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Residual Herbicides Alone and in Combinations for Fallow Weed Control

R.S. Currie and P.W. Geier

Summary

The objective of this research was to compare various novel herbicides for efficacy in fallow. An experiment compared residual herbicides for preemergence weed control in fallow. While most herbicides provided good kochia control early on, only the treatments containing Alite 27 (isoxaflutole) controlled kochia 90% or more by 50 days after treatment. Similarly, most herbicides controlled Russian thistle 83% or more early. However, Russian thistle control declined such that only the treatments containing Alite 27 provided as much as 74% control later in the season.

Introduction

In recent years, glyphosate-resistant kochia has become an increasing problem in Kansas agriculture. Preemergence control of kochia prior to crop emergence has become even more important for this early-emerging summer annual species. Consequently, this study was designed to look at various residual herbicides, alone or in tank mixtures, for preemergence weed control effectiveness in fallow.

Experimental Procedures

An experiment compared residual herbicides applied preemergence either alone or as tank mix partners for weed control in fallow. All herbicides were applied on May 10, 2022 using a tractor-mounted, compressed CO₂ sprayer delivering 19.4 gpa at 4.1 mph and 30 psi (Table 1). The experimental site was weed-free at the time of application. Three days after application, 1.1 inches of sprinkler irrigation was applied to promote weed germination and activate the herbicides. Soil was a Ulysses silt loam with 2.7% organic matter and pH of 7.9. Plots were 10 by 30 feet and arranged in a randomized complete block replicated four times. Visual weed control was determined on May 20, June 6, and June 29, 2022. These dates were 10, 24, and 50 days after treatment (DAT), respectively.

Results and Discussion

Kochia control at 10 DAT was 98% or more with all herbicides except Engenia (dicamba) or Weedar 64 (2,4-D) alone (Table 2). Valor SX (flumioxazin) alone, Alite 27 alone, and Alite 27 with Engenia, Weedar 64, or Valor SX controlled kochia 90 to 98% at 24 DAT. However, only the treatments containing Alite 27 provided 90% kochia control by 50 DAT. Valor SX alone or with Alite 27, Weedar 64 or Engenia controlled Russian thistle 90 to 98% at 10 DAT. Russian thistle control declined with

all herbicides by 50 DAT. Consequently, only Alite 27 alone or with Weedar 64 or Valor SX provided as much as 78% Russian thistle control late in the season.

Acknowledgments

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Table 1. Application and environmental information for the residual fallow experiment

Application timing	Preemergence
Application date	May 10, 2022
Air temperature, °F	83
Relative humidity, %	29
Soil temperature, °F	68
Wind speed, mph	2 to 5
Wind direction	West-northwest
Soil moisture	Dry

Table 2. Preemergence weed control in the residual fallow study

Treatment	Rate	Kochia			Russian thistle		
		10 DAT ¹	24 DAT	50 DAT	10 DAT	24 DAT	50 DAT
	oz/a	----- % Visual -----					
Alite 27	3.0	100	98	93	88	85	78
Engenia	12.8	68	48	20	73	50	18
Weedar 64	24	50	5	0	53	5	0
Valor SX	2.0	100	90	78	98	85	63
Alite 27	3.0	100	96	91	83	88	74
Engenia	12.8						
Alite 27	3.0	100	96	90	88	90	80
Weedar 64	24						
Alite 27	3.0	100	98	94	95	93	86
Valor SX	2.0						
Weedar 64	24	98	88	80	93	87	75
Valor SX	2.0						
Sharpen	2.0	98	79	43	90	75	40
Engenia	12.8						
LSD (0.05)		7	8	8	10	9	10

¹ DAT = days after treatment.



Figure 1. Untreated control.



Figure 2. Alite 27 3.0 oz/a applied preemergence. Photo taken 38 days after treatment.



Figure 3. Valor SX 2.0 oz/a applied preemergence. Photo taken 38 days after treatment.



Figure 4. Alite 27 3.0 oz/a plus Valor SX 2.0 oz/a applied preemergence. Photo taken 38 days after treatment.



Figure 5. Sharpen 2.0 oz/a plus Engenia 12.8 oz/a applied preemergence. Photo taken 38 days after treatment.