Preemergence and Postemergence Weed Control in Soybean

RFR-A15107

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Introduction

The purpose of this study was to evaluate various herbicides and application timings in soybean for crop injury and weed control.

Materials and Methods

The study was established using a randomized complete block design with three replications. Herbicides were applied in 15 gallons of water per acre. The crop rotation was soybean following corn. The pre-plant seedbed was prepared with a field cultivator. Soybean was planted at 182,000 seeds/acre in 30-in. rows on May 18. Preemergence (PRE) treatments were applied May 19. Postemergence (POST) treatments were applied June 19 to soybean at the V2 growth stage. Velvetleaf plant heights averaged 1 in. tall. Common waterhemp and common lambsquarters plant heights averaged 3 in. tall. Velvetleaf and common lambsquarters plant densities averaged <1 plant/ft^2, and common waterhemp averaged 5 plants/ft^2. Visual estimates of soybean injury and percentage weed control were made during the growing season. These observations were compared with an untreated control and made on a zero-to-100 rating scale (0% = no control or injury; 100% = complete control or crop kill).

Results and Discussion

Summarized in Tables 1 and 2 are the results of the study. None of the PRE treatments caused soybean injury (Table 1). Fierce and Authority Elite provided only 63 and 47 percent velvetleaf control, respectively. Other PRE treatments provided 80–99 percent control (Table 1). Enlite and Fierce gave only 62–67 percent common waterhemp control compared with 70–88 percent control by Authority Elite, Boundary, Sonic, and Surveil (Table 1). Common lambsquarters control by Fierce, Authority Elite, and Boundary was 68, 86, and 70 percent, respectively. The remaining treatments gave at least 93 percent common lambsquarters control (Table 1).

On July 7, 18 days after the POST applications, POST Harmony SG and Cobra caused 28 and 35 percent soybean injury (data not shown). By July 21, soybean injury caused by the two treatments was 17 and 20 percent, respectively (Table 2). All treatments provided at least 96 percent velvetleaf control on July 21 (Table 2). The common waterhemp population in the trial area contained glyphosate resistance, and control by the POST treatments was variable. PRE Enlite + POST Abundit Extra + Cobra, PRE Authority Elite + POST Roundup PowerMAX, PRE Sonic (4.5 and 6.0 oz wt) + POST Durango DMA, and PRE Surveil (2.8 and 4.2 oz wt) + POST Durango DMA provided 75, 82, 83, 67, 83 and 90 percent common waterhemp control, respectively (Table 2). All other treatments gave 33–72 percent common waterhemp control. All treatments afforded 99 percent common lambsquarters control (Table 2).

Acknowledgements

We would like to thank Ken Pecinovsky and farm staff for their assistance with this study. Funding for this study was provided by the crop protection industry.

Table 1. Preemergence and postemergence weed control in soybean in June.

Treatment	Rate	Appln timing	Injury Jun 19	Abuth[f] Jun 19	Amata Jun 19	Cheal Jun 19
	product/acre		- (%) -	(% weed control)		
Untreated	-	-	0	0	0	0
Enlite + (Abundit Extra + Assure II + NIS[a] + AMS[b])	3.5 oz wt + (32.0 fl oz + 6.0 fl oz + 0.125% v/v[c] + 2.0 lb)	PRE + (POST)	0	86	67	99
Enlite + (Abundit Extra+ Harmony SG + NIS + AMS)	3.5 oz wt + (32.0 fl oz + 0.125 oz wt + 0.125%v/v + 2.0 lb)	PRE + (POST)	0	90	67	99
Enlite + (Abundit Extra+ Cobra + COC[d] + AMS)	3.5 oz wt + (32.0 fl oz + 8.0 fl oz + 1.0 pt + 2.5 lb)	PRE + (POST)	0	86	62	99
Enlite + (Abundit Extra+ Cinch + AMS)	3.5 oz wt + (32.0 fl oz + 1.0 pt + 2.0 lb)	PRE + (POST)	0	83	62	96
Roundup PowerMAX + AMS + NIS	32.0 fl oz + 2.5 lb + 0.25% v/v	POST	0	0	0	0
Fierce + (Roundup PowerMAX + AMS + NIS)	3.0 oz wt + (32.0 fl oz + 2.5 lb + 0.25% v/v)	PRE + (POST)	0	63	65	68
Authority Elite + (Roundup PowerMAX + AMS + NIS)	32.0 fl oz + (32.0 fl oz + 2.5 + 0.25% v/v)	PRE + (POST)	0	47	80	86
Boundary + (Roundup PowerMAX + AMS + NIS)	2.0 pt + (32.0 fl oz + 2.5 lb + 0.25% v/v)	PRE + (POST)	0	80	70	70
Sonic + (Durango DMA + N-Pak AMS Liquid[e])	4.5 oz wt + (24.0 fl oz + 2.5 % v/v)	PRE + (POST)	0	93	83	95
Sonic + (Durango DMA + N-Pak AMS Liquid)	6.0 oz wt + (24.0 fl oz + 2.5 % v/v)	PRE + (POST)	0	96	73	99
Surveil + (Durango DMA + N-Pak AMS Liquid)	2.8 oz wt + (24.0 fl oz + 2.5 % v/v)	PRE + (POST)	0	99	77	93
Surveil + (Durango DMA + N-Pak AMS Liquid)	4.2 oz wt + (24.0 fl oz + 2.5 % v/v)	PRE + (POST)	0	99	88	99
LSD (P = 0.05)			0	25	18	12

