

Effect of Nitrogen on Common Waterhemp Control in Soybean.

02-51W-MS50

OBJECTIVE: This study was designed to evaluate the effect of nitrogen on common waterhemp control in soybean.

SUMMARY: Nitrogen had an effect on common waterhemp control where no soil herbicide or no Roundup Ultra Max was applied. Common waterhemp control decreased as nitrogen rate was increased from 0 to 120 lb/A. Nitrogen had no effect on common waterhemp control where Authority or Roundup Ultra Max were applied with control ranging from 97 to 100%. Nitrogen affected common waterhemp height with a 42% reduction in common waterhemp height 28 and 56 DAT where no nitrogen was applied. The greatest common waterhemp population was observed where nitrogen at 120 lb/A was applied. There was no difference in fresh weight of common waterhemp due to nitrogen. Common waterhemp competition did not reduce soybean height. Common waterhemp competition reduced grain yield by 22% where no nitrogen was applied. However, common waterhemp competition reduced grain yield by 69% where nitrogen at 120 lb/A was applied. Nitrogen did not increase soybean height or grain yield.

HERBICIDES

AUTHORITY 75 WG
ROUNDUP ULTRA MAX 3.7 SL
SELECT 2 EC

WEEDS

waterhemp, common

CROP

soybean

Ronald Krausz and Bryan Young

PLANT, SOIL AND GENERAL AGRICULTURE DEPARTMENT

SOUTHERN ILLINOIS UNIVERSITY

Effect of Nitrogen on Common Waterhemp Control in Soybean.

Project Code: 02-51W-MS50 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

Weed Code Common Name Scientific Name
 1. AMATA waterhemp, common Amaranthus rudis Sauer

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: 27 FT Reps: 3
 Tillage Type: Reduced-Till Study Design: Randomized complete block
 Previous Crop, Year: ZEAMX, 2001

Field Prep./Maintenance: N (see note), P205 50 LB/A, K20 200 LB/A

Soil Name: Weir % OM: 1.7 pH: 6.8 CEC: 11
 Texture: Silt loam Fert. Level: P1: 79 LB/A, K: 215 LB/A

APPLICATION DESCRIPTION

	A	B	C	D	E	F
Application Date:	6-4-02	6-4-02	6-19-02	6-19-02	7-1-02	7-15-02
Time of Day:	10:00	7:00	15:00	15:00	18:30	12:00
Application Method:	Spray	Hand Spread	Spray	Spray	Spray	Spray
Application Timing:	PRE-1	PRE-2	3"GR-1	3"GR-2	6"WH	14DA6"WH
Applic. Placement:	BROSIOI	BROSIOI	BROFOL	BROFOL	BROFOL	BROFOL
Air Temp., Unit:	90 F	92 F	90 F	90 F	96 F	88 F
% Relative Humidity:	48	52	36	36	36	38
Wind Velocity, Unit:	5-10 MPH	0 MPH	3 MPH	3 MPH	0-3 MPH	0 MPH
Soil Moisture:	NORMAL	NORMAL	NORMAL	NORMAL	BELNOR	BELNOR
% Cloud Cover:	10				5	40

CROP STAGE AT EACH APPLICATION

	A	B	C	D	E	F
Crop 1 Code, Stage:	GLXMA NA	GLXMA NA	GLXMA V1	GLXMA V1	GLXMA V3	GLXMA V8-R1
Height, Unit:	NA NA	NA NA	3-4 IN	3-4 IN	5-7 IN	12 IN

WEED STAGE AT EACH APPLICATION

	A	B	C	D	E	F
Weed 1 Code:					AMATA	AMATA
Stage(leaves):					8-10	6-15
Height(inches):					4-6	3-10
Density:					High	Low

APPLICATION EQUIPMENT

	A	B	C	D	E	F
Appl. Equipment:	CO2 sprayer	Hand Spread	CO2 sprayer	CO2 sprayer	CO2 sprayer	CO2 sprayer
Operating Pressure:	40 PSI	NA	40 PSI	40 PSI	40 PSI	40 PSI
Nozzle Type:	Flat fan	NA	Flat fan	Flat fan	Flat fan	Flat fan
Nozzle Size:	8002	NA	8002	8002	8002	8002
Boom Length, Unit:	7.5 FT	7.5 FT	7.5 FT	7.5 FT	7.5 FT	7.5 FT
Spray Volume, Unit:	20 GPA	NA NA	20 GPA	20 GPA	20 GPA	20 GPA

NOTES:

Harvested Oct-9-02, (2) 30 inch rows by 24 ft.

