

## Effect of Nitrogen on Common Waterhemp Control in Corn.

Project Code: 03-51W-S80 Location: Belleville Research Center

Investigator: Bryan Young, Assistant Professor, Southern Illinois University

City State Zip Country: Belleville IL 62221 USA  
 Trial Status: Final Updated: 11-4-03

**Objective:**

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

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

**Crop 1:** ZEAMX corn, field **Variety:** Pioneer 33P71 CL  
**Planting Method:** Seeded **Planting Date:** 6-19-03  
**Rate:** 28000 S/A **Depth:** 1.5 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:** GLXMA, 2002

**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
<b>Application Date:</b>	6-6-03	6-7-03			7-14-03
<b>Time of Day:</b>	11:00	16:00	NA	NA	13:00
<b>Application Method:</b>	Spray	Hand Spread	Spray	Spray	Spray
<b>Application Timing:</b>	PRE-1	PRE-2	3"GR-1	3"GR-2	4-6"WH
<b>Applic. Placement:</b>	BROSOI	BROSOI	BROFOL	BROFOL	BROFOL
<b>Air Temp., Unit:</b>	65 F	80 F			82 F
<b>% Relative Humidity:</b>	96	42			42
<b>Wind Velocity, Unit:</b>	0 MPH	0 MPH			5 MPH
<b>Soil Moisture:</b>	ABONOR	ABONOR			NORMAL

**CROP STAGE AT EACH APPLICATION**

	A	B	C	D	E
<b>Crop 1 Code, Stage:</b>	ZEAMX NA	ZEAMX NA	ZEAMX NA	ZEAMX NA	ZEAMX V6
<b>Height, Unit:</b>	NA NA	NA NA	NA NA	NA NA	10-12 IN

**WEED STAGE AT EACH APPLICATION**

	A	B	C	D	E
<b>Weed 1 Code:</b>					AMATA
<b>Stage(leaves):</b>					10+
<b>Height(inches):</b>					4-10
<b>Density:</b>					Medium

**APPLICATION EQUIPMENT**

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

**NOTES:**

Nitrogen applications either 0, 50, 100 or 150 lb N/A, see treatment list.  
 The 3"GR-1 and 3"GR-2 applications were not applied, not needed.  
 Harvested Oct-28-03, (2) 30 inch rows by 24 ft.

Effect of Nitrogen on Common Waterhemp Control in Corn.

