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Weed Management in Corn

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Abstract
The purpose of this study was to evaluate various two-pass and one-pass herbicide application timings in corn for crop injury and weed control.

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Weed Management in Corn

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Introduction

The purpose of this study was to evaluate various two-pass and one-pass herbicide 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 tandem disk and field cultivator. Corn was planted at 32,000 seeds/acre in 30-in. rows on May 12. Preemergence (PRE) treatments were applied following planting. Postemergence (EPOST and MPOST) treatments were applied on June 4 and 22, respectively. Corn growth was V3 to V4 and V6 to V7 on June 4 and 22, respectively. Weeds were generally 0.25 to 4 in. tall and 0.25 to 15 in. tall, on June 4 and June 22, respectively. Weed species in the study included: woolly cupgrass, velvetleaf, common waterhemp, and common lambsquarters with average populations of < 1 to 25 plants/ft^2. Woolly cupgrass and common lambsquarters population approached 20 to 25 plants/ft^2 in the study. Taller weeds on June 22 were woolly cupgrass, common waterhemp, and common lambsquarters. 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 100 rating scale (0% = no control or injury; 100% = complete control or crop kill). Corn yields were adjusted to 15.5% moisture.

Results and Discussion

Summarized in Tables 1 and 2 are the results of the study. EPOST treatments resulted in 2-10% corn injury when observed on June 11, 7 days after application (Table 1). MPOST treatments resulted in 2–5% corn injury on June 29, 7 days after application. Woolly cupgrass control ranged from 75–88% with EPOST treatments on July 7, 33 days after application. Velvetleaf, common waterhemp, and common lambsquarters control ranged from 88–99% with the EPOST treatments. Two-pass PRE plus MPOST and one-pass MPOST treatments gave 90–99% weed control on July 7, 15 days after application. EPOST treatments gave 57–78% woolly cupgrass control on July 22 (Table 2). Velvetleaf, common waterhemp, and common lambsquarters control with EPOST treatments ranged from 83–99%. PRE plus MPOST and MPOST treatments gave 85–95% woolly cupgrass, 98–99% velvetleaf, 95–98% common waterhemp, and 68–99% common lambsquarters control on July 22, 30 days after MPOST applications. One-pass MPOST treatments were not as effective in controlling common lambsquarters compared with PRE plus MPOST. Corn yields ranged from 169–229 bushels/acre with significant differences observed between treatments. Corn yields were lower with the one-pass MPOST treatments, where common lambsquarters control on July 22 ranged from 68–87%. All treatment yields were significantly higher than the untreated control.

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Table 1. Weed management in corn.

Treatment[a]	Rate[b]	Appln timing	Injury Jun 11	Injury Jun 29	Erbvi[c] Jul 7	Abuth Jul 7	Amata Jul 7	Cheal Jul 7
	Product/acre		------ (%) -------		---------- (%) ----------			
Untreated	-		0	0	0	0	0	0
Corvus + Atrazine + (Capreno + Atrazine + COC + AMS)	3.0 fl oz + 1.0 qt + (3.0 fl oz + 1.0 pt + 1.0% + 8.5 lb)	PRE + (MPOST)	0	5	95	99	99	99
Corvus + Atrazine + (Capreno + MSO + AMS)	3.0 fl oz + 1.0 qt + (3.0 fl oz + 0.5% + 8.5 lb)	PRE + (MPOST)	0	5	90	99	99	99
Capreno + Roundup PowerMAX + AMS	2.0 fl oz + 22.0 fl oz + 8.5 lb	MPOST	0	2	99	99	99	95
Capreno + Roundup PowerMAX + Superb HC +AMS	3.0 fl oz + 11.0 fl oz + 0.75 pt + 8.5 lb	MPOST	0	2	99	99	99	95
Capreno + Ignite 280 + AMS	2.0 fl oz + 22.0 fl oz + 8.5 lb	MPOST	0	0	99	99	99	90
Halex GT + NIS + AMS	3.6 pt + 0.25% + 8.5 lb	EPOST	3	0	88	98	88	99
Capreno + Atrazine + COC + AMS	3.0 fl oz + 1.0 pt + 1.0% + 8.5 lb	EPOST	10	0	80	98	95	99
Impact + Atrazine + COC + AMS	0.75 fl oz + 1.0 pt + 1.0% + 8.5 lb	EPOST	3	0	75	98	95	99
Capreno + Atrazine + MSO + AMS	3.0 fl oz + 1.0 pt + 0.5% + 8.5 lb	EPOST	7	0	85	99	90	99
Laudis + Atrazine + MSO + COC	3.0 fl oz + 1.0 pt + 1.0% + 8.5 lb	EPOST	2	3	85	99	91	99
Lumax + (Capreno + Atrazine + COC + AMS)	2.5 qt + (3.0 fl oz + 1.0 pt + 1.0% + 8.5 lb)	PRE + (MPOST)	0	3	93	99	98	99
LSD (P=0.05)			3	3	6	2	5	0

