

2001

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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

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Recommended Citation

Owen, Michael D.; Lux, James F.; and Franzenburg, Damian D., "Weed Management Strategies in Soybean Production" (2001). *Iowa State Research Farm Progress Reports*. 1842.

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Abstract

The purpose of this study was to evaluate several weed management strategies in soybean production. Various herbicide combinations and application timings were evaluated for soybean phytotoxicity and weed efficacy in glyphosate resistant soybean production.

Keywords

Agronomy

Disciplines

Agricultural Science | Agriculture | Agronomy and Crop Sciences

Weed Management Strategies in Soybean Production

Micheal D. K. Owen, professor,
James F. Lux, ag specialist,
Damian D. Franzenburg, ag specialist,
Department of Agronomy

Introduction

The purpose of this study was to evaluate several weed management strategies in soybean production. Various herbicide combinations and application timings were evaluated for soybean phytotoxicity and weed efficacy in glyphosate resistant soybean production.

Materials and Methods

The crop rotation was soybean following corn. The seedbed was prepared with chisel plow in the fall, followed by spring field cultivation. Crop residue was 30 to 40 percent at planting. A randomized complete block design with three replications was used. Herbicides were applied in 20 gallons of water per acre. Visual estimates of crop injury and percentage weed control were made during the growing season. These observations are compared with an untreated control and made on a zero to 100 rating scale (0 percent = no control or injury; 100 percent = complete control or crop kill).

'Asgrow variety 3303 RR/SCN' soybean was planted on April 28 and preemergence (PRE) treatments followed. Postemergence (POST)1, POST2, and POST3 treatments were applied on June 5 and 13, and July 13, respectively. Soybean was two trifoliolate and 3 to 5 inches tall on June 5, and on June 13 soybean was three trifoliolate and 3 to 6 inches tall. Weed growth was one to eight leaves and 0.5 to 3 inches tall on June 5. On June 13, weeds had one to numerous leaves and were 0.5 to 6 inches tall. On the July 13 POST3 application date soybean was eight trifoliolate and 18 to 22

inches tall, and weeds were three to numerous and up to 6 inches tall. Weed species occurring in this study included: giant foxtail, common cocklebur, common lambsquarters, common waterhemp, ivyleaf morningglory, and velvetleaf with an average population of 25, 1, 2, 1, 1, and 1 plants/ft², respectively.

Results and Discussion

Summarized in Table 1 are the data on soybean phytotoxicity, percentage weed control and yield as affected by weed management strategy. Raptor plus Flexstar applied POST2 and Basagran, Poast Plus, and Ultra Blazer POST1 demonstrated 10% injury on July 13. FirstRate plus Glyphomax Plus POST2, Classic plus Roundup Ultra POST1, and POST1 treatments with Flexstar demonstrated 5% injury or less.

Giant foxtail, velvetleaf and common cocklebur control was good to excellent with all treatments on July 13. Common lambsquarters control was excellent except with FirstRate plus Flexstar and Select applied POST1. Extreme and FirstRate plus Glyphomax Plus applied POST3 gave unacceptable control of common waterhemp. Ivyleaf morningglory control was variable. Weed control observations on August 3 were very similar to the July 13 evaluations (data not presented).

Outlook applied PRE followed by Basagran, Poast Plus, and Ultra Blazer POST1; Raptor and Flexstar POST2; and Extreme POST2 yielded from 40 to 43 bu/A. Flexstar plus Basagran and Fusion applied POST1 yielded 44 bu/A. FirstRate plus Flexstar and Select applied POST1 yielded 45 bu/A. The remaining treatments yielded from 47 to 54 bu/A.

Table 1. Herbicide combinations and application timings for weed control in soybean.

