Evaluation of Roundup Ready Soybean Tolerance to Formulations of Glyphosate.

02-20A-ME150

OBJECTIVE: Determine crop safety of various glyphosate formulations on Roundup Ready

soybeans.

SUMMARY:

Roundup Ready soybeans showed excellent tolerance to all glyphosate formulations applied at the 1X use rate except Touchdown 5. As in previous studies, some chlorotic and necrotic spots were visible on Roundup Ready soybean after treatment with Touchdown 5. This injury was most visible when Touchdown 5 was applied to soybeans in the V4 stage of soybean growth. Touchdown 5 is an "old" formulation and is no longer sold for use in Roundup Ready crops. This formulation was included solely to provide a benchmark of injury observed with past formulations. Roundup Ready soybeans were also very tolerant to 3X rates of all glyphosate formulations applied at V4. However, soybean injury (chlorosis of leaves that emerged after herbicide application) was visible 14 DAT (days after treatment) from R1 applications of the 3X rate of Roundup UltraMax (10%), MON78270 (7%), Clearout 41 Plus (7%), and Touchdown 5 (3%). In each case the soybeans quickly outgrew the injury and little to no soybean injury was visible by 28 DAT.

Soybean yield was 53 bu/A in the nontreated (weed free) plots. No reduction in soybean yield was observed from V4 glyphosate applications or R1 applications of glyphosate formulations at the 1X use rate. Soybean yield was reduced by 5 bu/A in plots treated at the R1 stage with the 3X rate of MON 78270, Clearout 41 Plus, or Touchdown 5. No other reductions in soybean yield were observed.

HERBICIDES WEEDS CROP

CLEAROUT 41 PLUS 3 L MON 78270 4.5 SL ROUNDUP ULTRA MAX 3.7 SL SIU 2002-H1 4.17 SL TOUCHDOWN 3 SL TOUCHDOWN 5 5 SL crop tolerance only

soybean

Bryan Young

PLANT, SOIL AND GENERAL AGRICULTURE DEPARTMENT

SOUTHERN ILLINOIS UNIVERSITY

Evaluation of Roundup Ready Soybean Tolerance to Formulations of Glyphosate.

Project Code: 02-20A-ME150 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:

Determine crop safety of various glyphosate formulations on Roundup Ready soybeans.

Weed Code Common Name Scientific Name

1. NA crop tolerance only

Crop 1: GLXMA soybean Variety: Asgrow 4602 RR

Planting Method: Seeded Planting Date: 5-29-02 Rate: 75 lb/A Depth: 1.0 IN

Row Spacing: 30 IN

Plot Width, Unit: 10 FT Plot Length, Unit: 37 FT Reps: 3
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 200 LB/A

 Soil Name:
 Ebbert
 % OM:
 1.5
 pH:
 6.4
 CEC:
 12

 Texture:
 Silt loam
 Fert. Level:
 P1:
 79 LB/A, K:
 182 LB/A

В

APPLICATION DESCRIPTION

Application Date: 6-28-02 7-15-02 **Time of Day:** 7:00 13:30

Time of Day: 7:00 Application Method: Spray Spray Application Timing: V4 R1 Applic. Placement: BROFOL BROFOL Air Temp., Unit: 74 F 88 F % Relative Humidity: 50 38 0-3 MPH Wind Velocity, Unit: 0-5 MPH

Wind Velocity, Unit: 0-5 MPH 0-3 MPH Soil Moisture: BELNOR BELNOR 40

CROP STAGE AT EACH APPLICATION

A B
Crop 1 Code, Stage: GLXMA V4 GLXMA R1

Height, Unit: 6-8 IN 12-16 IN

WEED STAGE AT EACH APPLICATION

A B

Weed 1 Code: NA

APPLICATION EQUIPMENT

A B
Appl. Equipment: CO2 sprayer CO2 sprayer

Nozzle Type:

Nozzle Size:

Boom Length, Unit:

Spray Volume, Unit:

OPSI

40 PSI

40 PSI

40 PSI

50 110015

60 110015

60 110015

60 110015

7.5 FT

7.5 FT

60 110015

60 110015

7.5 FT

7.5 FT

60 110015

60 110015

NOTES

Harvested Oct-2-02, (2) 30 inch rows by 34 ft.