Project Code: 03-51W-S80 Location: Belleville Research Center

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

Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Prod Rate	Prod Unit	Grow Stg	Appl Code	ZEAMX Yield 10-28-03	ZEAMX Injury Percent 14 DAT	ZEAMX Injury Percent 28 DAT	ZEAMX Injury Percent 56 DAT	ZEAMX HEIRED Percent 14 DAT	ZEAMX HEIRED Percent 28 DAT	ZEAMX HEIRED Percent 56 DAT	ZEAMX Height 9-25-03	AMATA Control Percent 14 DAT	AMATA Control Percent 28 DAT	AMATA Control Percent 56 DAT
1	NO NITROGEN FERTILIZER									30	0	0	0	0	25	40	83	80	33	0
1	LIGHTNING	70	WG	0.056	LB A/A	1.28	OZ/A	3"GR-1	C											
1	ACTIVATOR 90	100	LIQ	0.25	% V/V	0.25	%V/V	3"GR-1	C											
2	FERTILIZER 34-0-0	34	DRY	50	LB A/A	147	LB/A	PRE-2	B	43	0	0	0	0	2	22	92	73	17	0
2	LIGHTNING	70	WG	0.056	LB A/A	1.28	OZ/A	3"GR-1	C											
2	ACTIVATOR 90	100	LIQ	0.25	% V/V	0.25	%V/V	3"GR-1	C											
3	FERTILIZER 34-0-0	34	DRY	100	LB A/A	294	LB/A	PRE-2	B	69	0	0	0	0	0	13	98	80	0	0
3	LIGHTNING	70	WG	0.056	LB A/A	1.28	OZ/A	3"GR-1	C											
3	ACTIVATOR 90	100	LIQ	0.25	% V/V	0.25	%V/V	3"GR-1	C											
4	FERTILIZER 34-0-0	34	DRY	150	LB A/A	440	LB/A	PRE-2	B	94	0	0	0	0	0	0	99	80	0	0
4	LIGHTNING	70	WG	0.056	LB A/A	1.28	OZ/A	3"GR-1	C											
4	ACTIVATOR 90	100	LIQ	0.25	% V/V	0.25	%V/V	3"GR-1	C											
5	NO NITROGEN FERTILIZER									60	0	0	0	0	25	32	90	100	100	100
5	LIGHTNING	70	WG	0.056	LB A/A	1.28	OZ/A	3"GR-1	C											
5	ACTIVATOR 90	100	LIQ	0.25	% V/V	0.25	%V/V	3"GR-1	C											
5	HANDWEED AFTER POST APP																			
6	FERTILIZER 34-0-0	34	DRY	50	LB A/A	147	LB/A	PRE-2	B	68	0	0	0	0	5	22	97	100	100	100
6	LIGHTNING	70	WG	0.056	LB A/A	1.28	OZ/A	3"GR-1	C											
6	ACTIVATOR 90	100	LIQ	0.25	% V/V	0.25	%V/V	3"GR-1	C											
6	HANDWEED AFTER POST APP																			
7	FERTILIZER 34-0-0	34	DRY	100	LB A/A	294	LB/A	PRE-2	B	106	0	0	0	0	0	0	99	100	100	100
7	LIGHTNING	70	WG	0.056	LB A/A	1.28	OZ/A	3"GR-1	C											
7	ACTIVATOR 90	100	LIQ	0.25	% V/V	0.25	%V/V	3"GR-1	C											
7	HANDWEED AFTER POST APP																			
8	FERTILIZER 34-0-0	34	DRY	150	LB A/A	440	LB/A	PRE-2	B	125	0	0	0	0	0	0	101	100	100	100
8	LIGHTNING	70	WG	0.056	LB A/A	1.28	OZ/A	3"GR-1	C											
8	ACTIVATOR 90	100	LIQ	0.25	% V/V	0.25	%V/V	3"GR-1	C											
8	HANDWEED AFTER POST APP																			
9	BICEP II MAGNUM	5.5	L	2.89	LB A/A	2.1	QT/A	PRE-1	A	68	0	0	0	0	25	28	92	100	100	100
9	NO NITROGEN FERTILIZER																			
9	LIGHTNING	70	WG	0.056	LB A/A	1.28	OZ/A	3"GR-2	D											
9	ACTIVATOR 90	100	LIQ	0.25	% V/V	0.25	%V/V	3"GR-2	D											
10	BICEP II MAGNUM	5.5	L	2.89	LB A/A	2.1	QT/A	PRE-1	A	84	0	0	0	0	2	18	98	100	100	100
10	FERTILIZER 34-0-0	34	DRY	50	LB A/A	147	LB/A	PRE-2	B											
10	LIGHTNING	70	WG	0.056	LB A/A	1.28	OZ/A	3"GR-2	D											
10	ACTIVATOR 90	100	LIQ	0.25	% V/V	0.25	%V/V	3"GR-2	D											

