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UW – Madison Weed Science Renz Lab

Effectiveness of Indaziflam (Rezilon) alone and in combination with Pendimethalin (Prowl) on Yellow Foxtail

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Objective:

Determine the appropriate time to apply Rezilon alone or in combination with Prowl, for pre-emergent control on yellow foxtail in pastures.

Summary:

Yellow foxtail can be problematic in pastures as they compete with desirable forages and reduce forage quality and increase injury to grazing livestock. While populations can be controlled with residual herbicides, multiple applications are needed at high rates to maintain herbicide levels in the soil that prevent emergence throughout the season. Rezilon (indaziflam) has the potential to reduce the need for multiple applications as it persists longer than the standard treatments (pendimethalin), however it requires substantial precipitation to activate and doesn't become active until 1-2 weeks after precipitation. Research was undertaken to determine if one application or Rezilon alone or mixed with Prowl can provide yellow foxtail control in pastures. Treatments of Rezilon at 2 fl oz/A alone or mixed with 2 qt/A of Prowl were applied on 5/19, 6/6, 6/24 and 7/7 surrounding the hypothesized beginning of yellow foxtail emergence in pastures. While all treatments provided some suppression of yellow foxtail by September only Rezilon + Prowl applied on 6/24 gave acceptable season long control (> 90%). This timing success indicates that most yellow foxtail present in August/September emerged AFTER 6/24. This contrasts previous research that showed early emerging yellow foxtail was dominant. Given that each individual product is effective PRE on yellow foxtail but only the mixture provided control suggests that the additional delay in activation could be problematic for Rezilon in providing control. Further research is needed to determine the factors that drive yellow foxtail emergence and dominance in cool season pastures and how pasture management can influence late season populations.

Notes

Pasture consisted of Kentucky bluegrass, tall fescue, and red and white clover.
Treatments were applied approximately every two weeks starting 5/19 and ending 7/7.
Pasture was cut on June 18th and harvested June 20th.

Herbicide Treatments

Treatment Number	Application timing	Treatment	Rate
1	-	Nontreated Control (NTC)	-
2	A	Rezilon	2 fl oz/A
3	A A	Rezilon Prowl	2 fl oz/A 2 qt/A
4	B	Rezilon	2 fl oz/A
5	B B	Rezilon Prowl	2 fl oz/A 2 qt/A
6	B	Prowl	2 qt/A
7	C	Rezilon	2 fl oz/A
8	C C	Rezilon Prowl	2 fl oz/A 2 qt/A
9	D	Rezilon	2 fl oz/A
10	D D	Rezilon Prowl	2 fl oz/A 2 qt/A

