Influence of Weed Removal Techniques on Competition in Soybean.

00-21M-ME120

OBJECTIVE: Determine the influence of the speed of weed removal on soybean yield using immediate removal (handweeding), a fast acting herbicide program (Basagran plus Blazer plus Poast Plus), and a slow acting herbicide program (Roundup Ultra).

SUMMARY: Soybean injury ranging from 13 to 23% was observed at 7 days after treatment from treatments that included Basagran plus Blazer. Soybean yield ranged from 10 bu/A in nontreated plots to 44 bu/A. Soybean yield was significantly reduced when herbicides were applied at the 2 inch weed height and weeds were allowed to reinfest plots. In general, allowing weeds to compete until 12 inches in height did not reduce soybean yield. In some instances, soybean yield may have been reduced by poor weed control.

HERBICIDES	WEEDS	CROP
BASAGRAN 4 SL	COCKLEBUR, COMMON	SOYBEAN
BLAZER 2 EC	GRASSES, ANNUAL	
DUAL II MAGNUM 7.64 EC	LAMBSQUARTERS, COMMON	
FIRSTRATE 84 WG	MORNINGGLORY, IVYLEAF	
POAST PLUS 1 EC	NUTSEDGE, YELLOW	
ROUNDUP ULTRA 3 SL	WATERHEMP, COMMON	

Bryan Young

PLANT, SOIL AND GENERAL AGRICULTURE DEPARTMENT

SOUTHERN ILLINOIS UNIVERSITY

Influence of Weed Removal Techniques on Competition in Soybean.

Project Code: 00-21M-ME120 Location: Belleville Research Center

Investigator: Bryan Young, Assistant Professor, Southern Illinois University

Weed Code	Common Name	Scientific Name
1. GGGAN	GRASSES, ANNUAL	
2. CYPES	NUTSEDGE, YELLOW	CYPERUS ESCULENTUS L.
3. AMATA	WATERHEMP, COMMON	AMARANTHUS RUDIS SAUER
4. CHEAL	LAMBSQUARTERS, COMMON	CHENOPODIUM ALBUM L.
5. IPOHE	MORNINGGLORY, IVYLEAF	IPOMOEA HEDERACEA (L.) JACQ.
6. XANST	COCKLEBUR, COMMON	XANTHIUM STRUMARIUM L. SSP. STRUMARIUM

Crop 1:	GLXMA SOYBEAN	Variety:	B-T 369CR
Planting Method:	SEEDED	Planting Date:	May-5-00
Rate:	75 LB/A	Depth:	1.0 IN
Row Spacing:	30 IN		

Plot Width, Unit:	10 FT	Plot Length, Unit:	30 FT	Reps: 4	
Tillage Type:	REDUCED-TILL	Study Design:	RCB		
Previous Crop, Year:	GLXMA, 1999	Fertilizer applied:	N 0 LB/A,	P_2O_5 50 LB/A,	K_2O 150 LB/A

Soil Name:	EBBERT	% OM: 2.6	pH: 5.7	CEC: 14
Texture:	SILT LOAM	P_1: 72 LB/A,	K: 351 LB/A	

APPLICATION DESCRIPTION

	A	B	C	D	E	F
Application Date:	May-5-00	May-23-00	May-30-00	Jun-7-00	Jun-12-00	Jun-19-00
Time of Day:	18:00	12:00	14:30	16:30	12:30	12:00
Application Method:	SPRAY	SPRAY	SPRAY	SPRAY	SPRAY	SPRAY
Application Timing:	PRE	2"W-A+B	4"W-A+B	6"W-A+B	8"W-A+B	12"W-A+B
Applic. Placement:	BROSOI	BROFOL	BROFOL	BROFOL	BROFOL	BROFOL
Air Temp., Unit:	80 F	82 F	82 F	79 F	82 F	78 F
% Relative Humidity:	96	42	65	22	70	80
Wind Velocity, Unit:	5 MPH	2-3 MPH	5-10 MPH	5-10 MPH	2-3 MPH	2-3 MPH
Soil Moisture:	DRY	WET	NORMAL	DRY	NORMAL	WET
% Cloud Cover:		30	20	0	50	20

