

Influence of Application Timing and Herbicide Rate on the Efficacy of Soil Residual Herbicides.

Trial ID: 11-DSO-ISA-PPrateTime Location: DeSoto, IL

Investigator: Bryan Young, Professor, Southern Illinois University, bgyoung@siu.edu
City State Zip Country: De Soto IL 62924 USA
Trial Status: FINAL **Initiation Date:** 4-5-11

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

Crop 1: GLXMA Soybean **Variety:** AG 4005 **Description:** RR
Planting Method: SEEDED **Planting Date:** 5-20-11
Rate, Unit: 75 LB/A **Depth, Unit:** 1.0 IN
Row Spacing, Unit: 30 IN

Pest 1 Type: W **Code:** AMATA *Amaranthus rudis* Sauer waterhemp, common
Pest Description: glyphosate-resistant waterhemp
Pest 2 Type: W **Code:** PANDI *Panicum dichotomiflorum* Michx. panicum, fall

Plot Width, Unit: 10 FT **Site Type:** FIELD
Plot Length, Unit: 30 FT **Tillage Type:** NO-TILL
Replications: 3 **Study Design:** Randomized Complete Block

Prior Crops, Year
 1. ZEAMD 2010

Field Prep./Maintenance: N 0 LB/A, P205 0 LB/A, K20 0 LB/A

% Sand: 13.2 **% OM:** 2.4 **Texture:** SILT LOAM
% Silt: 65.5 **pH:** 6.6 **Soil Name:** OKAW
% Clay: 21.3 **CEC:** 12.5 **Fert. Level:** P1 40 LB/A, K 238 LB/A

Application Description

	A	B	C
Application Date:	4-5-11	4-20-11	5-20-11
Time of Day:	16:00	14:30	14:00
Application Method:	Spray	Spray	Spray
Application Timing:	28DBP	14DBP	0DBP
Application Placement:	BROS0I	BROS0I	BROS0I
Applied By:	LAH	LAH	LAH
Air Temperature, Unit:	70 F	55 F	84 F
% Relative Humidity:	25	41	50
Wind Velocity, Unit:	2 MPH	2 MPH	2 MPH
Wind Direction:	N	W	S
Dew Presence (Y/N):	N	N	N
Soil Temperature, Unit:	52 F	62 F	74 F
Soil Moisture:	ABONOR	ABONOR	NORMAL
% Cloud Cover:	0	65	100

Crop stage at application: 5-4-11 20-4-11 20-5-11
 NA NA NA

Pest Stage At Each Application

	4-5-11	4-20-11	5-20-11
Application Date:	4-5-11	4-20-11	5-20-11
Weed Code:	AMATA	AMATA	AMATA
Stage Majority (leaves):	NA	NA	NA
Weed Code:	PANDI	PANDI	PANDI
Stage Majority (leaves):	NA	NA	NA

