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Michael D. Owen

Iowa State University, mdowen@iastate.edu

Damian D. Franzenburg

Iowa State University, dfranzen@iastate.edu

Dean M. Grossnickle

Iowa State University

James F. Lux

Iowa State University, jlux@iastate.edu

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Abstract

The purpose of this study was to evaluate various herbicides and application timings in no-tillage soybean for crop injury and weed control.

Keywords

RFR 1281, Agronomy

Disciplines

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Weed Management Programs in No-tillage Soybean

RFR-A1281

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

Introduction

The purpose of this study was to evaluate various herbicides and application timings in no-tillage 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 left un-tilled from the 2011 corn cropping year. Soybean was planted at 160,000 seeds/acre in 30-in. rows on May 10. Weed species in the study included giant foxtail, horseweed, and common dandelion. Early preplant (EPP) treatments were applied April 20 to weed populations averaging 1 plant/ft² that were 0.5–2.0 in. tall. Postemergence (POST) treatments were applied on June 12. Soybean growth was V2–V3. Horseweed was generally 1.0–18.0 in. tall and common dandelion was a rosette form. Giant foxtail was 0.25–5.0 in. tall. Weed densities averaged <1.0–1.0 plant/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 zero to 100 rating scale (0 percent = no control or injury; 100 percent = complete control or crop kill).

Results and Discussion

Summarized in Tables 1, 2, and 3 are the results of the study. Each EPP application was

tank mixed with Roundup PowerMAX. None of the treatments, through EPP or POST applications, caused soybean injury.

Zidua plus Sharpen, Optill, Optill plus Outlook, and Verdict plus Prowl H2O afforded complete horseweed and common dandelion control on May 10, 20 days after the EPP application timing (Table 1). By June 12, these treatments attained at least 98 percent giant foxtail control, maintained 99 percent horseweed control, and gave at least 85 percent common dandelion control (Table 2). The 2,4-D LV4 plus Valor SX gave up to 67 percent horseweed and common dandelion control but gave 99 percent giant foxtail control on June 12. The 2,4-D LV4 gave 78 percent horseweed and common dandelion control on May 10 (Table 1) and provided 95 percent horseweed control compared with less than 50 percent giant foxtail and common dandelion control on June 12. The 2,4-D LV4 plus Prefix gave 90 percent horseweed and common dandelion control on May 10 and achieved 99 percent giant foxtail control on June 12. However, residual common dandelion control dropped to 80 percent. Control of all weeds on July 2, 20 days after the POST application, was at least 90 percent for Zidua plus Sharpen, Optill, Optill plus Outlook, Verdict plus Prowl H2O and 2,4-D LV4 plus Prefix (Table 3). The 2,4-D LV4 plus Valor SX provided 98 percent giant foxtail control and 85 percent common dandelion control on July 2. However, horseweed control was 65 percent. The 2,4-D LV4 gave 93 percent giant foxtail and horseweed control and 82 percent common waterhemp control.

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Table 1. Early preplant and postemergence applications for weed control in no-tillage grown soybean in May.