Treatment ^a	Rate	Appl. time	Injury 7/13	Gift 7/13	Cocb 7/13	Colq 7/13	Cowh 7/13	llmg 7/13	Vele 7/13	Yield 10/12
	Product/A		-(%)	----- (% weed control ^b) -----						bu/A
Control	-	-	0	0	0	0	0	0	0	25
Raptor 1AS+	5.0 oz+	POST2	10	87	99	90	99	55	99	40
Flexstar HL 1.88 SL+	1.25 pt+									
Sun-it II+AMS	1.0%v/v+2.5 lb/A									
Extreme 2.17 SL+	3.0 pt+	POST2	3	96	99	93	50	80	98	43
NIS+AMS	0.125 %v/v+15 lb/100gal									
Outlook 6 EC+	11.0 oz+	PRE+	10	92	91	90	93	82	95	40
(Basagran 4SL+	(2.0 pt+	(POST1)								
Poast Plus 1EC+	1.6 pt+									
Ultra Blazer 2 SL+28%N)	0.64 pt+1.25 lb/100gal)									
Outlook 6 EC+	11.0 oz+	PRE+	0	95	95	90	96	77	98	49
(Roundup Ultra 4SL+AMS)	(1.0 qt+2.5 lb/A)	(POST2)								
Outlook 6 EC+	11.0 oz+	POST1	0	98	98	99	93	90	93	52
Roundup Ultra 4SL+AMS	1.0 qt+2.5 lb/A									
FirstRate 84 WG+	0.3 oz+	POST2	5	96	99	88	48	80	99	47
Glyphomax Plus 4 SL+AMS	0.75 qt+2.0 lb/A									
FirstRate 84 WG+	0.3 oz+	POST1	2	90	99	77	98	92	95	45
Flexstar HL 1.88 SL+	0.63 pt+									
Select 2EC+	6.0 oz+									
MSO+AMS	1.0 %v/v+2.0 lb/A									
Authority 75 WG+	0.25 lb+	PRE+	2	93	98	99	96	85	93	49
(Classic 25WG+	(0.32 oz+	(POST1)								
Roundup Ultra 4SL+	0.75 qt+									
NIS+28%N)	0.25 %v/v+2.0 qt/A)									
Command 3MECS+	2.0 pt+	PRE	0	95	98	99	98	88	99	50
Authority 4F+FirstRate 84 WG	9.9 oz+0.74 oz									
Command 3ME CS+	1.0 pt+	PRE+	0	96	99	95	95	90	95	54
Authority 4F+	0.25 lb+									
(Roundup Ultra 4SL+AMS)	(0.75 qt+17 lb/100gal)	(POST2)								
FirstRate 84 WG+	0.55 oz+	PRE+	0	96	99	98	98	94	99	51
Authority 75 WG+	0.31 lb+									
(Roundup Ultra 4SL+AMS)	(0.75 qt+17 lb/100gal)	(POST2)								
Micro-Tech 4CS+	2.0 qt+	PRE+	0	98	89	89	99	73	96	51
(Roundup Ultra 4SL+AMS)	(1.0 qt+17 lb/100gal)	(POST2)								
Roundup Ultra 4SL+AMS+	1.0 qt+17 lb/100gal+	POST1+	0	96	86	99	90	93	93	49
(Roundup Ultra 4SL+AMS)	(1.0 qt+17 lb/100gal)	(POST3)								
Flexstar HL 1.88 SL+	1.0 pt+	POST1	5	92	96	98	98	85	85	44
Basagran 4SL+	1.0 pt+									
Fusion 2.66EC+COC	0.5 pt+1.0 %v/v									
Touchdown 3SL+	1.5 pt+	POST1+	5	95	93	99	99	92	95	47
Flexstar HL 1.88 SL+AMS+	1.25 pt+8.5 lb/100gal+									
(Touchdown 3SL+AMS)	(2.0 pt+8.5 lb/100gal)	(POST3)								
LSD (0.05)			4	4	11	9	10	15	5	6

^a Sun-it oil = crop oil surfactant adjuvant, a modified vegetable oil surfactant from American Cyanamid; NIS = Activator 90, a nonionic surfactant from Loveland Industries, Inc.; 28%N = mixture of urea and ammonium nitrate; MSO = Methylated seed oil from Loveland Industries, Inc.; COC = Herbimax, an oil plus surfactant from Loveland Industries.

^b % weed control: Gift = giant foxtail, Cocb = common cocklebur, Colq = common lambsquarters, Cowh = common waterhemp, llmg = ivyleaf morningglory, Vele = velvetleaf.