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Weed Management in Soybean, Part 2

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Abstract
The purpose of this study was to evaluate preemergence and postemergence applications of various herbicides with different mechanisms of action for crop injury, weed control, and yield.

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Weed Management in Soybean, Part 2

RFR-A10104

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Introduction

The purpose of this study was to evaluate preemergence and postemergence applications of various herbicides with different mechanisms of action for crop injury, weed control, and yield.

Materials and Methods

The study was established using a randomized complete block design with three replications. Herbicides were applied in 20 gallons of water/acre. The crop rotation was soybean following corn.

Soybeans were planted at 188,000 seeds/acre in 30-in. rows on May 18. Preemergence (PRE) treatments were applied on May 19. Early postemergence (EPOST), mid-postemergence (MPOST), and late postemergence (LPOST) treatments were applied on June 16, 24, and July 9, respectively. Soybean growth stage was V2, V3, and R1 on June 16, 24, and July 9, respectively. Weeds were 0.25–10 in. tall, 0.25–18 in. tall and 0.25–6 in. tall, on June 16, 24, and July 9, respectively. Weed species in the study included: giant foxtail, velvetleaf, common waterhemp, common lambsquarters, and Pennsylvania smartweed averaging a population of <1–10 plants/ft^2.

Visual estimates of crop injury and weed control were made during the growing season. These observations were compared with an untreated control and made on a rating scale (0% = no crop injury/no weed control; 100% = complete crop death/complete weed control). Soybean yields were measured and adjusted to 13 percent moisture.

Results and Discussion

No soybean injury was observed on June 22 from the PRE applied treatments (Table 1). PRE treatments gave 70–90 percent giant foxtail, 53–96 percent velvetleaf, 73–95 percent common waterhemp, 57–73 percent common lambsquarters and 38–60 percent Pennsylvania smartweed control. Prefix applied EPOST resulted in 32 percent soybean injury.

On July 9, 12 and 10 percent soybean injury was observed from EPOST applied Prefix plus Touchdown Total and MPOST applied Flexstar, respectively (Table 2). No other treatment caused soybean injury. Except for EPOST applied Touchdown Total and Warrant plus Roundup PowerMAX, weed control was 92 percent or higher with the treatments.

No soybean injury was evident from any treatment on August 12 (data not shown). Treatments gave 90 percent or higher weed control (Table 3). Exceptions were PRE applied Boundary plus MPOST Touchdown Total, MPOST applied Touchdown Total, and PRE applied Optill plus MPOST Roundup PowerMAX which gave 70 percent, 83 percent and 57 percent common waterhemp control, respectively. Soybean yields from the herbicide treatments ranged from 57–62 bushels/acre and were significantly higher than the untreated control.

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Table 1. Weed management in soybean, Part 2.

Treatment	Rate	Appln timing	Injury Jun 22	Setfa[c] Jun 22	Abuth[c] Jun 22	Amata[c] Jun 22	Cheal[c] Jun 22	Polpy[c] Jun 22
	product/acre		- (%) -	---------- (%) ----------				
Untreated			0	0	0	0	0	0
Prefix + (Touchdown Total + AMS[a])	2.0 pt + (24.0 fl oz + 2.5%[b])	PRE + (MPOST)	0	90	53	95	57	58
Boundary + (Touchdown Total + AMS)	6.5 pt + (24.0 fl oz + 2.5%)	PRE + (MPOST)	0	73	62	75	58	38
Touchdown Total + AMS + (Touchdown Total + AMS)	24.0 fl oz + 2.5% + (24.0 fl oz + 2.5%)	EPOST + (LPOST)	2	99	99	99	99	88
Touchdown Total + AMS	24.0 fl oz + 2.5%	MPOST	0	0	0	0	0	0
Prefix + Touchdown Total + AMS + (Touchdown Total + AMS)	2.0 pt + 24.0 fl oz + 2.5% + (24.0 fl oz + 2.5%)	EPOST + (LPOST)	32	99	99	99	99	99
Boundary + (Flexstar GT + AMS)	1.5 pt + (3.0 +2.5%)	PRE + (MPOST)	0	82	53	92	62	48
Valor XLT + (Roundup PowerMAX + AMS)	3.0 oz wt + (22.0 fl oz + 2.5%)	PRE + (MPOST)	0	70	85	90	73	58
Warrant + Roundup PowerMAX + AMS + (Roundup PowerMAX + AMS)	3.0 pt + 22.0 fl oz + 2.5% + (22.0 fl oz + 2.5%)	EPOST + (LPOST)	0	99	99	99	99	99
Sonic + (Durango DMA + AMS)	3.22 oz wt + (24.0 fl oz + 2.5%)	PRE + (MPOST)	0	77	96	73	65	50
Optill + (Roundup PowerMAX + AMS)	1.5 oz wt + (22.0 fl oz + 2.5%)	PRE + (MPOST)	0	80	96	80	72	60
LSD (P=0.05)			2	12	10	18	13	7

[a]AMS = N-Pak ammonium sulfate liquid fertilizer from Winfield Solutions, LCC.
[b]% = % volume/volume.
[c]Setfa = giant foxtail, Abuth = velvetleaf, Amata = common waterhemp, Cheal = common lambsquarters, Polpy = Pennsylvania smartweed.

