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Preplant and Postemergence Herbicide Programs for Weed Control in No-till Corn

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Abstract
The purpose of this study was to evaluate various herbicides applied early pre-plant in no-tillage corn for crop injury and weed control.

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Preplant and Postemergence Herbicide Programs for Weed Control in No-till Corn

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Introduction

The purpose of this study was to evaluate various herbicides applied early pre-plant in no-tillage corn for crop injury and weed control.

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 soybeans. The seedbed was left untilled from the 2013 soybean crop, and corn was planted at 35,000 seeds/acre in 30-in. rows on May 22. Early preplant (EPP) herbicide treatments were applied May 2. Postemergence (POST) treatments were applied June 20 to V5 corn. Weeds were generally 1 in. and 3–6 in. tall at the EPP and POST application dates, respectively. Weed species in the study included giant foxtail, velvetleaf, common waterhemp, and common lambsquarters with average population densities of < 1–3 plants/ft^2. Visual estimates of corn injury and percentage weed control were made during the growing season. These observations were compared with an untreated control and made on a zero to 100 rating scale (0% = no control or injury; 100% = complete control or crop kill).

Results and Discussion

Summarized in Tables 1 and 2 are the results of the study. None of the treatments caused corn injury (data not shown). On June 20, 49 days after application, EPP 2,4-D + Roundup PowerMax provided no residual weed control (Table 1). EPP 2,4-D + Touchdown Total + Lumax provided 63 percent giant foxtail control, while all remaining treatments gave 73 to 88 percent control. EPP 2,4-D + Roundup PowerMAX + Fierce provided 53 percent velvetleaf control on June 20. Basis Blend + Aatrex 4L + 2,4-D, 2,4-D + Roundup PowerMAX + Harness Xtra, and 2,4-D + Durango DMA + SureStart gave 70, 70, and 73 percent velvetleaf control, respectively. Other EPP treatments containing the residual herbicides Lumax EZ, Corvus + Aatrex 4L + Clarity, SureStart + Aatrex 4L, and Verdict + Zidua provided 90 to 96 percent velvetleaf control. Common waterhemp control by EPP Basis Blend + Aatrex 4L and 2,4-D + Durango DMA + SureStart was 83 and 85 percent, respectively. The remaining residual EPP treatments afforded 93 to 99 percent control. All EPP treatments gave at least 93 percent common lambsquarters control.

On July 18, 28 days after the POST application, all of the treatments afforded at least 96 percent control of giant foxtail and velvetleaf (Table 2). However, EPP 2,4-D + Roundup PowerMAX + POST Roundup PowerMAX gave only 65 percent control of common waterhemp and EPP 2,4-D + Harness Xtra + Roundup PowerMAX + POST Roundup PowerMAX gave 80 percent common waterhemp control. All other treatments provided 86 to 99 percent control. Common lambsquarters control ranged from 91 to 99 percent.

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We would like to thank Ken Pecinovsky and farm staff for their assistance with this study. Funding for this study was provided by the crop protection industry.

Table 1. Preplant and postemergence weed control in no-till corn.

Treatment	Rate	Appln timing	Setfa[e] Jun 20	Abuth[e] Jun 20	Amata[e] Jun 20	Cheal[e] Jun 20
	product/acre		---------- % weed control ----------			
Untreated			0	0	0	0
Basis Blend + Aatrex 4L+ 2,4-D LV4 + COC + AMS[a] + (Realm Q + Abundit Extra + AMS)	0.825 oz + 2.0 pt + 1.0 pt + 1.0% v/v + 2.0 lb + (4.0 oz wt + 32.0 fl oz + 2.0 lb)	EPP + (POST)	73	70	83	96
2,4-D LV4 + Roundup PowerMAX + Fierce + Aatrex 4L + AMS + (Roundup PowerMAX + AMS)	1.0 pt + 32.0 fl oz + 3.0 oz wt + 1.0 qt + 2.5 lb + (32.0 fl oz + 2.5 lb)	EPP + (POST)	77	53	96	96
2,4-D LV4 + Roundup PowerMAX + AMS + (Roundup PowerMAX + AMS)	1.0 pt + 32.0 fl oz + 2.5 lb + (32.0 fl oz + 2.5 lb)	EPP + (POST)	0	0	0	0
2,4-D LV4 + Touchdown Total + Lumax EZ + AMS + (Halex GT + Aatrex 4L + AMS + NIS[b])	1.0 pt + 32.0 fl oz + 1.8 qt + 2.5 lb + (3.6 pt + 1.0 pt + 2.5 lb + 0.25 % v/v[c])	EPP + (POST)	63	95	93	93
2,4-D LV4 + Harness Xtra 5.6 + Roundup PowerMAX + AMS + (Roundup PowerMAX + AMS)	1.0 pt + 2.46 qt + 32.0 fl oz + 2.5 lb + (32.0 fl oz + 2.5 lb)	EPP + (POST)	87	70	98	96
Corvus + Aatrex 4L + Clarity + COC + (Roundup PowerMAX + AMS)	5.6 fl oz + 1.0 qt + 8.0 fl oz + 1.0 % v/v + (32.0 fl oz + 2.5 lb)		88	96	96	99
2,4-D LV4 + Durango DMA + N-Pak AMS Liquid[d] + SureStart + Aatrex 4L + (Durango DMA + N-Pak AMS Liquid)	1.0 pt + 1.5 pt + 2.5% v/v + 2.5 pt + 1.0 qt + (1.5 pt + 2.5 % v/v)	EPP + (POST)	75	90	98	98
2,4-D LV4 + Durango DMA + N-Pak AMS Liquid + SureStart + (SureStart + Durango DMA + N-Pak AMS Liquid)	1.0 pt + 1.5 pt + 2.5% v/v + 2.0 pt + (1.5 pt + 1.5 pt + 2.5 % v/v)	EPP + (POST)	80	73	85	99
Verdict + Zidua + Roundup PowerMAX + AMS + (Roundup PowerMAX + AMS)	18.0 fl oz + 1.5 fl oz + 32.0 fl oz + 2.5 lb + (32.0 fl oz + 2.5 lb)	EPP + (POST)	88	95	99	99
LSD (P = .05)			18	15	11	6

