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Abstract

The purpose of this study was to evaluate weed management strategies using various herbicide tank-mix combinations and postemergence application timings for crop phytotoxicity and weed control in corn.

Keywords

Agronomy

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Weed Management Strategies in Corn

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Introduction

The purpose of this study was to evaluate weed management strategies using various herbicide tank-mix combinations and postemergence application timings for crop phytotoxicity and weed control in corn.

Materials and Methods

The crop rotation was corn following soybean. The seedbed was prepared in the spring with a field cultivator. Crop residue was 25 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).

Preplant (PPI) treatments were applied on May 2 and incorporated by one pass with a field cultivator. 'Dekalb hybrid 477' corn was planted, and preemergence (PRE) treatments followed. A SPIKE corn treatment was applied on May 10. Early postemergence (EPOST) and postemergence (POST) treatments were applied on May 17 and June 2, respectively. Corn growth

stage was V2 and 1.5 inches tall on May 17, and on June 2 corn was V4 and 4 to 5 inches tall. Weed growth stage was cotyledon to one leaf and 0.25 to 1 inches tall on May 17. On June 2, weeds were one to six leaves and 0.25 to 3.5 inches tall. Late postemergence (LPOST) treatments were applied on June 11. Corn was V5, 10 to 11 inches tall. Weeds were one to numerous leaves and 0.5 to 4 inches tall.

Weed species occurring in this study included: giant foxtail, common lambsquarters, common waterhemp, Pennsylvania smartweed and velvetleaf with an average population of 10, 1, 1, 1, and 3 plants/ft², respectively.

Results and Discussion

Data on corn injury and percentage weed control as affected by herbicide treatment tank-mix combinations and postemergence application timing are summarized in Table 1. Corn injury was observed on June 30 from SPIKE, EPOST, POST and LPOST treatments. Injury ranged from 2 to 12%. Marksman applied POST caused 12% injury. Other treatments causing more than 5% injury included Resource plus Atrazine, Northstar, and Prowl plus Marksman applied POST, LPOST and EPOST, respectively. Very light weed infestations were noted in the study. This resulted in excellent giant foxtail, common lambsquarters, common waterhemp, Pennsylvania smartweed and velvetleaf control with all tank-mix treatment combinations and application timings when observed on June 30.

Table 1. Herbicide tank-mix combinations and application timings for weed control in corn.

| Treatment ^a | Rate | Appl. time | Injury 6/30 | Gift 6/30 | Colq 6/30 | Cowh 6/30 | Pesw 6/30 | Vele 6/30 |
|--|---|-----------------|-------------|--|-----------|-----------|-----------|-----------|
| | Product/A | | - (%) - | ----- (% weed control ^b) ----- | | | | |
| Control | - | - | 0 | 0 | 0 | 0 | 0 | 0 |
| Doubleplay 7EC+ (Marksman 3.2SC+28%N) | 7.0 pt+ (3.5 pt+2.5 %v/v) | PPI+ (POST) | 12 | 98 | 99 | 99 | 99 | 99 |
| Doubleplay 7EC+ (Resource 0.86EC+ Atrazine 90DF WG+COC) | 7.0 pt+ (4.0 oz+ 0.9 lb+1.0 %v/v) | PRE+ (POST) | 8 | 96 | 99 | 99 | 99 | 99 |
| Doubleplay 7EC+ (Northstar 47.4 WG+NIS+ 28%N) | 7.0 pt+ (5.0 oz+0.25 %v/v+ 2.5 %v/v) | PPI+ (LPOST) | 7 | 99 | 99 | 99 | 99 | 99 |
| Bicep II Magnum 5.5 L+ (Prowl 3.3EC+Basis Gold 89.5 DF+ COC+AMS) | 1.58 qt+ (1.21 qt+14 oz+ 1.0 %v/v+2 lb/A) | PRE+ (LPOST) | 2 | 99 | 99 | 99 | 99 | 99 |
| Prowl 3.3EC+Marksman 3.2SC+ NIS | 1.82 qt+3.5 pt+ 0.25 %v/v | EPOST | 7 | 95 | 99 | 99 | 99 | 98 |
| Guardsman 5SE+ (Distinct 70WG+NIS+ 28%N) | 2.5 qt+ (4.0 oz+0.25 %v/v+ 1.25 %v/v) | PRE+ (LPOST) | 0 | 99 | 99 | 99 | 99 | 99 |
| Outlook 6 EC+Marksman 3.2SC+ 28%N | 18.0 oz+3.5 pt+ 2.5 %v/v | SPIKE | 5 | 99 | 99 | 99 | 99 | 98 |
| Outlook 6 EC+ (Celebrity Plus 70 WG+NIS+ 28%N) | 12.0 oz+ (4.8 oz+0.25 %v/v+ 2.5 %v/v) | PRE+ (LPOST) | 5 | 98 | 99 | 99 | 99 | 95 |
| Harness 7EC+ (Hornet WDG 68.5 WG+ Atrazine 90DF WG+COC+ AMS) | 2.5 pt+ (3.0 oz+ 0.83 lb+1.0 %v/v+ 2.0 lb/A) | PRE+ (LPOST) | 2 | 99 | 99 | 99 | 99 | 99 |
| Harness 7EC+ (Hornet WDG 68.5 WG+NIS+ AMS) | 2.5 pt+ (3.0 oz+0.25 %v/v+ 2.0 lb/A) | PRE+ (LPOST) | 2 | 99 | 99 | 99 | 99 | 99 |
| Balance Pro 4 SC+ (Accent Gold 83.8 DF+COC+ 28%N) | 1.5 oz+ (2.9 oz+1.0 %v/v+ 2.0 qt/A) | PRE+ (LPOST) | 5 | 99 | 99 | 99 | 99 | 99 |
| Dual II Magnum 7.64 EC+ (AIM 40DF+ Atrazine 90DF WG+NIS) | 1.66 pt+ (0.32 oz+ 0.83+0.25 %v/v) | PRE+ (POST) | 3 | 99 | 99 | 99 | 99 | 99 |
| Dual II Magnum 7.64 EC+ (AIM 40DF+Clarity 4SL+ NIS) | 1.66 pt+ (0.32 oz+0.5 pt+ 0.25 %v/v) | PRE+ (POST) | 3 | 98 | 99 | 99 | 99 | 99 |
| Dual II Magnum 7.64 EC+ (AIM 40DF+Hornet 85.6 WG+ NIS) | 1.66 pt+ (0.32 oz+2.4 oz+ 0.25 %v/v) | PRE+ (POST) | 3 | 99 | 99 | 99 | 99 | 99 |
| LSD (0.05) | | | 5 | 2 | 0 | 0 | 0 | 1 |

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

^b % weed control: Gift = giant foxtail, Colq = common lambsquarters, Cowh = common waterhemp, Pesw = Pennsylvania smartweed, Vele = velvetleaf.