CROP STAGE AT EACH APPLICATION

	A	B	C	D	E	F
Crop 1 Code, Stage:	GLXMA PRE	GLXMA UNI	GLXMA V1	GLXMA V2	GLXMA V3	GLXMA V4
Height, Unit:	NA	1-2.5 IN	3-4 IN	5-7 IN	6-8 IN	12 IN

WEED STAGE AT EACH APPLICATION

	A	B	C	D	E	F
Weed 1 Code:		GGGAN	GGGAN	GGGAN	GGGAN	GGGAN
Stage(leaves):		1-3	2-5	5-6	5-6	5-6
Height(inches):		0.25-3	2-7	4-9	4-10	6-12
Density:				HIGH	HIGH	HIGH
Weed 2 Code:		CYPES	CYPES	CYPES	CYPES	CYPES
Stage(leaves):		3-5	4-6	4-5	4-6	4-6
Height(inches):		2-4	1-4	2-5	4-6	4-8
Density:				MEDIUM	MEDIUM	LOW
Weed 3 Code:		AMATA	AMATA	AMATA	AMATA	AMATA
Stage(leaves):		COTL-2	COTL-4	5-6	5-6	5-10
Height(inches):		0.5	0.5-1	2-4	2-5	3-10
Density:				LOW	LOW	LOW
Weed 4 Code:		CHEAL	CHEAL	CHEAL	CHEAL	CHEAL
Stage(leaves):		COTL-4	2-6	4-10	4-10	4-10
Height(inches):		0.5	0.5	2-3	2-5	3-8
Density:				LOW	LOW	LOW
Weed 5 Code:		IPOHE	IPOHE	IPOHE	IPOHE	IPOHE
Stage(leaves):		COTL-2	2-6	3-5	3-6	4-10
Height(inches):		1-2	1-3	2-4	2-5	4-15
Density:				MEDIUM	MEDIUM	MEDIUM
Weed 6 Code:		XANST	XANST	XANST	XANST	XANST
Stage(leaves):		COTL-4	2-6	4-6	4-8	4-10
Height(inches):		0.5-2	0.5-6	3-7	3-10	4-13
Density:				HIGH	HIGH	HIGH

APPLICATION EQUIPMENT

	A	B	C	D	E	F
Appl. Equipment:	CO_2 SPRAY	CO_2 SPRAY	CO_2 SPRAY	CO_2 SPRAY	CO_2 SPRAY	CO_2 SPRAY
Operating Pressure:	40 PSI	40 PSI	40 PSI	40 PSI	40 PSI	40 PSI
Nozzle Type:	FLAT FAN	FLAT FAN	FLAT FAN	FLAT FAN	FLAT FAN	FLAT FAN
Nozzle Size:	8003	8002	8002	8002	8002	8002
Boom Length, Unit:	7.33 FT	7.33 FT	7.33 FT	7.33 FT	7.33 FT	7.33 FT
Spray Volume, Unit:	20 GPA	20 GPA	20 GPA	20 GPA	20 GPA	20 GPA

NOTES:

Harvested Oct-30-00, (2) 30 inch rows by 27 ft.

