

Effect of weed emergence and timing of weed removal on corn yield at Rochester, MN in 2004.

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The objective of this trail was to determine the effect of weed emergence and timing of weed removal on corn yield in southeastern Minnesota. The research site was a Lawler loam series containing 2.7% organic matter with a pH test of 6.5 and soil test P and K levels of 43 ppm and 185 ppm, respectively. The previous crop was soybean. The area was fertilized in the spring with 122 lb/A nitrogen, 23 lb/A phosphorus, 120 lb/A potash, 23 lb/A sulfur and 3 T/A of lime. The area was topdressed with 40 lb/A of nitrogen on June 15. The field was disked and field cultivated once prior to planting. The corn hybrid, DKC 47-10, was planted on April 29, 2004 at a depth of 1.5 inches in 30-inch rows at 32,000 seeds/A. A randomized complete block design with four replications was used. Preemergence (PRE) and postemergence (POST) treatments were applied with a tractor-mounted sprayer, delivering 20 gpa at 32 psi using Turbo Tee 11002 nozzles. Application dates, environmental conditions, and crop and weed stages are listed below.

Date	April 29	May 20	June 2	June 7	June 14	June 18	June 28
Treatment	PRE	POST I	POST II	POST III	POST IV	POST V	POST VI
Temperature (F)							
Air	61	71	67	91	73	61	72
Relative humidity (%)	49	59	49	43	57	59	44
Wind (mph)	13	14	12	29	13	18	9
Corn							
stage	--	V1	V2	V4	V5	V6	6-7 collar
height (inches)	--	3.0	4.0	5.4	14.0	15.0	17.0
Giant ragweed							
weed density	--	heavy	heavy	heavy	heavy	heavy	heavy
height (inch)	--	0.5	4.6	10.8	13.0	15.0	2-4
							regrowth
Common lambsquarters							
weed density	--	light	light	light	light	light	light
height (inch)	--	0.5	1.4	3.0	4.0	5.0	2-4
							regrowth
Common waterhemp							
weed density	--	moderate	moderate	moderate	moderate	moderate	moderate
height (inch)	--	0.0	1.4	0.75	2.5	3.0	2-4
							regrowth
Giant foxtail							
weed density	--	moderate	moderate	moderate	moderate	moderate	moderate
height (inch)	--	0.5	1.0	4.3	5.0	5.5	2-4
							regrowth
Rainfall after application (inch)							
week 1	0.01	2.91	0.20	5.65	1.85	0.38	0.16
week 2	1.44	1.30	5.46	1.85	0.63	0.26	2.82
week 3	1.02	4.32	1.92	0.63	1.68	1.73	0.23

Different weeds emerge at different times during the growing season. Timing of weed removal is a critical factor in maximizing corn yields. At this location, which has a heavy giant ragweed population, the sequential POST II / POST VI applications of Roundup WeatherMax and Harness followed by Roundup WeatherMax at POST III (5 inch weeds) were the best treatments in this trial, 156 and 150 bu/A, respectively. When weeds were removed too early, treatments 1 and 2, later emerging weeds caused enough competition to substantially reduce

corn yields. When removed too late, treatments 9 and 10, early season competition caused a substantial reduction in corn yield.

In the combined location study, Lamberton, Morris, Rochester, and Waseca, the one-pass Roundup WeatherMax treatments did not maximize yield or returns. The PRE / POST sequential applications of Harness followed by Roundup WeatherMax, gave the best economic returns (average over all locations). The two pass Roundup WeatherMax system resulted in the highest yield, but has more economic risk than PRE / POST III (5 inch weeds), which also resulted in top yields. This data is presented in the report on page C-21, (University of Minnesota Extension Service, Regional Center, Rochester, MN).

Table. Effect of time of weed removal on corn yield at Rochester, MN in 2004 (Breitenbach, Behnken, Hoverstad and Gunsolus).

Trt number	Treatment	Rate/A	Corn yield (bu/A)
	PRE		
11	Harness	1.25 pt	3
	PRE / POST I (1"weeds)		
1	Harness / Roundup WeatherMax + AMS	1.25 pt / 22 oz + 2.5 lb	27
	POST I (1"weeds)		
2	Roundup WeatherMax + AMS	22 oz + 2.5 lb	33
	PRE / POST II (3"weeds)		
3	Harness / Roundup WeatherMax + AMS	1.25 pt / 22 oz + 2.5 lb	134
	POST II (3"weeds)		
4	Roundup WeatherMax + AMS	22 oz + 2.5 lb	128
	PRE / POST III (5"weeds)		
5	Harness / Roundup WeatherMax + AMS	1.25 pt / 22 oz + 2.5 lb	150
	POST III (5"weeds)		
6	Roundup WeatherMax + AMS	22 oz + 2.5 lb	130
	PRE / POST IV (7"weeds)		
7	Harness / Roundup WeatherMax + AMS	1.25 pt / 22 oz + 2.5 lb	128
	POST IV (7"weeds)		
8	Roundup WeatherMax + AMS	22 oz + 2.5 lb	122
	PRE / POST V (9"weeds)		
9	Harness / Roundup WeatherMax + AMS	1.25 pt / 22 oz + 2.5 lb	94
	POST V (9"weeds)		
10	Roundup Weathermax + AMS	22 oz + 2.5 lb	48
	POST II / POST VI (3"weeds / 2-4" regrowth)		
12	Roundup WeatherMax + AMS / Roundup WeatherMax + AMS	22 oz + 2.5 lb / 22 oz + 2.5 lb	156
	LSD (0.10)		18