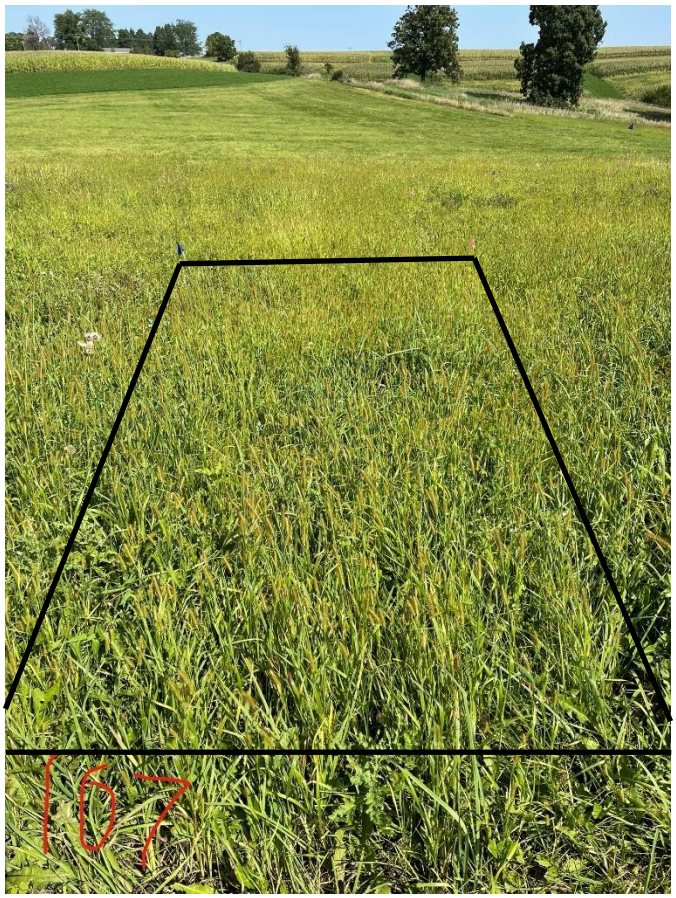
Herbicide Application

Application Timing	A	B	C	D
Date	May, 19, 2022, 10:40am – 11:02am	June, 6, 2022, 9:26am – 9:55am	June, 24, 2022, 1:05pm – 1:15pm	July, 7, 2022, 12:20pm – 12:30pm
Equipment	CO_2 pressurized 10-foot boom sprayer (20 GPA)			
Nozzles & spacing	8 Teejet XR 11002VS nozzles, with 15-inch spacing			
Regulator PSI	48	48	44	44

Weather Data				
Weather Station	KWILANCA17			
Application Timing	A	B	C	D
Temperature	67.0°F – 66.0°F	68.5°F – 74.1°F	86.7°F – 87.1°F	79.4°F – 82.9°F
Wind Speed and Direction	0.58 mph NE – 2.3 mph NE	0.5 mph NE	8.63 mph SSW – 8.98 mph SSW	5.75 mph NE – 6.21 mph NE
Relative Humidity	71%	63% - 68%	41%	74%
Cloud Cover	100%	5%	30%	90%
Previous Rain Event Within 48 Hours	None	June, 6, 2022 – 0.81 inches	None	July, 6, 2022 – 1.69 inches
When ≥ 0.25 inches of precipitation occurred after treatment	6 DAT – 0.83 inches	6 DAT – 0.51 inches	1 DAT – 0.61 inches	1 DAT – 0.29 inches

Research Plot Information	
Plot Dimensions	10 feet by 25 feet
Design	Randomized Complete Block, 4 blocks
Soil Type	Newglarus silt loam
Soil Characteristics	39.1% clay, 0.62% organic matter, 6.5 pH, 25% slope

Pasture Height at Application	
Application Timing	**Average Height (in)**
May, 19, 2022 (A)	10
June, 6, 2022(B)	18
June, 24, 2022 (C)	5
July, 7, 2022 (D)	12

