Effect of nitrogen on common waterhemp control in corn. Krausz, Ronald F. and Bryan G. Young. This study was designed to evaluate the effect of nitrogen on common waterhemp control in corn. The study was conducted on a Weir silt loam with 1.4% organic matter and pH 6.5 at the Belleville Research Center. Fertilizer applied was 50 and 200 lb/A P_2O_5 and K_2O, respectively, to an area that had been cropped to soybean in 2001. Pioneer brand '33P71 CL' imidazolinone-resistant field corn was planted 1.5 inch deep at 28 000 seed/A into a reduced-till seedbed on May 30. Nitrogen applications were hand spread at 0, 50, 100, or 150 lb N/A (see table) on June 2. Plots consisted of four rows with 30 inch row spacing, 27 ft long arranged in a randomized complete block design with 3 replications. The herbicides were broadcast applied with a CO_2 pressurized sprayer using 8002 flat fan tips at 40 PSI in 20 GPA water. Application timings were preemergence herbicide (PRE-1), preemergence fertilizer (PRE-2), 3 inch grass POST only (3"GR-1), 3 inch grass PRE/POST (3"GR-2) and 4 to 6 inch waterhemp (4-6"WH). Imazethapyr&imazapyr were applied at 3 inch grass to control all weeds except common waterhemp. The population of waterhemp is ALS resistant. Monthly rainfall in inches was 4.9, 6.6, 1.7, 3.7 and 3.6 in April, May, June, July and August, respectively. The study was weed-free with the exception of common waterhemp which was present at 58 to 100 plants per m^2 in the nontreated plots at mid-season.

Application information is listed below.

Date	May-30-02	Jun-2-02	Jun-14-02	Jun-19-02	Jun-24-02
Treatment	PRE-1	PRE-2	3"GR-1	3"GR-2	4-6"WH
Air temperature (F)	84	76	69	88	88
Relative humidity (%)	48	72	50	40	30
Soil moisture	normal	normal	normal	normal	dry
field corn					
leaf no.			V4	V5	V5-V6
height (inch)			6-10	10-12	13-16
common waterhemp					
leaf no.			0-8		4-15
height (inch)			0-3		1-8

Nitrogen had an effect on common waterhemp control at 14 days after treatment (DAT) where no soil herbicide or no POST mesotrione was applied. Common waterhemp control decreased as nitrogen rate was increased from 0 to 50 lb/A. Nitrogen also affected common waterhemp height with a 42 to 50% reduction in common waterhemp height 28 and 56 DAT where no nitrogen was applied. The greatest common waterhemp population was observed where nitrogen was applied at 100 lb/A. Fresh weight of common waterhemp was increased as nitrogen rate was increased from 50 to 100 lb/A. Common waterhemp competition reduced corn height by 22 to 35% 56 DAT and reduced grain yield by 28 to 68%. Nitrogen had no effect on common waterhemp control where soil herbicides were applied with control ranging from 96 to 100%. However, common waterhemp control with POST mesotrione was decreased by 13 to 18% where nitrogen was applied. (Dept. of Plant, Soil and General Agriculture, Southern Illinois University, Carbondale).

Table 1. Effect of nitrogen on common waterhemp control in corn. (Krausz and Young)

