

## Two-Pass Herbicide Demonstration in Corn

### RFR-A1871

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### Introduction

The purpose of this study was to evaluate crop injury and weed control for corn herbicide programs utilizing both preemergence and postemergence applications.

### Materials and Methods

The study was established using a randomized complete block design with three replications. Herbicides were applied in 15 gallons of water/acre. The crop rotation was corn following soybean. The pre-plant seedbed was prepared with a field cultivator, and corn was planted at 36,068 seeds/acre in 30-in. rows May 10. Preemergence (PRE) herbicide treatments were applied May 10. Postemergence (POST) treatments were applied June 7 to V5 corn. Weeds were generally 2–3 in. tall at the POST application dates. Weed species in the study included giant foxtail, velvetleaf, and common waterhemp with average population densities of 10, 2, and 100 plants/plot, respectively. Visual estimates of corn 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 99 rating scale (0 percent = no control or injury; 99 percent = complete control or crop kill).

### Results and Discussion

Summarized in Tables 1 (June data) and 2 (July data) are the results of the study. None of the PRE treatments caused corn injury, and only POST Roundup PowerMAX + Harness MAX + Aatrex caused injury (13%, data not

shown). All PRE treatments provided excellent giant foxtail control (at least 92%, Table 1). Harness Xtra 5.6, Breakfree NXT ATZ, and Dual II Magnum gave 66, 86, and 25–73 percent velvetleaf control, respectively. The remaining PRE treatments gave at least 95 percent velvetleaf control. PRE Dual II Magnum treatments gave 47–63 percent common waterhemp control compared with at least 90 percent control by all other PRE treatments (Table 1).

All POST treatments gave at least 95 percent control of all weeds June 20, 13 days after POST applications (data not shown). Giant foxtail and velvetleaf residual control observed July 6, 29 days after POST, was at least 96 percent for all treatments. However, residual control of common waterhemp varied between treatments by July 6 (Table 2). PRE Harness Xtra 5.6 + POST ImpactZ + Liberty 280, PRE Verdict + POST Status + Roundup PowerMAX, and PRE Dual II Magnum + POST Shieldex + Aatrex 4L gave 75, 88, and 83–87 percent common waterhemp control July 6 compared with at least 92 percent control by the rest of the treatments.

### Acknowledgements

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Dr. Mike Owen, Extension Weed Specialist and project leader of the Weed Science Research and Demonstration Program since 1984, retired in 2018. We thank Dr. Owen for 35 years of guidance and faithful service to Iowa growers and the crop protection industry. Dr. Prashant Jha, Montana State University, will succeed Dr. Owen as the new Extension Weed Specialist and will continue the leadership role for the Weed Science Research

and Demonstration Program. We look forward to continuing this work with Dr. Jha in 2019 and beyond.

Additional research results from numerous sites for 2018 and previous years can be downloaded at the following address:  
<https://store.extension.iastate.edu/Topic/Crops/Weeds-and-Weed-Control?S=0&A=0&F=0>

**Table 1. Two-pass herbicide demonstration in corn (June data).**

Treatment	Rate product/acre	Appln timing	Setfa <sup>g</sup>	Abuth	Amata
			Jun 7	Jun 7	Jun 7
			----- % weed control -----		
Untreated			0	0	0
Harness Xtra 5.6 + (ImpactZ + Liberty 280 + N-Pak AMS Liquid <sup>a</sup> )	3.6 pt + (8.0 fl oz + 22.0 fl oz + 5.0% v/v <sup>b</sup> )	PRE (POST)	95	66	96
Verdict + (Status+ Roundup PowerMAX+ NIS <sup>c</sup> + AMS <sup>d</sup> )	18.0 fl oz + (5.0 oz wt + 32.0 fl oz + 0.25% v/v + 8.5 lb/100 gal)	PRE + (POST)	96	99	93
Corvus + Degree Xtra + (Roundup PowerMAX + DiFlexx DUO +Aatrex 4L + COC <sup>e</sup> )	4.0 fl oz + 2.0 qt + (32.0 fl oz + 24.0 fl oz + 1.0 pt + 0.5% v/v)	PRE + (POST)	96	99	98
Corvus + Aatrex 4L + (Roundup PowerMAX + Harness MAX + Aatrex 4L + COC + AMS)	4.5 fl oz + 1.5 pt + (32.0 fl oz + 40.0 fl oz + 2.0 pt + 1.0% v/v + 8.5 lb/100 gal)	PRE + (POST)	95	99	96
Breakfree NXT ATZ + (Realm Q+Abundit Edge+AMS)	2.5 qt + (4.0 oz + 22 fl oz + 2.0 lb/a)	PRE + (POST)	98	86	95
Resicore + Aatrex 4L + (Realm Q+Abundit Edge+AMS)	2.5 qt + 2.0 pt + (4.0 oz + 22 fl oz + 2.0 lb/a)	PRE + (POST)	95	99	99
Anthem Maxx + Aatrex 4L + (Solstice + Aatrex 4L + Roundup PowerMAX + NIS + AMS)	4.5 fl oz + 1.0 qt + (2.5 fl oz + 1.0 pt + 32.0 fl oz + 0.25% v/v + 8.5 lb/100 gal)	PRE + (POST)	92	95	90
Dual II Magnum + (Shieldex + Aatrex 4L + MSO <sup>f</sup> + UAN 28%)	1.67 pt + (1.0 fl oz + 1.0 pt + 0.5 % v/v + 2.5% v/v)	PRE + (POST)	98	25	47
Dual II Magnum + (Shieldex + Aatrex 4L + MSO + UAN 28%)	1.67 pt + (1.35 fl oz + 1.0 pt + 0.5 % v/v + 2.5% v/v)	PRE + (POST)	98	73	63
Acruon + (Halex GT + Aatrex 4L + AMS + NIS)	2.0 qt + (3.6 pt + 1.0 pt + 8.5 lb/100 gal + 0.25% v/v)	PRE + (POST)	98	99	96
Acruon Flexi + (Halex GT + Aatrex 4L + AMS + NIS)	1.5 qt + (3.6 pt + 1.0 pt + 8.5 lb/100 gal + 0.25% v/v)	PRE + (POST)	96	99	93
Coyote + Tricor DF + (Interline + AMS)	2.0 qt + 5.33 oz + (29 fl oz + 8.5 lb/100 gal)	PRE + (POST)	96	99	99
LSD (P = .05)			4	23	14