TABLE. INFLUENCE OF WEED REMOVAL TECHNIQUES ON COMPETITION IN SOYBEAN. PROJECT CODE:00-21M-ME120

	TREATMENT	FORM.	RATE	UNIT	PROD RATE	APPL TIME	APPL CODE	YIELD	GLXMA INJURY 7 DAT	CONTROL, 7 DAYS AFTER TREATMENT GGGAN	XANST	IPOHE	AMATA	CYPES	CHEAL
								BU/A	%	%	%	%	%	%	%
1	WEED FREE ALL SEASON							41							
1	DUAL II MAGNUM	7.64 EC	1.59	LB A/A	1.66 PT/A	PRE	A								
1	FIRSTRATE	84 WG	0.031	LB A/A	0.59 OZ/A	PRE	A								
2	NONTREATED							10							
3	HANDWEED					2"W-B	B	35							
4	ROUNDUP ULTRA	3 SL	0.75	LB AE/A	2.0 PT/A	2"W-B	B	25	0	99	96	98	99	87	99
5	POAST PLUS	1 EC	0.281	LB A/A	2.25 PT/A	2"W-A	B	17	13	99	97	99	99	95	99
5	PRIME OIL COC	100 LIQ	1.0	% V/V	1.0 % V/V	2"W-A	B								
5	BASAGRAN	4 SL	1.0	LB A/A	2.0 PT/A	2"W-B	B								
5	BLAZER	2 EC	0.25	LB A/A	1.0 PT/A	2"W-B	B								
5	PRIME OIL COC	100 LIQ	1.0	% V/V	1.0 %V/V	2"W-B	B								
6	WEED FREE							42	0						
6	DUAL II MAGNUM	7.64 EC	1.59	LB A/A	1.66 PT/A	PRE	A								
6	FIRSTRATE	84 WG	0.031	LB A/A	0.59 OZ/A	PRE	A								
6	ROUNDUP ULTRA	3 SL	0.75	LB AE/A	2.0 PT/A	2"W-B	B								
7	WEED FREE							35	15						
7	DUAL II MAGNUM	7.64 EC	1.59	LB A/A	1.66 PT/A	PRE	A								
7	FIRSTRATE	84 WG	0.031	LB A/A	0.59 OZ/A	PRE	A								
7	POAST PLUS	1 EC	0.281	LB A/A	2.25 PT/A	2"W-A	B								
7	PRIME OIL COC	100 LIQ	1.0	% V/V	1.0 % V/V	2"W-A	B								
7	BASAGRAN	4 SL	1.0	LB A/A	2.0 PT/A	2"W-B	B								
7	BLAZER	2 EC	0.25	LB A/A	1.0 PT/A	2"W-B	B								
7	PRIME OIL COC	100 LIQ	1.0	% V/V	1.0 %V/V	2"W-B	B								
8	HANDWEED					4"W-B	C	34	0						
9	ROUNDUP ULTRA	3 SL	0.75	LB AE/A	2.0 PT/A	4"W-B	C	32	4	99	99	90	99	70	99
10	POAST PLUS	1 EC	0.281	LB A/A	2.25 PT/A	4"W-A	C	22	19	99	99	99	99	92	99
10	PRIME OIL COC	100 LIQ	1.0	% V/V	1.0 % V/V	4"W-A	C								
10	BASAGRAN	4 SL	1.0	LB A/A	2.0 PT/A	4"W-B	C								
10	BLAZER	2 EC	0.25	LB A/A	1.0 PT/A	4"W-B	C								
10	PRIME OIL COC	100 LIQ	1.0	% V/V	1.0 %V/V	4"W-B	C								
11	WEED FREE							39	1						
11	DUAL II MAGNUM	7.64 EC	1.59	LB A/A	1.66 PT/A	PRE	A								
11	FIRSTRATE	84 WG	0.031	LB A/A	0.59 OZ/A	PRE	A								
11	ROUNDUP ULTRA	3 SL	0.75	LB AE/A	2.0 PT/A	4"W-B	C								

(CONTINUED)

TABLE. INFLUENCE OF WEED REMOVAL TECHNIQUES ON COMPETITION IN SOYBEAN. PROJECT CODE:00-21M-ME120 (CONTINUED)

