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UW – Madison Weed Science Renz Lab

Is Rezilon effective at controlling yellow foxtail in pastures?

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Objective:

Determine the appropriate rate and timing to apply Rezilon, for pre-emergent control of yellow foxtail in cool season pastures.

Summary:

Yellow foxtail, an annual grass, is difficult to manage in cool season grass pastures. Producers rely on pre-emergent herbicides to suppress, but the timing of foxtail emergence isn't known in pastures making application timing difficult. Current recommendations overcome this by applying Prowl at high rates in spring and summer. While modestly effective, the cost prohibits adoption. This experiment evaluated the use of Rezilon, a pre-emergent herbicide registered for use in warm season grass pastures. Research looked to determine the optimum time of application, rate and if injury to cool season grasses occurred. By the end of July (7/29) foxtail cover was low (3-14%) with Rezilon at 5 fl oz/A applied in either the fall or spring providing the lowest cover (<5%) which was similar in value as prowl applied in June after harvest and the split application of Rezilon at the 3 fl oz/a rate in spring and summer. By late august (8/29) only Rezilon at 5 fl oz/A applied the previous fall kept foxtail cover <10%. While these treatments showed promise, none of them differed from other treatments due to the high variability of foxtail cover at the location at either the July or August timing.

Results suggest that foxtail emergence occurred at multiple times throughout the season, as fall and early spring treatments consistently had the lowest cover, however the higher rates were needed suggesting that cohorts also emerged later in the spring/summer. Future research is needed to determine the appropriate timings for foxtail control with pre-emergent herbicides.

Notes

Pasture was primarily tall fescue and Kentucky bluegrass with sparce patches of smooth brome and red and white clovers mixed in.
Trial was cut on June 21st, 2022 and harvested on June 23rd, 2022.

Herbicide Treatments

Treatment Number	Application Timing	Treatment	Rate
1	-	Nontreated Control (NTC)	-
2	A	Rezilon	5 fl oz/A
3	B	Rezilon	2 fl oz/A
4	B	Rezilon	3 fl oz/A
5	B	Rezilon	5 fl oz/A
6	B	Prowl	3 qt/A
7	C	Rezilon	2 fl oz/A
8	C	Rezilon	3 fl oz/A
9	C	Rezilon	5 fl oz/A
10	C	Prowl	3 qt/A
11	A C	Rezilon Rezilon	3 fl oz/A 3 fl oz/A
12	A C	Rezilon Rezilon	2 fl oz/A 2 fl oz/A
13	B C	Rezilon Rezilon	2 fl oz/A 2 fl oz/A
14	B C	Rezilon Rezilon	3 fl oz/A 2 fl oz/A
15	B C	Rezilon Rezilon	3 fl oz/A 3 fl oz/A

Herbicide Application

Application Timing	A	B	C
Date	October, 23, 2021 1:00pm – 2:00pm	April 27, 2022 11:14am – 11:47am	June, 27, 2022 10:55am – 11:45am
Equipment	CO_2 pressurized 10-foot boom sprayer (20 GPA)		
Nozzles & spacing	Eight Teejet XR 11002 VS nozzles, with 15-inch spacing		
Regulator PSI	40	48	44

Weather Data			
Weather Station	KIMADIS233		
Application Timing	A	B	C
Temperature	50°F	35°F – 37°F	70.1°F – 73.3 °F
Wind Speed and Direction	3.0 mph N – 4.5 mph N	7.3 mph E – 8.1 mph E	7.3 mph NW – 8.5 mph NW
Relative Humidity	45%	47%	37%
Cloud Cover	35%	95%	5%
Previous Rain Event Within 48 Hours	None	None	June 25, 2022 – 0.22 inches
When ≥ 0.25 inches of precipitation occurred after treatment	26 hours after treatment – 0.5 inches	3.5 DAT– 0.31 inches	7.5 DAT – 0.54 inches

Research Plot Information	
Plot Dimensions	10 feet by 25 feet
Design	Randomized Complete Block, 4 blocks
Soil Type	Plano silt loam
Soil Characteristics	21% clay, 0.91% organic matter, 7.1 pH, 1% slope

