

Weed emergence patterns and the effect of time of weed removal on soybean yield at Rochester, MN in 2004.

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The objective of this trail was to evaluate the effect of time of weed removal on soybean yield in southeastern Minnesota. The research site was a Lawler loam series containing 2.5% organic matter with a pH of 6.1 and soil test P and K levels of 42 ppm and 135 ppm respectively. The area was fertilized with 3 T/A of lime in the spring. The previous crop was corn. The field was disked and field cultivated once prior to planting. The soybean variety, Pioneer 92-MOO, was planted on May 28, 2004 at a depth of 1.5 inches in 30-inch rows at 150,000 seeds/A. A randomized complete block design with four replications was used. Preemergence (PRE) and postemergence (POST I, II, III, IV, V, and VI) 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	May 26	June 21	June 28	July 2	July 8	July 14	July 19
Treatment	PRE	POST I	POST II	POST III	POST IV	POST V	POST VI
Temperature (F)							
air	57	72	70	74	73	72	79
Relative humidity (%)	64	57	51	78	48	68	71
Wind (mph)	13	8	9	10	7	12	7
Soil moisture	adequate	adequate	adequate	adequate	adequate	adequate	adequate
Soybean							
stage	--	V1	V2	V3	V4	V5	R1
height (inches)	--	4.7	6.7	8.0	12.5	18.0	22.0
Giant ragweed							
weed density/ft ²	--	1.1	0.8	moderate	moderate	moderate	moderate
height (inch)	--	2.8	5.4	7.6	12.0	26.0	8.0
Common lambsquarters							
weed density/ft ²	--	2.1	1.7	light	light	light	light
height (inch)	--	0.6	0.75	1.8	4.0	3.0	0.25
Common waterhemp							
weed density/ft ²	--	4.6	4.8	moderate	moderate	moderate	moderate
height (inch)	--	1.0	1.0	2.0	6.0	12.0	0.25
Giant foxtail							
weed density/ft ²	--	8.8	6.3	moderate	moderate	moderate	Moderate
height (inch)	--	1.0	2.7	2.7	12.0	16.0	2.0
Rainfall after application (inch)							
week 1	1.31	0.63	0.16	1.73	0.92	0.60	0.60
week 2	0.20	0.16	2.82	0.92	0.60	0	1.36
week 3	5.46	2.82	0.23	0.60	1.00	2.09	0.81

Different weeds emerge at different times during the growing season. If left uncontrolled, weeds emerging before or with the crop are more competitive than weeds that emerge after crop emergence. The preemergence application of Boundary at 1.25 pt/A was not enough to maximize yield, 28.3 bu/A. At this location, Touchdown Total applied alone and following Boundary performed well at POST I, II, III and IV (1, 3, 5 and 7 inch weeds) or when applied as a sequential application at POST II and VI.

In the combined location study from Lamberton, Morris, Rochester, Waseca, Luverne, and Potsdam, the results indicate that a one-pass Touchdown Total application at 5 inch weeds (POST III) could maximize yield. If the application of Touchdown Total was made too early,

soybean yield was reduced. The preemergence application Boundary followed by POST III application of Touchdown Total also provided good results. Two pass Touchdown Total at POST II and POST V also provided an effective weed control program. This data is presented in the next report. (University of Minnesota Extension Service, Regional Center, Rochester, MN)

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

Treatment number	Treatment	Rate	Soybean yield (bu/A)
11	PRE Boundary	1.25 pt	28.3
1	PRE / POST I (1" weeds) Boundary / Touchdown Total + AMS	1.25 pt / 24 oz + 2.5 lb	42.2
2	POST I (1" weeds) Touchdown Total + AMS	24 oz + 2.5 lb	42.1
3	PRE / POST II (3" weeds) Boundary / Touchdown Total + AMS	1.25 pt / 24 oz + 2.5 lb	41.3
4	POST II (3"weeds) Touchdown Total + AMS	24 oz + 2.5 lb	42.6
5	PRE / POST III (5"weeds) Boundary / Touchdown Total + AMS	1.25 pt / 24 oz + 2.5 lb	39.6
6	POST III (5"weeds) Touchdown Total + AMS	24 oz + 2.5 lb	40.9
7	PRE / POST IV (7"weeds) Boundary / Touchdown Total + AMS	1.25 pt / 24 oz + 2.5 lb	40.8
8	POST IV (7"weeds) Touchdown Total + AMS	24 oz + 2.5 lb	41.2
9	PRE / POST V (9"weeds) Boundary / Touchdown Total + AMS	1.25 pt / 24 oz + 2.5 lb	38.4
10	POST V (9"weeds) Touchdown Total + AMS	24 oz + 2.5 lb	39.1
12	POST II / POST V (3" weeds / 3" regrowth) Touchdown Total + AMS / Touchdown Total + AMS	24 oz + 2.5 lb / 24 oz + 2.5 lb	40.8
	LSD (0.10)		3.2