	TREATMENT	FORM.		RATE	UNIT	PROD RATE		APPL TIME	APPL CODE	YIELD	GLXMA INJURY 7 DAT	CONTROL, 7 DAYS AFTER TREATMENT					
												GGGAN	XANST	IPOHE	AMATA	CYPES	CHEAL
										BU/A	%	%	%	%	%	%	%
12	WEED FREE									34	20						
12	DUAL II MAGNUM	7.64	EC	1.59	LB A/A	1.66	PT/A	PRE	A								
12	FIRSTRATE	84	WG	0.031	LB A/A	0.59	OZ/A	PRE	A								
12	POAST PLUS	1	EC	0.281	LB A/A	2.25	PT/A	4"W-A	C								
12	PRIME OIL COC	100	LIQ	1.0	% V/V	1.0	% V/V	4"W-A	C								
12	BASAGRAN	4	SL	1.0	LB A/A	2.0	PT/A	4"W-B	C								
12	BLAZER	2	EC	0.25	LB A/A	1.0	PT/A	4"W-B	C								
12	PRIME OIL COC	100	LIQ	1.0	% V/V	1.0	%V/V	4"W-B	C								
13	HANDWEED							6"W-B	D	27	0	99	99	99	99	99	99
14	ROUNDUP ULTRA	3	SL	0.75	LB AE/A	2.0	PT/A	6"W-B	D	37	3	98	94	86	99	81	99
15	POAST PLUS	1	EC	0.281	LB A/A	2.25	PT/A	6"W-A	D	34	23	94	97	90	99	85	98
15	PRIME OIL COC	100	LIQ	1.0	% V/V	1.0	% V/V	6"W-A	D								
15	BASAGRAN	4	SL	1.0	LB A/A	2.0	PT/A	6"W-B	D								
15	BLAZER	2	EC	0.25	LB A/A	1.0	PT/A	6"W-B	D								
15	PRIME OIL COC	100	LIQ	1.0	% V/V	1.0	%V/V	6"W-B	D								
16	WEED FREE									41	1						
16	DUAL II MAGNUM	7.64	EC	1.59	LB A/A	1.66	PT/A	PRE	A								
16	FIRSTRATE	84	WG	0.031	LB A/A	0.59	OZ/A	PRE	A								
16	ROUNDUP ULTRA	3	SL	0.75	LB AE/A	2.0	PT/A	6"W-B	D								
17	WEED FREE									40	20						
17	DUAL II MAGNUM	7.64	EC	1.59	LB A/A	1.66	PT/A	PRE	A								
17	FIRSTRATE	84	WG	0.031	LB A/A	0.59	OZ/A	PRE	A								
17	POAST PLUS	1	EC	0.281	LB A/A	2.25	PT/A	6"W-A	D								
17	PRIME OIL COC	100	LIQ	1.0	% V/V	1.0	% V/V	6"W-A	D								
17	BASAGRAN	4	SL	1.0	LB A/A	2.0	PT/A	6"W-B	D								
17	BLAZER	2	EC	0.25	LB A/A	1.0	PT/A	6"W-B	D								
17	PRIME OIL COC	100	LIQ	1.0	% V/V	1.0	%V/V	6"W-B	D								
18	HANDWEED							8"W-B	E	26	0						
19	ROUNDUP ULTRA	3	SL	0.75	LB AE/A	2.0	PT/A	8"W-B	E	39	0	93	96	55	90	40	85
20	POAST PLUS	1	EC	0.281	LB A/A	2.25	PT/A	8"W-A	E	26	18	81	94	78	97	30	95
20	PRIME OIL COC	100	LIQ	1.0	% V/V	1.0	% V/V	8"W-A	E								
20	BASAGRAN	4	SL	1.0	LB A/A	2.0	PT/A	8"W-B	E								
20	BLAZER	2	EC	0.25	LB A/A	1.0	PT/A	8"W-B	E								
20	PRIME OIL COC	100	LIQ	1.0	% V/V	1.0	%V/V	8"W-B	E								
21	WEED FREE									44	1						
21	DUAL II MAGNUM	7.64	EC	1.59	LB A/A	1.66	PT/A	PRE	A								
21	FIRSTRATE	84	WG	0.031	LB A/A	0.59	OZ/A	PRE	A								
21	ROUNDUP ULTRA	3	SL	0.75	LB AE/A	2.0	PT/A	8"W-B	E								

(CONTINUED)