[a]NIS = preference nonionic surfactant.
[b]AMS = ammonium sulfate fertilizer.
[c]v/v = volume of product per volume tank mix.
[d]COC = premium crop oil concentrate.
[e]N-Pak AMS liquid = ammonium sulfate.
[f]Abuth = velvetleaf, amata = common waterhemp, cheal = common lambsquarters.

Table 2. Preemergence and postemergence weed control in soybean in July.

Treatment	Rate	Appln timing	Injury Jul 21	Abuth[f] Jul 21	Amata Jul 21	Cheal Jul 21
	product/acre		- (%) -		(% weed control)	
Untreated	-	-	0	0	0	0
Enlite + (Abundit Extra + Assure II + NIS[a] + AMS[b])	3.5 oz wt + (32.0 fl oz + 6.0 fl oz + 0.125% v/v[c] + 2.0 lb)	PRE + (POST)	0	99	63	99
Enlite + (Abundit Extra+ Harmony SG + NIS + AMS)	3.5 oz wt + (32.0 fl oz + 0.125 oz wt + 0.125%v/v + 2.0 lb)	PRE + (POST)	17	96	65	99
Enlite + (Abundit Extra+ Cobra + COC[d] + AMS)	3.5 oz wt + (32.0 fl oz + 8.0 fl oz + 1.0 pt + 2.5 lb)	PRE + (POST)	20	99	75	99
Enlite + (Abundit Extra+ Cinch + AMS)	3.5 oz wt + (32.0 fl oz + 1.0 pt + 2.0 lb)	PRE + (POST)	0	99	62	99
Roundup PowerMAX + AMS + NIS	32.0 fl oz + 2.5 lb + 0.25% v/v	POST	0	99	33	99
Fierce + (Roundup PowerMAX + AMS + NIS)	3.0 oz wt + (32.0 fl oz + 2.5 lb + 0.25% v/v)	PRE + (POST)	0	98	72	99
Authority Elite + (Roundup PowerMAX + AMS + NIS)	32.0 fl oz + (32.0 fl oz + 2.5 + 0.25% v/v)	PRE + (POST)	0	99	82	99
Boundary + (Roundup PowerMAX + AMS + NIS)	2.0 pt + (32.0 fl oz + 2.5 lb + 0.25% v/v)	PRE + (POST)	0	99	67	99
Sonic + (Durango DMA + N-Pak AMS Liquid[e])	4.5 oz wt + (24.0 fl oz + 2.5 % v/v)	PRE + (POST)	0	99	83	99
Sonic + (Durango DMA + N-Pak AMS Liquid)	6.0 oz wt + (24.0 fl oz + 2.5 % v/v)	PRE + (POST)	0	99	67	99
Surveil + (Durango DMA + N-Pak AMS Liquid)	2.8 oz wt + (24.0 fl oz + 2.5 % v/v)	PRE + (POST)	0	99	83	99
Surveil + (Durango DMA + N-Pak AMS Liquid)	4.2 oz wt + (24.0 fl oz + 2.5 % v/v)	PRE + (POST)	0	99	90	99
LSD (P = 0.05)			3	3	21	0

[a]NIS = preference nonionic surfactant.
[b]AMS = ammonium sulfate fertilizer.
[c]v/v = volume of product per volume tank mix.
[d]COC = premium crop oil concentrate.
[e]N-Pak AMS liquid = ammonium sulfate.
[f]Abuth = velvetleaf, amata = common waterhemp, cheal = common lambsquarters.