[a]COC = Herbimax crop oil concentrate from UAP - Loveland Industries; AMS = ammonium sulfate fertilizer from Agriliance, LLC; MSO = modified vegetable oil and surfactant blend from UAP - Loveland Industries; Superb HC = oil-surfactant adjuvant from Winfield Solutions, LLC; NIS = Activator 90 a non-ionic surfactant from UAP - Loveland Industries.

[b]% = % volume/volume; lb = lb/100 gallons water.

[c]Erbvi = woolly cupgrass, Abuth = velvetleaf, Amata = common waterhemp, Cheal = common lambsquarters.

Table 2. Weed management in corn.

Treatment[a]	Rate[b]	Appln Timing	Erbvi[c] Jul 22	Abuth Jul 22	Amata Jul 22	Cheal Jul 22	Yield Nov 3
	Product/acre		---------- (%) ----------				(bu/acre)
Untreated	-		0	0	0	0	76
Corvus + Atrazine + (Capreno + Atrazine + COC + AMS)	3.0 fl oz + 1.0 qt + (3.0 fl oz + 1.0 pt + 1.0% + 8.5 lb)	PRE + (MPOST)	90	99	96	99	222
Corvus + Atrazine + (Capreno + MSO + AMS)	3.0 fl oz + 1.0 qt + (3.0 fl oz + 0.5% + 8.5 lb)	PRE + (MPOST)	85	99	96	98	219
Capreno + Roundup PowerMAX + AMS	2.0 fl oz + 22.0 fl oz + 8.5 lb	MPOST	98	99	98	85	169
Capreno + Roundup PowerMAX + Superb HC +AMS	3.0 fl oz + 11.0 fl oz + 0.75 pt + 8.5 lb	MPOST	96	99	96	87	172
Capreno + Ignite 280 + AMS	2.0 fl oz + 22.0 fl oz + 8.5 lb	MPOST	98	98	95	68	180
Halex GT + NIS + AMS	3.6 pt + 0.25% + 8.5 lb	EPOST	78	95	85	96	223
Capreno + Atrazine + COC + AMS	3.0 fl oz + 1.0 pt + 1.0% + 8.5 lb	EPOST	65	96	93	99	203
Impact + Atrazine + COC + AMS	0.75 fl oz + 1.0 pt + 1.0% + 8.5 lb	EPOST	57	96	91	98	206
Capreno + Atrazine + MSO + AMS	3.0 fl oz + 1.0 pt + 0.5% + 8.5 lb	EPOST	68	99	87	96	211
Laudis + Atrazine + MSO + COC	3.0 fl oz + 1.0 pt + 1.0% + 8.5 lb	EPOST	68	98	83	98	229
Lumax + (Capreno + Atrazine + COC + AMS)	2.5 qt + (3.0 fl oz + 1.0 pt + 1.0% + 8.5 lb)	PRE + (MPOST)	95	99	98	99	226
LSD (P=0.05)			7	4	7	3	26

[a]COC = Herbimax crop oil concentrate from UAP - Loveland Industries; AMS = ammonium sulfate fertilizer from Agriliance, LLC; MSO = modified vegetable oil and surfactant blend from UAP - Loveland Industries; Superb HC = oil-surfactant adjuvant from Winfield Solutions, LLC; NIS = Activator 90 a non-ionic surfactant from UAP - Loveland Industries.

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