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										AMATA	AMATA	AMATA	AMATA	AMATA	AMATA	AMATA	AMATA				
										GLXMA	GLXMA	GLXMA	GLXMA	Control	Control	Control	HEIRED	HEIRED	Plants	Fresh Wt	Dry Wt
										Yield	Injury	Injury	Injury	Percent	Percent	Percent	Percent	Percent	1.0 m2	g/1.0 m2	g/1.0 m2
										bu/A	Percent	Percent	Percent	Percent	Percent	Percent	Percent	Percent	7-29-02	7-29-02	7-29-02
										10-9-02	14 DAT	28 DAT	56 DAT	14 DAT	28 DAT	56 DAT	28 DAT	56 DAT	56 DAP	56 DAP	56 DAP
Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Prod Rate	Prod Unit	Grow Stg	Appl Code												
1	NO NITROGEN FERTILIZER									31	0	0	0	50	17	17	42	42	213	1769	212
1	SELECT	2	EC	0.125	LB A/A	8	OZ/A	3"GR-1	C												
1	PRIME OIL COC	100	LIQ	1.0	% V/V	1	%V/V	3"GR-1	C												
2	FERTILIZER 34-0-0	34	DRY	120	LB A/A	353	LB/A	PRE-2	B	15	0	0	0	0	0	0	0	0	230	2800	336
2	SELECT	2	EC	0.125	LB A/A	8	OZ/A	3"GR-1	C												
2	PRIME OIL COC	100	LIQ	1.0	% V/V	1	%V/V	3"GR-1	C												
3	NO NITROGEN FERTILIZER									53	0	0	0	100	100	100	100	100			
3	SELECT	2	EC	0.125	LB A/A	8	OZ/A	3"GR-1	C												
3	PRIME OIL COC	100	LIQ	1.0	% V/V	1	%V/V	3"GR-1	C												
3	HANDWEED AFTER POST APP																				
4	FERTILIZER 34-0-0	34	DRY	120	LB A/A	353	LB/A	PRE-2	B	49	0	0	0	100	100	100	100	100			
4	SELECT	2	EC	0.125	LB A/A	8	OZ/A	3"GR-1	C												
4	PRIME OIL COC	100	LIQ	1.0	% V/V	1	%V/V	3"GR-1	C												
4	HANDWEED AFTER POST APP																				
5	AUTHORITY	75	WG	0.25	LB A/A	5.33	OZ/A	PRE-1	A	46	0	0	0	100	99	97	58	33			
5	NO NITROGEN FERTILIZER																				
5	SELECT	2	EC	0.125	LB A/A	8	OZ/A	3"GR-2	D												
5	PRIME OIL COC	100	LIQ	1.0	% V/V	1	%V/V	3"GR-2	D												
6	AUTHORITY	75	WG	0.25	LB A/A	5.33	OZ/A	PRE-1	A	43	0	0	0	98	96	97	20	17			
6	FERTILIZER 34-0-0	34	DRY	120	LB A/A	353	LB/A	PRE-2	B												
6	SELECT	2	EC	0.125	LB A/A	8	OZ/A	3"GR-2	D												
6	PRIME OIL COC	100	LIQ	1.0	% V/V	1	%V/V	3"GR-2	D												
7	NO NITROGEN FERTILIZER									54	0	0	0	90	97	100	90	100			
7	SELECT	2	EC	0.125	LB A/A	8	OZ/A	3"GR-1	C												
7	PRIME OIL COC	100	LIQ	1.0	% V/V	1	%V/V	3"GR-1	C												
7	ROUNDUP ULTRA MAX	3.7	SL	0.75	LB AE/A	26	OZ/A	6"WH	E												
8	FERTILIZER 34-0-0	34	DRY	120	LB A/A	353	LB/A	PRE-2	B	50	0	0	0	90	97	100	90	100			
8	SELECT	2	EC	0.125	LB A/A	8	OZ/A	3"GR-1	C												
8	PRIME OIL COC	100	LIQ	1.0	% V/V	1	%V/V	3"GR-1	C												
8	ROUNDUP ULTRA MAX	3.7	SL	0.75	LB AE/A	26	OZ/A	6"WH	E												
9	NO NITROGEN FERTILIZER									48	0	0	0	90	96	100	90	100			
9	SELECT	2	EC	0.125	LB A/A	8	OZ/A	3"GR-1	C												
9	PRIME OIL COC	100	LIQ	1.0	% V/V	1	%V/V	3"GR-1	C												
9	ROUNDUP ULTRA MAX	3.7	SL	0.75	LB AE/A	26	OZ/A	6"WH	E												
9	ROUNDUP ULTRA MAX	3.7	SL	0.75	LB AE/A	26	OZ/A	14DA6"WH	F												

