Kansas Agricultural Experiment Station Research Reports

Volume 7
Issue 7 *Southwest Research-Extension Reports*

Article 17

2021

Outlook Alone and in Mixtures for Efficacy in Corn

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Summary

The objective of the study was to compare Outlook (dimethenamid) alone and in various tank mixtures for season-long weed control in corn. Kochia control with most herbicides was 95% or more late in the season. However, Russian thistle control did not exceed 83% with any herbicide tested. Palmer amaranth control at 59 days after the postemergence treatments was similar among all herbicides, while green foxtail control was 93% or more with each treatment. All herbicides increased grain yields relative to the untreated control, but corn treated with Outlook or Verdict alone yielded less grain than the best yielding plots.

Introduction

Preemergence (PRE) weed control is an important component in any cropping system. Allowing corn to become established prior to competition from weeds is no exception. Several dozen different herbicides are currently labeled for PRE use in Kansas corn, and these herbicides vary in their efficacy and length of residual activity. The objective of this study was to compare several PRE herbicides alone and in combinations for efficacy in corn.

Materials and Methods

An experiment was conducted at the Kansas State University Southwest Research-Extension Center near Garden City, KS, to evaluate Outlook (dimethenamid) alone or with various mixtures for efficacy in corn. Herbicides (Table 2) were applied using a tractor-mounted, compressed CO_2 sprayer delivering 19.4 gpa at 30 psi and 4.1 mph. Application, environmental, and weed information is 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 7.6. Visual estimates of weed control were taken on June 17 and August 10, 2020. These dates were 5 and 59 days after the postemergence treatment (DAB), respectively. Corn yields were determined on October 6, 2020, by mechanically harvesting the center two rows of each plot and adjusting grain weights to 15.5% moisture.

Results and Discussion

Common sunflower control was 83 to 95% at 5 DAB and 80 to 93% control at 59 DAB, and did not differ between herbicide treatments (data not shown). All herbicides controlled kochia more than 90% at 5 DAB except Verdict (dimethenamid/saflufenacil) applied PRE followed by Zidua SC (pyroxasulfone) postemergence

(POST) (Table 2). Verdict alone, or with a drift control agent (DCA) PRE, and Verdict followed by Zidua SC controlled kochia less than 90% at 59 DAT. Zidua SC with Sharpen (saflufenacil) and Callisto (mesotrione) or Verdict PRE controlled Russian thistle the best at each rating date. However, no herbicide provided more than 81% Russian thistle control. Outlook alone, or with a DCA PRE, and Verdict plus Callisto PRE controlled Palmer amaranth 100% at 5 DAB; however, no difference occurred among herbicides for Palmer amaranth control at 59 DAB. Similarly, green foxtail control did not differ among herbicides at 5 DAT, and only Verdict alone PRE provided less than 95% foxtail control later in the season. Grain yields were 68 to 108 bu/a higher from herbicide-treated plots than from untreated plots (37.5 bu/a). However, yields were generally lowest when Outlook alone or Verdict alone were applied (105 to 108 bu/a).

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Table 1. Application, environmental, and weed information for the Outlook study in corn

Application timing	Preemergence	Postemergence
Application date	May 14, 2020	June 12, 2020
Air temperature (°F)	80	70
Relative humidity	49	41
Soil temperature (°F)	64	68
Wind speed (mph)	5 to 9	7 to 10
Wind direction	North-northwest	Southwest
Soil moisture	Good	Good
Corn		
Height (inches)	---	5 to 8
Leaves (no.)	0	3 to 4
Kochia		
Height (inches)	---	---
Density (plants/10 ft^2)	0	0
Palmer amaranth		
Height (inches)	---	2 to 4
Density (plants/10 ft^2)	0	1
Russian thistle		
Height (inches)	---	3 to 6
Density (plants/10 ft^2)	0	2
Green foxtail		
Height (inches)	---	---
Density (plants/10 ft^2)	0	0
Shattercane		
Height (inches)	---	3 to 5
Density (plants/10 ft^2)	0	1

Table 2. Weed control and grain yield from the Outlook in corn trial

			Kochia		Russian thistle		Palmer amaranth		Green foxtail		
Treatment[1]	Rate	Timing[2]	5 DAB[3]	59 DAB	5 DAB	59 DAB	5 DAB	59 DAB	5 DAB	59 DAB	Grain yield
	oz/a		% Visual								bu/a
Untreated			---	---	---	---	---	---	---	---	37.5
Outlook	14	PRE	100	98	70	53	100	85	98	100	108.5
Verdict	10	PRE	95	83	68	53	95	88	98	93	105.1
Outlook DCA-DA	14 32	PRE PRE	95	95	73	58	100	90	98	100	137.4
Verdict DCA-DA	10 32	PRE PRE	95	88	73	55	95	93	98	100	131.4
Zidua SC Callisto	3.3 4.0	PRE PRE	98	98	74	63	85	93	93	95	148.8
Zidua SC Callisto	4.4 4.0	PRE PRE	100	98	79	70	90	88	100	98	154.1
Zidua SC Sharpen Callisto MSO AMS	3.3 2.0 4.0 1.0% 2.5%	PRE PRE PRE PRE PRE	100	100	83	73	98	98	100	98	144.3
Verdict Zidua SC	10 3.3	PRE PRE	100	98	81	80	100	95	100	100	141.5
Verdict Zidua SC	10 3.3	PRE POST	90	85	70	68	95	88	94	100	136.8
LSD (0.05)			7	8	8	8	8	NS	NS	6	25.4

[1] DCA-DA = a drift control agent/deposition aid. MSO = methylated seed oil. AMS = ammonium sulfate.
[2] PRE = preemergence. POST = postemergence.
[3] DAB = days after the postemergence treatments.

Figure 1. Untreated control.

Figure 2. Outlook at 14 oz/a applied preemergence. Photo taken 56 days after the preemergence treatment.

Figure 3. Verdict at 10 oz/a applied preemergence. Photo taken 56 days after the preemergence treatment.

Figure 4. Zidua SC at 3.3 oz/a plus Callisto 4.0 oz/a applied preemergence. Photo taken 56 days after the preemergence treatment.

Figure 5. Verdict at 10 oz/a plus Zidua SC at 3.3 oz/a applied preemergence. Photo taken 56 days after the preemergence treatment.