Treatment[a]	Application Rate	Application Time	Corn yield	Corn injury[b] days after treatment 14	28	56	Corn height Sep 26	Common waterhemp Control days after treatment 14	28	56	Common waterhemp Height reduction days after treatment 28	56
	(lb/A)		bu/A	%	%	%	inch	%	%	%	%	%
No nitrogen fertilizer imazethapyr&imazapyr+NIS	0.042&0.014	3"GR-1	26	0	42	67	65	30	17	0	42	50
Fertilizer 34-0-0 /imazethapyr&imazapyr+NIS	50.0 /0.042&0.014	PRE-2 /3"GR-1	39	0	3	50	76	0	17	0	17	17
Fertilizer 34-0-0 /imazethapyr&imazapyr+NIS	100.0 /0.042&0.014	PRE-2 /3"GR-1	57	0	0	32	75	0	0	0	0	0
Fertilizer 34-0-0 /imazethapyr&imazapyr+NIS	150.0 /0.042&0.014	PRE-2 /3"GR-1	94	0	0	22	86	0	0	0	0	0
No nitrogen fertilizer imazethapyr&imazapyr+NIS handweed after POST	0.042&0.014	3"GR-1	80	0	20	32	83	100	100	100	100	100
Fertilizer 34-0-0 /imazethapyr&imazapyr+NIS handweed after POST	50.0 /0.042&0.014	PRE-2 /3"GR-1	100	0	10	20	84	100	100	100	100	100
Fertilizer 34-0-0 /imazethapyr&imazapyr+NIS handweed after POST	100.0 /0.042&0.014	PRE-2 /3"GR-1	139	0	0	0	92	100	100	100	100	100
Fertilizer 34-0-0 /imazethapyr&imazapyr+NIS handweed after POST	150.0 /0.042&0.014	PRE-2 /3"GR-1	130	0	0	0	90	100	100	100	100	100
S-metolachlor&atrazine&CGA-154281 no nitrogen fertilizer /imazethapyr&imazapyr+NIS	1.26&1.63+ /0.042&0.014	PRE-1 /3"GR-2	75	0	7	25	82	100	99	98	97	75
S-metolachlor&atrazine&CGA-154281 /fertilizer 34-0-0 /imazethapyr&imazapyr+NIS	1.26&1.63 /50.0 /0.042&0.014	PRE-1 /PRE-2 /3"GR-2	112	0	0	17	89	100	100	99	100	97
S-metolachlor&atrazine&CGA-154281 /fertilizer 34-0-0 /imazethapyr&imazapyr+NIS	1.26&1.63 /100.0 /0.042&0.014	PRE-1 /PRE-2 /3"GR-2	161	0	0	0	95	100	100	96	100	78
S-metolachlor&atrazine&CGA-154281 /fertilizer 34-0-0 /imazethapyr&imazapyr+NIS	1.26&1.63 /150.0 /0.042&0.014	PRE-1 /PRE-2 /3"GR-2	170	0	0	0	97	100	100	100	100	100
No nitrogen fertilizer imazethapyr&imazapyr+NIS /mesotrione+COC+28%N	0.042&0.014 /0.094	3"GR-1 /4-6"WH	72	50	35	32	81	100	98	98	97	97
Fertilizer 34-0-0 /imazethapyr&imazapyr+NIS /mesotrione+COC+28%N	50.0 /0.042&0.014 /0.094	PRE-2 /3"GR-1 /4-6"WH	96	45	40	32	81	90	80	80	73	55
Fertilizer 34-0-0 /imazethapyr&imazapyr+NIS /mesotrione+COC+28%N	100.0 /0.042&0.014 /0.094	PRE-2 /3"GR-1 /4-6"WH	127	23	8	10	86	90	85	86	63	63
Fertilizer 34-0-0 /imazethapyr&imazapyr+NIS /mesotrione+COC+28%N	150.0 /0.042&0.014 /0.094	PRE-2 /3"GR-1 /4-6"WH	153	0	0	0	91	97	87	87	87	60
LSD			19	9	10	12	10	22	17	5	20	25
P			0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01

[a]All NIS at 0.25% v/v. NIS = Activator 90, a nonionic surfactant from Loveland Industries, Inc.
All COC at 1.0 % v/v. COC = Prime Oil crop oil concentrate, a petroleum based additive with 17% emulsifier from Agriliance.
All 28%N at 2.5% v/v. 28%N = 28% urea ammonium nitrate.

