Evaluation of soil herbicides in glyphosate-resistant corn. Krausz, Ronald F. and Bryan G. Young. This study was designed to evaluate the effects of soil herbicides and weed height at glyphosate application on weed control and grain yield in glyphosate-resistant corn. The study was conducted on an Ebbert silt loam with 2.9% organic matter and pH 6.2 at the Belleville Research Center. Fertilizer applied was 150, 50, and 100 lb/A of N, P_2O_5, and K_2O, respectively, to an area that had been cropped to soybean in 2003. Dekalb 'DKC 60-17 RR' corn was planted 1.5 inch deep at 28000 seeds per acre into a reduced-till seedbed on May 22, 2004. Plots consisted of four rows with 30 inch row spacing, 25 ft long arranged in a randomized complete block design with 3 replications. The herbicides were broadcast applied with a CO_2 pressurized sprayer using 8003 flat fan tips at 40 PSI and 20 GPA water. Monthly rainfall in inches was 1.3, 8.7, 2.8, 6.6, and 5.2 in April, May, June, July and August, respectively. Weed populations per 0.25 M^2 in the nontreated plots, mid-season, were: 5 giant foxtail; 3 common cocklebur; and 7 velvetleaf. Application timings were preemergence (PRE), 2 to 4 inch weed height (2-4"W) , 4 to 6 inch weed height for postemergence only treatments (4-6"W-1), 4 to 6 inch weed height for preemergence/postemergence treatments (4-6"W-2), as well as postemergence applications for weed heights 6 to 8, 8 to 10, 10 to 12, 12 to 14, 14 to 16, 16 to 18 and 18 to 20 inches (6-8"W), (8-10"W), (10-12"W), (12-14"W), (14-16"W), (16-18"W), and (18-20"W), respectively. Additionally, for most postemergence only treatments, a sequential application was planned for 2 weeks after the first application, but only to be applied if needed. None of the sequential applications were needed. Total rainfall for the 7 days following the PRE application was 5.1 inches. Application information is listed below.

Date	May-24-04	Jun-14-04	Jun-17-04	Jun-18-04	Jun-17-04	Jun-19-04	Jun-21-04	Jun-22-04	Jun-23-04	Jun-25-04	Jun-28-04
Treatment	PRE	2-4"W	4-6"W-1	4-6"W-2	6-8"W	8-10"W	10-12"W	12-14"W	14-16"W	16-18"W	18-20"W
Air temp (F)	78	76	84	79	84	73	70	70	66	61	75
Rel humidity (%)	50	98	80	81	80	59	74	92	98	80	60
field corn											
leaf no.	NA	V5	V6	V6	V6	V7	V7	V8	V8	V8	V10
height (inch)	NA	12-16	16-18	16-18	16-18	20-24	20-24	26-28	26-28	34-36	46-48
giant foxtail											
leaf no.		2-3	5-6	5-6	5-6	5-8		5-8	5-10	5-7	12-14
height (inch)		1-4	4-6	4-6	4-8	5-8		10-12	12-16	10-12	16-18
common cocklebur											
leaf no.		5-6	5-8	5-8	5-8	5-8	5-8	5-8	5-10		
height (inch)		2-4	4-8	4-6	4-8	8-10	10-12	12-14	12-16		
velvetleaf											
leaf no.		5-6	5-6	5-6	5-6	5-8	5-8	5-8	5-10	5-10	6-8
height (inch)		2-4	4-6	4-6	4-8	6-10	10-12	12-14	12-16	16-24	24-28

There was no difference in giant foxtail control among corn premix herbicides with either additional atrazine or followed by glyphosate. Acetochlor&atrazine followed by gylphosate provided greater common cocklebur control compared with acetochlor&atrazine plus atrazine. There was no difference in common cocklebur control among other corn premix herbicides with either additional atrazine or followed by glyphosate. Acetochlor&atrazine and dimethenamid&atrazine followed by gylphosate provided greater velvetleaf control compared with acetochlor&atrazine plus atrazine or dimethenamid&atrazine plus atrazine. There was no difference in velvetleaf control among other corn premix herbicides with either additional atrazine or followed by glyphosate. A single application of glyphosate controlled 100% of the giant foxtail and common cocklebur, regardless of weed height. A single application of glyphosate controlled velvetleaf, 88 to 100%. Glyphosate controlled 100% of the velvetleaf that was 10 inches or less in height. No sequential applications of glyphosate were required to maintain season-long weed control. Weed competition did not reduce corn height. Season-long weed competition reduced corn grain yield by 59%. However, competition with weeds 20 inches or less did not reduce grain yield. The lack of yield reductions may be related to the ideal growing conditions that existed during most of the growing season. Air temperatures were below normal to normal and rainfall was slightly above normal. Grain yield ranged from 85 bu/A in the nontreated to 213 bu/A. (Dept. of Plant, Soil and Agricultural Systems, Southern Illinois University, Carbondale).

