Corn Herbicide Programs for Glyphosate-Resistant Common Waterhemp Control

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Prashant Jha, associate professor
Damian Franzenburg, ag specialist
James Lee, ag specialist
Iththiphonh Macvilay, research associate
Department of Agronomy

Introduction

The purpose of this study was to compare herbicide programs for crop injury and control of glyphosate-resistant common waterhemp in corn.

Materials and Methods

The study was established using a randomized complete block design with four replications. The crop rotation was corn following soybean. The pre-plant seedbed was prepared with a tandem disc, and glyphosate-resistant corn was planted at 34,000 seeds/acre in 30-in. rows May 14. Preemergence (PRE) herbicide treatments were applied May 14 delivering 15 gallons/acre with 11015TTI tips at 35 psi. Postemergence (POST) treatments were applied June 13 to V4 corn delivering 15 gallons/acre with 11015TT tips at 35 psi. Weed species in the study included velvetleaf, common waterhemp (glyphosate-resistant), and horseweed. Average weed population densities were 5, 1500, and 5 plants/plot, respectively. Velvetleaf and waterhemp were mostly 2 in. tall and horseweed 11 in. tall at the POST application. Visual estimates of percent corn injury and weed control during the growing season were compared with an untreated control (0 percent = no injury or control and 99 percent = complete crop kill or control).

Results and Discussion

Summarized in Tables 1 and 2 are the results of the study. None of the treatments caused more than 6 percent injury to corn (data not shown).

All PRE treatments provided at least 97 percent common waterhemp control June 11, prior to POST applications (Table 1). PRE Bicep II Magnum gave 91 and 85 percent control of velvetleaf and horseweed, respectively. All remaining PRE treatments afforded at least 97 and 92 percent control of velvetleaf and horseweed, respectively.

All herbicide programs provided at least 95 percent control of glyphosate-resistant common waterhemp August 7 (55 days after POST application) except for the single-pass PRE Corvus program giving 79 percent waterhemp control (Table 2). All treatments afforded at least 98 percent control of velvetleaf. The single-pass program of POST Halex GT + Aatrex 4L gave 93 percent control of horseweed and all other programs provided complete horseweed control. In conclusion, two-pass effective PRE followed by POST programs (multiple sites of action) tested in this study should be used to obtain season-long control of glyphosate-resistant common waterhemp in corn.

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Table 1. One-pass and two-pass herbicide comparisons in corn (June data).

Treatment	Rate	Appln timing	Abuth[d] Jun 11	Amata Jun 11	Erica Jun 11
	product/acre		---------- % weed control ----------		
Acuron	3.0 qt	PRE	99	99	99
Acuron + (Halex GT + Aatrex + N-Pak AMS[a] Liquid + NIS[b])	1.5 qt + (3.6 pt + 1.0 pt + 2.5% v/v[c] + 0.25% v/v)	PRE + (POST)	98	98	96
Bicep II Magnum + (Halex GT + Aatrex + N-Pak AMS Liquid + NIS)	1.3 qt + (3.6 pt + 1.0 pt + 2.5% v/v + 0.25% v/v)	PRE + (POST)	91	98	85
Halex GT + Aatrex + N-Pak AMS Liquid + NIS	3.6 pt + 1.0 pt + 2.5% v/v + 0.25% v/v	POST	0	0	0
SureStart II + (Resicore + N-Pak AMS Liquid + NIS)	2.0 pt + (1.5 qt + 2.5% v/v + 0.25% v/v)	PRE + (POST)	98	99	95
Corvus + (Harness MAX + N-Pak AMS Liquid + NIS)	4.0 fl oz + (1.25 qt + 2.5% v/v + 0.25% v/v)	PRE + (POST)	99	98	93
Verdict + (Armezon PRO + N-Pak AMS Liquid + NIS)	10.0 fl oz + (16.0 fl oz + 2.5% v/v + 0.25% v/v)	PRE + (POST)	97	99	96
Resicore	2.5 qt	PRE	99	99	99
Corvus	5.6 fl oz	PRE	99	97	92
Untreated			0	0	0
LSD (P = 0.05)			5	3	10

[a]AMS = ammonium sulfate fertilizer.

[b]NIS = Preference nonionic surfactant.

[c]v/v = Volume of product per volume tank mix.

[d]Abuth = velvetleaf, Amata = common waterhemp, Erica = horseweed.

Table 2. One-pass and two-pass herbicide comparisons in corn (August data).

Treatment	Rate	Appln timing	Abuth[d] Aug 7	Amata Aug 7	Erica Aug 7
	product/acre		---------- % weed control ----------		
Acuron	3.0 qt	PRE	99	98	99
Acuron + (Halex GT + Aatrex + N-Pak AMS[a] Liquid + NIS[b])	1.5 qt + (3.6 pt + 1.0 pt + 2.5% v/v[c] + 0.25% v/v)	PRE + (POST)	99	99	99
Bicep II Magnum + (Halex GT + Aatrex + N-Pak AMS Liquid + NIS)	1.3 qt + (3.6 pt + 1.0 pt + 2.5% v/v + 0.25% v/v)	PRE + (POST)	99	99	99
Halex GT + Aatrex + N-Pak AMS Liquid + NIS	3.6 pt + 1.0 pt + 2.5% v/v + 0.25% v/v	POST	99	99	93
SureStart II + (Resicore + N-Pak AMS Liquid + NIS)	2.0 pt + (1.5 qt + 2.5% v/v + 0.25% v/v)	PRE + (POST)	99	99	99
Corvus + (Harness MAX + N-Pak AMS Liquid + NIS)	4.0 fl oz + (1.25 qt + 2.5% v/v + 0.25% v/v)	PRE + (POST)	99	99	99
Verdict + (Armezon PRO + N-Pak AMS Liquid + NIS)	10.0 fl oz + (16.0 fl oz + 2.5% v/v + 0.25% v/v)	PRE + (POST)	98	99	99
Resicore	2.5 qt	PRE	99	95	99
Corvus	5.6 fl oz	PRE	99	79	99
Untreated			0	0	0
LSD (P = 0.05)			1	7	3

[a]AMS = ammonium sulfate fertilizer.

[b]NIS = Preference nonionic surfactant.

[c]v/v = Volume of product per volume tank mix.

[d]Abuth = velvetleaf, Amata = common waterhemp, Erica = horseweed.