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Michael D. Owen

Iowa State University, mdowen@iastate.edu

James F. Lux

Iowa State University, jlux@iastate.edu

Damian D. Franzenburg

Iowa State University, dfranzen@iastate.edu

Dean M. Grossnickle

Iowa State University

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Weed Management Programs in Soybeans

Abstract

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

Keywords

RFR A11124, Agronomy

Disciplines

Agricultural Science | Agriculture | Agronomy and Crop Sciences

Weed Management Programs in Soybeans

RFR-A11124

Micheal Owen, professor
James Lux, research coordinator
Damian Franzenburg, ag specialist
Dean Grossnickle, ag specialist
Department of Agronomy

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 20 gallons of water/acre. The crop rotation was soybean following corn. The pre-plant seedbed was prepared with a tandem disk. Soybeans were planted at 188,000 seeds/acre in 30-in. rows on May 24. Preemergence (PRE) treatments were applied on May 24. Early postemergence (EPOST) treatments were applied on June 18. Soybean growth was V1. Weeds were generally 0.25–5 in. tall. Postemergence (POST) and sequential postemergence (SPOST) treatments were applied on July 2 and July 15 to V4 and R1 soybean, respectively. Weed sizes for POST and SPOST applications ranged from 0.25–20 and 0.25–7 in., respectively. Weed species in the study included: giant foxtail, velvetleaf, common waterhemp, and common lambsquarters with average populations of 1–5 plants/ft². 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 0–100 rating scale (0 percent = no control or injury; 100 percent = complete control or crop kill). Soybean yields were adjusted to 13 percent moisture.

Results and Discussion

The results of the study are summarized in Tables 1 through 3. No soybean injury was evident from the PRE treatments (data not shown). EPOST treatments caused soybean injury ranging from 2 to 35 percent when observed on June 24, 6 days after application (Table 1). EPOST applied Anthem plus Roundup PowerMAX, Prefix plus Roundup PowerMAX, Flexstar GT 3.5, and Extreme caused the most injury. On June 30, 2 days prior to POST treatment timing, PRE applied Valor SX gave 58 percent giant foxtail control, while remaining treatments gave 80 to 92 percent control. Velvetleaf, common waterhemp, and common lambsquarters control with PRE applied Authority First and Authority Assist was 88 to 95 percent, while remaining PRE treatments provided 7 to 87 percent control. PRE plus EPOST and EPOST treatments provided 99 percent overall weed control.

POST treatments following PRE, gave 99 percent overall weed control on July 15, 13 days after application (Table 2). Late-season weed control observations were made on July 29 (Table 3). Treatments provided 92 to 99 percent giant foxtail, velvetleaf and common lambsquarters control and 85 to 98 percent common waterhemp control. Soybean treatment yields, including the untreated control, ranged from 37 to 61 bushels/acre. Significant differences in yield between herbicide treatments were determined. All treatment yields were significantly higher than the untreated control.

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Table 1. Weed management programs in soybean in late June.