Table. Evaluation of soil herbicides in glyphosate-resistant corn. (Krausz and Young)

			Corn[c]														
			Injury						Control, days after treatment								
	Application[b]		Days after treatment			Height			SETFA			XANST			ABUTH		
Treatment[a]	Rate	Time	14	28	56	EOS	Moisture	Yield	14	28	56	14	28	56	14	28	56
	(lb/A)					inch	%	bu/A	%	%	%	%	%	%	%	%	%
Nontreated			0	0	0	87	18.4	85	0	0	0	0	0	0	0	0	0
Acetochlor & atra & MON 4660 + atrazine	2.14 & 1.06 + 1.0	PRE	0	0	0	96	16.9	213	100	100	100	92	92	92	94	93	93
Acet & atra & MON 4660 / glyt	1.07 & 0.53 / 0.75	PRE / 4-6"W-2	0	0	0	92	17.0	197	100	100	100	88	87	100	93	93	100
S-metolachlor & atra & benoxacor + atrazine	1.27 & 1.63 + 0.4	PRE	0	0	0	92	17.7	208	100	100	100	98	98	98	98	96	96
S-meto & atra & benoxacor / glyt	0.63 & 0.82 / 0.75	PRE / 4-6"W-2	0	0	0	94	17.1	207	100	100	100	90	88	100	92	88	100
Acet & atra & dichlormid + atrazine	2.13 & 1.57 + 0.4	PRE	0	0	0	95	17.2	200	100	100	100	98	95	95	98	95	95
Acet & atra & dcmd / glyphosate	1.07 & 0.785 / 0.75	PRE / 4-6"W-2	0	0	0	93	17.3	210	100	100	100	93	92	100	93	89	100
Dimethenamid-P & atra + atrazine	0.85 & 1.65 + 0.4	PRE	0	0	0	93	18.0	208	100	100	100	99	99	99	97	93	93
Dime-P & atra / glyt	0.425 & 0.825 / 0.75	PRE / 4-6"W-2	0	0	0	95	17.3	200	100	100	100	94	94	100	92	87	100
Flufenacet & isoxaflutole + atrazine	0.556 & 0.069 + 2.0	PRE	0	0	0	93	17.0	198	100	100	100	99	100	100	99	100	100
Flufenacet & isoxaflutole / glyt	0.279 & 0.0344 / 0.75	PRE / 4-6"W-2	0	0	0	91	17.0	194	100	100	100	92	88	100	98	95	100
S-meto & atra & mesotrione + atrazine	1.31 & 1.31 & 0.167 + 0.7	PRE	0	0	0	95	17.4	213	100	100	100	100	100	100	100	100	100
S-meto & atra & mesotrione / glyt	0.653 & 0.653 & 0.083 / 0.75	PRE / 4-6"W-2	0	0	0	91	17.5	208	100	95	100	92	92	100	92	90	100
Glyt	0.75	4-6"W-1	0	0	0	96	17.0	207	100	100	100	100	100	100	100	100	100
Glyt / glyt	0.75 / 0.75	2-4"W / 2WA2-4"-IN	0	0	0	95	16.9	210	100	100	100	100	100	100	99	99	99
Glyt / glyt	0.75 / 0.75	4-6"W-1 / 2WA4-6"-IN	0	0	0	93	17.5	213	100	100	100	100	100	100	100	97	100
Glyt / glyt	1.12 / 0.75	6-8"W / 2WA6-8"-IN	0	0	0	89	17.2	202	100	100	100	100	100	100	100	100	100
Glyt / glyt	1.12 / 0.75	8-10"W / 2WA8-10"-IN	0	0	0	92	18.0	209	100	100	100	100	100	100	100	100	100

(continued)

Table. Evaluation of soil herbicides in glyphosate-resistant corn. (Krausz and Young)
(continued)

			Corn[c]														
			Injury						Control, days after treatment								
	Application[b]		Days after treatment			Height			SETFA			XANST			ABUTH		
Treatment[a]	Rate	Time	14	28	56	EOS	Moisture	Yield	14	28	56	14	28	56	14	28	56
	(lb/A)					inch	%	bu/A	%	%	%	%	%	%	%	%	%
Glyt / glyt	1.12 / 0.75	10-12"W / 2WA10-12"-IN	0	0	0	95	16.8	196	100	100	100	100	100	100	88	88	88
Glyt / glyt	1.12 / 0.75	12-14"W / 2WA12-14"-IN	0	0	0	95	16.7	205	100	100	100	100	100	100	90	90	90
Glyt / glyt	1.12 / 0.75	14-16"W / 2WA14-16"-IN	0	0	0	92	16.9	202	100	100	100	100	100	100	96	96	96
Glyt / glyt	1.12 / 0.75	16-18"W / 2WA16-18"-IN	0	0	0	93	17.8	180	100	100	100	100	100	100	92	92	92
Glyt / glyt	1.12 / 0.75	18-20"W / 2WA18-20"-IN	0	0	0	93	17.0	189	100	100	100	100	100	100	93	93	93
No herbicide + handweed			0	0	0	94	17.6	208	100	100	100	100	100	100	100	100	100
LSD			0	0	0	6	1	33	0	3	0	5	6	2	6	7	5
P			1.0	1.0	1.0	0.4	0.6	0.01	1.0	0.01	1.0	0.01	0.01	0.01	0.01	0.01	0.01

[a]All glyphosate was Roundup WeatherMax.

[b]Application timings: 2WA = 2 weeks after; IN = if needed.

[c]Days after treatment was days after PRE for PRE/POST or PRE only treatments and days after first POST for POST only treatments. EOS = End of season.