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Weed Management in No-tillage Corn Production

Abstract

The purpose of this study was to evaluate various weed management strategies in no-tillage corn. Herbicide treatments applied as preemergence and preemergence followed by postemergence were evaluated for crop phytotoxicity and weed control.

Keywords

Agronomy

Disciplines

Agricultural Science | Agriculture | Agronomy and Crop Sciences

Weed Management in No-tillage Corn Production

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Introduction

The purpose of this study was to evaluate various weed management strategies in no-tillage corn. Herbicide treatments applied as preemergence and preemergence followed by postemergence were evaluated for crop phytotoxicity and weed control.

Materials and Methods

The crop rotation was corn following soybean. The seedbed was left untilled prior to planting. Crop residue was 90 to 95 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).

'Cargill Hybrid 5320 BT' corn was planted on April 28 and preemergence (PRE) treatments followed. Weed growth at PRE timing included: giant foxtail, common lambsquarters, and giant ragweed at one to six leaves and 0.5 to 2 inches tall. Postemergence (POST) treatments were applied on May 25. Corn and weed stage of growth on May 25 was V3 to V4

and 3 to 6 inches tall and one to numerous leaves and 1 to 8 inches tall, respectively. Weed species occurring in this study included: giant foxtail, common lambsquarters, common waterhemp, and giant ragweed with an average population of 5, 2, 1, and 3 plants/ft², respectively.

Results and Discussion

Summarized in Table 1 are the data on corn injury and percentage weed control as affected by weed management strategy. No injury was observed on June 5 or July 13 from any treatments. Giant foxtail control was good to excellent on May 25 (data not presented). On July 13, control was generally unacceptable for all treatments. This resulted from heavy foxtail pressure and diminished herbicide activity.

Control of broadleaf weeds was good to excellent on July 13. PRE and PRE plus POST applied herbicides were effective in controlling common lambsquarters, common waterhemp, and giant ragweed. Ninety-five to 99% common lambsquarters control was attained by all of the treatment combinations and application strategies. Epic plus MSO applied PRE, Outlook plus Roundup Ultra PRE followed by Distinct POST and Dual II Magnum plus Roundup Ultra PRE followed by Northstar POST provided 85, 87, and 82% common waterhemp control, respectively. All other treatments achieved 93% or better control. Herbicide treatments provided 93 to 99% giant ragweed control.

Table 1. Preemergence and postemergence applied herbicide combinations for weed control in no-tillage corn.

Treatment ^a	Rate	Appl. time	Injury		Gift	Colq	Cowh	Girw
			6/5	7/13	7/13	7/13	7/13	7/13
	Product/A		---- (%) ----		----- (% weed control ^b) -----			
Control	-	-	0	0	0	0	0	0
Harness Xtra 6SC+	2.3 qt+	PRE	0	0	43	99	98	93
Roundup Ultra 4SL	0.75 qt							
Epic 58 DF+	14.9 oz+	PRE	0	0	65	99	93	99
Roundup Ultra 4SL	0.75 qt							
Epic 58 DF+	14.9 oz+	PRE	0	0	68	99	95	98
Atrazine 90DF WG+	1.0 lb+							
Roundup Ultra 4SL	0.75 qt							
Epic 58 DF+MSO	14.9 oz+1.0 qt/A	PRE	0	0	62	99	85	98
Guardsman 5SE+	2.5 qt+	PRE	0	0	37	99	99	99
Hornet 85.6 WG+Roundup Ultra 4SL	2.4 oz+0.75 qt							
Outlook 6 EC+Roundup Ultra 4SL+	17.9 oz+0.75 qt+	PRE+	0	0	73	95	87	98
(Distinct 70WG+NIS+	(6 oz+0.25 %v/v+	(POST)						
28%N)	1.25 %v/v)							
Harness 7EC+	2.75 pt+	PRE+	0	0	57	99	98	93
Touchdown 5SL+AMS+	1.0 pt+8.5 lb/100gal+	(POST)						
(Hornet WDG 68.5 WG+	(3.0 oz+							
Atrazine 90DF WG+COC+AMS)	0.83 lb+1.0 %v/v+2 lb/A)							
Leadoff 5 SL+Balance Pro 4 SC+	0.75 qt+1.5 oz	PRE+	0	0	75	99	90	96
Touchdown 5SL+AMS+	1.0 qt+8.5 lb/100gal+	(POST)						
(Basis Gold 89.5 DF+COC+AMS)	(14.0 oz+1.0 %v/v+2 lb/A)							
Dual II Magnum 7.64 EC+	2.0 pt+	PRE+	0	0	68	99	95	93
Roundup Ultra 4SL+	0.75 qt+	(POST)						
(AIM 40DF+	(0.32 oz+							
Northstar 47.4 WG+NIS)	5.0 oz+0.25 %v/v)							
Dual II Magnum 7.64 EC+	2.0 pt+	PRE+	0	0	67	99	82	93
Roundup Ultra 4SL+	0.75 qt+	(POST)						
(Northstar 47.4 WG+NIS+	(5.0 oz+0.25 %v/v+							
28%N)	2.0 qt/A)							
Degree Xtra 4.04 CS+	3.5 qt+	PRE	0	0	58	99	99	96
Hornet 85.6 WG+Roundup Ultra 4SL	3.0 oz+0.75 qt							
Fultime 4SC+	3.3 qt+	PRE	0	0	37	99	99	93
Touchdown 5SL+AMS	1.0 pt+8.5 lb/100gal							
Fultime 4SC+Balance Pro 4 SC+	2.0 qt+3.0 oz+	PRE	0	0	55	99	96	94
Touchdown BTU 5 SL+AMS	1.0 pt+8.5 lb/100gal							
LSD (0.05)			0	0	12	2	10	7

^a MSO = Methylated seed oil from Loveland Industries, Inc.; NIS = Activator 90, a nonionic surfactant from Loveland Industries, Inc.; 28%N = mixture of urea and ammonium nitrate; COC = Herbimax, an oil plus surfactant from Loveland Industries.

^b % weed control: Gift = giant foxtail, Colq = common lambsquarters, Cowh = common waterhemp, Girw = giant ragweed.