[a]AMS = ammonium sulfate fertilizer from United Suppliers.
[b]NIS = Preference nonionic surfactant from Winfield Solutions.
[c]Volume of product per volume tank mix.
[d]N-Pak AMS liquid = ammonium sulfate from Winfield Solutions, LLC.
[e]Setfa = giant foxtail, Abuth = velvetleaf, Amata = common waterhemp, Cheal = common lambsquarters.

Table 2. Preplant and postemergence weed control in no-till corn.

Treatment	Rate	Appln timing	Setfa[e] Jul 18	Abuth[e] Jul 18	Amata[e] Jul 18	Cheal[e] Jul 18
	product/acre		---------- % weed control ----------			
Untreated			0	0	0	0
Basis Blend + Aatrex 4L+ 2,4-D LV4 + COC + AMS[a] + (Realm Q + Abundit Extra + AMS)	0.825 oz + 2.0 pt + 1.0 pt + 1.0% v/v + 2.0 lb + (4.0 oz wt + 32.0 fl oz + 2.0 lb)	EPP + (POST)	99	99	99	99
2,4-D LV4 + Roundup PowerMAX + Fierce + Aatrex 4L + AMS + (Roundup PowerMAX + AMS)	1.0 pt + 32.0 fl oz + 3.0 oz wt + 1.0 qt + 2.5 lb + (32.0 fl oz + 2.5 lb)	EPP + (POST)	96	98	93	98
2,4-D LV4 + Roundup PowerMAX + AMS + (Roundup PowerMAX + AMS)	1.0 pt + 32.0 fl oz + 2.5 lb + (32.0 fl oz + 2.5 lb)	EPP + (POST)	98	98	65	98
2,4-D LV4 + Touchdown Total + Lumax EZ + AMS + (Halex GT + Aatrex 4L + AMS + NIS[b])	1.0 pt + 32.0 fl oz + 1.8 qt + 2.5 lb + (3.6 pt + 1.0 pt + 2.5 lb + 0.25 % v/v[c])	EPP + (POST)	99	99	99	99
2,4-D LV4 + Harness Xtra 5.6 + Roundup PowerMAX + AMS + (Roundup PowerMAX + AMS)	1.0 pt + 2.46 qt + 32.0 fl oz + 2.5 lb + (32.0 fl oz + 2.5 lb)	EPP + (POST)	96	99	80	98
Corvus + Aatrex 4L + Clarity + COC + (Roundup PowerMAX + AMS)	5.6 fl oz + 1.0 qt + 8.0 fl oz + 1.0 % v/v + (32.0 fl oz + 2.5 lb)		98	99	93	91
2,4-D LV4 + Durango DMA + N-Pak AMS Liquid[d] + SureStart + Aatrex 4L + (Durango DMA + N-Pak AMS Liquid)	1.0 pt + 1.5 pt + 2.5% v/v + 2.5 pt + 1.0 qt + (1.5 pt + 2.5 % v/v)	EPP + (POST)	96	98	86	99
2,4-D LV4 + Durango DMA + N-Pak AMS Liquid + SureStart + (SureStart + Durango DMA + N-Pak AMS Liquid)	1.0 pt + 1.5 pt + 2.5% v/v + 2.0 pt + (1.5 pt + 1.5 pt + 2.5 % v/v)	EPP + (POST)	99	99	98	99
Verdict + Zidua + Roundup PowerMAX + AMS + (Roundup PowerMAX + AMS)	18.0 fl oz + 1.5 fl oz + 32.0 fl oz + 2.5 lb + (32.0 fl oz + 2.5 lb)	EPP + (POST)	99	98	96	96
LSD (P = .05)			5	2	19	8

[a]AMS = ammonium sulfate fertilizer from United Suppliers.
[b]NIS = preference nonionic surfactant from Winfield Solutions.
[c]Volume of product per volume tank mix.
[d]N-Pak AMS liquid = ammonium sulfate from Winfield Solutions, LLC.
[e]Setfa = giant foxtail, Abuth = velvetleaf, Amata = common waterhemp, Cheal = common lambsquarters.