Influence of Soybean Rowspacing on Weed Competition Duration.

00-21M-E120

OBJECTIVE: Determine the effect of 7, 15, and 30 inch soybean row spacings on weed competition and ultimately soybean yield.

SUMMARY: Little to no soybean injury was observed from any treatment. Roundup Ultra controlled at least 90% of giant foxtail regardless of soybean row spacing or application timing. Ivyleaf morningglory control was generally unacceptable from all herbicide treatments. Delaying Roundup Ultra applications until weeds were 8 to 12 inches in height increased control of common cocklebur in 7 and 15 inch rows. Velvetleaf control was variable.

Soybean yield was not decreased by allowing weeds to compete until they were 8 to 12 inches in height (in plots maintained weed free after application). However, allowing weeds to reinfest plots after the earliest application timing (2 to 4 inch weed height) significantly reduced yield in all row spacings.

HERBICIDES	WEEDS	CROP
DUAL II MAGNUM 7.64 EC	COCKLEBUR, COMMON	NOTE
FIRSTRATE 84 WG	FOXTAIL, GIANT	SOYBEAN
ROUNDUP ULTRA 3 SL	MORNINGGLORY, IVYLEAF	
	NUTSEDGE, YELLOW	
	VELVETLEAF	

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PLANT, SOIL AND GENERAL AGRICULTURE DEPARTMENT

SOUTHERN ILLINOIS UNIVERSITY

Influence of Soybean Rowspacing on Weed Competition Duration.

Project Code: 00-21M-E120 Location: Belleville Research Center

Investigator: Bryan Young, Assistant Professor, Southern Illinois University

Weed Code	Common Name	Scientific Name
1. XANST	COCKLEBUR, COMMON	XANTHIUM STRUMARIUM L.
2. SETFA	FOXTAIL, GIANT	SETARIA FABERI HERRM.
3. CYPES	NUTSEDGE, YELLOW	CYPERUS ESCULENTUS L.
4. IPOHE	MORNINGGLORY, IVYLEAF	IPOMOEA HEDERACEA (L.) JACQ.
5. ABUTH	VELVETLEAF	ABUTILON THEOPHRASTI MEDICUS
6. AMBEL	RAGWEED, COMMON	AMBROSIA ARTEMISIIFOLIA L.
7. AMATA	WATERHEMP, COMMON	AMARANTHUS RUDIS SAUER
8. CHEAL	LAMBSQUARTERS, COMMON	CHENOPODIUM ALBUM L.
9. ZEAMX	CORN, VOLUNTEER	ZEA MAYS L.
10. POROL	PURSLANE, COMMON	PORTULACA OLERACEA L.
11. DIGSA	CRABGRASS, LARGE	DIGITARIA SANGUINALIS (L.) SCOP.
12. SIDSP	SIDA, PRICKLY	SIDA SPINOSA L.
13. AMBTR	RAGWEED, GIANT	AMBROSIA TRIFIDA L.
14. POLPY	SMARTWEED, PENNSYLVANIA	POLYGONUM PENSYLVANICUM L.

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:	SEE NOTE		

Plot Width, Unit:	10 FT	Plot Length, Unit:	27 FT	Reps: 4	
Tillage Type:	REDUCED-TILL	Study Design:	SPLIT-PLOT		
Previous Crop, Year:	ZEAMX, 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	G
Application Date:	May-5-00	May-30-00	Jun-6-00	Jun-12-00	Jun-19-00	Jun-13-00	Jun-21-00
Time of Day:	18:00	10:15	13:00	11:00	11:30		9:30
Application Method:	SPRAY	SPRAY	SPRAY	SPRAY	SPRAY	SPRAY	SPRAY
Application Timing:	PRE	2-4"W	4-6"W	6-8"W	8-12"W	IF-NEED	IF-NEED
Applic. Placement:	BROSOI	BROFOL	BROFOL	BROFOL	BROFOL	BROFOL	BROFOL
Air Temp., Unit:	80 F	75 F	62 F	82 F	78 F	F	78 F
% Relative Humidity:	96	80	24	70	80		92
Wind Velocity, Unit:	5 MPH	5-10 MPH	0-5 MPH	2-4 MPH	1-3 MPH	5-10 MPH	3-5 MPH
Soil Moisture:	DRY	WET	NORMAL	NORMAL	WET	NORMAL	WET
% Cloud Cover:		10	0	90	20	0	90