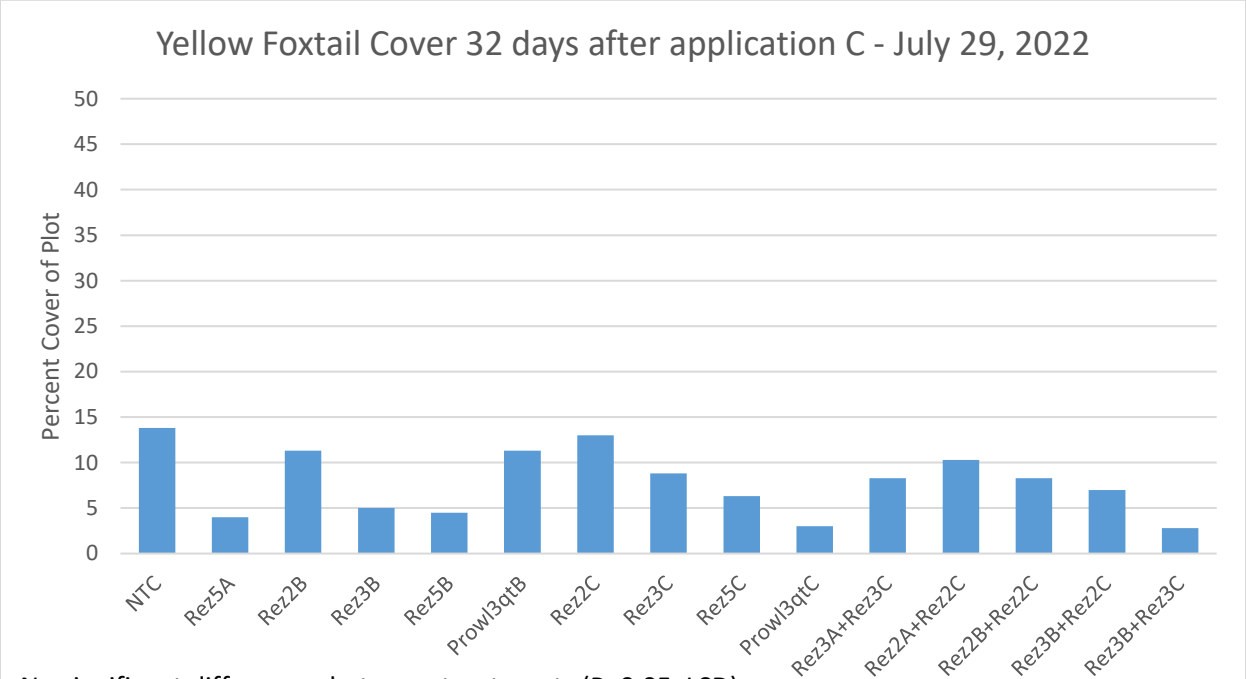
Pasture Height at Application	
Application Timing	**Average Height (in)**
October, 23, 2021 (A)	20
April 27, 2022 (B)	6
June, 27, 2022 (C)	25

