

Surtain Herbicide Evaluation in Corn

P. W. Geier

Summary

This study investigated the use of Surtain herbicide compared to commercial standards for efficacy in corn. All herbicides evaluated provided good control of kochia, Russian thistle, and green foxtail. Surtain and Trivolt each controlled common sunflower and Johnsongrass 90% or more, whereas only Surtain controlled Palmer amaranth more than 80% throughout the season. Relative to the untreated control, grain yields were greatest when Surtain was applied preemergence at the higher rate, as an early postemergence treatment, or when it was followed by a postemergence treatment.

Introduction

The use of layered residual herbicides (herbicides with multiple modes of action in a single application) is recommended to control a wide spectrum of weeds and delay the onset of herbicide resistance. Common herbicides used preemergence in corn, such as Acuron, Lumax, and Degree Xtra, contain two or three modes-of-action. Surtain is a new corn herbicide that contains microencapsulated saflufenacil (a PPO inhibitor) and pyroxasulfone (a VLCFA inhibitor). The microencapsulation of the saflufenacil molecule allows this product to also be applied early postemergence to extend the period of weed control. The objective of this research was to compare Surtain to standard herbicides in corn.

Experimental Procedures

An experiment compared Surtain herbicide to standard treatments for weed control in irrigated corn. Herbicides were applied using a tractor-mounted, compressed-CO₂ sprayer delivering 19.4 gpa at 30 psi and 4.1 mph. Application, environmental, and plant information is shown in Table 1. Plots were 10 by 35 feet and arranged in a randomized complete block design replicated four times. Soil was Beeler silt loam having 2.4% organic matter, pH of 7.5, and CEC of 17.8. Visual weed control was determined on June 8 and July 7, 2023. These dates were 3 and 32 days after the postemergence (POST) applications (DAC), respectively. Corn yields were determined on October 9, 2023, by mechanically harvesting the center two rows of each plot and adjusting grain moistures to 15.5%.

Results and Discussion

All herbicides controlled kochia, Russian thistle, and green foxtail 90% or more regardless of evaluation date (data not shown). Surtain-containing treatments provided near-complete Palmer amaranth control at 3 DAC (Table 2), and were better than Acuron, Degree Xtra, or Trivolt. Palmer amaranth control remained 90% or more at 32 DAC when Surtain at 17 oz/a was applied preemergence (PRE), when Surtain

was applied early postemergence (EPOST), and when Surtain PRE was followed by Armezon Pro or Status POST. Early-season sunflower control was 90% with all herbicides, and control remained 95% or more with Trivolt and all Surtain treatments at 32 DAC. Similarly, Trivolt and Surtain were the most effective herbicides for Johnsongrass control, especially later in the season. Corn receiving Acuron, Degree Xtra, or Trivolt yielded 24 to 38 bu/a more grain than untreated corn. However, corn treated with Surtain yielded 65 to 98 bu/a more than untreated corn.

Acknowledgments

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Table 1. Application, environmental, and plant information in the Surtain herbicide study in corn

Application timing	Preemergence	Early postemergence	Postemergence
Application date	May 13, 2023	May 25, 2023	June 5, 2023
Air temperature (F)	57	78	78
Relative humidity (%)	76	60	50
Soil temperature (F)	58	69	68
Wind speed (mph)	3 to 5	7 to 11	1 to 3
Wind direction	North-northwest	South-southeast	South-southeast
Soil moisture	Good	Wet	Wet
Corn			
Height (inches)	---	1 to 2	5 to 7
Leaves (no.)	0	1 to 2	3 to 4
Russian-thistle			
Height (inches)	---	1 to 2	---
Density (plants/ft ²)	0	0.2	0
Palmer amaranth			
Height (inches)	---	0.25 to 1	---
Density (plants/ft ²)	0	0.5	0
Johnsongrass			
Height (inches)	---	0.5 to 1	---
Density (plants/ft ²)	0	0.3	0
Kochia			
Height (inches)	---	1 to 2	---
Density (plants/ft ²)	0	0.4	0
Green foxtail			
Height (inches)	---	0.25 to 1	0.25 to 1
Density (plants/ft ²)	0	0.1	0.1
Common sunflower			
Height (inches)	---	1 to 2	---
Density (plants/ft ²)	0	0.1	0

Table 2. Weed control and grain yield in the Surtain herbicide study in corn

Treatment	Rate	Timing ¹	Palmer amaranth		Common sunflower		Johnsongrass		Corn yield
			3 DAC ²	32 DAC ²	3 DAC	32 DAC	3 DAC	32 DAC	
	oz/a		----- % Visual -----						bu/a
Untreated	---	---	---	---	---	---	---	---	30.2
Acuron	48	PRE	90	60	93	85	85	60	60.4
Degree Xtra	64	PRE	89	60	95	85	90	60	54.1
Trivolt	12	PRE	76	53	90	95	100	93	68.0
Surtain	14	PRE	100	85	98	95	100	90	96.6
Surtain	14	PRE	100	89	100	100	100	91	94.7
Atrazine	32	PRE							
Surtain	17	PRE	100	91	98	98	100	93	113.9
Surtain	17	PRE	100	90	100	100	100	93	96.2
Atrazine	32	PRE							
Surtain	14	EPOST	98	95	98	96	98	95	113.8
Armezon	0.75	EPOST							
Atrazine	32	EPOST							
Glyphosate	30	EPOST							
Ammonium sulfate	8.5 lb	EPOST							
Crop oil concentrate	1.0 %	EPOST							
Surtain	14	PRE	100	99	98	100	100	96	112.6
Armezon Pro	16	POST							
Atrazine	16	POST							
Glyphosate	30	POST							
Ammonium sulfate	8.5 lb	POST							
Crop oil concentrate	1.0 %	POST							
Surtain	14	PRE	100	99	100	100	100	100	128.1
Status	5.0	POST							
Zidua SC	2.5	POST							
Glyphosate	30	POST							
Ammonium sulfate	8.5 lb	POST							
Nonionic surfactant	0.25 %	POST							
LSD (0.05)			6	8	NS	11	6	9	22.0

¹ PRE = preemergence. EPOST is early postemergence. POST = postemergence.

² DAC = days after the postemergence applications.