Treatment	Rate Product/acre	Appln timing	Erica ^c	Tarof ^c
			May 10 (% weed control)	May 10
Untreated Check	-	-	0	0
Zidua + Sharpen + Roundup PowerMAX + MSO ^a + AMS ^b + (Roundup PowerMAX + AMS)	3.0 oz wt + 1.0 fl oz + 22.0 fl oz + 1.0 % v/v + 8.5 lb/100 gal + (22.0 fl oz + 8.5 lb/100 gal)	EPP + EPP + EPP + (POST)	99	99
Optill + Roundup PowerMAX + MSO + AMS + (Roundup PowerMAX + AMS)	2.0 oz wt + 22.0 fl oz + 1.0 % v/v + 8.5 lb/100 gal + (22.0 fl oz + 8.5 lb/100 gal)	EPP + EPP + EPP + (POST)	99	99
Optill + Outlook + Roundup PowerMAX + MSO + AMS + (Roundup PowerMAX + AMS)	2.0 oz wt + 10.0 fl oz + 22.0 fl oz + 1.0 % v/v + 8.5 lb/100 gal + (22.0 fl oz + 8.5 lb/100 gal)	EPP + EPP + EPP + (POST)	99	99
Verdict + Prowl H2O + Roundup PowerMAX + MSO + AMS + (Roundup PowerMAX + AMS)	5.0 fl oz + 2.5 pt + 22.0 fl oz + 1.0 % v/v + 8.5 lb/100 gal + (22.0 fl oz + 8.5 lb/100 gal)	EPP + EPP + EPP + (POST)	99	99
2,4-D LV4 + Valor SX + Roundup PowerMAX + AMS + (Roundup PowerMAX + AMS)	16.0 fl oz + 2.0 oz wt + 22.0 fl oz + 8.5 lb/100 gal + (22.0 fl oz + 8.5 lb/100 gal)	EPP + EPP + (POST)	43	52
2,4-D LV4 + Roundup PowerMAX + AMS + (Roundup PowerMAX + AMS)	16.0 fl oz + 22.0 fl oz + 8.5 lb/100 gal + (22.0 fl oz + 8.5 lb/100 gal)	EPP + EPP + (POST)	78	78
2,4-D LV4 + Prefix + Roundup PowerMAX + AMS + (Roundup PowerMAX + AMS)	16.0 fl oz + 2.0 pt + 22.0 fl oz + 8.5 lb/100 gal + (22.0 fl oz + 8.5 lb/100 gal)	EPP + EPP + (POST)	90	90
LSD (P=0.05)			8	9

^aMSO = modified vegetable oil and surfactant (Concentrate) from Loveland Products, Inc.

^bAMS = ammonium sulfate fertilizer from United Suppliers.

^cErica = horseweed, Tarof = common dandelion.

Table 2. Early preplant and postemergence applications for weed control in no-tillage grown soybean in June.

Treatment	Rate	Appln timing	Injury	Setfa ^c	Erica ^c	Tarof ^c
			Jun 12	Jun 12	Jun 12	Jun 12
	Product/acre		(%)	(% weed control)		
Untreated Check			0	0	0	0
Zidua + Sharpen + Roundup PowerMAX + MSO ^a + AMS ^b + (Roundup PowerMAX + AMS)	3.0 oz wt + 1.0 fl oz + 22.0 fl oz + 1.0 % v/v + 8.5 lb/100 gal + (22.0 fl oz + 8.5 lb/100 gal)	EPP + EPP + EPP + (POST)	0	99	99	88
Optill + Roundup PowerMAX + MSO + AMS + (Roundup PowerMAX + AMS)	2.0 oz wt + 22.0 fl oz + 1.0 % v/v + 8.5 lb/100 gal + (22.0 fl oz + 8.5 lb/100 gal)	EPP + EPP + EPP + (POST)	0	99	99	92
Optill + Outlook + Roundup PowerMAX + MSO + AMS + (Roundup PowerMAX + AMS)	2.0 oz wt + 10.0 fl oz + 22.0 fl oz + 1.0 % v/v + 8.5 lb/100 gal + (22.0 fl oz + 8.5 lb/100 gal)	EPP + EPP + EPP + (POST)	0	99	99	90
Verdict + Prowl H2O + Roundup PowerMAX + MSO + AMS + (Roundup PowerMAX + AMS)	5.0 fl oz + 2.5 pt + 22.0 fl oz + 1.0 % v/v + 8.5 lb/100 gal + (22.0 fl oz + 8.5 lb/100 gal)	EPP + EPP + EPP + (POST)	0	98	99	85
2,4-D LV4 + Valor SX + Roundup PowerMAX + AMS + (Roundup PowerMAX + AMS)	16.0 fl oz + 2.0 oz wt + 22.0 fl oz + 8.5 lb/100 gal + (22.0 fl oz + 8.5 lb/100 gal)	EPP + EPP + (POST)	0	99	62	67
2,4-D LV4 + Roundup PowerMAX + AMS + (Roundup PowerMAX + AMS)	16.0 fl oz + 22.0 fl oz + 8.5 lb/100 gal + (22.0 fl oz + 8.5 lb/100 gal)	EPP + EPP + (POST)	0	48	95	45
2,4-D LV4 + Prefix + Roundup PowerMAX + AMS + (Roundup PowerMAX + AMS)	16.0 fl oz + 2.0 pt + 22.0 fl oz + 8.5 lb/100 gal + (22.0 fl oz + 8.5 lb/100 gal)	EPP + EPP + (POST)	0	99	92	80
LSD (P=0.05)			0	5	8	15

