Herbicide Drift Reduction Methods - Study 1.

02-52-E130

OBJECTIVE: Evaluate the efficacy associated with glyphosate applications performed using drift reduction type nozzles and drift control spray additives.

SUMMARY: In general, the addition of a drift retardant did not reduce control of giant foxtail with glyphosate when applied using XR Flat Fan or Drift Guard nozzles. Variable increases in control of giant foxtail were observed from combinations of nozzles and agents ranging from 4 to 7% at 28 DAT. The use of drift reduction nozzles with glyphosate alone did not reduce giant foxtail control compared to similar treatments with flat fan nozzles. Similarly, control of common waterhemp was not reduced with the use of drift reduction nozzles in combination with glyphosate alone at 14 DAT. However, by 28 DAT reduced control of common waterhemp was evident with the use of Drift Guard nozzles. By 28 DAT, control of common waterhemp was reduced with the addition of either PA at 4 oz/100 gal or HPG at 10.3 oz/100 gal to glyphosate applied with Turbo TeeJet nozzles, and with any rate of PA or HPG applied with Air Induction nozzles. All herbicide treated plots yielded similar to glyphosate alone applied with flat fan nozzles regardless of nozzle type or addition of drift retardant.

HERBICIDES/ADJUVANTS/NOZZLES	WEEDS	CROP
ROUNDUP ULTRA MAX 3.7 SL	foxtail, giant	soybean
30% PA 100 LIQ	waterhemp, common	
HPG 77.5 WG		
RUSA 703 100 DRY		
AIR INDUCTION NOZZLES		
DRIFT GUARD NOZZLES		
FLAT FAN NOZZLES		
TURBO TEEJET NOZZLES		

Bryan Young

PLANT, SOIL AND GENERAL AGRICULTURE DEPARTMENT

SOUTHERN ILLINOIS UNIVERSITY

Herbicide Drift Reduction Methods - Study 1.

Project Code: 02-52-E130 Location: Belleville Research Center

Investigator: Bryan Young, Assistant Professor, Southern Illinois University

City State Zip Country: Belleville IL 62221 USA
Trial Status: Final **Updated:** 10-24-02

Objective:
Evaluate the efficacy associated with glyphosate applications performed using drift reduction type nozzles and drift control spray additives.

Weed Code	Common Name	Scientific Name
1.	SETFA foxtail, giant	Setaria faberi Herrm.
2.	AMATA waterhemp, common	Amaranthus rudis Sauer

Crop 1: GLXMA soybean **Variety:** B-T 371CR
Planting Method: Seeded **Planting Date:** 6-4-02
Rate: 75 lb/A **Depth:** 1.0 IN
Row Spacing: 30 IN

Plot Width, Unit: 10 FT **Plot Length, Unit:** 25 FT **Reps:** 4
Tillage Type: Reduced-Till **Study Design:** Randomized complete block
Previous Crop, Year: GLXMA, 2001

Field Prep./Maintenance: N 0 LB/A, P2O5 50 LB/A, K2O 150 LB/A

Soil Name: Weir **% OM:** 1.9 **pH:** 7.1 **CEC:** 12
Texture: Silt loam **Fert. Level:** P1: 97 LB/A, K: 282 LB/A

APPLICATION DESCRIPTION

	A
Application Date:	7-4-02
Time of Day:	8:30
Application Method:	Spray
Application Timing:	6-8"W
Applic. Placement:	BROFOL
Air Temp., Unit:	81 F
% Relative Humidity:	62
Wind Velocity, Unit:	3-5 MPH
Dew Presence (Y/N):	N
Soil Moisture:	BELNOR
% Cloud Cover:	0

CROP STAGE AT EACH APPLICATION

	A
Crop 1 Code, Stage:	GLXMA V3
Height, Unit:	6-8 IN

WEED STAGE AT EACH APPLICATION

	A
Weed 1 Code:	SETFA
Stage(leaves):	5-7
Height(inches):	7-14
Density:	High
Weed 2 Code:	AMATA
Stage(leaves):	6-9
Height(inches):	4-8
Density:	High

APPLICATION EQUIPMENT

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

NOTES:

Nozzle types are flat fan, turbo teejet, air induction and drift guard, see treatment list.
Harvested Oct-2-02, (2) 30 inch rows by 22 ft.

Herbicide Drift Reduction Methods - Study 1.