Application Equipment

	A	B	C
Appl. Equipment:	CO2 sprayer	CO2 sprayer	CO2 sprayer
Operating Pressure:	30 PSI	30 PSI	30 PSI
Nozzle Type:	Flat fan	Flat fan	Flat fan
Nozzle Size:	XR 8002	XR 8002	XR 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 Data Type	Rating Unit	Rating Timing	Trt-Eval Interval	AMATA-HR									
							GLXMA 6-10-11 Injury Percent 3 WAP	GLXMA 7-1-11 Injury Percent 6 WAP	GLXMA 7-22-11 Injury Percent 9 WAP	AMATA-HR 5-20-11 Control Percent 0 WAP	AMATA-HR 6-10-11 Control Percent 3 WAP	AMATA-HR 7-1-11 Control Percent 6 WAP	AMATA-HR 7-22-11 Control Percent 9 WAP			
Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Other Rate	Other Rate Unit	Growth Stage	Appl Code							
1	NO RESIDUAL HERB							28DBP	A	0 d	0 b	0 a	0 f	0 k	0 g	0 g
2	VALOR XLT	40.3	WG			3.0	oz/a	28DBP	A	0 d	0 b	0 a	93 a	62 c-f	37 cde	7 g
2	VALOR SX	51	WG	0.056	lb ai/a			28DBP	A							
2	CLASSIC	25	WG	0.0194	lb ai/a			28DBP	A							
3	VALOR XLT	40.3	WG			4.0	oz/a	28DBP	A	5 abc	0 b	0 a	98 a	78 b	50 bc	7 g
3	VALOR SX	51	WG	0.075	lb ai/a			28DBP	A							
3	CLASSIC	25	WG	0.0258	lb ai/a			28DBP	A							
4	SONIC	70	WG	0.14	lb ai/a	3.2	oz/a	28DBP	A	0 d	0 b	0 a	68 cd	50 fg	43 cde	13 g
5	SONIC	70	WG	0.282	lb ai/a	6.45	oz/a	28DBP	A	2 cd	0 b	0 a	50 d	37 gh	37 cde	3 g
6	AUTHORITY XL	70	WG	0.175	lb ai/a	4.0	oz/a	28DBP	A	2 cd	0 b	0 a	87 abc	55 ef	43 cde	2 g
7	AUTHORITY XL	70	WG	0.328	lb ai/a	7.5	oz/a	28DBP	A	0 d	0 b	0 a	95 a	78 b	50 bc	10 g
8	PREFIX	5.29	EC	1.65	lb ai/a	2.5	pt/a	28DBP	A	0 d	0 b	0 a	12 ef	23 hi	27 c-g	15 fg
9	SHARPEN	2.85	SC	0.0223	lb ai/a	1.0	fl oz/a	28DBP	A	2 cd	0 b	0 a	50 d	37 gh	23 c-g	0 g
9	PROWL H2O	3.8	CS	1.19	lb ai/a	2.5	pt/a	28DBP	A							
10	KIH-485	85	WG	0.133	lb ai/a	2.5	oz/a	28DBP	A	2 cd	0 b	0 a	22 e	18 ij	17 efg	0 g
11	NO RESIDUAL HERB							14DBP	B	0 d	0 b	0 a	0 f	0 k	0 g	0 g
12	VALOR XLT	40.3	WG			3.0	oz/a	14DBP	B	0 d	0 b	0 a	97 a	67 b-e	40 cde	0 g
12	VALOR SX	51	WG	0.056	lb ai/a			14DBP	B							
12	CLASSIC	25	WG	0.0194	lb ai/a			14DBP	B							
13	VALOR XLT	40.3	WG			4.0	oz/a	14DBP	B	0 d	0 b	0 a	91 ab	76 bc	47 cd	0 g
13	VALOR SX	51	WG	0.075	lb ai/a			14DBP	B							
13	CLASSIC	25	WG	0.0258	lb ai/a			14DBP	B							
14	SONIC	70	WG	0.14	lb ai/a	3.2	oz/a	14DBP	B	0 d	0 b	0 a	70 bcd	50 fg	33 c-f	3 g
15	SONIC	70	WG	0.282	lb ai/a	6.45	oz/a	14DBP	B	3 bcd	0 b	0 a	95 a	77 bc	75 ab	17 fg
16	AUTHORITY XL	70	WG	0.175	lb ai/a	4.0	oz/a	14DBP	B	0 d	0 b	0 a	88 abc	55 ef	22 d-g	0 g
17	AUTHORITY XL	70	WG	0.328	lb ai/a	7.5	oz/a	14DBP	B	0 d	0 b	0 a	90 ab	71 bcd	25 c-g	0 g
18	PREFIX	5.29	EC	1.65	lb ai/a	2.5	pt/a	14DBP	B	0 d	0 b	0 a	13 ef	7 jk	17 efg	10 g
19	SHARPEN	2.85	SC	0.0223	lb ai/a	1.0	fl oz/a	14DBP	B	0 d	0 b	0 a	78 abc	60 def	48 bcd	0 g
19	PROWL H2O	3.8	CS	1.19	lb ai/a	2.5	pt/a	14DBP	B							
20	KIH-485	85	WG	0.133	lb ai/a	2.5	oz/a	14DBP	B	0 d	0 b	0 a	13 ef	7 jk	7 fg	0 g
21	NO RESIDUAL HERB							0DBP	C	0 d	0 b	0 a		0 k	0 g	0 g
22	VALOR XLT	40.3	WG			3.0	oz/a	0DBP	C	0 d	0 b	0 a		99 a	93 a	53 b-e
22	VALOR SX	51	WG	0.056	lb ai/a			0DBP	C							
22	CLASSIC	25	WG	0.0194	lb ai/a			0DBP	C							
23	VALOR XLT	40.3	WG			4.0	oz/a	0DBP	C	6 ab	0 b	0 a		99 a	93 a	50 cde
23	VALOR SX	51	WG	0.075	lb ai/a			0DBP	C							
23	CLASSIC	25	WG	0.0258	lb ai/a			0DBP	C							
24	SONIC	70	WG	0.14	lb ai/a	3.2	oz/a	0DBP	C	2 cd	0 b	0 a		98 a	90 a	42 de
25	SONIC	70	WG	0.282	lb ai/a	6.45	oz/a	0DBP	C	5 abc	0 b	0 a		99 a	97 a	90 a
26	AUTHORITY XL	70	WG	0.175	lb ai/a	4.0	oz/a	0DBP	C	1 d	1 a	0 a		99 a	97 a	63 bcd
27	AUTHORITY XL	70	WG	0.328	lb ai/a	7.5	oz/a	0DBP	C	8 a	1 a	0 a		99 a	96 a	71 abc
28	PREFIX	5.29	EC	1.65	lb ai/a	2.5	pt/a	0DBP	C	2 cd	0 b	0 a		99 a	97 a	63 bcd

