

Weed Control With ImiFlex in Igrowth Forage Sorghum

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Summary

Igrowth (imidazolinone-resistant) forage sorghum hybrids were recently commercialized in Kansas. Even though the active ingredient of the herbicide associated with these systems, imazamox, is used in other crops, data are needed to define best practices for use in forage sorghum. The objective of experiments in Manhattan and Garden City, KS, was to investigate the use of ImiFlex (imazamox) herbicide in Igrowth (imidazolinone-tolerant) forage sorghum. At Garden City, volunteer corn and johnsongrass control 29 days after treatment was 90% or greater in all treatments that included ImiFlex. Similarly, Palmer amaranth control 28 days after treatment was 91% or greater at Manhattan. Forage sorghum injury (5%) was noted 18 days after treatment in Manhattan, however, by 28 days after treatment plants had recovered. These results suggest that Igrowth forage sorghum may help Kansas farmers manage troublesome weeds; however, proper stewardship of the technology will be necessary.

Introduction

Weed control in sorghum has largely been dependent on preemergence herbicides, particularly for grass species. Few postemergence options for grasses were available until the recent introduction of herbicide-resistant sorghum hybrids. Igrowth forage sorghum allows preemergence or postemergence application of ImiFlex herbicide for broadleaf and grass weed control. Two experiments in Kansas examined ImiFlex efficacy and crop response in Igrowth forage sorghum in 2022.

Procedures

Experiments were conducted at Manhattan and Garden City, KS, to examine ImiFlex herbicide in Igrowth forage sorghum. Herbicides were applied either at 15 or 19.4 gpa using either a backpack or tractor-mounted compressed CO₂ sprayer. Application information for each location is given in Tables 1 and 2. Treatments at each location were arranged in randomized complete blocks and replicated four times. Forage sorghum response to ImiFlex at Manhattan was evaluated at 18 and 28 days after the postemergence (DA-B), and weed control was taken 28 and 56 DA-B. Forage sorghum response and weed control at Garden City was determined at 2 and 29 DA-B.

Results

Preemergence applications of ImiFlex provided less than 50% volunteer corn control early in the season at Garden City (Table 3). However, volunteer corn control 29 DA-B was 90% or more with all ImiFlex treatments, except when ImiFlex plus Moccasin II

Plus (*S*-metolachlor) PRE was followed by atrazine POST. Johnsongrass control at Garden City 2 DA-B was better in treatments that included ImiFlex compared to those that did not. By 29 DA-B, ImiFlex applied PRE or POST controlled johnsongrass 90% or more. All herbicides controlled Palmer amaranth and crabgrass 90% or more throughout the season at Garden City (data not shown). Palmer amaranth control at Manhattan was 87% or more regardless of treatment (Table 4). Postemergence treatments containing Clarity (dicamba) caused 18% sorghum injury early on, but no visible injury was detected at 29 DA-B (data not shown). At 18 DA-B, minor injury occurred when ImiFlex was applied with Huskie (pyrasulfotole/bromoxynil) and atrazine at Manhattan (Table 5). However, no injury was visible by 28 DA-B.

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Table 1. Application, environmental, and plant information for the Igrowth forage sorghum trial

Application timing	Preemergence	Postemergence
Application date	June 10, 2022	June 27, 2022
Air temperature, °F	76	70
Relative humidity, %	86	35
Soil temperature, °F	67	69
Wind speed, mph	3 to 7	7 to 11
Wind direction	North	South-southwest
Soil moisture	Good	Good
Forage sorghum		
Leaves, no.	0	4 to 5
Volunteer corn		
Height, inches	---	6 to 8
Johnsongrass		
Height, inches	---	2 to 4
Palmer amaranth		
Height, inches	---	1 to 2
Crabgrass		
Height, inches	---	0.5 to 1

Table 2. Application and plant information for ImiFlex forage sorghum trial in Manhattan, KS

Application timing	Preemergence	Postemergence
Application date	June 17, 2022	July 8, 2022
Air temperature, °F	100	81
Relative humidity, %	51	78
Soil temperature, °F	90	83
Wind speed, mph	1 to 5	1 to 4
Wind direction	East-northeast	North-northwest
Soil moisture	Good	Fair
Forage sorghum		
Leaves, no.	---	6 to 7
Palmer amaranth		
Height, inches	---	1 to 3