Weed Code										AMATA	AMATA	AMATA	AMATA	AMATA	AMATA	AMATA	AMATA				
Crop Code										GLXMA	GLXMA	GLXMA	GLXMA	GLXMA	GLXMA	GLXMA	GLXMA				
Rating Data Type										Yield	Injury	Injury	Injury	Injury	Injury	Injury	Injury				
Rating Unit										bu/A	Percent	Percent	Percent	Percent	Percent	Percent	Percent				
Rating Date										10-9-02											
Trt-Eval Interval										14 DAT	28 DAT	56 DAT	14 DAT	28 DAT	56 DAT	28 DAT	56 DAT				
Trt No.	Treatment Name	Form Conc	Form Type	Rate	Unit	Prod Rate	Prod Unit	Grow Stg	Appl Code	Control Percent	Control Percent	Control Percent	HEIRED Percent	HEIRED Percent	Plants	Fresh Wt	Dry Wt				
										Percent	Percent	Percent	Percent	Percent	1.0 m2	g/1.0 m2	g/1.0 m2				
10	FERTILIZER 34-0-0	34	DRY	120	LB A/A	353	LB/A	PRE-2	B	51	0	0	0	92	95	100	90	100			
10	SELECT	2	EC	0.125	LB A/A	8	OZ/A	3"GR-1	C												
10	PRIME OIL COC	100	LIQ	1.0	% V/V	1	%V/V	3"GR-1	C												
10	ROUNDUP ULTRA MAX	3.7	SL	0.75	LB AE/A	26	OZ/A	6"WH	E												
10	ROUNDUP ULTRA MAX	3.7	SL	0.75	LB AE/A	26	OZ/A	14DA6"WH	F												
LSD (P=.05)										6.0	0.0	0.0	0.0	2.1	15.9	15.8	26.2	17.9	7.6	1517.3	186.2
Replicate F										5.804	0.000	0.000	0.000	1.128	0.836	0.971	1.159	2.489	280.429	1.795	2.932
Replicate Prob(F)										0.0113	1.0000	1.0000	1.0000	0.3456	0.4498	0.3975	0.3361	0.1111	0.0036	0.3578	0.2543
Treatment F										35.594	0.000	0.000	0.000	2126.742	49.823	52.935	16.739	46.830	89.286	8.544	8.214
Treatment Prob(F)										0.0001	1.0000	1.0000	1.0000	0.0001	0.0001	0.0001	0.0001	0.0001	0.0110	0.0998	0.1032

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Trial Comments

1. Protocol: SIU (RFK).
2. EOS = End of season. DAT = days after treatment. HEIRED = height reduction. DAP = days after planting. 1.0 m² = 1.0 square meter.
3. Rating dates:
 - Ratings at 14, 28, and 56 days after the PRE application were on 6-18-02, 7-2-02, and 7-30-02, respectively.
 - Ratings at 14, 28, and 56 days after the 6"WH application were on 7-15-02, 7-29-02, and 8-26-02, respectively.
 - Ratings at 14, 28, and 56 days after the 6"WH application were also 0, 14, and 42 days after the 14DA6"WH application, respectively.
4. AMATA height reduction due to lack of nitrogen or herbicide treatment.