

Time of Day Effects with Glyphosate.

02-6A-E150

OBJECTIVE: Determine the influence of the time of day glyphosate applications are performed on herbicide efficacy with different adjuvants.

SUMMARY: Weed control at the 9 PM application timing was significantly reduced for all species compared to all other timings ranging from 6 AM to 6 PM. To determine if time of day effects could be overcome, different adjuvant systems were evaluated at each application timing. However, the adjuvant systems tested at the 9 PM application timing did not show significant gains in weed control for any weed species. Therefore, it has not been shown that reduced weed control at late day application timings can be overcome by the use of the adjuvants systems tested.

HERBICIDES/ADJUVANTS/APPLICATION TIMES	WEEDS	CROP
ROUNDUP ULTRA MAX 3.7 SL PX331 100 LIQ RUSA 703 100 DRY 6:00 AM 9:00 AM 12:00 PM 3:00 PM 6:00 PM 9:00 PM	cocklebur, common foxtail, giant velvetleaf waterhemp, common	soybean

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SOUTHERN ILLINOIS UNIVERSITY

Time of Day Effects with Glyphosate.

Project Code: 02-6A-E150 Location: Belleville Research Center

Investigator: Bryan Young, Assistant Professor, Southern Illinois University

City State Zip Country: Belleville IL 62221 USA
 Trial Status: Final Updated: 10-31-02

Objective:

Determine the influence of the time of day glyphosate applications are performed on herbicide efficacy with different adjuvants.

Weed Code	Common Name	Scientific Name
1. SETFA	foxtail, giant	Setaria faberi Herrm.
2. XANST	cocklebur, common	Xanthium strumarium L.
3. AMATA	waterhemp, common	Amaranthus rudis Sauer
4. ABUTH	velvetleaf	Abutilon theophrasti Medicus

Crop 1:	GLXMA soybean	Variety:	Asgrow 4602 RR
Planting Method:	Seeded	Planting Date:	6-3-02
Rate:	75 lb/A	Depth:	1.0 IN
Row Spacing:	30 IN		

Plot Width, Unit:	10 FT	Plot Length, Unit:	25 FT	Reps:	3
Tillage Type:	Reduced-Till	Study Design:	Randomized complete block		
Previous Crop, Year:	ZEAMX, 2001				

Field Prep./Maintenance: N 0 LB/A, P205 50 LB/A, K20 150 LB/A

Soil Name:	Stoy	% OM:	2.1	pH:	5.7	CEC:	7
Texture:	Silt loam	Fert. Level:	P1: 82 LB/A, K: 266 LB/A				

APPLICATION DESCRIPTION

A

Application Date:	6-27-02
Time of Day:	See note
Application Method:	Spray
Application Timing:	6-8"W
Applic. Placement:	BROFOL
Wind Velocity, Unit:	0 MPH
Soil Moisture:	NORMAL
% Cloud Cover:	0

CROP STAGE AT EACH APPLICATION

A

Crop 1 Code, Stage:	GLXMA V2
Height, Unit:	8 IN

WEED STAGE AT EACH APPLICATION

A

Weed 1 Code:	SETFA
Stage(leaves):	4-6
Height(inches):	6-12
Density:	High
Weed 2 Code:	XANST
Stage(leaves):	4-8
Height(inches):	4-8
Density:	Medium
Weed 3 Code:	AMATA
Stage(leaves):	3-6
Height(inches):	4-8
Density:	Medium
Weed 4 Code:	ABUTH
Stage(leaves):	3-6
Height(inches):	5-7
Density:	Medium

APPLICATION EQUIPMENT

A

Appl. Equipment: CO2 sprayer
Operating Pressure: 40 PSI
Nozzle Type: Flat fan
Nozzle Size: TT 110015
Boom Length, Unit: 7.5 FT
Spray Volume, Unit: 10 GPA

NOTES:

Time of day for applications A-F are 6:00 AM, 9:00 AM, 12:00 PM, 3:00 PM, 6:00 PM and 9:00 PM, see treatment list.

This study was not harvested.

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Weed Code	GLXMA	GLXMA	SETFA	SETFA	XANST	XANST	AMATA	AMATA	ABUTH	ABUTH
Crop Code	Injury	Injury	Control	Control	Control	Control	Control	Control	Control	Control
Rating Data Type	Percent	Percent	Percent	Percent	Percent	Percent	Percent	Percent	Percent	Percent
Rating Unit	7-11-02	7-25-02	7-11-02	7-25-02	7-11-02	7-25-02	7-11-02	7-25-02	7-11-02	7-25-02
Rating Date	14 DA-A	28 DA-A	14 DA-A	28 DA-A	14 DA-A	28 DA-A	14 DA-A	28 DA-A	14 DA-A	28 DA-A
Trt-Eval Interval										

Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Prod Rate	Prod Unit	Grow Stg	Appl Code										
1	NONTREATED									0	0	0	0	0	0	0	0		
2	6:00 AM 2 ROUNDUP ULTRA MAX	3.7	SL	0.188	LB AE/A	6.5	OZ/A	6-8"	W A	0	0	70	90	43	60	21	3	18	17
3	6:00 AM 3 ROUNDUP ULTRA MAX 3 AMS	3.7 100	SL DRY	0.188 1.0	LB AE/A % W/W	6.5 1	OZ/A %W/W	6-8"	W A 6-8" W A	0	0	70	90	45	60	22	3	18	7
4	6:00 AM 4 ROUNDUP ULTRA MAX 4 RUSA 703	3.7 100	SL DRY	0.188 0.9	LB AE/A LB/A	6.5 0.9	OZ/A LB/A	6-8"	W A 6-8" W A	0	0	70	90	45	60	24	10	19	7
5	6:00 AM 5 ROUNDUP ULTRA MAX 5 PX331	3.7 100	SL LIQ	0.188 2.5	LB AE/A % V/V	6.5 2.5	OZ/A %V/V	6-8"	W A 6-8" W A	0	0	70	90	43	63	22	3	18	10
6	9:00 AM 6 ROUNDUP ULTRA MAX	3.7	SL	0.188	LB AE/A	6.5	OZ/A	6-8"	W B	0	0	70	90	45	68	23	7	20	20
7	9:00 AM 7 ROUNDUP ULTRA MAX 7 AMS	3.7 100	SL DRY	0.188 1.0	LB AE/A % W/W	6.5 1	OZ/A %W/W	6-8"	W B 6-8" W B	0	0	70	90	45	63	25	13	22	17
8	9:00 AM 8 ROUNDUP ULTRA MAX 8 RUSA 703	3.7 100	SL DRY	0.188 0.9	LB AE/A LB/A	6.5 0.9	OZ/A LB/A	6-8"	W B 6-8" W B	0	0	70	90	45	68	25	17	20	53
9	9:00 AM 9 ROUNDUP ULTRA MAX 9 PX331	3.7 100	SL LIQ	0.188 2.5	LB AE/A % V/V	6.5 2.5	OZ/A %V/V	6-8"	W B 6-8" W B	0	0	70	90	45	73	25	15	20	30
10	12:00 PM 10 ROUNDUP ULTRA MAX	3.7	SL	0.188	LB AE/A	6.5	OZ/A	6-8"	W C	0	0	65	90	45	65	23	0	20	37
11	12:00 PM 11 ROUNDUP ULTRA MAX 11 AMS	3.7 100	SL DRY	0.188 1.0	LB AE/A % W/W	6.5 1	OZ/A %W/W	6-8"	W C 6-8" W C	0	0	65	90	45	70	25	13	20	30
12	12:00 PM 12 ROUNDUP ULTRA MAX 12 RUSA 703	3.7 100	SL DRY	0.188 0.9	LB AE/A LB/A	6.5 0.9	OZ/A LB/A	6-8"	W C 6-8" W C	0	0	65	90	45	75	23	23	20	33

Weed Code	Crop Code	Rating Data Type	Rating Unit	Rating Date	Trt-Eval Interval	GLXMA	GLXMA	SETFA	SETFA	XANST	XANST	AMATA	AMATA	ABUTH	ABUTH
						Injury	Injury	Control	Control	Control	Control	Control	Control	Control	Control
						Percent	Percent	Percent	Percent	Percent	Percent	Percent	Percent	Percent	Percent
						7-11-02	7-25-02	7-11-02	7-25-02	7-11-02	7-25-02	7-11-02	7-25-02	7-11-02	7-25-02
						14 DA-A	28 DA-A	14 DA-A	28 DA-A	14 DA-A	28 DA-A	14 DA-A	28 DA-A	14 DA-A	28 DA-A

Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Prod Rate	Prod Unit	Grow Stg	Appl Code										
13	12:00 PM									0	0	65	90	45	72	23	23	18	37
13	ROUNDUP ULTRA MAX	3.7	SL	0.188	LB AE/A	6.5	OZ/A	6-8"W	C										
13	PX331	100	LIQ	2.5	% V/V	2.5	%V/V	6-8"W	C										
14	3:00 PM									0	0	62	90	45	60	20	0	15	33
14	ROUNDUP ULTRA MAX	3.7	SL	0.188	LB AE/A	6.5	OZ/A	6-8"W	D										
15	3:00 PM									0	0	63	90	45	70	18	7	15	23
15	ROUNDUP ULTRA MAX	3.7	SL	0.188	LB AE/A	6.5	OZ/A	6-8"W	D										
15	AMS	100	DRY	1.0	% W/W	1	%W/W	6-8"W	D										
16	3:00 PM									0	0	62	90	45	67	20	7	15	23
16	ROUNDUP ULTRA MAX	3.7	SL	0.188	LB AE/A	6.5	OZ/A	6-8"W	D										
16	RUSA 703	100	DRY	0.9	LB/A	0.9	LB/A	6-8"W	D										
17	3:00 PM									0	0	62	90	45	67	20	3	15	13
17	ROUNDUP ULTRA MAX	3.7	SL	0.188	LB AE/A	6.5	OZ/A	6-8"W	D										
17	PX331	100	LIQ	2.5	% V/V	2.5	%V/V	6-8"W	D										
18	6:00 PM									0	0	65	90	45	68	22	13	15	23
18	ROUNDUP ULTRA MAX	3.7	SL	0.188	LB AE/A	6.5	OZ/A	6-8"W	E										
19	6:00 PM									0	0	65	90	45	73	20	37	15	30
19	ROUNDUP ULTRA MAX	3.7	SL	0.188	LB AE/A	6.5	OZ/A	6-8"W	E										
19	AMS	100	DRY	1.0	% W/W	1	%W/W	6-8"W	E										
20	6:00 PM									0	0	65	90	45	68	20	17	15	23
20	ROUNDUP ULTRA MAX	3.7	SL	0.188	LB AE/A	6.5	OZ/A	6-8"W	E										
20	RUSA 703	100	DRY	0.9	LB/A	0.9	LB/A	6-8"W	E										
21	6:00 PM									0	0	65	90	45	70	20	27	15	30
21	ROUNDUP ULTRA MAX	3.7	SL	0.188	LB AE/A	6.5	OZ/A	6-8"W	E										
21	PX331	100	LIQ	2.5	% V/V	2.5	%V/V	6-8"W	E										
22	9:00 PM									0	0	57	90	25	33	15	0	5	3
22	ROUNDUP ULTRA MAX	3.7	SL	0.188	LB AE/A	6.5	OZ/A	6-8"W	F										
23	9:00 PM									0	0	58	90	25	27	12	0	5	28
23	ROUNDUP ULTRA MAX	3.7	SL	0.188	LB AE/A	6.5	OZ/A	6-8"W	F										
23	AMS	100	DRY	1.0	% W/W	1	%W/W	6-8"W	F										
24	9:00 PM									0	0	57	90	23	23	10	0	5	27
24	ROUNDUP ULTRA MAX	3.7	SL	0.188	LB AE/A	6.5	OZ/A	6-8"W	F										
24	RUSA 703	100	DRY	0.9	LB/A	0.9	LB/A	6-8"W	F										
25	9:00 PM									0	0	58	90	25	23	10	0	5	17
25	ROUNDUP ULTRA MAX	3.7	SL	0.188	LB AE/A	6.5	OZ/A	6-8"W	F										
25	PX331	100	LIQ	2.5	% V/V	2.5	%V/V	6-8"W	F										

Weed Code				SETFA	SETFA	XANST	XANST	AMATA	AMATA	ABUTH	ABUTH
Crop Code	GLXMA	GLXMA									
Rating Data Type	Injury	Injury	Control	Control	Control	Control	Control	Control	Control	Control	Control
Rating Unit	Percent	Percent	Percent	Percent	Percent	Percent	Percent	Percent	Percent	Percent	Percent
Rating Date	7-11-02	7-25-02	7-11-02	7-25-02	7-11-02	7-25-02	7-11-02	7-25-02	7-11-02	7-25-02	7-11-02
Trt-Eval Interval	14 DA-A	28 DA-A	14 DA-A	28 DA-A	14 DA-A	28 DA-A	14 DA-A	28 DA-A	14 DA-A	28 DA-A	14 DA-A

Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Unit Unit	Prod Rate	Prod Unit	Grow Stg	Appl Code						
LSD (P=.05)				0.0	0.0	2.5	0.0	1.6	8.3	3.5	15.8	2.0	28.5		
Replicate F				0.000	0.000	5.448	0.000	3.273	12.473	4.463	2.130	4.450	1.033		
Replicate Prob(F)				1.0000	1.0000	0.0074	1.0000	0.0465	0.0001	0.0167	0.1299	0.0169	0.3639		
Treatment F				0.000	0.000	249.080	0.000	412.364	46.503	23.677	3.255	76.208	1.501		
Treatment Prob(F)				1.0000	1.0000	0.0001	1.0000	0.0001	0.0001	0.0001	0.0002	0.0001	0.1145		

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Location: Belleville Research Center

Trial Comments

1. Protocol: SIU (BGY).
2. Ratings: CI and WC at 14 and 28 DAT.
3. Air temperature and relative humidity for each application time were:
 - 6am = 70 F, 92%;
 - 9am = 82 F, 60%;
 - 12pm = 88 F, 54%;
 - 3pm = 90 F, 50%;
 - 6pm = 86 F, 60%; and
 - 9pm = 77 F, 98%.
4. DA-A = days after 6-8"W application.