Index of Ratings and Results

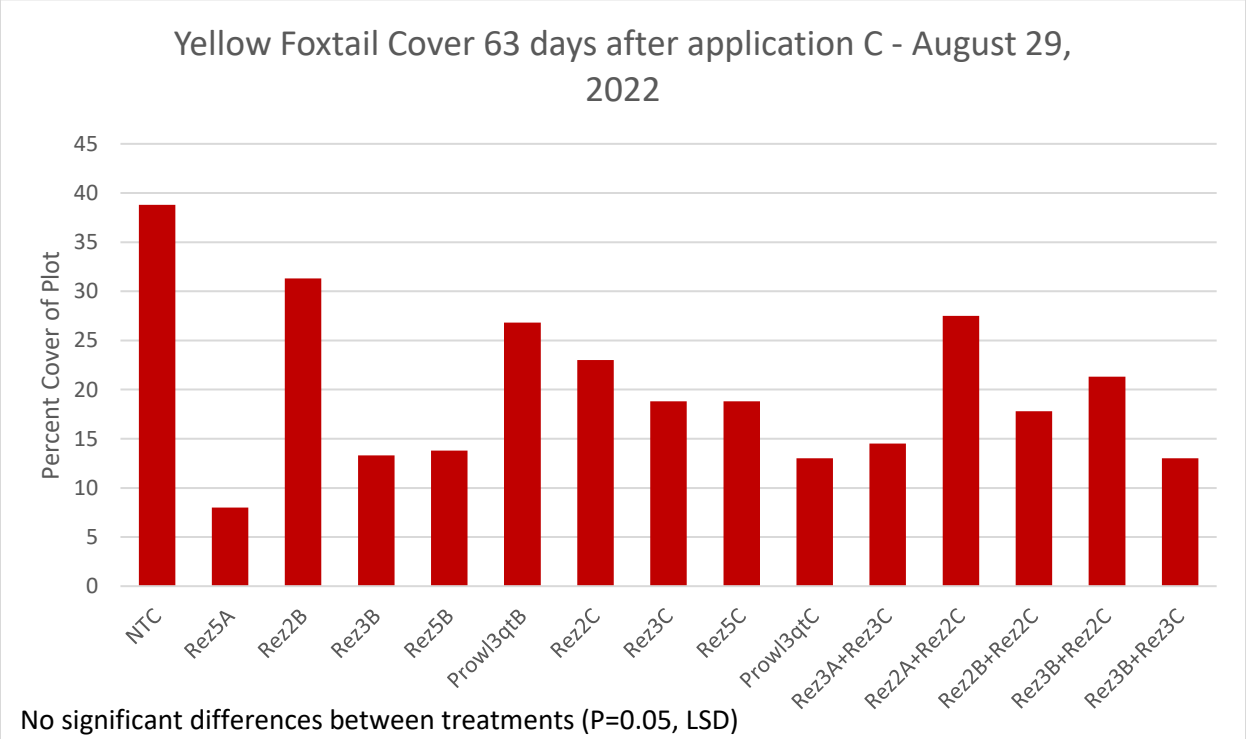
Example of Yellow Foxtail @ 32 DAT C. Note the distinct white hairs on upper surface of leaf, near the base circled in red.

Picture of trial pasture, taken from NW corner @ 63 DAT C. Note widespread yellow foxtail in fields.

Results:



No significant differences between treatments (P=0.05, LSD)



No significant differences between treatments (P=0.05, LSD)

16 Days After Treatment C (DAT C) – July, 13, 2022 1/2							
Trt. No.	**App. Timing**	**Treatment**	**Rate**	**Tall Fescue Ht. Reduc. (%)**	**Tall Fescue Cover (%)**	**Kentucky Bluegrass Cover (%)**	**Red/White Clover Cover (%)**
1	-	NTC	-	3.8 -	13.0 -	35.0 -	1.5 -
2	A	Rezilon	5 fl oz/A	2.5 -	12.0 -	25.0 -	1.8 -
3	B	Rezilon	2 fl oz/A	3.8 -	10.8 -	31.3 -	1.5 -
4	B	Rezilon	3 fl oz/A	5.0 -	11.0 -	28.8 -	1.3 -
5	B	Rezilon	5 fl oz/A	2.5 -	15.3 -	31.3 -	1.3 -
6	B	Prowl	3 qt/A	6.3 -	11.8 -	27.5 -	1.5 -
7	C	Rezilon	2 fl oz/A	8.8 -	10.0 -	33.8 -	1.0 -
8	C	Rezilon	3 fl oz/A	5.0 -	13.0 -	35.0 -	0.5 -
9	C	Rezilon	5 fl oz/A	5.0 -	13.0 -	27.5 -	0.8 -
10	C	Prowl	3 qt/A	0.0 -	10.5 -	35.0 -	1.3 -
11	A C	Rezilon Rezilon	3 fl oz/A 3 fl oz/A	0.0 -	10.5 -	28.8 -	0.8 -
12	A C	Rezilon Rezilon	2 fl oz/A 2 fl oz/A	6.3 -	6.5	33.8 -	1.0 -
13	B C	Rezilon Rezilon	2 fl oz/A 2 fl oz/A	2.5 -	15.5 -	23.8 -	0.8 -
14	B C	Rezilon Rezilon	3 fl oz/A 2 fl oz/A	2.5 -	14.5 -	25.0 -	0.8 -
15	B C	Rezilon Rezilon	3 fl oz/A 3 fl oz/A	2.5 -	9.5 -	28.8 -	0.8 -
Statistics[1]							
Least Significant Difference (LSD) P=.05				5.34	8.79	10.15	0.96
Standard Deviation				3.74	6.16	7.12	0.67
Coefficient of Variation (CV)				99.74	52.29	23.72	61.81
Treatment Prob(F)				0.1206	0.8540	0.3117	0.2795