CROP STAGE AT EACH APPLICATION

	A	B	C	D	E	F	G
Crop 1 Code, Stage:	GLXMA PRE	GLXMA V1	GLXMA V2	GLXMA V3	GLXMA V4	GLXMA V3	GLXMA V4-V5
Height, Unit:	NA	5.5 IN	5.5 IN	7-9 IN	10-12 IN	7-9 IN	10-12 IN

WEED STAGE AT EACH APPLICATION

	A	B	C	D	E	F	G
Weed 1 Code:		XANST	XANST	XANST	XANST	XANST	XANST
Stage(leaves):		3-4	4-6	6-7	6-10	COTL-4	COTL-4
Height(inches):		4-5	4-8	6-9	8-18	0-3	2-6
Density:		HIGH	HIGH	HIGH	HIGH	HIGH	LOW
Weed 2 Code:		SETFA	SETFA	SETFA	SETFA	SETFA	
Stage(leaves):		3-4	4-6	6-7	6-7	2-3	
Height(inches):		4-6	4-8	6-9	10-12	0-1	
Density:		HIGH	HIGH	HIGH	HIGH	LOW	
Weed 3 Code:		CYPES	CYPES		CYPES	CYPES	CYPES
Stage(leaves):		3-4	4-6		4-6	3-6	4-6
Height(inches):		3	3-5		4-8	1-3	3-6
Density:		LOW	LOW		LOW	LOW	LOW
Weed 4 Code:		IPOHE	IPOHE	IPOHE	IPOHE	IPOHE	IPOHE
Stage(leaves):		3-5	4-6	4-6	5-10	COTL-4	COTL-3
Height(inches):		2-4	2-4	3-5	5-12	0-2	2-5
Density:		MEDIUM	MEDIUM	MEDIUM	MEDIUM	LOW	LOW
Weed 5 Code:			ABUTH		ABUTH	ABUTH	ABUTH
Stage(leaves):			4		4-6	2-3	2-4
Height(inches):			4		4-9	0-1	2-5
Density:			LOW		LOW	LOW	LOW

APPLICATION EQUIPMENT

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

NOTES:

ROW SPACINGS ARE 7, 15, AND 30 INCHES, SEE TREATMENT LIST.
Harvested Sep-19-00, (2) 30 inch row by 24 ft.