TABLE. INFLUENCE OF WEED REMOVAL TECHNIQUES ON COMPETITION IN SOYBEAN. PROJECT CODE:00-21M-ME120 (CONTINUED)

	TREATMENT	FORM.	RATE	UNIT	PROD RATE	APPL TIME	APPL CODE	YIELD	GLXMA INJURY 7 DAT	CONTROL, 7 DAYS AFTER TREATMENT					
										GGGAN	XANST	IPOHE	AMATA	CYPES	CHEAL
								BU/A	%	%	%	%	%	%	%
22	WEED FREE							37	16						
22	DUAL II MAGNUM	7.64 EC	1.59	LB A/A	1.66 PT/A	PRE	A								
22	FIRSTRATE	84 WG	0.031	LB A/A	0.59 OZ/A	PRE	A								
22	POAST PLUS	1 EC	0.281	LB A/A	2.25 PT/A	8"W-A	E								
22	PRIME OIL COC	100 LIQ	1.0	% V/V	1.0 % V/V	8"W-A	E								
22	BASAGRAN	4 SL	1.0	LB A/A	2.0 PT/A	8"W-B	E								
22	BLAZER	2 EC	0.25	LB A/A	1.0 PT/A	8"W-B	E								
22	PRIME OIL COC	100 LIQ	1.0	% V/V	1.0 %V/V	8"W-B	E								
23	HANDWEED					12"W-B	F	28	0						
24	ROUNDUP ULTRA	3 SL	0.75	LB AE/A	2.0 PT/A	12"W-B	F	38	0	89	93	64	76	33	99
25	POAST PLUS	1 EC	0.281	LB A/A	2.25 PT/A	12"W-A	F	36	17	89	96	88	79		55
25	PRIME OIL COC	100 LIQ	1.0	% V/V	1.0 % V/V	12"W-A	F								
25	BASAGRAN	4 SL	1.0	LB A/A	2.0 PT/A	12"W-B	F								
25	BLAZER	2 EC	0.25	LB A/A	1.0 PT/A	12"W-B	F								
25	PRIME OIL COC	100 LIQ	1.0	% V/V	1.0 %V/V	12"W-B	F								
26	WEED FREE							39	0						
26	DUAL II MAGNUM	7.64 EC	1.59	LB A/A	1.66 PT/A	PRE	A								
26	FIRSTRATE	84 WG	0.031	LB A/A	0.59 OZ/A	PRE	A								
26	ROUNDUP ULTRA	3 SL	0.75	LB AE/A	2.0 PT/A	12"W-B	F								
27	WEED FREE							39	16						
27	DUAL II MAGNUM	7.64 EC	1.59	LB A/A	1.66 PT/A	PRE	A								
27	FIRSTRATE	84 WG	0.031	LB A/A	0.59 OZ/A	PRE	A								
27	POAST PLUS	1 EC	0.281	LB A/A	2.25 PT/A	12"W-A	F								
27	PRIME OIL COC	100 LIQ	1.0	% V/V	1.0 % V/V	12"W-A	F								
27	BASAGRAN	4 SL	1.0	LB A/A	2.0 PT/A	12"W-B	F								
27	BLAZER	2 EC	0.25	LB A/A	1.0 PT/A	12"W-B	F								
27	PRIME OIL COC	100 LIQ	1.0	% V/V	1.0 %V/V	12"W-B	F								
LSD								7	2	3	4	9	11	18	6
P								0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01

1. PROTOCOL: ISPOB, ASPECTS OF WEED COMPETITION IN SOYBEAN.
2. RATING DATES:
   7 DAYS AFTER 2"W, 4"W, 6"W, 8"W, AND 12"W APPLICATIONS ON MAY-30-00, JUN-6-00, JUN-14-00, JUN-19-00, AND JUN-26-00, RESPECTIVELY.
3. FOR EACH POSTEMERGENCE TIMING, POAST PLUS AND COC WERE APPLIED 2 HOURS PRIOR TO BROADLEAF HERBICDIES.