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Pest Code	Crop Code	GLXMA	GLXMA	GLXMA	AMATA-HR	AMATA-HR	AMATA-HR	AMATA-HR
Rating Date	Rating Data Type	6-10-11	7-1-11	7-22-11	5-20-11	6-10-11	7-1-11	7-22-11
Rating Unit	Rating Timing	Injury	Injury	Injury	Control	Control	Control	Control
Trt-Eval Interval		Percent	Percent	Percent	Percent	Percent	Percent	Percent
		3 WAP	6 WAP	9 WAP	0 WAP	3 WAP	6 WAP	9 WAP

Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Other Rate	Other Rate Unit	Growth Stage	Appl Code													
29	SHARPEN	2.85	SC	0.0223	lb ai/a	1.0	fl oz/a	0DBP	C	3	bcd	0	b	0	a		96	a	92	a	76	ab
29	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	0	d	0	b	0	a		99	a	93	a	37	ef
LSD (P=.05)										3.4	0.6	0.0		21.2	15.4	28.0	22.8					
Replicate F										4.894	1.952	0.000		0.061	0.635	0.292	0.786					
Replicate Prob(F)										0.0109	0.1514	1.0000		0.9412	0.5334	0.7480	0.4607					
Treatment F										2.950	0.983	0.000		24.639	41.334	11.735	12.174					
Treatment Prob(F)										0.0002	0.5073	1.0000		0.0001	0.0001	0.0001	0.0001					

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

Influence of Application Timing and Herbicide Rate on the Efficacy of Soil Residual Herbicides.

