 fl oz/a 2.5 pt/a		14DBP B 14DBP B		98 a	89 abc
20	KIH-485	85 WG		0.133 lb ai/a	2.5 oz/a		14DBP B		99 a	90 abc
21	NO RESIDUAL HERB						0DBP C			0 g
22	VALOR XLT	40.3 WG		0.0756 lb ai/a	3.0 oz/a		0DBP C			95 a
23	VALOR XLT	40.3 WG		0.101 lb ai/a	4.0 oz/a		0DBP C			96 a
24	SONIC	70 WG		0.14 lb ai/a	3.2 oz/a		0DBP C			91 ab
25	SONIC	70 WG		0.282 lb ai/a	6.45 oz/a		0DBP C			96 a
26	AUTHORITY XL	70 WG		0.175 lb ai/a	4.0 oz/a		0DBP C			94 ab

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Pest Code										GGGAN	GGGAN	GGGAN	GGGAN
Crop Code													
Rating Date										4-29-12	5-20-12	6-10-12	7-1-12
Rating Type										Control	Control	Control	Control
Rating Unit										Percent	Percent	Percent	Percent
Rating Timing													
Trt-Eval Interval										0 WAP	3 WAP	6 WAP	9 WAP
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Unit Unit	Other Rate	Other Rate	Growth Stage	Appl Code				
27	AUTHORITY XL	70	WG	0.328	lb ai/a	7.5	oz/a	0DBP	C		96 a	95 a	94 a
28	PREFIX	5.29	EC	1.65	lb ai/a	2.5	pt/a	0DBP	C		91 ab	57 ef	43 fg
29	SHARPEN	2.85	SC	0.0223	lb ai/a	1.0	fl oz/a	0DBP	C		85 bc	60 ef	50 efg
	PROWL H2O	3.8	CS	1.19	lb ai/a	2.5	pt/a	0DBP	C				
30	KIH-485	85	WG	0.133	lb ai/a	2.5	oz/a	0DBP	C		93 ab	77 bcd	62 def
LSD (P=.05)										8.1	9.1	15.9	21.8
Standard Deviation										4.9	5.6	9.7	13.4
CV										5.62	6.84	14.43	22.06
Replicate F										0.363	3.011	2.430	0.292
Replicate Prob(F)										0.6981	0.0570	0.0969	0.7482
Treatment F										112.021	79.920	29.129	15.220
Treatment Prob(F)										0.0001	0.0001	0.0001	0.0001

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Pest Code Crop Code Rating Date Rating Type Rating Unit Rating Timing Trt-Eval Interval							AMATA-HR 4-29-12 Control Percent 0 WAP	AMATA-HR 5-20-12 Control Percent 3 WAP	AMATA-HR 6-10-12 Control Percent 6 WAP	AMATA-HR 7-1-12 Control Percent 9 WAP
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Other Rate	Other Rate Unit	Growth Stage	Appl Code		
1	NO RESIDUAL HERB						28DBP A		0 c	0 i
2	VALOR XLT	40.3 WG		0.0756 lb ai/a	3.0 oz/a		28DBP A		99 a	84 ef
3	VALOR XLT	40.3 WG		0.101 lb ai/a	4.0 oz/a		28DBP A		99 a	86 ef
4	SONIC	70 WG		0.14 lb ai/a	3.2 oz/a		28DBP A		99 a	80 f
5	SONIC	70 WG		0.282 lb ai/a	6.45 oz/a		28DBP A		99 a	96 ab
6	AUTHORITY XL	70 WG		0.175 lb ai/a	4.0 oz/a		28DBP A		99 a	89 cde
7	AUTHORITY XL	70 WG		0.328 lb ai/a	7.5 oz/a		28DBP A		99 a	97 ab
8	PREFIX	5.29 EC		1.65 lb ai/a	2.5 pt/a		28DBP A		99 a	81 f
9	SHARPEN PROWL H2O	2.85 SC 3.8 CS		0.0223 lb ai/a 1.19 lb ai/a	1.0 fl oz/a 2.5 pt/a		28DBP A 28DBP A		98 b	48 h
10	KIH-485	85 WG		0.133 lb ai/a	2.5 oz/a		28DBP A		99 a	60 g
11	NO RESIDUAL HERB						14DBP B		0 c	0 i
12	VALOR XLT	40.3 WG		0.0756 lb ai/a	3.0 oz/a		14DBP B		99 a	93 a-d
13	VALOR XLT	40.3 WG		0.101 lb ai/a	4.0 oz/a		14DBP B		99 a	94 abc
14	SONIC	70 WG		0.14 lb ai/a	3.2 oz/a		14DBP B		99 a	91 b-e
15	SONIC	70 WG		0.282 lb ai/a	6.45 oz/a		14DBP B		99 a	97 ab
16	AUTHORITY XL	70 WG		0.175 lb ai/a	4.0 oz/a		14DBP B		99 a	96 ab
17	AUTHORITY XL	70 WG		0.328 lb ai/a	7.5 oz/a		14DBP B		99 a	98 a
18	PREFIX	5.29 EC		1.65 lb ai/a	2.5 pt/a		14DBP B		99 a	96 ab
19	SHARPEN PROWL H2O	2.85 SC 3.8 CS		0.0223 lb ai/a 1.19 lb ai/a	1.0 fl oz/a 2.5 pt/a		14DBP B 14DBP B		99 a	87 def
20	KIH-485	85 WG		0.133 lb ai/a	2.5 oz/a		14DBP B		99 a	94 abc
21	NO RESIDUAL HERB						0DBP C			0 i
22	VALOR XLT	40.3 WG		0.0756 lb ai/a	3.0 oz/a		0DBP C			97 ab
23	VALOR XLT	40.3 WG		0.101 lb ai/a	4.0 oz/a		0DBP C			98 a
24	SONIC	70 WG		0.14 lb ai/a	3.2 oz/a		0DBP C			95 abc
25	SONIC	70 WG		0.282 lb ai/a	6.45 oz/a		0DBP C			99 a
26	AUTHORITY XL	70 WG		0.175 lb ai/a	4.0 oz/a		0DBP C			97 ab