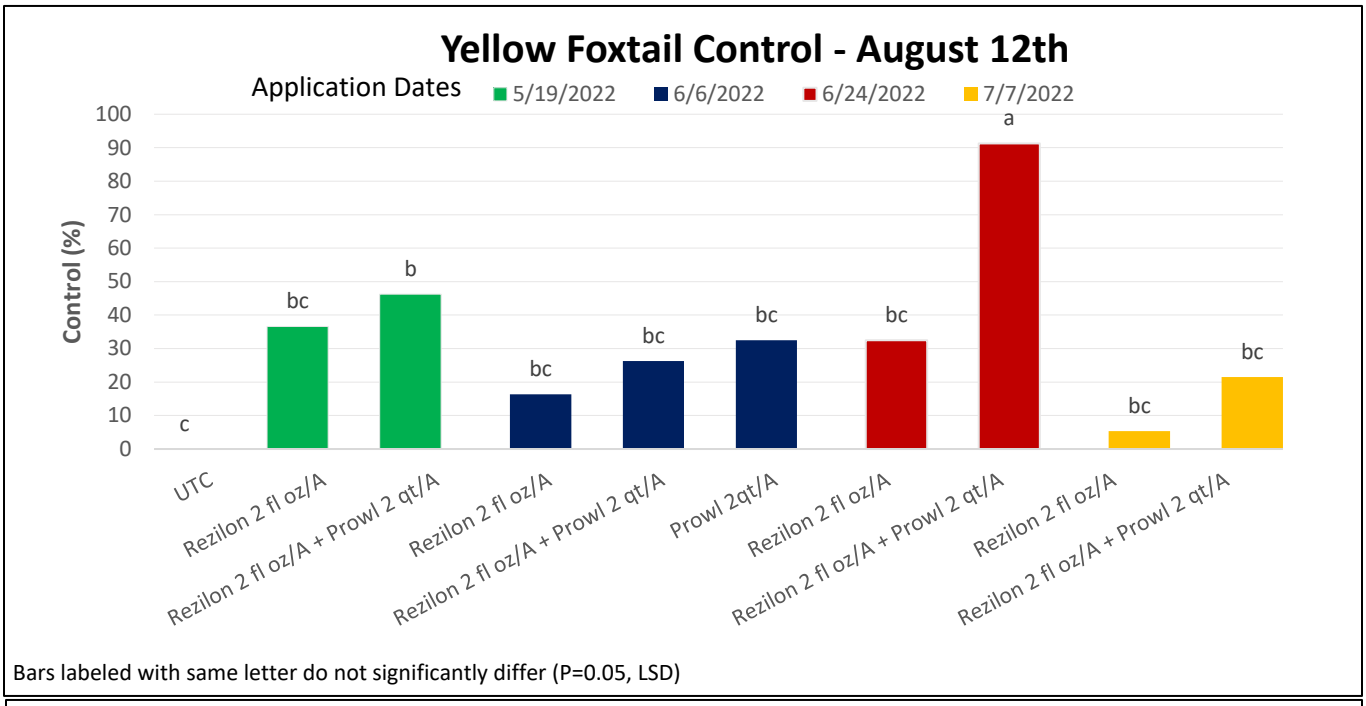


Yellow Foxtail 64 DAT D: Nontreated Control (plot outlined in black)

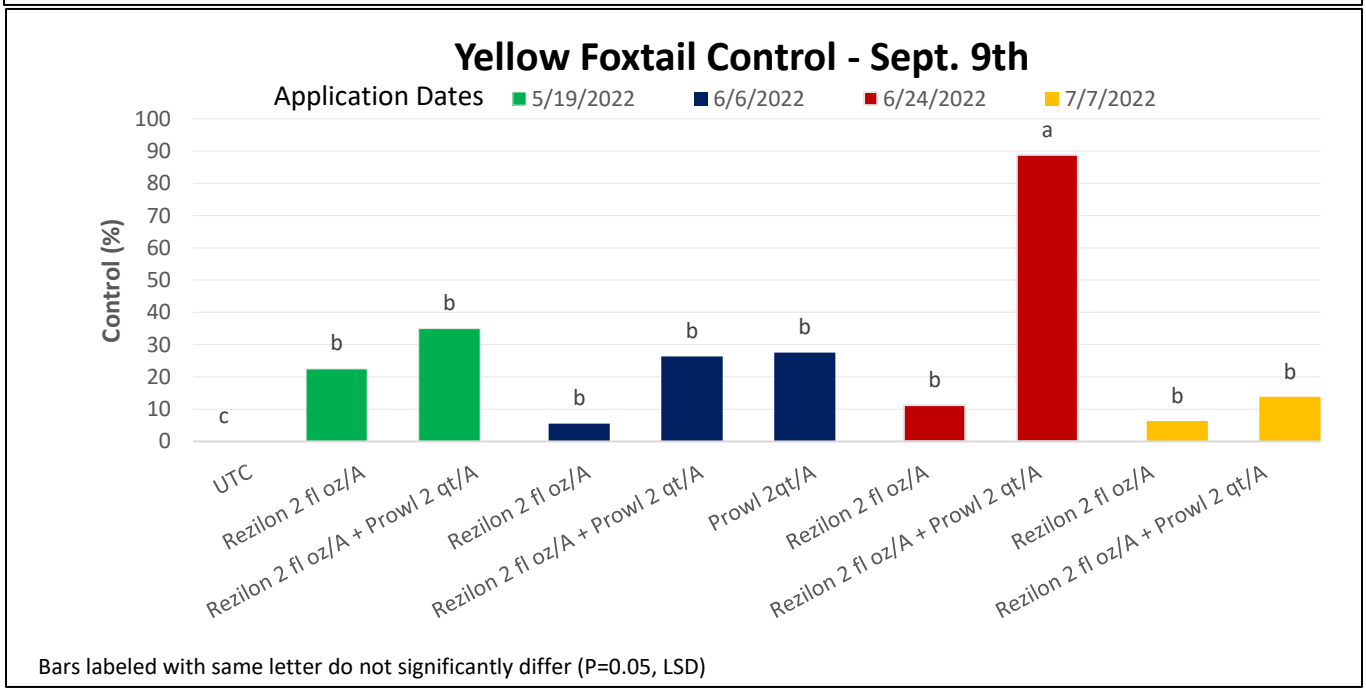
Yellow Foxtail 64 DAT D: Rezilon 2 fl oz/A + Prowl 2 qt/A sprayed at "C"-timing (plot outlined in black)

