Winter annual weed control in glyphosate resistant corn. Krausz, Ronald F. and Bryan G. Young. This study was designed to determine performance of various strategies for control of winter annual weeds in a glyphosate-resistant corn system. The study was conducted on a Weir silt loam with 1.8% organic matter and pH 5.8 at the Belleville Research Center. Fertilizer applied was 150, 50, and 100 lb/A N, P_2O_5, and K_2O, respectively, and 2 ton/A lime 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 no-till seedbed on May 10, 2004. Plots consisted of four rows with 30 inch row spacing, 23 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 4.2, 5.0, 2.2, 5.9, and 2.9 in August, September, October, November, and December 2003, respectively, and 4.5, 1.0, 2.9, 1.3, 8.7, 2.8, 6.6, and 5.2 in January, February, March, April, May, June, July and August 2004, respectively. Weed populations per 0.25 M^2 in the nontreated plots at planting were: 27 fall panicum; 1 mouseear chickweed; and less than 1 wild garlic, common chickweed, little barley, smallflower buttercup, giant ragweed, common lambsquarters, and giant foxtail. Application timings were in the fall following harvest of the previous crop (FALL), early preplant at 14 days before the planned planting date (14DBP), and preemergence (PRE). Total rainfall for the 7 days following the PRE application was 1.6 inches. Application information is listed below.

Date	11-21-03	4-26-04	5-11-04
Treatment	FALL	14DBP	PRE
Air temperature (F)	55	60	70
Relative humidity (%)	75	62	88
wild garlic			
leaf no.	1-3		
height (inch)	2-6		
common chickweed			
leaf no.	2-6		10+
height (inch)	1-2		2-4
little barley			
leaf no.	2-3		5-6
height (inch)	1-2		12-14
mouseear chickweed			
leaf no.			10+
height (inch)			2-4
smallflower buttercup			
leaf no.		10+	
height (inch)		10-12	
giant ragweed			
leaf no.		5-6	5-8
height (inch)		3-4	3-5
common lambsquarters			
leaf no.		10+	10+
height (inch)		3-4	5-10
giant foxtail			
leaf no.			3-4
height (inch)			1-3

Fall-applied glyphosate provided 95 to 100% control of wild garlic, little barley, common chickweed, mouseear chickweed and smallflower buttercup by April. However, in plots where glyphosate was applied alone in the fall, giant ragweed and common lambsquarters control was 17 to 27% by April 26. The addition of a residual herbicide with glyphosate in the fall increased control of giant ragweed and common lambsquarters by 75 to 83%. Winter annual weed competition in the nontreated plots controlled giant ragweed and common lambsquarters 99%. Three glyphosate applications (FALL, 14DBP, and postemergence) were required to control 95 to 100% of giant ragweed, common lambsquarters, common waterhemp, and giant foxtail where glyphosate was applied in the fall. Two glyphosate applications (preemergence and postemergence) provided 92 to100% control of these weeds where glyphosate was applied preemergence with or without a residual herbicide. Despite corn injury at 28 and 56 days after the preemergence application, chlorimuron plus sulfentrazone applied in the fall did not affect corn grain yield. (Dept. of Plant, Soil and Agricultural Systems, Southern Illinois University, Carbondale)

Table 1. Winter annual weed control in glyphosate-resistant corn. (Krausz and Young)