Treatment	Rate	Appln timing	Injury Jun 24	Injury Jun 30	Setfa ^c Jun 30	Abuth Jun 30	Amata Jun 30	Cheal Jun 30
	product/acre		----- (%) -----		----- (% weed control) -----			
Untreated	-		0	0	0	0	0	0
Anthem + (Roundup PowerMAX + AMS ^a)	8.0 fl oz + (22.0 fl oz + 1.0%)	PRE + (POST)	0	0	82	50	75	47
Authority First DF + (Roundup PowerMAX + AMS)	6.4 oz wt + (22.0 fl oz + 1.0%)	PRE + (POST)	0	0	80	88	88	95
Authority Assist + (Roundup PowerMAX + AMS)	9.0 fl oz + (22.0 fl oz + 1.0%)	PRE + (POST)	0	0	92	95	93	93
Valor SX + (Roundup PowerMAX + AMS)	3.0 oz wt + (22.0 fl oz + 1.0%)	PRE + (POST)	0	2	58	42	75	65
Fierce + (Roundup PowerMAX + AMS)	3.0 oz wt + (22.0 fl oz + 1.0%)	PRE + (POST)	0	0	82	35	80	58
Prefix + (Roundup PowerMAX + AMS)	2.0 pt + (22.0 fl oz + 1.0%)	PRE + (POST)	0	0	90	7	87	17
Authority Assist + (Anthem + Roundup PowerMAX + AMS)	5.0 fl oz + (5.0 fl oz + 22.0 fl oz + 1.0%)	PRE + (EPOST)	22	17	99	99	99	99
Anthem + Roundup PowerMAX + AMS + (Roundup PowerMAX + AMS)	6.0 fl oz + 22.0 fl oz + 1.0% + (22.0 fl oz + 1.0%)	EPOST + (SPOST)	23	17	99	99	99	99
Prefix + Roundup PowerMAX + AMS + (Roundup PowerMAX + AMS)	2.0 pt + 22.0 fl oz + 1.0% + (22.0 fl oz + 1.0%)	EPOST + (SPOST)	35	30	99	99	99	99
Flexstar GT 3.5 + AMS + (Roundup PowerMAX + AMS)	3.5 pt + 1.0 % + (22.0 fl oz + 1.0%)	EPOST + (SPOST)	23	18	99	99	99	99
Extreme + NIS ^b + AMS + (Roundup PowerMAX + AMS)	3.0 pt + 0.125 % + 1.0% + (22.0 fl oz + 1.0%)	EPOST + (SPOST)	18	13	99	99	99	99
Warrant + Roundup PowerMAX + AMS + (Roundup PowerMAX + AMS)	3.0 pt + 22.0 fl oz + 1.0% + (22.0 fl oz + 1.0 %)	EPOST + (SPOST)	2	3	99	99	99	99
Roundup PowerMAX + AMS + (Roundup PowerMAX + AMS)	22.0 fl oz + 1.0% + (22.0 fl oz + 1.0%)	EPOST + (SPOST)	2	0	99	99	99	99
LSD (P=0.05)			3	3	12	8	7	12

^aAMS = percent weight/volume ammonium sulfate fertilizer from United Suppliers.

^bNIS = percent volume/volume non-ionic surfactant (Preference) from Winfield Solutions, LLC.

^cSetfa = giant foxtail, Abuth = velvetleaf, Amata = common waterhemp, Cheal = common lambsquarters.

Table 2. Weed management programs in soybean in early to mid July.

Treatment	Rate	Appln timing	Injury Jul 8	Injury Jul 15	Setfa ^c Jul 15	Abuth Jul 15	Amata Jul 15	Cheal Jul 15
	product/acre		----- (%) -----		----- (% weed control) -----			
Untreated	-		0	0	0	0	0	0
Anthem + (Roundup PowerMAX + AMS ^a)	8.0 fl oz + (22.0 fl oz + 1.0%)	PRE + (POST)	0	0	99	99	99	99
Authority First DF + (Roundup PowerMAX + AMS)	6.4 oz wt + (22.0 fl oz + 1.0%)	PRE + (POST)	0	0	99	99	99	99
Authority Assist + (Roundup PowerMAX + AMS)	9.0 fl oz + (22.0 fl oz + 1.0%)	PRE + (POST)	0	0	99	99	99	99
Valor SX + (Roundup PowerMAX + AMS)	3.0 oz wt + (22.0 fl oz + 1.0%)	PRE + (POST)	0	0	99	99	99	99
Fierce + (Roundup PowerMAX + AMS)	3.0 oz wt + (22.0 fl oz + 1.0%)	PRE + (POST)	0	0	99	99	99	99
Prefix + (Roundup PowerMAX + AMS)	2.0 pt + (22.0 fl oz + 1.0%)	PRE + (POST)	0	0	99	99	99	99
Authority Assist + (Anthem + Roundup PowerMAX + AMS)	5.0 fl oz + (5.0 fl oz + 22.0 fl oz + 1.0%)	PRE + (EPOST)	8	0	96	98	90	99
Anthem + Roundup PowerMAX + AMS + (Roundup PowerMAX + AMS)	6.0 fl oz + 22.0 fl oz + 1.0% + (22.0 fl oz + 1.0%)	EPOST + (SPOST)	10	0	93	88	85	78
Prefix + Roundup PowerMAX + AMS + (Roundup PowerMAX + AMS)	2.0 pt + 22.0 fl oz + 1.0% + (22.0 fl oz + 1.0%)	EPOST + (SPOST)	13	0	99	85	96	77
Flexstar GT 3.5 + AMS + (Roundup PowerMAX + AMS)	3.5 pt + 1.0 % + (22.0 fl oz + 1.0%)	EPOST + (SPOST)	10	0	92	82	88	70
Extreme + NIS ^b + AMS + (Roundup PowerMAX + AMS)	3.0 pt + 0.125 % + 1.0% + (22.0 fl oz + 1.0%)	EPOST + (SPOST)	5	0	98	96	72	99
Warrant + Roundup PowerMAX + AMS + (Roundup PowerMAX + AMS)	3.0 pt + 22.0 fl oz + 1.0% + (22.0 fl oz + 1.0 %)	EPOST + (SPOST)	2	0	96	86	95	63
Roundup PowerMAX + AMS + (Roundup PowerMAX + AMS)	22.0 fl oz + 1.0% + (22.0 fl oz + 1.0%)	EPOST + (SPOST)	0	0	92	77	50	58
LSD (P=0.05)			2	0	4	12	8	8