Location: Belleville Research Center

Weed Code Crop Code Rating Data Type Rating Unit Rating Date

GLXMA GLXMA GLXMA Yield Injury Injury bu/A Percent Percent 10-2-02

	Eval Interval									10-2-02	14 DAT	28 DAT
	Treatment Name		Form Type	Rate	Rate Unit		Prod Unit	Grow Stg	Appl Code			
1	NONTREATED									53	0	0
2	ROUNDUP ULTRA MAX	3.7	SL	0.75	LB AE/A	26	OZ/A	V4	Α	53	0	0
3	MON 78270	4.5	SL	0.75	LB AE/A	21.3	OZ/A	V4	Α	54	0	0
4	CLEAROUT 41 PLUS	3	L	0.75	LB AE/A	32	OZ/A	V4	Α	53	0	0
5	TOUCHDOWN	3	SL	0.75	LB AE/A	32	OZ/A	V4	Α	54	0	0
6	SIU 2002-H1	4.17	SL	0.75	LB AE/A	23	OZ/A	V4	Α	51	0	0
7	TOUCHDOWN 5	5	SL	1.0	LB A/A	25.6	OZ/A	V4	Α	54	9	0
8	ROUNDUP ULTRA MAX	3.7	SL	2.25	LB AE/A	78	OZ/A	V4	Α	54	0	0
9	MON 78270	4.5	SL	2.25	LB AE/A	64	OZ/A	V4	Α	52	0	0
10	CLEAROUT 41 PLUS	3	L	2.25	LB AE/A	96	OZ/A	V4	Α	50	1	0
11	TOUCHDOWN	3	SL	2.25	LB AE/A	96	OZ/A	V4	Α	50	1	0
12	SIU 2002-H1	4.17	SL	2.25	LB AE/A	69	OZ/A	V4	Α	52	4	0
13	TOUCHDOWN 5	5	SL	3.0	LB A/A	77	OZ/A	V4	Α	53	15	0
14	ROUNDUP ULTRA MAX	3.7	SL	0.75	LB AE/A	26	OZ/A	R1	В	53	0	0
15	MON 78270	4.5	SL	0.75	LB AE/A	21.3	OZ/A	R1	В	50	0	0
16	CLEAROUT 41 PLUS	3	L	0.75	LB AE/A	32	OZ/A	R1	В	53	0	0
17	TOUCHDOWN	3	SL	0.75	LB AE/A	32	OZ/A	R1	В	51	0	0
18	SIU 2002-H1	4.17	SL	0.75	LB AE/A	23	OZ/A	R1	В	54	0	0
19	TOUCHDOWN 5	5	SL	1.0	LB A/A	25.6	OZ/A	R1	В	52	1	0
20	ROUNDUP ULTRA MAX	3.7	SL	2.25	LB AE/A	78	OZ/A	R1	В	53	10	0
21	MON 78270	4.5	SL	2.25	LB AE/A	64	OZ/A	R1	В	48	7	0
22	CLEAROUT 41 PLUS	3	L	2.25	LB AE/A	96	OZ/A	R1	В	48	7	0

Weed Code Crop Code
Rating Data Type
Rating Unit
Rating Date
Trt-Eval Interval

GLXMA GLXMA GLXMA Yield Injury Injury bu/A Percent Percent

Rating Unit									bu/A 10-2-02	Percent	Percen	1
Rating Date Trt-Eval Inter	val								10-2-02	14 DAT	28 DAT	
Trt Treatme No. Name	ent		Form Type				Prod Grov Unit Stg					
23 TOUCHI	DOWN	3	SL	2.25	LB AE/A	96	OZ/A R1	В	50	2	C)
24 SIU 200	2-H1	4.17	SL	2.25	LB AE/A	69	OZ/A R1	В	49	2	C)
25 TOUCH	DOWN 5	5	SL	3.0	LB A/A	77	OZ/A R1	В	48	3	C)
	UP ULTRA MAX UP ULTRA MAX	3.7 3.7			LB AE/A LB AE/A		OZ/A V4 OZ/A R1	A B	52	0	2	
27 MON 78 27 MON 78		4.5 4.5					OZ/A V4 OZ/A R1	A B	50	0	C	i
	OUT 41 PLUS OUT 41 PLUS		L L		LB AE/A LB AE/A		OZ/A V4 OZ/A R1	A B	52	0	C	í
29 TOUCHI 29 TOUCHI			SL SL		LB AE/A LB AE/A		OZ/A V4 OZ/A R1	A B	52	3	C	í
30 SIU 2003 30 SIU 2003		4.17 4.17			LB AE/A LB AE/A		OZ/A V4 OZ/A R1	A B	55	0	C	1
LSD (P=.05)									5.0	2.2	0.9	į
Replicate F Replicate Pro Treatment F Treatment Pr									2.352 0.1042 1.313 0.1873	22.440	0.3741 1.000))

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Project Code: 02-20A-ME150 Location: Belleville Research Center

Trial Comments

- 1. Protocol: SIU (BGY).
- 2. Blanket PRE application of Dual II Magnum at 1.27 Ibai/A applied 10 ft wide to all plots including the nontreated on 5-30-02.
- 3. DAT = days after V4 or R1 application.
- 4. Rating dates:

14 and 28 days after the V4 application was on 7-12-02 and 7-26-02, respectively.

14 and 28 days after the R1 application was on 7-21-02 and 8-12-02, respectively.