Index of Ratings and Results

Results:



Bars labeled with same letter do not significantly differ (P=0.05, LSD)



Bars labeled with same letter do not significantly differ (P=0.05, LSD)

36 Days After Treatment D (DAT D) – August, 12, 2022 (1/2)							
Trt. No.	**Timing**	**Treatment**	**Rate**	**Yellow Foxtail Control (%)**	**Tall Fescue Injury (%)**	**Yellow Foxtail Cover (%)**	**Tall Fescue Cover (%)**
1	-	Nontreated Control (NTC)	-	0 c	7.8 c	36.3 a	18.8 -
2	A	Rezilon	2 fl oz/A	36.6 bc	13.8 abc	17.5 ab	17.5 -
3	A A	Rezilon Prowl	2 fl oz/A 2 qt/A	46.3 b	25.0 a	14.3 b	21.3 -
4	B	Rezilon	2 fl oz/A	16.3 bc	15.0 abc	26.3 ab	22.5 -
5	B B	Rezilon Prowl	2 fl oz/A 2 qt/A	26.3 bc	18.8 abc	21.8 ab	21.3 -
6	B	Prowl	2 qt/A	32.5 bc	22.5 ab	20.0 ab	20.0 -
7	C	Rezilon	2 fl oz/A	32.5 bc	16.3 abc	23.0 ab	16.3 -
8	C C	Rezilon Prowl	2 fl oz/A 2 qt/A	91.3 a	25.0 a	1.5 c	16.3 -
9	D	Rezilon	2 fl oz/A	5.3 bc	15.0 abc	31.3 ab	17.5 -
10	D D	Rezilon Prowl	2 fl oz/A 2 qt/A	21.5 bc	10.0 bc	28.8 ab	21.3 -
Statistics[1]							
Least Significant Difference (LSD) P=.05				27.06	8.34	12.21	5.33
Standard Deviation				18.65	5.75	8.41	3.68
Coefficient of Variation (CV)				60.55	34.03	38.16	19.1
Treatment Prob(F)				0.0001	0.0017	0.0003	0.1773

Note: Means followed by same letter or symbol do not significantly differ (P=.05, LSD).

[1] All statistical analyses were conducted in ARM software and assumptions of ANOVA were not evaluated.

36 DAT D – August, 12, 2022 (2/2)						
Trt. No.	**Timing**	**Treatment**	**Rate**	**Kentucky Bluegrass Cover (%)**	**White/Red Clover Cover (%)**	**Bareground/ Litter Cover (%)**
1	-	NTC	-	8.8 -	28.8 ab	7.5 -
2	A	Rezilon	2 fl oz/A	16.3 -	35.0 ab	13.8 -
3	A A	Rezilon Prowl	2 fl oz/A 2 qt/A	13.0 -	40.8 ab	10.8 -
4	B	Rezilon	2 fl oz/A	10.8 -	31.3 ab	9.3 -
5	B B	Rezilon Prowl	2 fl oz/A 2 qt/A	15.0 -	31.3 ab	10.8 -
6	B	Prowl	2 qt/A	15.0 -	31.8 ab	13.3 -
7	C	Rezilon	2 fl oz/A	15.0 -	34.5 ab	11.3 -
8	C C	Rezilon Prowl	2 fl oz/A 2 qt/A	22.5 -	43.5 a	16.3 -
9	D	Rezilon	2 fl oz/A	12.5 -	29.3 ab	9.5 -
10	D D	Rezilon Prowl	2 fl oz/A 2 qt/A	15.0 -	26.3 b	8.8 -
Statistics[2]						
LSD P=.05				7.36	9.02	6.47
Standard Deviation				5.08	6.22	4.46
CV				35.31	18.72	40.19
Treatment Prob(F)				0.0669	0.0129	0.2350