^aAMS = percent weight/volume ammonium sulfate fertilizer from United Suppliers.

^bNIS = percent volume/volume non-ionic surfactant (Preference) from Winfield Solutions, LLC.

^cSetfa = giant foxtail, Abuth = velvetleaf, Amata = common waterhemp, Cheal = common lambsquarters.

Table 3. Weed management programs in soybean in late July.

Treatment	Rate	Appln timing	Setfa ^c Jul 29	Abuth Jul 29	Amata Jul 29	Cheal Jul 29	Yield Oct 10
	product/acre		----- (% weed control) -----				bu/acre
Untreated	-		0	0	0	0	37
Anthem + (Roundup PowerMAX + AMS ^a)	8.0 fl oz + (22.0 fl oz + 1.0%)	PRE + (POST)	99	96	98	98	59
Authority First DF + (Roundup PowerMAX + AMS)	6.4 oz wt + (22.0 fl oz + 1.0%)	PRE + (POST)	92	96	96	99	61
Authority Assist + (Roundup PowerMAX + AMS)	9.0 fl oz + (22.0 fl oz + 1.0%)	PRE + (POST)	96	98	93	99	60
Valor SX + (Roundup PowerMAX + AMS)	3.0 oz wt + (22.0 fl oz + 1.0%)	PRE + (POST)	96	94	96	94	61
Fierce + (Roundup PowerMAX + AMS)	3.0 oz wt + (22.0 fl oz + 1.0%)	PRE + (POST)	99	96	98	96	57
Prefix + (Roundup PowerMAX + AMS)	2.0 pt + (22.0 fl oz + 1.0%)	PRE + (POST)	98	92	96	93	58
Authority Assist + (Anthem + Roundup PowerMAX + AMS)	5.0 fl oz + (5.0 fl oz + 22.0 fl oz + 1.0%)	PRE + (EPOST)	93	95	85	99	58
Anthem + Roundup PowerMAX + AMS + (Roundup PowerMAX + AMS)	6.0 fl oz + 22.0 fl oz + 1.0% + (22.0 fl oz + 1.0%)	EPOST + (SPOST)	99	98	96	95	57
Prefix + Roundup PowerMAX + AMS + (Roundup PowerMAX + AMS)	2.0 pt + 22.0 fl oz + 1.0% + (22.0 fl oz + 1.0%)	EPOST + (SPOST)	99	96	96	93	56
Flexstar GT 3.5 + AMS + (Roundup PowerMAX + AMS)	3.5 pt + 1.0 % + (22.0 fl oz + 1.0%)	+ (SPOST)	98	96	98	98	61
Extreme + NIS ^b + AMS + (Roundup PowerMAX + AMS)	3.0 pt + 0.125 % + 1.0% + (22.0 fl oz + 1.0%)	+ (SPOST)	96	99	92	99	57
Warrant + Roundup PowerMAX + AMS + (Roundup PowerMAX + AMS)	3.0 pt + 22.0 fl oz + 1.0% + (22.0 fl oz + 1.0 %)	+ (SPOST)	99	98	96	93	57
Roundup PowerMAX + AMS + (Roundup PowerMAX + AMS)	22.0 fl oz + 1.0% + (22.0 fl oz + 1.0%)	+ (SPOST)	98	99	88	92	56
LSD (P=0.05)			3	5	7	6	3

^aAMS = percent weight/volume ammonium sulfate fertilizer from United Suppliers.

^bNIS = percent volume/volume non-ionic surfactant (Preference) from Winfield Solutions, LLC.