^aMSO = modified vegetable oil and surfactant (Concentrate) from Loveland Products, Inc.

^bAMS = ammonium sulfate fertilizer from United Suppliers.

^cSetfa = giant foxtail, Erica = horseweed, Tarof = common dandelion.

Table 3. Early preplant and postemergence applications for weed control in no-tillage grown soybean in July.

Treatment	Rate	Appln Timing	Injury	Setfa ^c	Erica ^c	Tarof ^c
			Jul 2	Jul 2	Jul 2	Jul 2
	Product/Acre		(%)	(% weed control)		
Untreated Check			0	0	0	0
Zidua + Sharpen + Roundup PowerMAX + MSO ^a + AMS ^b + (Roundup PowerMAX + AMS)	3.0 oz wt + 1.0 fl oz + 22.0 fl oz + 1.0 % v/v + 8.5 lb/100 gal + (22.0 fl oz + 8.5 lb/100 gal)	EPP + EPP + EPP + (POST)	0	99	99	95
Optill + Roundup PowerMAX + MSO + AMS + (Roundup PowerMAX + AMS)	2.0 oz wt + 22.0 fl oz + 1.0 % v/v + 8.5 lb/100 gal + (22.0 fl oz + 8.5 lb/100 gal)	EPP + EPP + EPP + (POST)	0	99	99	95
Optill + Outlook + Roundup PowerMAX + MSO + AMS + (Roundup PowerMAX + AMS)	2.0 oz wt + 10.0 fl oz + 22.0 fl oz + 1.0 % v/v + 8.5 lb/100 gal + (22.0 fl oz + 8.5 lb/100 gal)	EPP + EPP + EPP + (POST)	0	98	99	93
Verdict + Prowl H2O + Roundup PowerMAX + MSO + AMS + (Roundup PowerMAX + AMS)	5.0 fl oz + 2.5 pt + 22.0 fl oz + 1.0 % v/v + 8.5 lb/100 gal + (22.0 fl oz + 8.5 lb/100 gal)	EPP + EPP + EPP + (POST)	0	99	99	91
2,4-D LV4 + Valor SX + Roundup PowerMAX + AMS + (Roundup PowerMAX + AMS)	16.0 fl oz + 2.0 oz wt + 22.0 fl oz + 8.5 lb/100 gal + (22.0 fl oz + 8.5 lb/100 gal)	EPP + EPP + (POST)	0	98	65	85
2,4-D LV4 + Roundup PowerMAX + AMS + (Roundup PowerMAX + AMS)	16.0 fl oz + 22.0 fl oz + 8.5 lb/100 gal + (22.0 fl oz + 8.5 lb/100 gal)	EPP + EPP + (POST)	0	93	93	82
2,4-D LV4 + Prefix + Roundup PowerMAX + AMS + (Roundup PowerMAX + AMS)	16.0 fl oz + 2.0 pt + 22.0 fl oz + 8.5 lb/100 gal + (22.0 fl oz + 8.5 lb/100 gal)	EPP + EPP + (POST)	0	98	93	90
LSD (P=0.05)			0	3	8	8

^aMSO = modified vegetable oil and surfactant (Concentrate) from Loveland Products Inc.

^bAMS = ammonium sulfate fertilizer from United Suppliers.

^cSetfa = giant foxtail, Erica = horseweed, Tarof = common dandelion.