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Weed Management Programs in Corn

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Abstract
The purpose of this study was to evaluate various herbicides and application timings in corn for crop injury and weed control.

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Weed Management Programs in Corn

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Introduction

The purpose of this study was to evaluate various herbicides and application timings in 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 20 gallons of water/acre. The crop rotation was corn following soybean. The pre-plant seedbed was prepared with a field cultivator. Corn was planted at 35,000 seeds/acre in 30-in. rows on May 14. Preemergence (PRE) treatments were applied following planting. Postemergence (EPOST and POST) treatments were applied on June 7 and 14. Corn growth was V4 to V5 and V5 to V6 on June 7, and 14, respectively. Weeds were generally 0.25–3.5 and 0.25–4 in. tall, on June 7 and 14, respectively. Weed species in the study included giant foxtail, velvetleaf, common waterhemp, and common lambsquarters with average populations of < 1–10 plants/ft^2. Giant foxtail populations approached 10 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 percent = no control or injury; 100 percent = complete control or crop kill).

Results and Discussion

Summarized in Tables 1, 2, and 3 are the results of the study. None of the PRE treatments caused more than 3 percent corn injury when observed on June 14 (Table 1). Prior to postemergence applications, PRE treatments of Lexar, Lumax, and Zemax applied at 3.5, 3.0, and 2.4 qts/acre, respectively, provided 90–99 percent giant foxtail and velvetleaf control. The same herbicides applied PRE at 1.5, 1.0, and 1.0 qts/acre, respectively, provided 82–91 percent giant foxtail and velvetleaf control. Remaining PRE treatments gave 85–99 percent giant foxtail and velvetleaf control, with the exception of 8 and 32 percent velvetleaf control by Outlook and Breakfree ATZ, respectively. All PRE treatments afforded 99 percent common waterhemp control. With the exception of 87 and 93 percent common lambsquarters control by Outlook and Breakfree ATZ, respectively, all PRE treatments gave at least 98 percent common lambsquarters control.

Postemergence (EPOST and POST) treatments did not cause more than 7 percent injury on June 22, 8 and 15 days after applications, respectively (data not shown). On June 29, 8 days after the POST application, all treatments with postemergence applications gave at least 93 percent giant foxtail, velvetleaf, common waterhemp, and common lambsquarters control (Table 2).

No POST treatments exhibited injury on July 6 (data not shown). Treatments with only PRE applications maintained at least 87 percent velvetleaf and 90 percent giant foxtail control through July 13 (Table 3). Common waterhemp and common lambsquarters control remained at 99 percent.

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Table 1. Two and one-pass weed management programs in corn in mid-June.

Treatment	Rate	Appln timing	Injury Jun 14	Setfa[d] Jun 14	Abuth Jun 14	Amata Jun 14	Cheal Jun 14
	product/acre		-(%)-	------(% weed control)-------			
Untreated			0	0	0	0	0
Lexar	3.5 qt	PRE	0	94	95	99	99
Lumax	3.0 qt	PRE	0	95	96	99	99
Zemax	2.4 qt	PRE	0	90	91	99	99
Lexar + (Touchdown Total + AMS[a])	3.5 qt + (32.0 fl oz + 17.0 lb/100 gal)	PRE + (POST)	0	98	99	99	99
Lumax + (Touchdown Total + AMS)	3.0 qt + (32.0 fl oz + 17.0 lb/100 gal)	PRE + (POST)	0	96	98	99	99
Lexar + (Halex GT + Atrazine + NIS[b] + AMS)	1.5 qt + (3.6 pt + 1.0 pt + 1.0 qt/100 gal + 8.5 lb/ 100 gal)	PRE + (POST)	0	90	88	99	99
Lumax + (Halex GT + Atrazine + NIS + AMS)	1.0 qt + (3.6 pt + 1.0 pt + 1.0 qt/100 gal + 8.5 lb/ 100 gal)	PRE + (POST)	0	87	90	99	99
Zemax + (Halex GT + Atrazine + NIS + AMS)	1.0 qt + (3.6 pt + 1.0 pt + 1.0 qt/100 gal + 8.5 lb/ 100 gal)	PRE + (POST)	0	82	85	99	99
Zemax + (Callisto Xtra + Touchdown Total + AMS)	1.0 qt + (20.0 fl oz + 32.0 fl oz + 8.5 lb/100 gal)	PRE + (POST)	0	90	91	99	99
Halex GT + Atrazine + NIS + AMS	3.6 pt + 1.0 pt + 1.0 qt/100 gal + 8.5 lb/100 gal	EPOST	2	99	98	99	99
Outlook + (Status + Roundup PowerMAX + NIS + AMS)	16.0 fl oz + (5.0 oz wt + 22.0 fl oz + 0.25 % v/v + 8.5 lb/100 gal)	PRE + (POST)	0	92	8	99	87
Verdict + (Armezon + Atrazine + Roundup PowerMAX NIS + AMS)	15.0 fl oz + (0.75 fl oz + 1.0 pt + 22.0 fl oz + 0.25 % v/v + 8.5 lb/100 gal)	PRE + (POST)	0	88	91	99	99
SureStart + Atrazine + (Durango DMA + N-Pak AMS Liquid[c])	2.5 pt + 2.0 pt + (1.5 pt + 2.5 % v/v)	PRE + (POST)	0	91	85	99	99
SureStart + Durango DMA + N-Pak AMS Liquid	2.0 pt + 1.5 pt + 2.5 % v/v	EPOST	3	99	98	99	98
Keystone LA + Hornet WDG	2.1 qt + 3.5 oz wt	PRE	0	93	90	99	99
Breakfree ATZ + (Realm Q + Abundit Extra + Atrazine)	3.0 pt + (4.0 oz wt + 32.0 fl oz + 1.0 pt)	PRE + (POST)	0	88	32	99	93
Prequel + Atrazine + (Realm Q + Abundit Extra + Atrazine)	1.66 oz wt + pt + (4.0 oz wt + 32.0 fl oz + 1.0 pt)	PRE + (POST)	0	85	93	99	99
LSD (P=.05)			2	10	19	0	5