Weed Code														AMATA	AMATA	AMATA								
Crop Code														ZEAMX	ZEAMX	ZEAMX	ZEAMX	ZEAMX	ZEAMX	ZEAMX	ZEAMX	ZEAMX	ZEAMX	ZEAMX
Rating Data Type														Yield	Injury	Injury	Injury	HEIRED	HEIRED	HEIRED	Height	Control	Control	Control
Rating Unit														bu/A	Percent	Percent	Percent	Percent	Percent	Percent	Inches	Percent	Percent	Percent
Rating Date														10-28-03				9-25-03						
Trt-Eval Interval														14 DAT			28 DAT	56 DAT	14 DAT			28 DAT	56 DAT	
Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Prod Rate	Prod Unit	Grow Stg	Appl Code															
11	BICEP II MAGNUM	5.5	L	2.89	LB A/A	2.1	QT/A	PRE-1	A	100	0	0	0	0	0	102	100	100	100					
11	FERTILIZER 34-0-0	34	DRY	100	LB A/A	294	LB/A	PRE-2	B															
11	LIGHTNING	70	WG	0.056	LB A/A	1.28	OZ/A	3"GR-2	D															
11	ACTIVATOR 90	100	LIQ	0.25	% V/V	0.25	%V/V	3"GR-2	D															
12	BICEP II MAGNUM	5.5	L	2.89	LB A/A	2.1	QT/A	PRE-1	A	127	0	0	0	0	0	102	100	100	100					
12	FERTILIZER 34-0-0	34	DRY	150	LB A/A	440	LB/A	PRE-2	B															
12	LIGHTNING	70	WG	0.056	LB A/A	1.28	OZ/A	3"GR-2	D															
12	ACTIVATOR 90	100	LIQ	0.25	% V/V	0.25	%V/V	3"GR-2	D															
13	NO NITROGEN FERTILIZER									48	0	0	0	25	35	25	95	98	98	99				
13	LIGHTNING	70	WG	0.056	LB A/A	1.28	OZ/A	3"GR-1	C															
13	ACTIVATOR 90	100	LIQ	0.25	% V/V	0.25	%V/V	3"GR-1	C															
13	CALLISTO	4	SC	0.094	LB A/A	3	OZ/A	4-6"WH	E															
13	PRIME OIL COC	100	LIQ	1.0	% V/V	1	%V/V	4-6"WH	E															
13	28% UAN	100	LIQ	2.5	% V/V	2.5	%V/V	4-6"WH	E															
14	FERTILIZER 34-0-0	34	DRY	50	LB A/A	147	LB/A	PRE-2	B	56	0	0	0	25	25	25	96	98	91	98				
14	LIGHTNING	70	WG	0.056	LB A/A	1.28	OZ/A	3"GR-1	C															
14	ACTIVATOR 90	100	LIQ	0.25	% V/V	0.25	%V/V	3"GR-1	C															
14	CALLISTO	4	SC	0.094	LB A/A	3	OZ/A	4-6"WH	E															
14	PRIME OIL COC	100	LIQ	1.0	% V/V	1	%V/V	4-6"WH	E															
14	28% UAN	100	LIQ	2.5	% V/V	2.5	%V/V	4-6"WH	E															
15	FERTILIZER 34-0-0	34	DRY	100	LB A/A	294	LB/A	PRE-2	B	106	0	0	0	0	5	0	100	98	98	99				
15	LIGHTNING	70	WG	0.056	LB A/A	1.28	OZ/A	3"GR-1	C															
15	ACTIVATOR 90	100	LIQ	0.25	% V/V	0.25	%V/V	3"GR-1	C															
15	CALLISTO	4	SC	0.094	LB A/A	3	OZ/A	4-6"WH	E															
15	PRIME OIL COC	100	LIQ	1.0	% V/V	1	%V/V	4-6"WH	E															
15	28% UAN	100	LIQ	2.5	% V/V	2.5	%V/V	4-6"WH	E															
16	FERTILIZER 34-0-0	34	DRY	150	LB A/A	440	LB/A	PRE-2	B	112	0	0	0	0	5	0	99	98	95	99				
16	LIGHTNING	70	WG	0.056	LB A/A	1.28	OZ/A	3"GR-1	C															
16	ACTIVATOR 90	100	LIQ	0.25	% V/V	0.25	%V/V	3"GR-1	C															
16	CALLISTO	4	SC	0.094	LB A/A	3	OZ/A	4-6"WH	E															
16	PRIME OIL COC	100	LIQ	1.0	% V/V	1	%V/V	4-6"WH	E															
16	28% UAN	100	LIQ	2.5	% V/V	2.5	%V/V	4-6"WH	E															
LSD (P=.05)										27.3	0.0	0.0	0.0	0.0	6.7	6.5	5.6	4.8	16.9	0.9				
Replicate F										4.000	0.000	0.000	0.000	0.000	1.587	1.327	14.722	1.000	1.831	0.319				
Replicate Prob(F)										0.0288	1.0000	1.0000	1.0000	1.0000	0.2211	0.2805	0.0001	0.3798	0.1778	0.7292				
Treatment F										10.037	0.000	0.000	0.000	0.000	29.063	38.456	6.882	32.808	44.825	22779.234				
Treatment Prob(F)										0.0001	1.0000	1.0000	1.0000	1.0000	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001				