TABLE. INFLUENCE OF SOYBEAN ROWSPACING ON WEED COMPETITION DURATION. PROJECT CODE:00-21M-E120

	TREATMENT	FORM.	RATE	UNIT	PROD RATE	APPL TIME	APPL CODE	YIELD	GLXMA INJURY 7 DAT	CONTROL, DAYS AFTER 8-12"W SETFA 30	SETFA 60	CYPES 30	CYPES 60	IPOHE 30	IPOHE 60	ABUTH 30	ABUTH 60	XANST 30	XANST 60
								BU/A	%	%	%	%	%	%	%	%	%	%	%
1	7 INCH ROWS							8	0	0	0	0	0	0	0	0	0	0	0
1	NONTREATED																		
2	7 INCH ROWS							49											
2	DUAL II MAGNUM	7.64	EC	1.0	LB A/A	1.05 PT/A	PRE	A											
2	FIRSTRATE	84	WG	0.024	LB A/A	0.46 OZ/A	PRE	A											
2	ROUNDUP ULTRA	3	SL	0.75	LB AE/A	2.0 PT/A	IF-NEED	F-G											
2	AMS	100	DRY	2.0	% W/W	2.0 % W/W	IF-NEED	F-G											
2	HANDWEED																		
3	7 INCH ROWS							46	0										
3	ROUNDUP ULTRA	3	SL	0.75	LB AE/A	1.0 QT/A	2-4"W	B											
3	AMS	100	DRY	2.0	% W/W	2.0 % W/W	2-4"W	B											
3	ROUNDUP ULTRA	3	SL	0.75	LB AE/A	1.0 QT/A	IF-NEED	F-G											
3	AMS	100	DRY	2.0	% W/W	2.0 % W/W	IF-NEED	F-G											
3	HANDWEED																		
4	7 INCH ROWS							47	4										
4	ROUNDUP ULTRA	3	SL	0.75	LB AE/A	1.0 QT/A	4-6"W	C											
4	AMS	100	DRY	2.0	% W/W	2.0 % W/W	4-6"W	C											
4	ROUNDUP ULTRA	3	SL	0.75	LB AE/A	1.0 QT/A	IF-NEED	F-G											
4	AMS	100	DRY	2.0	% W/W	2.0 % W/W	IF-NEED	F-G											
4	HANDWEED																		
5	7 INCH ROWS							48	1										
5	ROUNDUP ULTRA	3	SL	0.75	LB AE/A	1.0 QT/A	6-8"W	D											
5	AMS	100	DRY	2.0	% W/W	2.0 % W/W	6-8"W	D											
5	ROUNDUP ULTRA	3	SL	0.75	LB AE/A	1.0 QT/A	IF-NEED	F-G											
5	AMS	100	DRY	2.0	% W/W	2.0 % W/W	IF-NEED	F-G											
5	HANDWEED																		
6	7 INCH ROWS							46	0										
6	ROUNDUP ULTRA	3	SL	0.75	LB AE/A	1.0 QT/A	8-12"W	E											
6	AMS	100	DRY	2.0	% W/W	2.0 % W/W	8-12"W	E											
6	HANDWEED																		
7	7 INCH ROWS							34	0	91	96	87	99	50		84	99	64	66
7	ROUNDUP ULTRA	3	SL	0.75	LB AE/A	1.0 QT/A	2-4"W	B											
7	AMS	100	DRY	2.0	% W/W	2.0 % W/W	2-4"W	B											
7	REINFEST																		
8	7 INCH ROWS							39	2	94	99	65	99	45	27	82	87	86	77
8	ROUNDUP ULTRA	3	SL	0.75	LB AE/A	1.0 QT/A	4-6"W	C											
8	AMS	100	DRY	2.0	% W/W	2.0 % W/W	4-6"W	C											
8	REINFEST																		

(CONTINUED)

TABLE. INFLUENCE OF SOYBEAN ROWSPACING ON WEED COMPETITION DURATION. PROJECT CODE:00-21M-E120 (CONTINUED)

	TREATMENT	FORM.	RATE	UNIT	PROD RATE	APPL TIME	APPL CODE	YIELD	GLXMA INJURY	CONTROL, DAYS AFTER 8-12"W									
										SETFA		CYPES		IPOHE		ABUTH		XANST	
										30	60	30	60	30	60	30	60	30	60
								BU/A	%	%	%	%	%	%	%	%	%	%	%
9	7 INCH ROWS							38	0	96	97	82	99	55	45	99	99	83	81
9	ROUNDUP ULTRA	3 SL	0.75	LB AE/A	1.0 QT/A	6-8"W	D												
9	AMS	100 DRY	2.0	% W/W	2.0 % W/W	6-8"W	D												
9	REINFEST																		
10	7 INCH ROWS							47	0	98	99	85	99	80	65	99	99	94	95
10	ROUNDUP ULTRA	3 SL	0.75	LB AE/A	1.0 QT/A	8-12"W	E												
10	AMS	100 DRY	2.0	% W/W	2.0 % W/W	8-12"W	E												
10	REINFEST																		
11	15 INCH ROWS							13	0	0	0	0	0	0	0	0	0	0	0
11	NONTREATED																		
12	15 INCH ROWS							47											
12	DUAL II MAGNUM	7.64 EC	1.0	LB A/A	1.05 PT/A	PRE	A												
12	FIRSTRATE	84 WG	0.024	LB A/A	0.46 OZ/A	PRE	A												
12	ROUNDUP ULTRA	3 SL	0.75	LB AE/A	2.0 PT/A	IF-NEED	F-G												
12	AMS	100 DRY	2.0	% W/W	2.0 % W/W	IF-NEED	F-G												
12	HANDWEED																		
13	15 INCH ROWS							47	10										
13	ROUNDUP ULTRA	3 SL	0.75	LB AE/A	1.0 QT/A	2-4"W	B												
13	AMS	100 DRY	2.0	% W/W	2.0 % W/W	2-4"W	B												
13	ROUNDUP ULTRA	3 SL	0.75	LB AE/A	1.0 QT/A	IF-NEED	F-G												
13	AMS	100 DRY	2.0	% W/W	2.0 % W/W	IF-NEED	F-G												
13	HANDWEED																		
14	15 INCH ROWS							50	2										
14	ROUNDUP ULTRA	3 SL	0.75	LB AE/A	1.0 QT/A	4-6"W	C												
14	AMS	100 DRY	2.0	% W/W	2.0 % W/W	4-6"W	C												
14	ROUNDUP ULTRA	3 SL	0.75	LB AE/A	1.0 QT/A	IF-NEED	F-G												
14	AMS	100 DRY	2.0	% W/W	2.0 % W/W	IF-NEED	F-G												
14	HANDWEED																		
15	15 INCH ROWS							50	0										
15	ROUNDUP ULTRA	3 SL	0.75	LB AE/A	1.0 QT/A	6-8"W	D												
15	AMS	100 DRY	2.0	% W/W	2.0 % W/W	6-8"W	D												
15	ROUNDUP ULTRA	3 SL	0.75	LB AE/A	1.0 QT/A	IF-NEED	F-G												
15	AMS	100 DRY	2.0	% W/W	2.0 % W/W	IF-NEED	F-G												
15	HANDWEED																		
16	15 INCH ROWS							50	0										
16	ROUNDUP ULTRA	3 SL	0.75	LB AE/A	1.0 QT/A	8-12"W	E												
16	AMS	100 DRY	2.0	% W/W	2.0 % W/W	8-12"W	E												
16	HANDWEED																		
17	15 INCH ROWS							34	2	97	99	99	99	77	99	99	87	73	70
17	ROUNDUP ULTRA	3 SL	0.75	LB AE/A	1.0 QT/A	2-4"W	B												
17	AMS	100 DRY	2.0	% W/W	2.0 % W/W	2-4"W	B												
17	REINFEST																		