[a]AMS = ammonium sulfate fertilizer from United Suppliers.
[b]NIS = Preference nonionic surfactant from WinField Solutions.
[c]N-Pak AMS liquid = ammonium sulfate from WinField Solutions, LLC.
[d]Setfa = giant foxtail, Abuth = velvetleaf, Amata = common waterhemp, Cheal = common lambsquarters.

Table 2. Two and one-pass weed management programs in corn in late June.

Treatment	Rate	Appln timing	Injury Jun 29	Setfa[d] Jun 29	Abuth Jun 29	Amata Jun 29	Cheal Jun 29
	product/acre		-(%)-	------(% weed control)-------			
Untreated			0	0	0	0	0
Lexar	3.5 qt	PRE	0	93	98	99	99
Lumax	3.0 qt	PRE	0	91	99	99	99
Zemax	2.4 qt	PRE	0	90	96	99	99
Lexar + (Touchdown Total + AMS[a])	3.5 qt + (32.0 fl oz + 17.0 lb/100 gal)	PRE + (POST)	0	99	99	99	99
Lumax + (Touchdown Total + AMS)	3.0 qt + (32.0 fl oz + 17.0 lb/100 gal)	PRE + (POST)	0	99	99	99	99
Lexar + (Halex GT + Atrazine + NIS[b] + AMS)	1.5 qt + (3.6 pt + 1.0 pt + 1.0 qt/100 gal + 8.5 lb/ 100 gal)	PRE + (POST)	2	96	99	99	99
Lumax + (Halex GT + Atrazine + NIS + AMS)	1.0 qt + (3.6 pt + 1.0 pt + 1.0 qt/100 gal + 8.5 lb/ 100 gal)	PRE + (POST)	2	96	99	99	99
Zemax + (Halex GT + Atrazine + NIS + AMS)	1.0 qt + (3.6 pt + 1.0 pt + 1.0 qt/100 gal + 8.5 lb/ 100 gal)	PRE + (POST)	2	95	99	99	99
Zemax + (Callisto Xtra + Touchdown Total + AMS)	1.0 qt + (20.0 fl oz + 32.0 fl oz + 8.5 lb/100 gal)	PRE + (POST)	3	96	99	99	99
Halex GT + Atrazine + NIS + AMS	3.6 pt + 1.0 pt + 1.0 qt/100 gal + 8.5 lb/100 gal	EPOST	2	96	99	99	99
Outlook + (Status + Roundup PowerMAX + NIS + AMS)	16.0 fl oz + (5.0 oz wt + 22.0 fl oz + 0.25 % v/v + 8.5 lb/100 gal)	PRE + (POST)	0	98	96	99	99
Verdict + (Armezon + Atrazine + Roundup PowerMAX NIS + AMS)	15.0 fl oz + (0.75 fl oz + 1.0 pt + 22.0 fl oz + 0.25 % v/v + 8.5 lb/100 gal)	PRE + (POST)	2	96	98	99	99
SureStart + Atrazine + (Durango DMA + N-Pak AMS Liquid[c])	2.5 pt + 2.0 pt + (1.5 pt + 2.5 % v/v)	PRE + (POST)	0	93	93	99	99
SureStart + Durango DMA + N-Pak AMS Liquid	2.0 pt + 1.5 pt + 2.5 % v/v +	EPOST	5	98	95	99	99
Keystone LA + Hornet WDG	2.1 qt + 3.5 oz wt	PRE	0	93	88	99	99
Breakfree ATZ + (Realm Q + Abundit Extra + Atrazine)	3.0 pt + (4.0 oz wt + 32.0 fl oz + 1.0 pt)	PRE + (POST)	0	96	99	99	99
Prequel + Atrazine + (Realm Q + Abundit Extra + Atrazine)	1.66 oz wt + pt + (4.0 oz wt + 32.0 fl oz + 1.0 pt)	PRE + (POST)	2	98	99	99	99
LSD (P=.05)			3	6	5	0	0