Weed Code	AMATA	AMATA	AMATA	AMATA	AMATA	AMATA
Crop Code						
Rating Data Type	HEIRED	HEIRED	HEIRED	Plants	FREWEI	Dry Wt.
Rating Unit	Percent	Percent	Percent	0.5 m2	g/0.5 m2	g/0.5 m2
Rating Date				8-14-03	8-14-03	8-14-03
Trt-Eval Interval	14 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									0	25	35	11 748 134
1	LIGHTNING	70	WG	0.056	LB A/A	1.28	OZ/A	3"GR-1	C				
1	ACTIVATOR 90	100	LIQ	0.25	% V/V	0.25	%V/V	3"GR-1	C				
2	FERTILIZER 34-0-0	34	DRY	50	LB A/A	147	LB/A	PRE-2	B	0	3	22	9 643 109
2	LIGHTNING	70	WG	0.056	LB A/A	1.28	OZ/A	3"GR-1	C				
2	ACTIVATOR 90	100	LIQ	0.25	% V/V	0.25	%V/V	3"GR-1	C				
3	FERTILIZER 34-0-0	34	DRY	100	LB A/A	294	LB/A	PRE-2	B	0	0	0	5 721 113
3	LIGHTNING	70	WG	0.056	LB A/A	1.28	OZ/A	3"GR-1	C				
3	ACTIVATOR 90	100	LIQ	0.25	% V/V	0.25	%V/V	3"GR-1	C				
4	FERTILIZER 34-0-0	34	DRY	150	LB A/A	440	LB/A	PRE-2	B	0	0	0	5 1691 251
4	LIGHTNING	70	WG	0.056	LB A/A	1.28	OZ/A	3"GR-1	C				
4	ACTIVATOR 90	100	LIQ	0.25	% V/V	0.25	%V/V	3"GR-1	C				
5	NO NITROGEN FERTILIZER									100	100	100	
5	LIGHTNING	70	WG	0.056	LB A/A	1.28	OZ/A	3"GR-1	C				
5	ACTIVATOR 90	100	LIQ	0.25	% V/V	0.25	%V/V	3"GR-1	C				
5	HANDWEED AFTER POST APP												
6	FERTILIZER 34-0-0	34	DRY	50	LB A/A	147	LB/A	PRE-2	B	100	100	100	
6	LIGHTNING	70	WG	0.056	LB A/A	1.28	OZ/A	3"GR-1	C				
6	ACTIVATOR 90	100	LIQ	0.25	% V/V	0.25	%V/V	3"GR-1	C				
6	HANDWEED AFTER POST APP												
7	FERTILIZER 34-0-0	34	DRY	100	LB A/A	294	LB/A	PRE-2	B	100	100	100	
7	LIGHTNING	70	WG	0.056	LB A/A	1.28	OZ/A	3"GR-1	C				
7	ACTIVATOR 90	100	LIQ	0.25	% V/V	0.25	%V/V	3"GR-1	C				
7	HANDWEED AFTER POST APP												
8	FERTILIZER 34-0-0	34	DRY	150	LB A/A	440	LB/A	PRE-2	B	100	100	100	
8	LIGHTNING	70	WG	0.056	LB A/A	1.28	OZ/A	3"GR-1	C				
8	ACTIVATOR 90	100	LIQ	0.25	% V/V	0.25	%V/V	3"GR-1	C				
8	HANDWEED AFTER POST APP												
9	BICEP II MAGNUM	5.5	L	2.89	LB A/A	2.1	QT/A	PRE-1	A	100	99	99	
9	NO NITROGEN FERTILIZER												
9	LIGHTNING	70	WG	0.056	LB A/A	1.28	OZ/A	3"GR-2	D				
9	ACTIVATOR 90	100	LIQ	0.25	% V/V	0.25	%V/V	3"GR-2	D				
10	BICEP II MAGNUM	5.5	L	2.89	LB A/A	2.1	QT/A	PRE-1	A	100	100	100	
10	FERTILIZER 34-0-0	34	DRY	50	LB A/A	147	LB/A	PRE-2	B				
10	LIGHTNING	70	WG	0.056	LB A/A	1.28	OZ/A	3"GR-2	D				
10	ACTIVATOR 90	100	LIQ	0.25	% V/V	0.25	%V/V	3"GR-2	D				

