

## Evaluation of weed emergence patterns and the effect of time of weed removal on soybean yield and the evaluation of one-pass postemergence systems in soybean at Rochester, MN in 2006.

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The objective of this trial was to evaluate weed emergence patterns and the effect of time of weed removal on soybean yield and the evaluation of one-pass postemergence systems in soybean in southeastern Minnesota. The research site was a Lawler loam series with a pH of 7.2 and soil test P and K levels of 81 ppm and 204 ppm, respectively. The field was chisel plowed, spring disked, and field cultivated once prior to planting. The soybean variety, Producers 210, was planted on May 17, 2006 at a depth of 1.5 inches in 30 inch rows at 140,000 seeds per acre. A randomized complete block design was used with four replications. Preemergence (PRE) and postemergence (POST I, POST II, POST III, POST IV, POST V, and POST VI) treatments were applied with a tractor-mounted sprayer delivering 20 gpa at 32 psi using TurboTee 11002 nozzles. Application dates, environmental conditions, and weed stages are listed below. The center two rows were harvested on October 14, 2006.

Date	May 19	June 7	June 16	June 19	June 23	June 27	July 3
<b>Treatment</b>	PRE	POST I	POST II	POST III	POST IV	POST V	POST VI
<b>Temperature (F)</b>							
air	65	82	74	76	65	69	75
soil	64.4	85.1	71.4	80.8	73.4	78	79.2
<b>Relative Humidity (%)</b>	43	34	71	44	75	65	76
<b>Wind (mph)</b>	6	15	18	16	12	7	8
<b>Soil moisture</b>	adequate	dry	adequate	adequate	dry	adequate	dry
<b>Soybean</b>							
stage	--	V1	V2	V3	V5	R1	R2
height (inch)	--	3.0	3.0	4.5	6.0	9	14.0
<b>Giant Ragweed</b>							
weed density (ft <sup>2</sup> )	--	2.1	2.1	2.1	2.1	2.1	2.1
height (inch)	--	3.0	7.5	8.5	16.5	19.0	--
<b>Common Lambsquarters</b>							
weed density (ft <sup>2</sup> )	--	1.8	1.8	1.8	1.8	1.8	1.8
height (inch)	--	1.8	1.4	5.0	8.0	9.0	1.0
<b>Common Waterhemp</b>							
weed density (ft <sup>2</sup> )	--	7.5	7.5	7.5	7.5	7.5	7.5
height (inch)	--	1.1	3.9	5.5	10.0	8.0	1.5
<b>Giant Foxtail</b>							
weed density (ft <sup>2</sup> )	--	14.4	14.4	14.4	14.4	14.4	14.4
height (inch)	--	4.0	8.0	5.5	11.5	11.0	2.5
<b>Rainfall after each application (inch)</b>							
week 1	0.11	2.13	0.16	0.43	0.27	0.00	0.12
week 2	0.24	0.26	0.27	0.00	0.00	0.12	0.90
week 3	0.42	0.27	0.00	0.12	0.12	0.90	1.86

## CONCLUSIONS

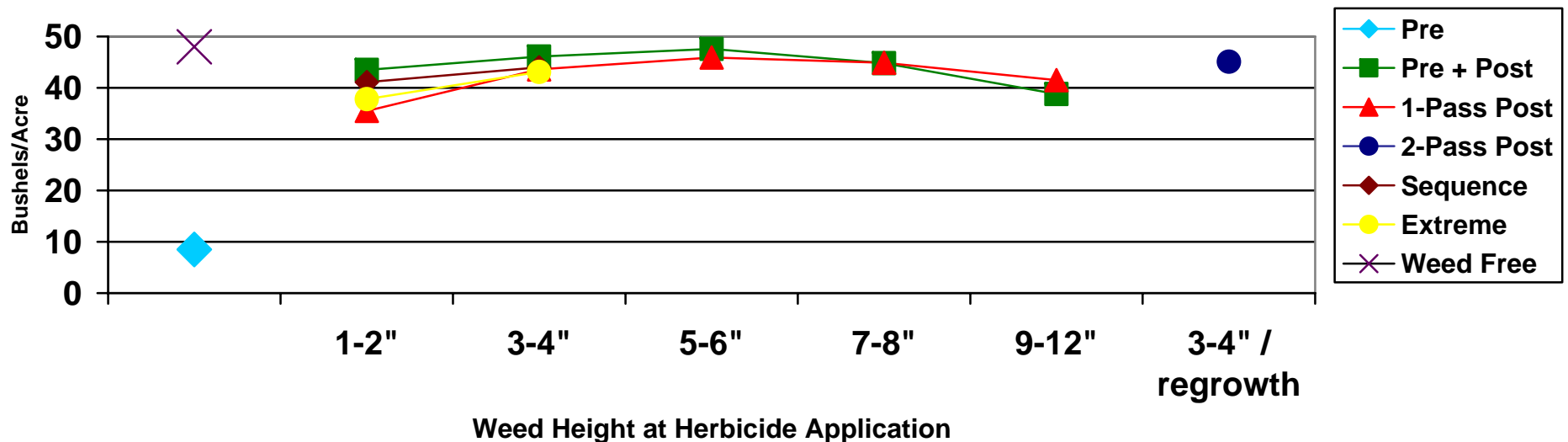
There is a critical herbicide application window or time of weed removal, when trying to achieve satisfactory weed control and maximize soybean yields. It is also extremely important to know the weed species and densities in the field when planning herbicide programs. At this location, four weed species were present: giant ragweed, common waterhemp, common lambsquarters, and giant foxtail. Giant ragweed was the most competitive weed species in the field.