[a]AMS = ammonium sulfate fertilizer from United Suppliers.
[b]NIS = Preference nonionic surfactant from WinField Solutions.
[c]N-Pak AMS liquid = ammonium sulfate from WinField Solutions, LLC.
[d]Setfa = giant foxtail, Abuth = velvetleaf, Amata = common waterhemp, Cheal = common lambsquarters.

Table 3. Two and one-pass weed management programs in corn in mid-July.

Treatment	Rate	Appln timing	Injury Jul 13	Setfa[d] Jul 13	Abuth Jul 13	Amata Jul 13	Cheal Jul 13
	product/acre		- (%) -	------ (% weed control) -------			
Untreated			0	0	0	0	0
Lexar	3.5 qt	PRE	0	93	98	99	99
Lumax	3.0 qt	PRE	0	90	99	99	99
Zemax	2.4 qt	PRE	0	91	98	99	99
Lexar + (Touchdown Total + AMS[a])	3.5 qt + (32.0 fl oz + 17.0 lb/100 gal)	PRE + (POST)	0	99	99	99	99
Lumax + (Touchdown Total + AMS)	3.0 qt + (32.0 fl oz + 17.0 lb/100 gal)	PRE + (POST)	0	99	99	99	99
Lexar + (Halex GT + Atrazine + NIS[b] + AMS)	1.5 qt + (3.6 pt + 1.0 pt + 1.0 qt/100 gal + 8.5 lb/ 100 gal)	PRE + (POST)	0	96	99	99	99
Lumax + (Halex GT + Atrazine + NIS + AMS)	1.0 qt + (3.6 pt + 1.0 pt + 1.0 qt/100 gal + 8.5 lb/ 100 gal)	PRE + (POST)	0	98	99	99	99
Zemax + (Halex GT + Atrazine + NIS + AMS)	1.0 qt + (3.6 pt + 1.0 pt + 1.0 qt/100 gal + 8.5 lb/ 100 gal)	PRE + (POST)	0	92	99	99	99
Zemax + (Callisto Xtra + Touchdown Total + AMS)	1.0 qt + (20.0 fl oz + 32.0 fl oz + 8.5 lb/100 gal)	PRE + (POST)	0	96	99	99	99
Halex GT + Atrazine + NIS + AMS	3.6 pt + 1.0 pt + 1.0 qt/100 gal + 8.5 lb/100 gal	EPOST	0	99	99	99	99
Outlook + (Status + Roundup PowerMAX + NIS + AMS)	16.0 fl oz + (5.0 oz wt + 22.0 fl oz + 0.25 % v/v + 8.5 lb/100 gal)	PRE + (POST)	0	96	92	99	96
Verdict + (Armezon + Atrazine + Roundup PowerMAX NIS + AMS)	15.0 fl oz + (0.75 fl oz + 1.0 pt + 22.0 fl oz + 0.25 % v/v + 8.5 lb/100 gal)	PRE + (POST)	0	96	99	99	99
SureStart + Atrazine + (Durango DMA + N-Pak AMS Liquid[c])	2.5 pt + 2.0 pt + (1.5 pt + 2.5 % v/v)	PRE + (POST)	0	92	92	99	98
SureStart + Durango DMA + N-Pak AMS Liquid	2.0 pt + 1.5 pt + 2.5 % v/v +	EPOST	0	98	92	99	98
Keystone LA + Hornet WDG	2.1 qt + 3.5 oz wt	PRE	0	95	87	99	99
Breakfree ATZ + (Realm Q + Abundit Extra + Atrazine)	3.0 pt + (4.0 oz wt + 32.0 fl oz + 1.0 pt)	PRE + (POST)	0	96	99	99	99
Prequel + Atrazine + (Realm Q + Abundit Extra + Atrazine)	1.66 oz wt + pt + (4.0 oz wt + 32.0 fl oz + 1.0 pt)	PRE + (POST)	0	96	99	99	99
LSD (P=.05)			0	6	4	0	2

[a]AMS = ammonium sulfate fertilizer from United Suppliers.
[b]NIS = Preference nonionic surfactant from WinField Solutions.
[c]N-Pak AMS liquid = ammonium sulfate from WinField Solutions, LLC.
[d]Setfa = giant foxtail, Abuth = velvetleaf, Amata = common waterhemp, Cheal = common lambsquarters.