(CONTINUED)

TABLE. INFLUENCE OF SOYBEAN ROWSPACING ON WEED COMPETITION DURATION. PROJECT CODE:00-21M-E120 (CONTINUED)

	TREATMENT	FORM.	RATE	UNIT	PROD RATE	APPL TIME	APPL CODE	YIELD	GLXMA INJURY 7 DAT	CONTROL, DAYS AFTER 8-12"W SETFA 30	SETFA 60	CYPES 30	CYPES 60	IPOHE 30	IPOHE 60	ABUTH 30	ABUTH 60	XANST 30	XANST 60
								BU/A	%	%	%	%	%	%	%	%	%	%	%
18	15 INCH ROWS							41	1	97	99	82	99	71	60	99	77	90	95
18	ROUNDUP ULTRA	3 SL	0.75	LB AE/A	1.0 QT/A	4-6"W	C												
18	AMS	100 DRY	2.0	% W/W	2.0 % W/W	4-6"W	C												
18	REINFEST																		
19	15 INCH ROWS							43	0	96	99	84	99	53	42	99	99	90	99
19	ROUNDUP ULTRA	3 SL	0.75	LB AE/A	1.0 QT/A	6-8"W	D												
19	AMS	100 DRY	2.0	% W/W	2.0 % W/W	6-8"W	D												
19	REINFEST																		
20	15 INCH ROWS							46	0	99	99	99	99	79	99	99	99	96	99
20	ROUNDUP ULTRA	3 SL	0.75	LB AE/A	1.0 QT/A	8-12"W	E												
20	AMS	100 DRY	2.0	% W/W	2.0 % W/W	8-12"W	E												
20	REINFEST																		
21	30 INCH ROWS							10	0	0	0	0	0	0	0	0	0	0	0
21	NONTREATED																		
22	30 INCH ROWS							44											
22	DUAL II MAGNUM	7.64 EC	1.0	LB A/A	1.05 PT/A	PRE	A												
22	FIRSTRATE	84 WG	0.024	LB A/A	0.46 OZ/A	PRE	A												
22	ROUNDUP ULTRA	3 SL	0.75	LB AE/A	2.0 PT/A	IF-NEED	F-G												
22	AMS	100 DRY	2.0	% W/W	2.0 % W/W	IF-NEED	F-G												
22	HANDWEED																		
23	30 INCH ROWS							46	0										
23	ROUNDUP ULTRA	3 SL	0.75	LB AE/A	1.0 QT/A	2-4"W	B												
23	AMS	100 DRY	2.0	% W/W	2.0 % W/W	2-4"W	B												
23	ROUNDUP ULTRA	3 SL	0.75	LB AE/A	1.0 QT/A	IF-NEED	F-G												
23	AMS	100 DRY	2.0	% W/W	2.0 % W/W	IF-NEED	F-G												
23	HANDWEED																		
24	30 INCH ROWS							49	3										
24	ROUNDUP ULTRA	3 SL	0.75	LB AE/A	1.0 QT/A	4-6"W	C												
24	AMS	100 DRY	2.0	% W/W	2.0 % W/W	4-6"W	C												
24	ROUNDUP ULTRA	3 SL	0.75	LB AE/A	1.0 QT/A	IF-NEED	F-G												
24	AMS	100 DRY	2.0	% W/W	2.0 % W/W	IF-NEED	F-G												
24	HANDWEED																		
25	30 INCH ROWS							50	0										
25	ROUNDUP ULTRA	3 SL	0.75	LB AE/A	1.0 QT/A	6-8"W	D												
25	AMS	100 DRY	2.0	% W/W	2.0 % W/W	6-8"W	D												
25	ROUNDUP ULTRA	3 SL	0.75	LB AE/A	1.0 QT/A	IF-NEED	F-G												
25	AMS	100 DRY	2.0	% W/W	2.0 % W/W	IF-NEED	F-G												
25	HANDWEED																		
26	30 INCH ROWS							46	0										
26	ROUNDUP ULTRA	3 SL	0.75	LB AE/A	1.0 QT/A	8-12"W	E												
26	AMS	100 DRY	2.0	% W/W	2.0 % W/W	8-12"W	E												
26	HANDWEED																		

