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Soybean Weed Management Studies

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Abstract
Several studies were conducted in soybeans to evaluate commercially available herbicides for weed control, crop phytotoxicity, and crop yield. Various herbicide treatment combinations and application methods were evaluated.

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Soybean Weed Management Studies

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Introduction

Several studies were conducted in soybeans to evaluate commercially available herbicides for weed control, crop phytotoxicity, and crop yield. Various herbicide treatment combinations and application methods were evaluated.

Materials and Methods

The studies were established using a randomized complete block design with three or four replications. Herbicide evaluation plot size was 10 ft by 25 ft. For studies that included yield evaluation the plot size was 15 ft by 25 ft. Herbicides were applied in 20 gallons of water per acre. Visual estimates of percentage weed control and crop injury data were made throughout June and July. Weed control observations are compared with an untreated control and made on a zero to 100 rating scale with zero percent equaling no weed control. Crop injury ratings are on a 0 to 100 rating scale, with 0 representing no crop injury. Weed species and populations evaluated included 50 foxtail, and three to ten waterhemp, Pennsylvania smartweed, and velvetleaf/ft^2.

The soil was a Canisteo clay loam with a pH of 6.9 and 6.4% organic matter. The experimental design was a randomized complete block with three replications. The 1999 crop was corn. Tillage included fall chisel plowing and two spring field cultivations. `Asgrow AG2201' glyphosate-tolerant corn was planted 2.0 inches deep on May 5 at 190,000 seeds/A in 30-inch rows. Herbicide application dates and crops stages are presented in Table 1. Precipitation data are presented in Table 2.

Results and Discussion

(KS-TWO, Table 3) – The ratings indicate the level of weed control prior to postemergence Roundup Ultra application. Following Roundup Ultra application all plots showed good to excellent weed control. Although yields varied among treatments, there were no significant differences. Although preemergence treatments combined with postemergence Roundup Ultra provided better early-season weed control, the were no significant differences in crop yield when compared with the single-pass Roundup Ultra treatment.

(KS-SYST, Table 4) – The most consistent weed control was provided by treatments containing glyphosate (Roundup Ultra, Extreme, Glyphomax Plus) and the combination in treatment 9. The combination of Raptor and Cobra showed significant crop injury. The treatment containing Select + Stellar showed good to excellent foxtail and waterhemp control, but provided poor lambsquarter control.

(KS-RRY, Table 5) – All treatments provided good to excellent weed control. The early postemergence treatments of Roundup Ultra alone and with Dual provided less control of velvetleaf and lambsquarters compared with later treatments. There were no significant differences in soybean yield.

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Table 1. Herbicide application dates and crop stages.

Treatment	Date	Crop stage
Preemergence (PRE)	May 5	--
Early postemergence (EPOST)	June 19	5 in.
Postemergence (POST)	June 19	8 in.
Late postemergence (LPOST)	July 7	20 in.

Table 2. Weekly rainfall totals and largest single rainfall following planting.

Week after planting	Total rainfall	Largest single rainfall event
	(inches)	(inches)
1	0.84	0.43
2	0.96	0.50
3	0.10	0.09
4	1.66	1.09
5	0.53	0.52

Table 3. Evaluation of preemergence weed control in planned two-pass program utilizing glyphosate-tolerant soybeans. (KS-TWO)

	Treatment	Rate	Unit/acre	Timing	Foxtail	Lambsquarters	Velvetleaf	Waterhemp	Soybean yield
						----- Jul 1 -----			Oct 10
						---- (% weed control) ----			(bu/acre)
1	BOUNDARY 7.8EC	1.25	pt	PRE	60	76	79	78	46
	ROUNDUP ULTRA (4SL)	24	fl oz	LPOST					
	FERT - 21% AMS	3	lb						
2	BOUNDARY 7.8EC	2.5	pt	PRE	71	80	85	85	45.9
	ROUNDUP ULTRA (4SL)	24	fl oz	LPOST					
	FERT - 21% AMS	3	lb						
3	DOMAIN 60WG	1	lb	PRE	61	83	88	89	35.5
	ROUNDUP ULTRA (4SL)	24	fl oz	LPOST					
	FERT - 21% AMS	3	lb						
4	PURSUIT (2SL)	4	fl oz	PRE	88	89	94	84	52.5
	ROUNDUP ULTRA (4SL)	24	fl oz	LPOST					
	FERT - 21% AMS	3	lb						
5	PURSUIT PLUS (2.9EC)	2.5	pt	PRE	89	89	90	90	49
	ROUNDUP ULTRA (4SL)	24	fl oz	LPOST					
	FERT - 21% AMS	3	lb						
6	PENDIMAX 3.3EC	3	pt	PRE	74	89	89	90	39.3
	PYTHON 80WDG	1	oz						
	ROUNDUP ULTRA (4SL)	24	fl oz	LPOST					
	FERT - 21% AMS	3	lb						
7	AUTHORITY (75DF)	5	oz	PRE	74	91	94	94	49.8
	COMMAND 3ME(CS)	2.67	pt						
	ROUNDUP ULTRA (4SL)	24	fl oz	LPOST					
	FERT - 21% AMS	3	lb						
8	ROUNDUP ULTRA (4SL)	24	fl oz	LPOST	50	73	85	84	42.9
	FERT - 21% AMS	3	lb						
9	UNTREATED CHECK			CHECK	0	0	0	0	23.7
	LSD (0.05)				17.7	8.4	9.6	7.2	18