

## PRE plus POST Herbicide Programs in Corn

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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 32,000 seeds/acre in 30-in. rows April 30. Preemergence (PRE) herbicide treatments were applied May 1.

Postemergence (POST) treatments were applied May 30 to V4 corn. Weeds were generally 2–3 in. tall at the POST application date. Weed species in the study included giant foxtail, velvetleaf, and common waterhemp with average population densities of 25, 12, and <1 plants/ft, 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 and 2 are the results of the study. None of the PRE treatments caused corn injury, and only POST Roundup PowerMAX + Capreno + Aatrex 4L caused

significant injury at 13 percent (data not shown).

PRE Acuron provided only 75 percent giant foxtail control, and Corvus + Degree Xtra, Anthem Maxx + Aatrex 4L, and Acuron Flexi gave 83–87 percent control (Table 1) when observed May 30, prior to POST applications. Harness Xtra 5.6, Verdict, Corvus + Harness, Breakfree NXT ATZ, Resicore + Aatrex 4L, and Dual II Magnum gave 92–96 percent giant foxtail control.

Velvetleaf control was more variable across the PRE treatments (Table 1). Harness Xtra 5.6 and Dual II Magnum gave unacceptable control with 60 and 20–30 percent, respectively. Verdict, Corvus + Harness, Breakfree NXT ATZ, and Anthem Maxx + Aatrex 4L gave 78–83 percent control, and Corvus + Degree Xtra, Resicore + Aatrex 4L, Acuron, Acuron Flexi, and Coyote + Tricor DF provided 88–96 percent velvetleaf control.

All PRE treatments, with the exception of Dual II Magnum, provided 99 percent common waterhemp control (Table 1). On June 29, 30 days after POST applications, all treatments provided at least 96 percent control of all weeds (Table 2).

### 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. PRE plus POST herbicide programs in corn (May data).**

| Treatment   | Rate<br>product/acre   | Appln<br>timing | Setfa <sup>g</sup>         | Abuth  | Amata  |
|---|--|-----------------|----------------------------|--------|--------|
|   |  |                 | May 30                     | May 30 | May 30 |
|   |  |                 | ----- % weed control ----- |        |        |
| Untreated   |  |                 | 0                          | 0      | 0      |
| Harness Xtra 5.6 +<br>(ImpactZ + Liberty 280 +<br>N-Pak AMS Liquid <sup>a</sup> )               | 3.6 pt +<br>(8.0 fl oz + 22.0 fl oz +<br>5.0% v/v <sup>b</sup> )                             | PRE<br>(POST)   | 95                         | 60     | 99     |
| Verdict +<br>(Status+ Roundup PowerMAX+<br>NIS <sup>c</sup> + AMS <sup>d</sup> )                | 18.0 fl oz +<br>(5.0 oz wt + 32.0 fl oz +<br>0.25% v/v + 8.5 lb/100 gal)                     | PRE +<br>(POST) | 92                         | 83     | 99     |
| Corvus + Degree Xtra +<br>(Roundup PowerMAX +<br>DiFlexx DUO +Aatrex 4L +<br>COC <sup>e</sup> ) | 4.0 fl oz + 2.0 qt +<br>(32.0 fl oz +<br>24.0 fl oz + 1.0 pt +<br>0.5% v/v)                  | PRE +<br>(POST) | 87                         | 92     | 99     |
| Corvus + Harness +<br>(Roundup PowerMAX +<br>Capreno + Aatrex 4L +<br>COC + AMS)                | 4.0 fl oz + 1.5 pt +<br>(32.0 fl oz +<br>3.0 fl oz + 1.0 pt +<br>1.0% v/v + 8.5 lb/100 gal)  | PRE +<br>(POST) | 95                         | 80     | 99     |
| Breakfree NXT ATZ +<br>(Realm Q+Abundit Edge+AMS)   | 2.5 qt +<br>(4.0 oz + 22 fl oz + 2.0 lb/a)   | PRE +<br>(POST) | 93                         | 80     | 99     |
| Resicore + Aatrex 4L +<br>(Realm Q+Abundit Edge+AMS)  | 2.5 qt + 2.0 pt +<br>(4.0 oz + 22 fl oz + 2.0 lb/a)  | PRE +<br>(POST) | 96                         | 93     | 99     |
| Anthem Maxx + Aatrex 4L +<br>(Solstice + Aatrex 4L +<br>Roundup PowerMAX +<br>NIS + AMS)        | 4.5 fl oz + 1.0 qt +<br>(2.5 fl oz + 1.0 pt +<br>32.0 fl oz +<br>0.25% v/v + 8.5 lb/100 gal) | PRE +<br>(POST) | 83                         | 78     | 99     |
| Dual II Magnum +<br>(Shieldex + Aatrex 4L +<br>MSO <sup>f</sup> + UAN 28%)                      | 1.67 pt +<br>(1.0 fl oz + 1.0 pt +<br>0.5 % v/v + 2.5% v/v)                                  | PRE +<br>(POST) | 92                         | 20     | 76     |
| Dual II Magnum +<br>(Shieldex + Aatrex 4L +<br>MSO + UAN 28%)                                   | 1.67 pt +<br>(1.35 fl oz + 1.0 pt +<br>0.5 % v/v + 2.5% v/v)                                 | PRE +<br>(POST) | 93                         | 30     | 80     |
| Acruon +<br>(Halex GT + Aatrex 4L +<br>AMS + NIS)   | 2.0 qt +<br>(3.6 pt + 1.0 pt +<br>8.5 lb/100 gal + 0.25% v/v)                                | PRE +<br>(POST) | 75                         | 90     | 99     |
| Acruon Flexi +<br>(Halex GT + Aatrex 4L +<br>AMS + NIS)   | 1.5 qt +<br>(3.6 pt + 1.0 pt +<br>8.5 lb/100 gal + 0.25% v/v)                                | PRE +<br>(POST) | 87                         | 88     | 99     |
| Coyote + Tricor DF +<br>(Interline + AMS)   | 2.0 qt + 5.33 oz +<br>(29 fl oz + 8.5 lb/100 gal)  | PRE +<br>(POST) | 93                         | 96     | 99     |
| LSD (P = .05)   |  |                 | 9                          | 16     | 13     |