Note: Means followed by same letter or symbol do not significantly differ (P=.05, LSD).

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[2] All statistical analyses were conducted in ARM software and assumptions of ANOVA were not evaluated.

64 DAT D – September, 9, 2022 (1/2)							
Trt. No.	**Timing**	**Treatment**	**Rate**	**Yellow Foxtail Control (%)**	**Yellow Foxtail Cover (%)**	**Tall Fescue Cover (%)**	**Kentucky Bluegrass Cover (%)**
1	-	NTC	-	0.0 b	46.3 a	8.8 -	12.5 -
2	A	Rezilon	2 fl oz/A	22.5 b	31.3 ab	10.0 -	20.0 -
3	A A	Rezilon Prowl	2 fl oz/A 2 qt/A	35.0 b	19.3 ab	12.5 -	21.3 -
4	B	Rezilon	2 fl oz/A	5.5 b	43.8 a	11.3 -	10.0 -
5	B B	Rezilon Prowl	2 fl oz/A 2 qt/A	26.3 b	27.0 ab	10.0 -	21.3 -
6	B	Prowl	2 qt/A	27.5 b	27.5 ab	7.5 -	20.0 -
7	C	Rezilon	2 fl oz/A	11.3 b	31.3 ab	6.3 -	21.3 -
8	C C	Rezilon Prowl	2 fl oz/A 2 qt/A	88.8 a	3.0 b	12.5 -	31.3 -
9	D	Rezilon	2 fl oz/A	6.3 b	41.3 a	10.0 -	10.0 -
10	D D	Rezilon Prowl	2 fl oz/A 2 qt/A	13.8 b	43.8 a	7.5 -	16.3 -
Statistics[3]							
LSD P=.05				23.95	22.65	5.51	13.41
Standard Deviation				16.51	15.61	3.80	9.24
CV				69.74	49.68	39.45	50.3
Treatment Prob(F)				0.0001	0.0145	0.3042	0.0867

Note: Means followed by same letter or symbol do not significantly differ (P=.05, LSD).

[3] All statistical analyses were conducted in ARM software and assumptions of ANOVA were not evaluated.

64 DAT D – September, 9, 2022 (2/2)					
Trt. No.	**Timing**	**Treatment**	**Rate**	**Red/White Clover Cover (%)**	**Bareground/ Litter Cover (%)**
1	-	NTC	-	23.8 -	8.8
2	A	Rezilon	2 fl oz/A	28.8 -	10.0 -
3	A A	Rezilon Prowl	2 fl oz/A 2 qt/A	37.5 -	9.5 -
4	B	Rezilon	2 fl oz/A	27.5 -	7.5 -
5	B B	Rezilon Prowl	2 fl oz/A 2 qt/A	32.5 -	10.5 -
6	B	Prowl	2 qt/A	35.0 -	10.0 -
7	C	Rezilon	2 fl oz/A	28.8 -	12.5 -
8	C C	Rezilon Prowl	2 fl oz/A 2 qt/A	40.0 -	13.3 -
9	D	Rezilon	2 fl oz/A	28.8 -	10.0 -
10	D D	Rezilon Prowl	2 fl oz/A 2 qt/A	26.3 -	6.3 -
Statistics[4]					
LSD P=.05				11.45	4.94
Standard Deviation				7.89	3.41
CV				25.56	34.69
Treatment Prob(F)				0.1280	0.2025

Note: Means followed by same letter or symbol do not significantly differ (P=.05, LSD).

[4] All statistical analyses were conducted in ARM software and assumptions of ANOVA were not evaluated.