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Pest Code								AMATA-HR	AMATA-HR	AMATA-HR	AMATA-HR
Crop Code								4-29-12	5-20-12	6-10-12	7-1-12
Rating Date								Control	Control	Control	Control
Rating Type								Percent	Percent	Percent	Percent
Rating Unit											
Rating Timing											
Trt-Eval Interval								0 WAP	3 WAP	6 WAP	9 WAP
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Unit Unit	Other Rate	Other Rate	Growth Stage	Appl Code		
27	AUTHORITY XL	70	WG	0.328	lb ai/a	7.5	oz/a	0DBP	C		
										99 a	97 a
28	PREFIX	5.29	EC	1.65	lb ai/a	2.5	pt/a	0DBP	C		
										98 a	94 a
29	SHARPEN	2.85	SC	0.0223	lb ai/a	1.0	fl oz/a	0DBP	C		
	PROWL H2O	3.8	CS	1.19	lb ai/a	2.5	pt/a	0DBP	C		
										95 abc	82 bcd
30	KIH-485	85	WG	0.133	lb ai/a	2.5	oz/a	0DBP	C		
										96 ab	91 ab
LSD (P=.05)								0.9	6.7	11.1	12.7
Standard Deviation								0.6	4.1	6.8	7.8
CV								0.62	5.03	9.89	12.25
Replicate F								1.688	1.925	0.080	0.179
Replicate Prob(F)								0.1985	0.1551	0.9231	0.8362
Treatment F								9076.044	158.961	55.476	40.515
Treatment Prob(F)								0.0001	0.0001	0.0001	0.0001

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Trial Comments

1. Protocol: ISA.
2. Ratings: CI/WC at 0, 3, 6, and 9 WAP. Photos at all evaluation timings. This study is NOT yielded. Describe crop injury symptoms and rate separately (chlorosis, necrosis, stunting) if severe enough.
3. Plot area should be no-till and have a blanket burndown at 28 DBP on the entire site.
Blanket application of Intimidator Plus (1.5 qt/) plus 2,4-D LV4 (1 pt/A) plus AMS (17 lb/100 gal) was applied on 4-2-12.
If weeds are present in plots receiving the B+C applications, a foliar burndown herbicide should also be used (10 ft wide).
Blanket trial area with glyphosate plus AMS after the 9 WAP evaluation if needed.
4. Rainfall following the 28DBP application was approximately 0.7 inch over the next two days and an additional 0.98 inch within the next 14 days.
Rainfall following the 14DBP application was approximately 0.27 inch with 5 days and an additional 0.6 inch within the next 14 days.
Rainfall following the 0DBP application was approximately 0.5 inch the next day and an additional 0.25 inch 7 days later.
5. AMATA-HR = Herbicide-resistant waterhemp (glyphosate).
GGGAN = Annual grasses including PANDI (fall panicum) and ECHCG (barnyardgrass).
6. Not harvested.