<sup>a</sup>N-Pak AMS liquid = ammonium sulfate.<sup>b</sup>v/v = Volume of product per volume tank mix.<sup>c</sup>NIS = Preference nonionic surfactant.<sup>d</sup>AMS = ammonium sulfate fertilizer.<sup>e</sup>COC = Premium Crop Oil Concentrate.<sup>f</sup>MSO = Succeed Ultra methylated seed oil.<sup>g</sup>Setfa = giant foxtail, Abuth = velvetleaf, Amata = common waterhemp.

**Table 2. Two-pass herbicide demonstration in corn (July data).**

Treatment	Rate product/acre	Appln timing	Setfa <sup>g</sup>	Abuth	Amata
			Jul 6	Jul 6	Jul 6
			----- % weed control -----		
Untreated			0	0	0
Harness Xtra 5.6 + (ImpactZ + Liberty 280 + N-Pak AMS Liquid <sup>a</sup> )	3.6 pt + (8.0 fl oz + 22.0 fl oz + 5.0% v/v <sup>b</sup> )	PRE (POST)	96	98	75
Verdict + (Status+ Roundup PowerMAX+ NIS <sup>c</sup> + AMS <sup>d</sup> )	18.0 fl oz + (5.0 oz wt + 32.0 fl oz + 0.25% v/v + 8.5 lb/100 gal)	PRE + (POST)	99	99	88
Corvus + Degree Xtra + (Roundup PowerMAX + DiFlexx DUO +Aatrex 4L + COC <sup>e</sup> )	4.0 fl oz + 2.0 qt + (32.0 fl oz + 24.0 fl oz + 1.0 pt + 0.5% v/v)	PRE + (POST)	98	99	96
Corvus + Aatrex 4L + (Roundup PowerMAX + Harness MAX + Aatrex 4L + COC + AMS)	4.5 fl oz + 1.5 pt + (32.0 fl oz + 40.0 fl oz + 2.0 pt + 1.0% v/v + 8.5 lb/100 gal)	PRE + (POST)	99	99	98
Breakfree NXT ATZ + (Realm Q+Abundit Edge+AMS)	2.5 qt + (4.0 oz + 22 fl oz + 2.0 lb/a)	PRE + (POST)	99	99	99
Resicore + Aatrex 4L + (Realm Q+Abundit Edge+AMS)	2.5 qt + 2.0 pt + (4.0 oz + 22 fl oz + 2.0 lb/a)	PRE + (POST)	98	99	99
Anthem Maxx + Aatrex 4L + (Solstice + Aatrex 4L + Roundup PowerMAX + NIS + AMS)	4.5 fl oz + 1.0 qt + (2.5 fl oz + 1.0 pt + 32.0 fl oz + 0.25% v/v + 8.5 lb/100 gal)	PRE + (POST)	99	99	99
Dual II Magnum + (Shieldex + Aatrex 4L + MSO <sup>f</sup> + UAN 28%)	1.67 pt + (1.0 fl oz + 1.0 pt + 0.5 % v/v + 2.5% v/v)	PRE + (POST)	98	98	87
Dual II Magnum + (Shieldex + Aatrex 4L + MSO + UAN 28%)	1.67 pt + (1.35 fl oz + 1.0 pt + 0.5 % v/v + 2.5% v/v)	PRE + (POST)	99	98	83
Acruon + (Halex GT + Aatrex 4L + AMS + NIS)	2.0 qt + (3.6 pt + 1.0 pt + 8.5 lb/100 gal + 0.25% v/v)	PRE + (POST)	99	99	99
Acruon Flexi + (Halex GT + Aatrex 4L + AMS + NIS)	1.5 qt + (3.6 pt + 1.0 pt + 8.5 lb/100 gal + 0.25% v/v)	PRE + (POST)	99	99	99
Coyote + Tricor DF + (Interline + AMS)	2.0 qt + 5.33 oz + (29 fl oz + 8.5 lb/100 gal)	PRE + (POST)	99	99	92
LSD (P = .05)			3	2	8

<sup>a</sup>N-Pak AMS liquid = ammonium sulfate.<sup>b</sup>v/v = Volume of product per volume tank mix.<sup>c</sup>NIS = Preference nonionic surfactant.<sup>d</sup>AMS = ammonium sulfate fertilizer.<sup>e</sup>COC = Premium Crop Oil Concentrate.<sup>f</sup>MSO = Succeed Ultra methylated seed oil.<sup>g</sup> Setfa = giant foxtail, Abuth = velvetleaf, Amata = common waterhemp.