								Control[d]												
			POST[b]		Corn injury[c]			ALLVI		STEME		HORPU					CERVU		RANAB	
	Application		application	Corn	DA PRE			DA FALL		DA FALL		DA FALL		DA 14DBP		14 DA	DA 14DBP		DA 14DBP	
Treatment[a]	Rate	Time	required on	yield	14	28	56	21	132	21	132	21	132	0	14	PRE	0	14	0	14
	(lb/A)			bu/A	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%
Nontreated				117	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Glyphosate / glyt	0.75 / 0.75	FALL / PRE	June 11	207	0	0	0	50	95	50	100	50	100	99	99	100	99	99	96	96
Glyt + simazine / glyt	0.75+1.0 / 0.75	FALL / PRE	June 11	217	0	0	0	50	95	50	100	50	100	100	99	100	100	99	100	99
Glyt / glyt	0.75 / 0.75	FALL / 14DBP	May 29	194	0	0	0	50	95	50	100	50	100	99	100	100	99	100	96	100
Glyt + simazine / glyt	0.75+1.0 / 0.75	FALL / 14DBP	May 29	190	0	0	0	50	95	50	100	50	100	99	100	100	99	100	99	100
Glyt	0.75	PRE	June 11	197	0	0	0									100				
Glyt + simazine	0.75+2.0	PRE	none	207	0	0	0									100				
Glyt + atrazine	0.75+2.0	PRE	June 11	175	0	0	0									100				
Glyt + s-metolachlor & atra & benoxacor	0.75 + 1.26 & 1.63	PRE	none	185	0	0	0									100				
Glyt + chlorimuron & sulfentrazone	0.75 + 0.0264 & 0.132	FALL	May 29	186	0	37	15	50	100	50	100	50	100	100	100	100	100	100	100	100
LSD				40	0	7	5	0	4	0	0	0	0	1	1	0	1	1	5	4
P				0.01	1.0	0.01	0.01	1.0	0.01	1.0	1.0	1.0	1.0	0.01	0.01	1.0	0.01	0.01	0.01	0.01

[a]All glyphosate was Roundup WeatherMax. All glyphosate applications included AMS at 2.0% w/w. AMS = spray grade ammonium sulfate.

[b]Postemergence application was glyphosate as Roundup WeatherMax 0.75 lbae/A + AMS 2.0%.

[c]Crop injury was height reduction.

[d]DA = Days after application. Zero days after application = At application.

Table 2. Winter annual weed control in glyphosate-resistant corn. (Krausz and Young)

				Control[c]															
			POST[b]	AMBTR					CHEAL					AMATA			SETFA		
	Application		application	DA 14DBP		DA PRE			DA 14DBP		DA PRE			DA PRE			DA PRE		
Treatment[a]	Rate	Time	required on	0	14	14	28	56	0	14	14	28	56	14	28	56	14	28	56
	(lb/A)			%	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%
Nontreated				99	99	93	67	0	99	99	97	97	90	93	0	0	80	0	0
Glyphosate / glyt	0.75 / 0.75	FALL / PRE	June 11	17	17	100	63	100	17	17	100	93	100	97	0	100	93	0	100
Glyt + simazine / glyt	0.75+1.0 / 0.75	FALL / PRE	June 11	92	92	100	100	100	100	99	100	100	100	97	0	100	97	0	100
Glyt / glyt	0.75 / 0.75	FALL / 14DBP	May 29	27	100	97	100	100	27	100	100	100	100	50	93	95	50	95	95
Glyt + simazine / glyt	0.75+1.0 / 0.75	FALL / 14DBP	May 29	92	100	100	100	100	99	100	100	100	100	63	94	93	63	97	93
Glyt	0.75	PRE	June 11			100	100	100			100	100	100	100	0	100	93	0	100
Glyt + simazine	0.75+2.0	PRE	none			100	100	100			100	100	100	100	98	92	100	100	96
Glyt + atrazine	0.75+2.0	PRE	June 11			100	100	100			100	100	100	100	99	100	100	33	100
Glyt + s-metolachlor & atra & benoxacor	0.75 + 1.26 & 1.63	PRE	none			100	99	100			100	100	100	100	98	98	100	100	97
Glyt + chlorimuron & sulfentrazone	0.75 + 0.0264 & 0.132	FALL	May 29	99	99	90	100	100	100	100	100	100	100	83	100	100	87	100	90
LSD				35	21	7	41	0	36	21	3	4	0	13	4	7	20	30	7
P				0.01	0.01	0.09	0.4	1.0	0.01	0.01	0.5	0.05	1.0	0.01	0.01	0.01	0.01	0.01	0.01

[a]All glyphosate was Roundup WeatherMax. All glyphosate applications included AMS at 2.0% w/w. AMS = spray grade ammonium sulfate.

[b]Postemergence application was glyphosate as Roundup WeatherMax 0.75 lbae/A + AMS 2.0%.

[c]DA = Days after application. Zero days after application = At application.