[b]Ratings at 14, 28, and 56 days after the PRE application were on 6-13-02, 6-27-02, and 7-25-02, respectively.
Ratings at 14, 28, and 56 days after the 4-6"WH application were on 7-8-02, 7-22-02, and 8-19-02, respectively.
ZEAMX and AMATA height reduction due to lack of nitrogen.

Table 2. Effect of nitrogen on common waterhemp control in corn. (Krausz and Young)

Treatment[a]	Application Rate	Application Time	Common waterhemp Plants	Common waterhemp Fresh weight	Common waterhemp Dry weight
	(lb/A)		1 m^2	g/1 m^2	g/1 m^2
No nitrogen fertilizer imazethapyr&imazapyr+NIS	0.042&0.014	3"GR-1	88	849	147
Fertilizer 34-0-0 /imazethapyr&imazapyr+NIS	50.0 /0.042&0.014	PRE-2 /3"GR-1	58	873	119
Fertilizer 34-0-0 /imazethapyr&imazapyr+NIS	100.0 /0.042&0.014	PRE-2 /3"GR-1	100	1951	269
Fertilizer 34-0-0 /imazethapyr&imazapyr+NIS	150.0 /0.042&0.014	PRE-2 /3"GR-1	68	2113	276
No nitrogen fertilizer imazethapyr&imazapyr+NIS handweed after POST	0.042&0.014	3"GR-1			
Fertilizer 34-0-0 /imazethapyr&imazapyr+NIS handweed after POST	50.0 /0.042&0.014	PRE-2 /3"GR-1			
Fertilizer 34-0-0 /imazethapyr&imazapyr+NIS handweed after POST	100.0 /0.042&0.014	PRE-2 /3"GR-1			
Fertilizer 34-0-0 /imazethapyr&imazapyr+NIS handweed after POST	150.0 /0.042&0.014	PRE-2 /3"GR-1			
S-metolachlor&atrazine&CGA-154281 no nitrogen fertilizer /imazethapyr&imazapyr+NIS	1.26&1.63+ /0.042&0.014	PRE-1 /3"GR-2			
S-metolachlor&atrazine&CGA-154281 /fertilizer 34-0-0 /imazethapyr&imazapyr+NIS	1.26&1.63 /50.0 /0.042&0.014	PRE-1 /PRE-2 /3"GR-2			
S-metolachlor&atrazine&CGA-154281 /fertilizer 34-0-0 /imazethapyr&imazapyr+NIS	1.26&1.63 /100.0 /0.042&0.014	PRE-1 /PRE-2 /3"GR-2			
S-metolachlor&atrazine&CGA-154281 /fertilizer 34-0-0 /imazethapyr&imazapyr+NIS	1.26&1.63 /150.0 /0.042&0.014	PRE-1 /PRE-2 /3"GR-2			
No nitrogen fertilizer imazethapyr&imazapyr+NIS /mesotrione+COC+28%N	0.042&0.014 /0.094	3"GR-1 /4-6"WH			
Fertilizer 34-0-0 /imazethapyr&imazapyr+NIS /mesotrione+COC+28%N	50.0 /0.042&0.014 /0.094	PRE-2 /3"GR-1 /4-6"WH			
Fertilizer 34-0-0 /imazethapyr&imazapyr+NIS /mesotrione+COC+28%N	100.0 /0.042&0.014 /0.094	PRE-2 /3"GR-1 /4-6"WH			
Fertilizer 34-0-0 /imazethapyr&imazapyr+NIS /mesotrione+COC+28%N	150.0 /0.042&0.014 /0.094	PRE-2 /3"GR-1 /4-6"WH			
LSD			37	885	139
P			0.1	0.02	0.07

[a]All NIS at 0.25% v/v. NIS = Activator 90, a nonionic surfactant from Loveland Industries, Inc.
All COC at 1.0 % v/v. COC = Prime Oil crop oil concentrate, a petroleum based additive with 17% emulsifier from Agriliance.
All 28%N at 2.5% v/v. 28%N = 28% urea ammonium nitrate.