Weed Code	AMATA	AMATA	AMATA	AMATA	AMATA	AMATA
Crop Code						
Rating Data Type	HEIRED	HEIRED	HEIRED	Plants	FREWEI	Dry Wt.
Rating Unit	Percent	Percent	Percent	0.5 m2	g/0.5 m2	g/0.5 m2
Rating Date				8-14-03	8-14-03	8-14-03
Trt-Eval Interval	14 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						
11	BICEP II MAGNUM	5.5	L	2.89	LB A/A	2.1	QT/A	PRE-1	A	100	100	100			
11	FERTILIZER 34-0-0	34	DRY	100	LB A/A	294	LB/A	PRE-2	B						
11	LIGHTNING	70	WG	0.056	LB A/A	1.28	OZ/A	3"GR-2	D						
11	ACTIVATOR 90	100	LIQ	0.25	% V/V	0.25	%V/V	3"GR-2	D						
12	BICEP II MAGNUM	5.5	L	2.89	LB A/A	2.1	QT/A	PRE-1	A	100	100	100			
12	FERTILIZER 34-0-0	34	DRY	150	LB A/A	440	LB/A	PRE-2	B						
12	LIGHTNING	70	WG	0.056	LB A/A	1.28	OZ/A	3"GR-2	D						
12	ACTIVATOR 90	100	LIQ	0.25	% V/V	0.25	%V/V	3"GR-2	D						
13	NO NITROGEN FERTILIZER									50	58	90			
13	LIGHTNING	70	WG	0.056	LB A/A	1.28	OZ/A	3"GR-1	C						
13	ACTIVATOR 90	100	LIQ	0.25	% V/V	0.25	%V/V	3"GR-1	C						
13	CALLISTO	4	SC	0.094	LB A/A	3	OZ/A	4-6"WH	E						
13	PRIME OIL COC	100	LIQ	1.0	% V/V	1	%V/V	4-6"WH	E						
13	28% UAN	100	LIQ	2.5	% V/V	2.5	%V/V	4-6"WH	E						
14	FERTILIZER 34-0-0	34	DRY	50	LB A/A	147	LB/A	PRE-2	B	50	50	78			
14	LIGHTNING	70	WG	0.056	LB A/A	1.28	OZ/A	3"GR-1	C						
14	ACTIVATOR 90	100	LIQ	0.25	% V/V	0.25	%V/V	3"GR-1	C						
14	CALLISTO	4	SC	0.094	LB A/A	3	OZ/A	4-6"WH	E						
14	PRIME OIL COC	100	LIQ	1.0	% V/V	1	%V/V	4-6"WH	E						
14	28% UAN	100	LIQ	2.5	% V/V	2.5	%V/V	4-6"WH	E						
15	FERTILIZER 34-0-0	34	DRY	100	LB A/A	294	LB/A	PRE-2	B	58	75	92			
15	LIGHTNING	70	WG	0.056	LB A/A	1.28	OZ/A	3"GR-1	C						
15	ACTIVATOR 90	100	LIQ	0.25	% V/V	0.25	%V/V	3"GR-1	C						
15	CALLISTO	4	SC	0.094	LB A/A	3	OZ/A	4-6"WH	E						
15	PRIME OIL COC	100	LIQ	1.0	% V/V	1	%V/V	4-6"WH	E						
15	28% UAN	100	LIQ	2.5	% V/V	2.5	%V/V	4-6"WH	E						
16	FERTILIZER 34-0-0	34	DRY	150	LB A/A	440	LB/A	PRE-2	B	50	75	87			
16	LIGHTNING	70	WG	0.056	LB A/A	1.28	OZ/A	3"GR-1	C						
16	ACTIVATOR 90	100	LIQ	0.25	% V/V	0.25	%V/V	3"GR-1	C						
16	CALLISTO	4	SC	0.094	LB A/A	3	OZ/A	4-6"WH	E						
16	PRIME OIL COC	100	LIQ	1.0	% V/V	1	%V/V	4-6"WH	E						
16	28% UAN	100	LIQ	2.5	% V/V	2.5	%V/V	4-6"WH	E						
LSD (P=.05)										6.0	6.2	9.6	5.5	699.0	130.9
Replicate F										1.000	0.541	0.275	3.174	1.969	1.563
Replicate Prob(F)										0.3798	0.5880	0.7615	0.1147	0.2201	0.2841
Treatment F										420.200	340.784	127.377	3.522	6.022	3.142
Treatment Prob(F)										0.0001	0.0001	0.0001	0.0886	0.0306	0.1082

Effect of Nitrogen on Common Waterhemp Control in Corn.

Project Code: 03-51W-S80      Location: Belleville Research Center

Trial Comments

1. Protocol: SIU (RFK).
2. Ratings:
3. 0.5 m<sup>2</sup> = 0.5 square meter. FREWEI = Fresh weight. DRY WT = Dry weight. DAP = days after planting. EOS = end of season.
4. Ratings at 14 days after PRE-1 and 4-6"WH application were on 7-3-03 and 7-28-03, respectively.  
Ratings at 28 days after PRE-1 and 4-6"WH application were on 7-17-03 and 8-11-03, respectively.  
Ratings at 56 days after PRE-1 and 4-6"WH application were on 8-14-03 and 9-8-03, respectively.