Table 2. Weed management in soybean, Part 2.

Treatment	Rate	Appln timing	Injury Jul 9	Setfa[c] Jul 9	Abuth[c] Jul 9	Amata[c] Jul 9	Cheal[c] Jul 9	Polpy[c] Jul 9
	product/acre		- (%) -	---------- (%) ----------				
Untreated			0	0	0	0	0	0
Prefix + (Touchdown Total + AMS[a])	2.0 pt + (24.0 fl oz + 2.5%[b])	PRE + (MPOST)	0	99	99	99	99	95
Boundary + (Touchdown Total + AMS)	6.5 pt + (24.0 fl oz + 2.5%)	PRE + (MPOST)	0	99	98	99	99	92
Touchdown Total + AMS + (Touchdown Total + AMS)	24.0 fl oz + 2.5% + (24.0 fl oz + 2.5%)	EPOST + (LPOST)	0	92	67	55	88	98
Touchdown Total + AMS	24.0 fl oz + 2.5%	MPOST	0	99	98	99	96	93
Prefix + Touchdown Total + AMS + (Touchdown Total + AMS)	2.0 pt + 24.0 fl oz + 2.5% + (24.0 fl oz + 2.5%)	EPOST + (LPOST)	12	99	96	98	96	99
Boundary + (Flexstar GT + AMS)	1.5 pt + (3.0 +2.5%)	PRE + (MPOST)	10	99	99	99	98	98
Valor XLT + (Roundup PowerMAX + AMS)	3.0 oz wt + (22.0 fl oz + 2.5%)	PRE + (MPOST)	0	99	99	99	99	95
Warrant + Roundup PowerMAX + AMS + (Roundup PowerMAX + AMS)	3.0 pt + 22.0 fl oz + 2.5% + (22.0 fl oz + 2.5%)	EPOST + (LPOST)	0	95	87	92	90	98
Sonic + (Durango DMA + AMS)	3.22 oz wt + (24.0 fl oz + 2.5%)	PRE + (MPOST)	0	99	99	98	98	96
Optill + (Roundup PowerMAX + AMS)	1.5 oz wt + (22.0 fl oz + 2.5%)	PRE + (MPOST)	0	99	99	98	99	98
LSD (P = 0.05)			2	2	12	11	4	5

[a]AMS = N-Pak ammonium sulfate liquid fertilizer from Winfield Solutions, LCC.
[b]% = % volume/volume.
[c]Setfa = giant foxtail, Abuth = velvetleaf, Amata = common waterhemp, Cheal = common lambsquarters, Polpy = Pennsylvania smartweed.

Table 3. Weed management in soybean, Part 2.

Treatment	Rate	Appln timing	Setfa[c] Aug 12	Abuth[c] Aug 12	Amata[c] Aug 12	Cheal[c] Aug 12	Polpy[c] Aug 12	Yield Oct 5
	product/acre		---------- (%) ----------					bu/acre
Untreated			0	0	0	0	0	46
Prefix + (Touchdown Total + AMS[a])	2.0 pt + (24.0 fl oz + 2.5%[b])	PRE + (MPOST)	98	95	99	98	98	61
Boundary + (Touchdown Total + AMS)	6.5 pt + (24.0 fl oz + 2.5%)	PRE + (MPOST)	98	90	70	96	95	62
Touchdown Total + AMS + (Touchdown Total + AMS)	24.0 fl oz + 2.5% + (24.0 fl oz + 2.5%)	EPOST + (LPOST)	99	99	99	99	99	60
Touchdown Total + AMS	24.0 fl oz + 2.5%	MPOST	96	92	83	90	96	59
Prefix + Touchdown Total + AMS + (Touchdown Total + AMS)	2.0 pt + 24.0 fl oz + 2.5% + (24.0 fl oz + 2.5%)	EPOST + (LPOST)	99	99	99	98	99	59
Boundary + (Flexstar GT + AMS)	1.5 pt + (3.0 +2.5%)	PRE + (MPOST)	99	95	99	98	98	61
Valor XLT + (Roundup PowerMAX + AMS)	3.0 oz wt + (22.0 fl oz + 2.5%)	PRE + (MPOST)	96	98	98	95	98	58
Warrant + Roundup PowerMAX + AMS + (Roundup PowerMAX + AMS)	3.0 pt + 22.0 fl oz + 2.5% + (22.0 fl oz + 2.5%)	EPOST + (LPOST)	99	99	99	99	99	59
Sonic + (Durango DMA + AMS)	3.22 oz wt + (24.0 fl oz + 2.5%)	PRE + (MPOST)	96	99	93	96	98	60
Optill + (Roundup PowerMAX + AMS)	1.5 oz wt + (22.0 fl oz + 2.5%)	PRE + (MPOST)	95	98	57	99	99	57
LSD (P = 0.05)			3	6	9	5	4	6

[a]AMS = N-Pak ammonium sulfate liquid fertilizer from Winfield Solutions, LCC.
[b]% = % volume/volume.
[c]Setfa = giant foxtail, Abuth = velvetleaf, Amata = common waterhemp, Cheal = common lambsquarters, Polpy = Pennsylvania smartweed.