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Pest Code		PANDI				PANDI							
Crop Code		PANDI				PANDI							
Rating Date		5-20-11		6-10-11		7-1-11		7-22-11					
Rating Data Type		Control		Control		Control		Control					
Rating Unit		Percent		Percent		Percent		Percent					
Rating Timing		0 WAP		3 WAP		6 WAP		9 WAP					
Trt-Eval Interval													
Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Other Rate	Other Rate Unit	Growth Stage	Appl Code				
1	NO RESIDUAL HERB							28DBP A		0 g	0 i	0 k	0 d
2	VALOR XLT	40.3	WG			3.0	oz/a	28DBP A		85 ab	82 abc	75 a-e	10 d
2	VALOR SX	51	WG	0.056	lb ai/a			28DBP A					
2	CLASSIC	25	WG	0.0194	lb ai/a			28DBP A					
3	VALOR XLT	40.3	WG			4.0	oz/a	28DBP A		96 ab	88 ab	80 a-d	7 d
3	VALOR SX	51	WG	0.075	lb ai/a			28DBP A					
3	CLASSIC	25	WG	0.0258	lb ai/a			28DBP A					
4	SONIC	70	WG	0.14	lb ai/a	3.2	oz/a	28DBP A		30 ef	20 hi	17 ijk	0 d
5	SONIC	70	WG	0.282	lb ai/a	6.45	oz/a	28DBP A		82 ab	60 def	43 f-i	0 d
6	AUTHORITY XL	70	WG	0.175	lb ai/a	4.0	oz/a	28DBP A		15 fg	37 gh	37 g-j	0 d
7	AUTHORITY XL	70	WG	0.328	lb ai/a	7.5	oz/a	28DBP A		50 de	70 b-f	60 b-g	12 d
8	PREFIX	5.29	EC	1.65	lb ai/a	2.5	pt/a	28DBP A		7 fg	3 i	3 k	0 d
9	SHARPEN	2.85	SC	0.0223	lb ai/a	1.0	fl oz/a	28DBP A		89 ab	78 a-d	75 a-e	3 d
9	PROWL H2O	3.8	CS	1.19	lb ai/a	2.5	pt/a	28DBP A					
10	KIH-485	85	WG	0.133	lb ai/a	2.5	oz/a	28DBP A		77 abc	53 efg	47 e-h	3 d
11	NO RESIDUAL HERB							14DBP B		0 g	0 i	0 k	0 d
12	VALOR XLT	40.3	WG			3.0	oz/a	14DBP B		97 a	85 ab	67 a-f	3 d
12	VALOR SX	51	WG	0.056	lb ai/a			14DBP B					
12	CLASSIC	25	WG	0.0194	lb ai/a			14DBP B					
13	VALOR XLT	40.3	WG			4.0	oz/a	14DBP B		92 ab	78 a-d	60 b-g	8 d
13	VALOR SX	51	WG	0.075	lb ai/a			14DBP B					
13	CLASSIC	25	WG	0.0258	lb ai/a			14DBP B					
14	SONIC	70	WG	0.14	lb ai/a	3.2	oz/a	14DBP B		70 bcd	50 fg	40 f-j	3 d
15	SONIC	70	WG	0.282	lb ai/a	6.45	oz/a	14DBP B		53 cde	37 gh	17 ijk	0 d
16	AUTHORITY XL	70	WG	0.175	lb ai/a	4.0	oz/a	14DBP B		81 ab	78 a-d	52 d-h	3 d
17	AUTHORITY XL	70	WG	0.328	lb ai/a	7.5	oz/a	14DBP B		70 bcd	82 abc	80 a-d	8 d
18	PREFIX	5.29	EC	1.65	lb ai/a	2.5	pt/a	14DBP B		15 fg	15 i	12 jk	0 d
19	SHARPEN	2.85	SC	0.0223	lb ai/a	1.0	fl oz/a	14DBP B		86 ab	73 a-e	57 c-g	3 d
19	PROWL H2O	3.8	CS	1.19	lb ai/a	2.5	pt/a	14DBP B					
20	KIH-485	85	WG	0.133	lb ai/a	2.5	oz/a	14DBP B		94 ab	82 abc	63 a-g	3 d
21	NO RESIDUAL HERB							0DBP C			0 i	0 k	0 d
22	VALOR XLT	40.3	WG			3.0	oz/a	0DBP C			77 a-d	76 a-e	50 c
22	VALOR SX	51	WG	0.056	lb ai/a			0DBP C					
22	CLASSIC	25	WG	0.0194	lb ai/a			0DBP C					
23	VALOR XLT	40.3	WG			4.0	oz/a	0DBP C			90 ab	81 a-d	63 abc
23	VALOR SX	51	WG	0.075	lb ai/a			0DBP C					
23	CLASSIC	25	WG	0.0258	lb ai/a			0DBP C					
24	SONIC	70	WG	0.14	lb ai/a	3.2	oz/a	0DBP C			63 c-f	58 b-g	43 c
25	SONIC	70	WG	0.282	lb ai/a	6.45	oz/a	0DBP C			83 abc	78 a-d	73 ab
26	AUTHORITY XL	70	WG	0.175	lb ai/a	4.0	oz/a	0DBP C			87 ab	87 ab	63 abc
27	AUTHORITY XL	70	WG	0.328	lb ai/a	7.5	oz/a	0DBP C			92 a	92 a	80 a
28	PREFIX	5.29	EC	1.65	lb ai/a	2.5	pt/a	0DBP C			86 ab	73 a-e	48 c