<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. PRE plus POST herbicide programs in corn (June data).**

| Treatment   | Rate<br>product/acre   | Appln<br>timing | Setfa <sup>g</sup>         | Abuth  | Amata  |
|---|--|-----------------|----------------------------|--------|--------|
|   |  |                 | Jun 29                     | Jun 29 | Jun 29 |
|   |  |                 | ----- % weed control ----- |        |        |
| Untreated   |  |                 | 0                          | 0      | 0      |
| Harness Xtra 5.6 +<br>(ImpactZ + Liberty 280 +<br>N-Pak AMS Liquid <sup>a</sup> )               | 3.6 pt +<br>(8.0 fl oz + 22.0 fl oz +<br>5.0% v/v <sup>b</sup> )                             | PRE<br>(POST)   | 96                         | 96     | 99     |
| Verdict +<br>(Status+ Roundup PowerMAX+<br>NIS <sup>c</sup> + AMS <sup>d</sup> )                | 18.0 fl oz +<br>(5.0 oz wt + 32.0 fl oz +<br>0.25% v/v + 8.5 lb/100 gal)                     | PRE +<br>(POST) | 98                         | 99     | 99     |
| Corvus + Degree Xtra +<br>(Roundup PowerMAX +<br>DiFlexx DUO +Aatrex 4L +<br>COC <sup>e</sup> ) | 4.0 fl oz + 2.0 qt +<br>(32.0 fl oz +<br>24.0 fl oz + 1.0 pt +<br>0.5% v/v)                  | PRE +<br>(POST) | 99                         | 99     | 99     |
| Corvus + Harness +<br>(Roundup PowerMAX +<br>Capreno + Aatrex 4L +<br>COC + AMS)                | 4.0 fl oz + 1.5 pt +<br>(32.0 fl oz +<br>3.0 fl oz + 1.0 pt +<br>1.0% v/v + 8.5 lb/100 gal)  | PRE +<br>(POST) | 99                         | 99     | 99     |
| Breakfree NXT ATZ +<br>(Realm Q+Abundit Edge+AMS)   | 2.5 qt +<br>(4.0 oz + 22 fl oz + 2.0 lb/a)   | PRE +<br>(POST) | 98                         | 99     | 99     |
| Resicore + Aatrex 4L +<br>(Realm Q+Abundit Edge+AMS)  | 2.5 qt + 2.0 pt +<br>(4.0 oz + 22 fl oz + 2.0 lb/a)  | PRE +<br>(POST) | 99                         | 99     | 99     |
| Anthem Maxx + Aatrex 4L +<br>(Solstice + Aatrex 4L +<br>Roundup PowerMAX +<br>NIS + AMS)        | 4.5 fl oz + 1.0 qt +<br>(2.5 fl oz + 1.0 pt +<br>32.0 fl oz +<br>0.25% v/v + 8.5 lb/100 gal) | PRE +<br>(POST) | 99                         | 99     | 99     |
| Dual II Magnum +<br>(Shieldex + Aatrex 4L +<br>MSO <sup>f</sup> + UAN 28%)                      | 1.67 pt +<br>(1.0 fl oz + 1.0 pt +<br>0.5 % v/v + 2.5% v/v)                                  | PRE +<br>(POST) | 96                         | 98     | 98     |
| Dual II Magnum +<br>(Shieldex + Aatrex 4L +<br>MSO + UAN 28%)                                   | 1.67 pt +<br>(1.35 fl oz + 1.0 pt +<br>0.5 % v/v + 2.5% v/v)                                 | PRE +<br>(POST) | 99                         | 99     | 99     |
| Acruon +<br>(Halex GT + Aatrex 4L +<br>AMS + NIS)   | 2.0 qt +<br>(3.6 pt + 1.0 pt +<br>8.5 lb/100 gal + 0.25% v/v)                                | PRE +<br>(POST) | 99                         | 99     | 99     |
| Acruon Flexi +<br>(Halex GT + Aatrex 4L +<br>AMS + NIS)   | 1.5 qt +<br>(3.6 pt + 1.0 pt +<br>8.5 lb/100 gal + 0.25% v/v)                                | PRE +<br>(POST) | 99                         | 99     | 99     |
| Coyote + Tricor DF +<br>(Interline + AMS)   | 2.0 qt + 5.33 oz +<br>(29 fl oz + 8.5 lb/100 gal)  | PRE +<br>(POST) | 99                         | 99     | 99     |
| LSD (P = .05)   |  |                 | 3                          | 2      | 1      |

<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.