Table 3. Weed control in the Igrowth forage sorghum study at Garden City, KS

Treatment ¹	Rate	Timing ²	Volunteer corn		Johnsongrass	
			2 DA-B ³	29 DA-B	2 DA-B	29 DA-B
	oz/a		----- % Visible control -----			
Moccasin II Plus	21	PRE	0	0	60	0
Atrazine	38	POST				
COC	1.0%	POST				
Moccasin II Plus	21	PRE	38	85	73	93
ImiFlex	9.0	PRE				
Atrazine	38	POST				
COC	1.0%	POST				
Moccasin II Plus	21	PRE	0	96	65	98
ImiFlex	6.0	POST				
Atrazine	38	POST				
COC	1.0%	POST				
UAN	2.5%	POST				
Moccasin II Plus	21	PRE	45	90	80	93
Atrazine	32	PRE				
ImiFlex	9.0	PRE				
Atrazine	32	POST				
COC	1.0%	POST				
UAN	2.5%	POST				
Moccasin II Plus	21	PRE	0	94	65	94
Atrazine	32	PRE				
ImiFlex	6.0	POST				
Atrazine	32	POST				
COC	1.0%	POST				
UAN	2.5%	POST				
Moccasin II Plus	21	PRE	33	90	78	90
ImiFlex	9.0	PRE				
Clarity	6.0	POST				
Atrazine	38	POST				
NIS	0.25%	POST				
UAN	2.5%	POST				
Moccasin II Plus	21	PRE	0	95	60	98
Atrazine	38	PRE				
ImiFlex	6.0	POST				
Clarity	6.0	POST				
NIS	0.25%	POST				
UAN	2.5%	POST				
LSD (0.05)			8	8	10	8

¹ COC = crop oil concentrate. UAN = 28% urea-ammonium nitrate. NIS = nonionic surfactant.

² PRE = preemergence. POST = postemergence.

³ DA-B = days after the postemergence treatment.

Table 4. Palmer amaranth control with ImiFlex in forage sorghum, Manhattan, KS, 2022

Treatment	Rate	Timing ¹	28 DA-B ²	56 DA-B
	oz/a		-----% Visual -----	
Nontreated check	---	---	---	---
Moccasin II Plus	1.33 pt	PRE	95	87
Atrazine	32	PRE		
ImiFlex	6.0	POST		
Nonionic surfactant	0.5%	POST		
Urea-ammonium nitrate	1.0%	POST		
Moccasin II Plus	1.33 pt	PRE	97	87
Atrazine	32	PRE		
Huskie	16	POST		
Nonionic surfactant	0.5%	POST		
Urea-ammonium nitrate	1.0%	POST		
Moccasin II Plus	1.33 pt	PRE	91	89
Atrazine	32	PRE		
Huskie	16	POST		
ImiFlex	6.0	POST		
Nonionic surfactant	0.5%	POST		
Urea-ammonium nitrate	1.0%	POST		
Moccasin II Plus	1.33 pt	PRE	98	98
Atrazine	32	PRE		
Huskie	16	POST		
ImiFlex	6.0	POST		
Atrazine	16	POST		
Nonionic surfactant	0.5%	POST		
Urea-ammonium nitrate	1.0%	POST		
LSD (0.05)			NS	NS

¹ PRE = preemergence. POST = postemergence.

² DA-B = days after the postemergence treatments.

Table 5. Forage sorghum response to ImiFlex at Manhattan, KS, 2022

Treatment	Rate	Timing ¹	Injury		Height
			18 DA-B ²	28 DA-B	28 DA-B
	oz/a		-----% Visual -----		Inches
Nontreated check	---	---	0	0	49
Moccasin II Plus	1.33 pt	PRE	0	1	46
Atrazine	32	PRE			
ImiFlex	6.0	POST			
Nonionic surfactant	0.5%	POST			
Urea-ammonium nitrate	1.0%	POST			
Moccasin II Plus	1.33 pt	PRE	1	0	45
Atrazine	32	PRE			
Huskie	16	POST			
Nonionic surfactant	0.5%	POST			
Urea-ammonium nitrate	1.0%	POST			
Moccasin II Plus	1.33 pt	PRE	0	1	48
Atrazine	32	PRE			
Huskie	16	POST			
ImiFlex	6.0	POST			
Nonionic surfactant	0.5%	POST			
Urea-ammonium nitrate	1.0%	POST			
Moccasin II Plus	1.33 pt	PRE	5	1	45
Atrazine	32	PRE			
Huskie	16	POST			
ImiFlex	6.0	POST			
Atrazine	16	POST			
Nonionic surfactant	0.5%	POST			
Urea-ammonium nitrate	1.0%	POST			
LSD (0.05)			4	NS	NS

¹ PRE = preemergence. POST = postemergence.

² DA-B = days after the postemergence treatments.