

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

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The objective of this trial was to evaluate the effect of time of weed removal on soybean yield in southeastern Minnesota. The research site was a Port Byron silt loam containing 3.2% organic matter with a pH of 6.7 and soil test P and K levels of 66 ppm and 376 ppm respectively. The previous crop was corn. The field was chisel plowed in the fall and disked and field cultivated once prior to planting in the spring. 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, and V) 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 28	June 25	July 1	July 12	July 19	July 23
Treatment	PRE	POST I	POST II	POST III	POST IV	POST V
Temperature (F)						
air	69	67	80	76	82	67
Relative humidity (%)	45	43	60	76	69	56
Wind (mph)	3	18	3	9	6	13
Soybean						
stage	--	V1-V2	V3	V4	R2	R2
height (inches)	--	4.5	6.0	11	15	19
Giant ragweed						
weed density/ft ²	--	0.2	0.7	moderate	moderate	moderate
height (inch)	--	2.5	5.8	10.0	22.0	30.0
Common lambsquarters						
weed density/ft ²	--	7.4	12.7	moderate	moderate	moderate
height (inch)	--	0.75	2.5	1.0	5.0	9.0
Velvetleaf						
weed density/ft ²	--	6	0.9	light	light	light
height (inch)	--	1.0	0.5	1.5	2.0	2.5
Wild proso millet						
weed density/ft ²	--	4.2	6.1	moderate	moderate	moderate
height (inch)	--	0.5	1.1	3.0	6.0	22
Rainfall after application (inch)						
week 1	1.3	0.26	1.73	0.23	1.1	0.65
week 2	4.32	1.73	0.92	1.1	0.54	0.58
week 3	3.24	0.92	0.32	0.54	1.72	0.11

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, 33.9 bu/A. Touchdown Total applied alone and following Boundary performed the best when applied at POST I, II and III (1, 3, and 5 inch weeds) or when applied as a sequential application at POST II and V. The exception was Boundary followed by Touchdown Total at POST V.

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. Data from this trial is presented in a following report. (University of Minnesota Extension Service, Regional Center, Rochester, MN)

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

Treatment Number	Treatment	Rate (rate/A)	Soybean yield (bu/A)
	PRE		
11	Boundary	1.25 pt	33.9
	PRE/POST I (1"weeds)		
1	Boundary / Touchdown Total + AMS	1.25 pt / 24 oz + 2.5 lb	44.1
	POST I (1"weeds)		
2	Touchdown Total + AMS	24 oz + 2.5 lbs	46.6
	PRE / POST II (3"weeds)		
3	Boundary / Touchdown Total + AMS	1.25 pt / 24 oz + 2.5 lb	45.3
	POST II (3"weeds)		
4	Touchdown Total + AMS	24 oz + 2.5 lbs	45.1
	PRE / POST III (5"weeds)		
5	Boundary / Touchdown Total + AMS	1.25 pt / 24 oz + 2.5 lb	42.4
	POST III (5"weeds)		
6	Touchdown Total + AMS	24 oz + 2.5 lbs	43.8
	PRE / POST IV (7"weeds)		
7	Boundary / Touchdown Total + AMS	1.25 pt / 24 oz + 2.5 lb	39.7
	POST IV (7"weeds)		
8	Touchdown Total + AMS	24 oz + 2.5 lbs	38.1
	PRE / POST V (9"weeds)		
9	Boundary / Touchdown Total + AMS	1.25 pt / 24 oz + 2.5 lb	42.1
	POST V (9"weeds)		
10	Touchdown Total + AMS	24 oz + 2.5 lbs	39.6
	POST II / POST V (3" / 3" regrowth)		
12	Touchdown Total + AMS / Touchdown Total + AMS	24 oz + 2.5 lbs / 24 oz + 2.5 lbs	45.3
LSD (0.10)			4.8