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Katagon at Two Timings Compared to Standards in Corn

R.S. Currie and P.W. Geier

Summary

The objective of this trial was to compare Katagon (tolpyralate/nicosulfuron) to standard treatments for weed control in corn. Katagon plus atrazine applied early postemergence was as effective as any herbicide tested on the weeds present. When application timing was delayed to late postemergence, most herbicides were less effective. Early season corn injury was minor and did not persist. Although most herbicide treatments increased yields relative to the non-treated control, yields were generally best when any treatment was applied early postemergence.

Introduction

Katagon is a relatively new herbicide that combines two chemistries, tolpyralate and nicosulfuron, for weed control in corn. Tolpyralate is an HPPD-inhibiting herbicide which may have utility in controlling weeds resistant to other herbicide modes of action. Nicosulfuron is an ALS-inhibiting herbicide that has long been used for grass control in corn. The objective of this study was to compare Katagon at two application timings to standard herbicides for efficacy in corn.

Experimental Procedures

An experiment was conducted to compare Katagon applied at two application timings to competitive standard practices for efficacy in corn. All herbicides were applied using a tractor-mounted, compressed CO₂ sprayer delivering 19.4 gpa at 30 psi and 4.1 mph. Application, environmental, and weed information are shown in Table 1. Plots were 10 by 35 feet and arranged in a randomized complete block design with four replications. Soil was a Beeler silt loam with 2.4% organic matter and pH of 7.5. Visual weed control estimates were determined on June 18 and July 2, 2021. These dates were 6 and 20 days after the late postemergence treatments (DA-B), respectively. Corn chlorosis was evaluated on June 6 and June 18, 2021, which was 2 days after the early postemergence treatments (2 DA-A), and 6 DA-B, respectively. Yields were determined on October 6, 2021, by mechanically harvesting the center two rows of each plot and adjusting grain weights to 15.5% moisture.

Results and Discussion

Katagon plus atrazine applied early postemergence (EPOST) controlled all weed species with results similar to Capreno (tembotrione/thienencarbazone), Armezon Pro (dimethenamid/topramezone), or Coyote (metolachlor/mesotrione), each with atrazine, applied EPOST (Tables 2 and 3). Late- postemergence (LPOST) applications of these

herbicides without atrazine were less effective on all species except common lambsquarters (97 to 100% control), and when Coyote was applied to green foxtail (33 to 35% control) late in the season. Less corn chlorosis was observed with Katagon applied EPOST than with Armezon Pro or Coyote at 2 DA-A (Table 3). However, injury did not persist. All herbicides increased grain yields 59 to 165 bu/a relative to the untreated control except Coyote LPOST. Yields were greatest when any of the herbicides evaluated was applied EPOST and when Status (dicamba/diflufenzopyr) plus glyphosate was applied LPOST. Delaying herbicide treatment to LPOST resulted in yields 61 to 124 bu/a less than with the same treatments applied EPOST.

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Table 1. Application, environmental, and weed data for Katagon study

Application timing	Early postemergence	Late postemergence
Application date	June 4, 2021	June 12, 2021
Air temperature (°F)	77	75
Relative humidity	60	64
Soil temperature (°F)	68	76
Wind speed (mph)	2 to 5	2 to 6
Wind direction	South	East
Soil moisture	Good	Good
Corn		
Height (inches)	5 to 7	9 to 12
Leaves (no.)	2 to 3	4 to 6
Kochia		
Height (inches)	1 to 3	3 to 5
Density (plants/ft ²)	0.5	0.5
Russian thistle		
Height (inches)	2 to 4	4 to 6
Density (plants/ft ²)	1	0.5
Palmer amaranth		
Height (inches)	1 to 4	4 to 10
Density (plants/ft ²)	3	2
Common lambsquarters		
Height (inches)	1 to 2	2 to 6
Density (plants/ft ²)	0.5	0.5
Green foxtail		
Height (inches)	1 to 2	2 to 6
Density (plants/ft ²)	0.5	0.5