In this trial, the window for a single postemergence glyphosate (Touchdown Total) treatment was four days, from POST III to POST IV (from 5 to 8 inch weeds). Adding a foundation herbicide such as Boundary widened that window nearly two-fold to 7 days, from POST II to POST IV (from 3 to 8 inch weeds). Likewise, using a herbicide with residual activity, such as Sequence (Dual II Magnum + Touchdown), also widened the window from POST II to POST IV (from 3 to 8 inch weeds).

Although not maximizing yields, the foundation Boundary treatment followed by Touchdown Total at POST I and the Sequence treatment applied at POST I did provide soybean yields which were statistically higher than that of Touchdown Total applied alone at POST I, 43.5 bushels/acre and 41.1 bushels/acre compared to 35.5 bushels/acre, respectively.

The weed free check was the highest yielding treatment in this trial at 48 bushels/acre. Seven treatments provided yields statistically the same as the weed free check. These treatments were: PRE Boundary followed by POST II Touchdown Total, 46.1 bushels/acre, POST II Sequence, 44.0 bushel/acre, PRE Boundary followed by POST III Touchdown Total, 47.6 bushels/acre, POST III Touchdown Total, 45.9 bushels/acre, PRE Boundary followed by POST IV Touchdown Total, 44.8 bushels/acre, POST IV Touchdown Total, 44.8 bushels/acre, and a POST II / POST V sequential Touchdown Total applications, 45.1 bushels/acre. (University of Minnesota Extension Service, Regional Center, Rochester, MN).

**Glyphosate Timing and Soybean Yield at Rochester, MN in 2006**



**Table. Weed emergence patterns, weed densities on July 25, and the effect of time of weed removal on soybean yield, oil and protein content at Rochester, MN in 2006.**

Treatment	Rate	Weed height at application	Giant ragweed density	Common lambsquarters density	Common waterhemp density	Giant foxtail density	Protein content	Oil content	Soybean yield
	(rate/A)	(inch)	(ft <sup>2</sup> )	(ft <sup>2</sup> )	(ft <sup>2</sup> )	(ft <sup>2</sup> )	(%)	(%)	(bu/A)
<b>PRE</b>									
Boundary	1.5 pt	0	2.8	0.1	0.6	3.8	34.1	17.3	8.5
<b>PRE / POST I</b>									
Boundary / Touchdown Total + AMS	1.5 pt / 24 oz + 2.5 lb	1-2	0	0.1	0.1	0.6	32.5	18.4	43.5
<b>POST I</b>									
Touchdown Total + AMS	24 oz + 2.5 lb	1-2	0.5	1.4	1.5	7.8	32.5	18.0	35.5
Sequence + AMS	3.5 pt + 2.5 lb	1-2	0	1.1	1.9	1.6	32.3	18.1	41.1
Extreme + NIS + AMS	3 pt + 0.125% v/v + 2.5 lb	1-2	0.5	0	4.8	2.6	32.2	18.1	37.8
<b>PRE / POST II</b>									
Boundary / Touchdown Total + AMS	1.5 pt / 24 oz + 2.5 lb	3-4	0	0	0	0	32.3	18.4	46.1
<b>POST II</b>									
Touchdown Total + AMS	24 oz + 2.5 lb	3-4	0.3	0.9	1.3	1.1	32.3	18.2	43.6
Sequence + AMS	3.5 pt + 2.5 lb	3-4	0.4	0.4	0.1	0	32.0	18.5	44.0
Extreme + NIS + AMS	3 pt + 0.125% v/v + 2.5 lb	3-4	0.3	0	1.5	2.1	32.2	18.2	43.1
<b>PRE / POST III</b>									
Boundary / Touchdown Total + AMS	1.5 pt / 24 oz + 2.5 lb	5-6	0	0.1	0.1	0	32.3	18.3	47.6
<b>POST III</b>									
Touchdown Total + AMS	24 oz + 2.5 lb	5-6	0	0	0.4	0.9	32.1	18.2	45.9
<b>PRE / POST IV</b>									
Boundary / Touchdown Total + AMS	1.5 pt / 24 oz + 2.5 lb	7-8	0.1	0.1	0	0	32.2	18.4	44.8
<b>POST IV</b>									
Touchdown Total + AMS	24 oz + 2.5 lb	7-8	0	0	0.3	0.4	32.0	18.5	44.9
<b>PRE / POST V</b>									
Boundary / Touchdown Total + AMS	1.5 pt / 24 oz + 2.5 lb	9-12	0.3	0	0	0	32.5	18.3	38.8
<b>POST V</b>									
Touchdown Total + AMS	24 oz + 2.5 lb	9-12	0.4	0.1	0.5	0.5	32.0	18.2	41.5
<b>POST II / POST V</b>									
Touchdown Total + AMS / Touchdown Total + AMS	24 oz + 2.5 lb / 24 oz + 2.5 lb	3-4 / regrowth	0	0	0.3	0	31.7	18.4	45.1
Weed Free Check	2.25 oz / 22 oz + 1.5 lb		0	0	0	0	32.4	18.4	48.0
Weedy Check			1.1	0.1	3.0	7.4	34.4	17.5	11.0
<b>LSD (P=0.10)</b>			<b>0.8</b>	<b>0.3</b>	<b>1.7</b>	<b>2.4</b>	<b>0.5</b>	<b>0.3</b>	<b>4.4</b>