(CONTINUED)

TABLE. INFLUENCE OF SOYBEAN ROWSPACING ON WEED COMPETITION DURATION. PROJECT CODE:00-21M-E120 (CONTINUED)

	TREATMENT	FORM.	RATE	UNIT	PROD RATE	APPL TIME	APPL CODE	YIELD	GLXMA INJURY 7 DAT	CONTROL, DAYS AFTER 8-12"W SETFA 30	SETFA 60	CYPES 30	CYPES 60	IPOHE 30	IPOHE 60	ABUTH 30	ABUTH 60	XANST 30	XANST 60
								BU/A	%	%	%	%	%	%	%	%	%	%	%
27	30 INCH ROWS							28	0	89	94	79	99	67	23	84	99	68	59
27	ROUNDUP ULTRA	3	SL	0.75	LB AE/A	1.0	QT/A	2-4"W	B										
27	AMS	100	DRY	2.0	% W/W	2.0	% W/W	2-4"W	B										
27	REINFEST																		
28	30 INCH ROWS							40	2	94	97	65	99	56	50	92	87	80	85
28	ROUNDUP ULTRA	3	SL	0.75	LB AE/A	1.0	QT/A	4-6"W	C										
28	AMS	100	DRY	2.0	% W/W	2.0	% W/W	4-6"W	C										
28	REINFEST																		
29	30 INCH ROWS							39	1	95	97	47	99	56	20	77	99	80	86
29	ROUNDUP ULTRA	3	SL	0.75	LB AE/A	1.0	QT/A	6-8"W	D										
29	AMS	100	DRY	2.0	% W/W	2.0	% W/W	6-8"W	D										
29	REINFEST																		
30	30 INCH ROWS							45	0	94	98	55	99	71	76	90	99	80	94
30	ROUNDUP ULTRA	3	SL	0.75	LB AE/A	1.0	QT/A	8-12"W	E										
30	AMS	100	DRY	2.0	% W/W	2.0	% W/W	8-12"W	E										
30	REINFEST																		
LSD								8	1	5	5	37	0	23	39	22	19	13	13
P								0.01	0.01	0.01	0.01	0.01	1.0	0.01	0.01	0.01	0.01	0.01	0.01

1. PROTOCOL: ISPOB PROJECT - ASPECTS OF WEED COMPETITION IN SOYBEAN.
2. RATING DATES:
   7 DAYS AFTER 2-4"W, 4-6"W, 6-8"W, AND 8-12"W APPLICATIONS ON JUN-6-00, JUN-13-00, JUN-19-00, AND JUN-26-00, RESPECTIVELY.
   30 DAYS AFTER 8-12"W, AND 60 DAYS AFTER 8-12"W ON JUL-19-00, AND AUG-18-00, RESPECTIVELY.