Table 2. Weed control in the Katagon study

Treatment ¹	Rate	Timing ²	Common					
			Palmer amaranth		lambsquarters		Russian thistle	
			6 DA-B ³	20 DA-B	6 DA-B	20 DA-B	6 DA-B	20 DA-B
	oz/a		----- % Visual -----					
Katagon	3.2	EPOST	95	89	100	100	100	100
Atrazine	32	EPOST						
HSOC	1%	EPOST						
Katagon	3.2	LPOST	45	60	48	97	40	60
HSOC	1%	LPOST						
Capreno	3.0	EPOST	96	86	100	100	100	100
Atrazine	32	EPOST						
COC	1%	EPOST						
AMS	1%	EPOST						
Capreno	3.0	LPOST	50	53	55	100	53	55
COC	1%	LPOST						
AMS	1%	LPOST						
Armezon Pro	20	EPOST	94	88	100	100	100	100
Atrazine	32	EPOST						
COC	1%	EPOST						
AMS	1%	EPOST						
Armezon Pro	20	LPOST	55	53	48	98	48	55
COC	1%	LPOST						
AMS	1%	LPOST						
Coyote	64	EPOST	94	88	100	100	100	100
Atrazine	1.0	EPOST						
COC	1%	EPOST						
AMS	1%	EPOST						
Coyote	64	LPOST	35	23	48	100	40	43
COC	1%	LPOST						
AMS	1%	LPOST						
Status	5.0	LPOST	96	96	100	100	100	100
Glyphosate	22	LPOST						
NIS	0.25%	LPOST						
AMS	1%	LPOST						
LSD (0.05)			6	9	9	NS	6	8

¹ HSOC = high surfactant oil concentrate. COC = crop oil concentrate. AMS = ammonium sulfate. NIS = nonionic surfactant.

² EPOST = early postemergence. LPOST = late postemergence.

³ DA-B = days after the late postemergence treatments.

Table 3. Weed control and crop response in the Katagon study

Treatment ¹	Rate	Timing ²	Kochia		Green foxtail		Corn chlorosis		Corn yield
			6 DA-B ³	20 DA-B	6 DA-B	20 DA-B	2 DA-A ⁴	6 DA-B	
	lb/a		----- % Visual -----						bu/a
Nontreated	---	---	---	---	---	---	0	0	15.4
Katagon	3.2	EPOST	99	99	99	99	5	0	175.3
Atrazine	32	EPOST							
HSOC	1%	EPOST							
Katagon	3.2	LPOST	45	45	30	70	---	0	114.2
HSOC	1%	LPOST							
Capreno	3.0	EPOST	100	100	100	96	1	0	180.6
Atrazine	32	EPOST							
COC	1%	EPOST							
AMS	1%	EPOST							
Capreno	3.0	LPOST	58	58	35	68	---	0	74.9
COC	1%	LPOST							
AMS	1%	LPOST							
Armezon Pro	20	EPOST	100	100	100	100	11	0	173.6
Atrazine	32	EPOST							
COC	1%	EPOST							
AMS	1%	EPOST							
Armezon Pro	20	LPOST	100	100	45	65	---	0	75.6
COC	1%	LPOST							
AMS	1%	LPOST							
Coyote	64	EPOST	48	48	73	35	18	0	154.3
Atrazine	1.0	EPOST							
COC	1%	EPOST							
AMS	1%	EPOST							
Coyote	64	LPOST	99	99	23	33	---	0	30.1
COC	1%	LPOST							
AMS	1%	LPOST							
Status	5.0	LPOST	100	100	95	100	---	0	180.4
Glyphosate	22	LPOST							
NIS	0.25%	LPOST							
AMS	1%	LPOST							
LSD (0.05)			45	45	8	11	3	NS	26.6

¹ HSOC = high surfactant oil concentrate. COC = crop oil concentrate. AMS = ammonium sulfate. NIS = nonionic surfactant.

² EPOST = early postemergence. LPOST = late postemergence.

³ DA-B = days after the late postemergence treatments.

⁴ DA-A = days after the early postemergence treatments.



Figure 1. Untreated control.



Figure 2. Katagon 3.2 oz/a plus atrazine 32 oz/a applied early postemergence. Photo taken 26 days after treatment.



Figure 3. Capreno 3.0 oz/a plus atrazine 32 oz/a applied early postemergence. Photo taken 26 days after treatment.



Figure 4. Armezon Pro 20 oz/a plus atrazine 32 oz/a applied early postemergence. Photo taken 26 days after treatment.



Figure 5. Coyote 64 oz/a plus atrazine 32 oz/a applied early postemergence. Photo taken 26 days after treatment.



Figure 6. Status 5.0 oz/a plus glyphosate 22 oz/a applied early postemergence. Photo taken 26 days after treatment.