

Effect of grass competition on common waterhemp control. Krausz, Ronald F. and Bryan G.

Young. This study was designed to evaluate the effect of grass competition on common waterhemp control. The study was conducted on a Stoy silt loam with 2.1% organic matter and pH 5.7 at the Belleville Research Center. Fertilizer applied was 50 and 150 lb/A P_2O_5 and K_2O , respectively, to an area that had been cropped to corn in 2001. Asgrow brand 'AG 4602 RR' glyphosate-resistant soybean was planted 1.0 inch deep at 75 lb/A into a reduced-till seedbed on June 3. Plots consisted of four rows with 30 inch row spacing, 25 ft long arranged in a randomized complete block design with 4 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 for the first postemergence application were 3, 6, 9, 12, 15, 18 and 21 inch grass height (3"G, 6"G, 9"G, 12"G, 15"G, 18"G and 21"G, respectively). Application timings for the second postemergence application were 14 days after the 3, 6, 9, 12, 15, 18 and 21 inch grass height applications (14DA3"G, 14DA6"G, 14DA9"G, 14DA12"G, 14DA15"G, 14DA18"G and 14DA21"G, respectively). Monthly rainfall in inches was 4.9, 6.6, 1.7, 3.7 and 3.6 in April, May, June, July and August, respectively. Weed population per 0.25 m² in the nontreated plots, mid-season, was >50 giant foxtail, and 9 common waterhemp.

Application information is listed below.

First postemergence application

Date	Jun-21-02	Jun-27-02	Jul-2-02	Jul-5-02	Jul-10-02	Jul-19-02	Jul-26-02
Treatment	3"G	6"G	9"G	12"G	15"G	18"G	21"G
Air temperature (F)	76	88	80	96	78	86	82
Relative humidity (%)	44	80	60	40	94	62	60
Soil moisture	normal	dry	dry	dry	dry	wet	wet

soybean							
leaf no.	V1	V2	V4	V4	V5	V5	V6-V7
height (inch)	3-4	4-6	8	8	10	10	12-14

giant foxtail							
leaf no.	1-3	3-5	5-7	5-8	6-10	6-10	8-10
height (inch)	1-3	3-5	7-10	6-12	8-12	16-18	18-21

common waterhemp							
leaf no.	1-2	3-6	5-7	5-8	6-8	8-10	8-20
height (inch)	1-2	2-4	4-6	4-6	6-8	8-12	8-14

Second postemergence application

Date	Jul-19-02	Jul-26-02	Jul-26-02	Jul-26-02	Jul-26-02	Aug-7-02	Aug-12-02
Treatment	14DA3"G	14DA6"G	14DA9"G	14DA12"G	14DA15"G	14DA18"G	14DA21"G
Air temperature (F)	86	82	82	82	82	75	80
Relative humidity (%)	62	60	60	60	60	50	70
Soil moisture	wet	wet	wet	wet	wet	wet	wet

soybean							
leaf no.	V6	V6-V7	V6-V7	V6-V7	V6-V7	R1	R1
height (inch)	12	12-14	12-14	12-14	12-14	20-24	20-24

None of the herbicides caused soybean injury. Imazamox provided no control of common waterhemp. Giant foxtail in the nontreated plots provided 93% control of common waterhemp. Glyphosate controlled common waterhemp 85 to 100%. Giant foxtail at the 15 and 18 inch height decreased common waterhemp control with glyphosate. Glyphosate controlled giant foxtail 100% regardless of height. Competition from 12 to 21 inch giant foxtail at 50 plants per 0.25 m² reduced grain yield by 15 to 36% with yield decreasing as height increased. Giant foxtail competition the entire growing season reduced grain yield by 86% whereas common waterhemp competition reduced grain yield by 60%. (Dept. of Plant, Soil and General Agriculture, Southern Illinois University, Carbondale).

Table. Effect of grass competition on common waterhemp control. (Krausz and Young)

Treatment ^a	Application		Soybean yield bu/A	Soybean injury ^b days after treatment			Control, days after treatment					
				14	28	56	AMATA			SETFA		
	Rate (lb/A)	Time					14	28	56	14	28	56
Nontreated			8	0	0	0	92	89	93	0	0	0
No herbicide+handweed all season			53	0	0	0	100	100	100	100	100	100
Imazamox+MSO+28%N	0.039+1.0%+2.5%	3"G	21	0	0	0	0	0	0	100	100	100
Glyphosate	0.75	3"G	48	0	0	0	98	96	95	100	100	100
Glyphosate	0.75	6"G	49	0	0	0	100	98	99	100	100	100
Glyphosate	0.75	9"G	48	0	0	0	100	100	100	100	100	100
Glyphosate	0.75	12"G	45	0	0	0	100	97	98	100	100	100
Glyphosate	0.75	15"G	40	0	0	0	90	83	85	100	100	100
Glyphosate	0.75	18"G	37	0	0	0	87	87	87	100	100	100
Glyphosate	0.75	21"G	35	0	0	0	100	100	100	100	100	100
Glyphosate/glyphosate+handweed after last POST	0.75/0.75	3"G/14DA3"G	48	0	0	0	100	100	100	100	100	100
Glyphosate/glyphosate+handweed after last POST	0.75/0.75	6"G/14DA6"G	47	0	0	0	100	100	100	100	100	100
Glyphosate/glyphosate+handweed after last POST	0.75/0.75	9"G/14DA9"G	47	0	0	0	100	100	100	100	100	100
Glyphosate/glyphosate+handweed after last POST	0.75/0.75	12"G/14DA12"G	45	0	0	0	100	100	100	100	100	100
Glyphosate/glyphosate+handweed after last POST	0.75/0.75	15"G/14DA15"G	43	0	0	0	100	100	100	100	100	100
Glyphosate/glyphosate+handweed after last POST	0.75/0.75	18"G/14DA18"G	41	0	0	0	100	100	100	100	100	100
Glyphosate/glyphosate+handweed after last POST	0.75/0.75	21"G/14DA21"G	34	0	0	0	100	100	100	100	100	100
Imazethapyr&glyphosate+NIS+AMS	0.059&0.76+0.25%+2.5	6"G	46	0	0	0	100	99	99	100	100	100
LSD			6	0	0	0	3	4	4	0	0	0
P			0.01	1.0	1.0	1.0	0.01	0.01	0.01	1.0	1.0	1.0

^aMSO = Destiny, a methylated soybean oil from Agrilience.

28%N = 28% urea ammonium nitrate.

NIS = Activator 90, a nonionic surfactant from Loveland Industries, Inc.

AMS = spray grade ammonium sulfate.

^bRatings at 14 days after 3"G, 6"G, 9"G, 12"G, 15"G, 18"G, and 21"G applications were on 7-5-02, 7-11-02, 7-16-02, 7-19-02, 7-24-02, 8-2-02, and 8-9-02, respectively.

Ratings at 28 days after 3"G, 6"G, 9"G, 12"G, 15"G, 18"G, and 21"G applications were on 7-19-02, 7-25-02, 7-30-02, 8-2-02, 8-7-02, 8-16-02, and 8-23-02, respectively.

Ratings at 56 days after 3"G, 6"G, 9"G, 12"G, 15"G, 18"G, and 21"G applications were on 8-16-02, 8-22-02, 8-27-02, 8-30-02, 9-4-02, 9-13-02, and 9-20-02, respectively.

Non-zero weed control ratings in the nontreated plots reflect competition between weeds.