Project Code: 02-52-E130 Location: Belleville Research Center

Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Prod Rate	Prod Unit	Grow Stg	Appl Code							
Weed Code											SETFA	SETFA	SETFA	AMATA	AMATA	AMATA
Crop Code										GLXMA						
Rating Data Type										Yield	Control	Control	Plants	Control	Control	Plants
Rating Unit										bu/A	Percent	Percent	1.0 m2	Percent	Percent	1.0 m2
Rating Date										10-2-02	7-18-02	8-1-02	7-25-02	7-18-02	8-1-02	7-25-02
Trt-Eval Interval											14 DA-A	28 DA-A	21 DA-A	14 DA-A	28 DA-A	21 DA-A
1	NONTREATED									3	0	0	257	0	0	533
2	FLAT FAN NOZZLES									18	83	87	38	60	58	211
2	ROUNDUP ULTRA MAX	3.7	SL	0.188	LB AE/A	0.4	PT/A	6-8"W	A							
3	FLAT FAN NOZZLES									18	80	87	34	64	58	248
3	ROUNDUP ULTRA MAX	3.7	SL	0.188	LB AE/A	0.4	PT/A	6-8"W	A							
3	30% PA	100	LIQ	2.0	OZ/100 GAL	2	OZ/100 GAL	6-8"W	A							
4	FLAT FAN NOZZLES									24	90	93	2	56	48	348
4	ROUNDUP ULTRA MAX	3.7	SL	0.188	LB AE/A	0.4	PT/A	6-8"W	A							
4	30% PA	100	LIQ	4.0	OZ/100 GAL	4	OZ/100 GAL	6-8"W	A							
5	FLAT FAN NOZZLES									23	83	88	18	59	54	188
5	ROUNDUP ULTRA MAX	3.7	SL	0.188	LB AE/A	0.4	PT/A	6-8"W	A							
5	HPG	77.5	WG	0.25	LB A/100 GAL	5.16	OZ/100 GAL	6-8"W	A							
6	FLAT FAN NOZZLES									24	88	93	12	62	49	201
6	ROUNDUP ULTRA MAX	3.7	SL	0.188	LB AE/A	0.4	PT/A	6-8"W	A							
6	HPG	77.5	WG	0.5	LB A/100 GAL	10.3	OZ/100 GAL	6-8"W	A							
7	FLAT FAN NOZZLES									23	91	94	11	73	61	174
7	ROUNDUP ULTRA MAX	3.7	SL	0.188	LB AE/A	0.4	PT/A	6-8"W	A							
7	RUSA 703	100	DRY	9.0	LB/100 GAL	9	LB/100 GAL	6-8"W	A							
8	TURBO TEEJET NOZZLES									23	87	91	5	68	52	200
8	ROUNDUP ULTRA MAX	3.7	SL	0.188	LB AE/A	0.4	PT/A	6-8"W	A							
9	TURBO TEEJET NOZZLES									20	89	91	36	58	51	227
9	ROUNDUP ULTRA MAX	3.7	SL	0.188	LB AE/A	0.4	PT/A	6-8"W	A							
9	30% PA	100	LIQ	2.0	OZ/100 GAL	2	OZ/100 GAL	6-8"W	A							
10	TURBO TEEJET NOZZLES									17	79	85	34	49	41	279
10	ROUNDUP ULTRA MAX	3.7	SL	0.188	LB AE/A	0.4	PT/A	6-8"W	A							
10	30% PA	100	LIQ	4.0	OZ/100 GAL	4	OZ/100 GAL	6-8"W	A							
11	TURBO TEEJET NOZZLES									19	81	89	17	61	58	335
11	ROUNDUP ULTRA MAX	3.7	SL	0.188	LB AE/A	0.4	PT/A	6-8"W	A							
11	HPG	77.5	WG	0.25	LB A/100 GAL	5.16	OZ/100 GAL	6-8"W	A							
12	TURBO TEEJET NOZZLES									18	73	85	21	54	43	228
12	ROUNDUP ULTRA MAX	3.7	SL	0.188	LB AE/A	0.4	PT/A	6-8"W	A							
12	HPG	77.5	WG	0.5	LB A/100 GAL	10.3	OZ/100 GAL	6-8"W	A							

Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Prod Rate	Prod Unit	Grow Stg	Appl Code	GLXMA Yield	SETFA Control	SETFA Control	SETFA Plants	AMATA Control	AMATA Control	AMATA Plants
	Weed Code										SETFA	SETFA	SETFA	AMATA	AMATA	AMATA
	Crop Code									GLXMA						
	Rating Data Type									Yield	Control	Control	Plants	Control	Control	Plants
	Rating Unit									bu/A	Percent	Percent	1.0 m2	Percent	Percent	1.0 m2
	Rating Date									10-2-02	7-18-02	8-1-02	7-25-02	7-18-02	8-1-02	7-25-02
	Trt-Eval Interval										14 DA-A	28 DA-A	21 DA-A	14 DA-A	28 DA-A	21 DA-A
13	TURBO TEEJET NOZZLES									19	87	90	7	60	52	195
13	ROUNDUP ULTRA MAX	3.7	SL	0.188	LB AE/A	0.4	PT/A	6-8"W	A							
13	RUSA 703	100	DRY	9.0	LB/100 GAL	9	LB/100 GAL	6-8"W	A							
14	AIR INDUCTION NOZZLES									18	80	86	34	60	53	243
14	ROUNDUP ULTRA MAX	3.7	SL	0.188	LB AE/A	0.4	PT/A	6-8"W	A							
15	AIR INDUCTION NOZZLES									16	73	84	29	63	53	230
15	ROUNDUP ULTRA MAX	3.7	SL	0.188	LB AE/A	0.4	PT/A	6-8"W	A							
15	30% PA	100	LIQ	2.0	OZ/100 GAL	2	OZ/100 GAL	6-8"W	A							
16	AIR INDUCTION NOZZLES									20	88	91	5	49	33	362
16	ROUNDUP ULTRA MAX	3.7	SL	0.188	LB AE/A	0.4	PT/A	6-8"W	A							
16	30% PA	100	LIQ	4.0	OZ/100 GAL	4	OZ/100 GAL	6-8"W	A							
17	AIR INDUCTION NOZZLES									19	88	93	23	51	45	257
17	ROUNDUP ULTRA MAX	3.7	SL	0.188	LB AE/A	0.4	PT/A	6-8"W	A							
17	HPG	77.5	WG	0.25	LB A/100 GAL	5.16	OZ/100 GAL	6-8"W	A							
18	AIR INDUCTION NOZZLES									21	89	89	19	48	34	271
18	ROUNDUP ULTRA MAX	3.7	SL	0.188	LB AE/A	0.4	PT/A	6-8"W	A							
18	HPG	77.5	WG	0.5	LB A/100 GAL	10.3	OZ/100 GAL	6-8"W	A							
19	AIR INDUCTION NOZZLES									22	92	92	4	59	44	194
19	ROUNDUP ULTRA MAX	3.7	SL	0.188	LB AE/A	0.4	PT/A	6-8"W	A							
19	RUSA 703	100	DRY	9.0	LB/100 GAL	9	LB/100 GAL	6-8"W	A							
20	DRIFT GUARD NOZZLES									21	88	91	41	54	43	266
20	ROUNDUP ULTRA MAX	3.7	SL	0.188	LB AE/A	0.4	PT/A	6-8"W	A							
21	DRIFT GUARD NOZZLES									20	90	93	3	55	49	220
21	ROUNDUP ULTRA MAX	3.7	SL	0.188	LB AE/A	0.4	PT/A	6-8"W	A							
21	30% PA	100	LIQ	2.0	OZ/100 GAL	2	OZ/100 GAL	6-8"W	A							
22	DRIFT GUARD NOZZLES									21	83	88	36	53	40	162
22	ROUNDUP ULTRA MAX	3.7	SL	0.188	LB AE/A	0.4	PT/A	6-8"W	A							
22	30% PA	100	LIQ	4.0	OZ/100 GAL	4	OZ/100 GAL	6-8"W	A							
23	DRIFT GUARD NOZZLES									20	86	90	27	61	53	236
23	ROUNDUP ULTRA MAX	3.7	SL	0.188	LB AE/A	0.4	PT/A	6-8"W	A							
23	HPG	77.5	WG	0.25	LB A/100 GAL	5.16	OZ/100 GAL	6-8"W	A							
24	DRIFT GUARD NOZZLES									22	84	90	9	56	49	236
24	ROUNDUP ULTRA MAX	3.7	SL	0.188	LB AE/A	0.4	PT/A	6-8"W	A							
24	HPG	77.5	WG	0.5	LB A/100 GAL	10.3	OZ/100 GAL	6-8"W	A							
25	DRIFT GUARD NOZZLES									18	86	90	13	74	61	127
25	ROUNDUP ULTRA MAX	3.7	SL	0.188	LB AE/A	0.4	PT/A	6-8"W	A							
25	RUSA 703	100	DRY	9.0	LB/100 GAL	9	LB/100 GAL	6-8"W	A							

Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Prod Rate	Prod Unit	Grow Stg	Appl Code							
Weed Code											SETFA	SETFA	SETFA	AMATA	AMATA	AMATA
Crop Code										GLXMA						
Rating Data Type										Yield	Control	Control	Plants	Control	Control	Plants
Rating Unit										bu/A	Percent	Percent	1.0 m2	Percent	Percent	1.0 m2
Rating Date										10-2-02	7-18-02	8-1-02	7-25-02	7-18-02	8-1-02	7-25-02
Trt-Eval Interval											14 DA-A	28 DA-A	21 DA-A	14 DA-A	28 DA-A	21 DA-A
26	HANDWEED									42	99	99	0	99	99	0
LSD (P=.05)										6.2	6.1	3.8	63.3	9.5	11.1	162.3
Replicate F										7.342	2.806	0.964	2.010	3.652	14.813	0.538
Replicate Prob(F)										0.0002	0.0454	0.4141	0.1197	0.0162	0.0001	0.6580
Treatment F										7.434	67.476	176.085	4.667	21.493	16.143	2.639
Treatment Prob(F)										0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0007

Herbicide Drift Reduction Methods - Study 1.

Project Code: 02-52-E130 Location: Belleville Research Center

Trial Comments

1. Protocol: SIU (BGY/ISPOB).
2. DA-A = days after 6-8"W application. 1.0 m2 = 1.0 square meter.
3. No crop injury was apparent with any treatment.