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Pest Code	PANDI	PANDI	PANDI	PANDI
Crop Code				
Rating Date	5-20-11	6-10-11	7-1-11	7-22-11
Rating Data Type	Control	Control	Control	Control
Rating Unit	Percent	Percent	Percent	Percent
Rating Timing	0 WAP	3 WAP	6 WAP	9 WAP
Trt-Eval Interval				

Trt No.	Treatment Name	Form Conc	Form Type	Form Rate	Rate Unit	Other Rate	Other Rate Unit	Growth Stage	Appl Code				
29	SHARPEN	2.85	SC	0.0223	lb ai/a	1.0	fl oz/a	0DBP	C		77 a-d	27 h-k	17 d
29	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		85 ab	82 abc	55 bc
LSD (P=.05)										26.3	20.1	29.4	20.4
Replicate F										0.261	0.227	0.835	1.940
Replicate Prob(F)										0.7713	0.7974	0.4389	0.1530
Treatment F										14.591	19.176	8.020	13.156
Treatment Prob(F)										0.0001	0.0001	0.0001	0.0001

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

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 of Roundup PowerMax (22 fl oz/A) + 2,4-D (1 pt/A) at 28 DBP on the entire site.
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 after the 9 WAP evaluation if needed.
4. Blanket application of Roundup WeatherMax (22 fl oz/A) + 2,4-D LV4 (1 pt/A) + NPAK AMS (2.5 %v/v) was applied to all plots on 4-2-11.
5. Blanket application of Gramoxone Inteon (2.5 pt/A) + Superb HC (0.5 %v/v) was applied 10 feet wide to "B" timing plots on 4-21-11.
6. The planned May 1 planting date was delayed until May 20 due to wet soil conditions.
7. WAP = Weeks after planting.
Ratings at 0 weeks after planting were 45, 30, and 0 days after the 28DBP, 14DBP, and ODBP applications, respectively.
Ratings at 3 weeks after planting were 66, 51, and 21 days after the 28DBP, 14DBP, and ODBP applications, respectively.
Ratings at 6 weeks after planting were 87, 72, and 42 days after the 28DBP, 14DBP, and ODBP applications, respectively.
Ratings at 9 weeks after planting were 108, 93, and 63 days after the 28DBP, 14DBP, and ODBP applications, respectively.
8. Rainfall (weekly totals) for the three weeks following application A were 1.1, 1.03, and 8.68 inch.
Rainfall (weekly totals) for the three weeks following application B were 10.58, 3.74, and 0.3 inch.
Rainfall (weekly totals) for the three weeks following application C were 2.18, 0, and 0 inch.