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

16 DAT C – July, 13, 2022 2/2						
Trt. No.	App. Timing	Treatment	Rate	Yellow Foxtail Cover (%)	Smooth Brome Cover (%)	Bareground/ Litter (%)
1	-	NTC	-	0.0 -	12.8 -	37.8 -
2	A	Rezilon	5 fl oz/A	0.3 -	19.3 -	41.8 -
3	B	Rezilon	2 fl oz/A	0.3 -	12.5 -	43.8 -
4	B	Rezilon	3 fl oz/A	0.0 -	14.5 -	44.5 -
5	B	Rezilon	5 fl oz/A	0.5 -	6.8 -	45.0 -
6	B	Prowl	3 qt/A	0.0 -	12.0 -	47.3 -
7	C	Rezilon	2 fl oz/A	0.3 -	13.3 -	41.8 -
8	C	Rezilon	3 fl oz/A	0.0 -	12.5 -	39.0 -
9	C	Rezilon	5 fl oz/A	0.0 -	13.5 -	45.3 -
10	C	Prowl	3 qt/A	0.0 -	9.3 -	44.0 -
11	A C	Rezilon Rezilon	3 fl oz/A 3 fl oz/A	0.8 -	11.3 -	48.0 -
12	A C	Rezilon Rezilon	2 fl oz/A 2 fl oz/A	0.5 -	11.8 -	46.5 -
13	B C	Rezilon Rezilon	2 fl oz/A 2 fl oz/A	0.0 -	15.5 -	44.5 -
14	B C	Rezilon Rezilon	3 fl oz/A 2 fl oz/A	0.0 -	12.8 -	47.0 -
15	B C	Rezilon Rezilon	3 fl oz/A 3 fl oz/A	0.0 -	19.3 -	41.8 -
Statistics[2]						
LSD P=.05				0.73	9.16	9.40
Standard Deviation				0.51	6.42	6.59
CV				307.99	48.91	15.02
Treatment Prob(F)				0.5615	0.4581	0.6488

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

32 DAT C – July, 29, 2022 1/2								
Trt. No.	App. Timing	Treatment	Rate	Tall Fescue Ht. Reduc. (%)	Yellow Foxtail Control (%)	Tall Fescue Cover (%)	Kentucky Bluegrass Cover (%)	Red/White Clover Cover (%)
1	-	NTC	-	0.0 b	0.0 -	17.5 -	33.8 -	1.8 -
2	A	Rezilon	5 fl oz/A	22.5 a	73.8 -	15.8 -	30.5 -	1.3 -
3	B	Rezilon	2 fl oz/A	16.3 a	40.0 -	12.3 -	42.5 -	1.3 -
4	B	Rezilon	3 fl oz/A	20.0 a	68.5 -	22.5 -	40.0 -	1.0 -
5	B	Rezilon	5 fl oz/A	14.3 a	70.0 -	18.8 -	45.0 -	0.8 -
6	B	Prowl	3 qt/A	17.5 a	42.5 -	17.5 -	36.3 -	1.3 -
7	C	Rezilon	2 fl oz/A	17.5 a	44.8 -	10.0 -	37.5 -	1.3 -
8	C	Rezilon	3 fl oz/A	16.3 a	52.5 -	8.0 -	40.0 -	1.0 -
9	C	Rezilon	5 fl oz/A	18.8 a	56.3 -	15.8 -	33.8 -	1.0 -
10	C	Prowl	3 qt/A	15.0 a	73.5 -	18.8 -	46.0 -	1.3 -
11	A C	Rezilon Rezilon	3 fl oz/A 3 fl oz/A	13.8 a	64.8 -	13.0 -	40.0 -	1.0 -
12	A C	Rezilon Rezilon	2 fl oz/A 2 fl oz/A	17.5 a	51.3 -	9.3 -	40.0 -	1.0 -
13	B C	Rezilon Rezilon	2 fl oz/A 2 fl oz/A	12.5 a	58.8 -	18.8 -	33.8 -	1.0 -
14	B C	Rezilon Rezilon	3 fl oz/A 2 fl oz/A	15.0 a	56.3 -	15.8 -	38.8 -	1.0 -
15	B C	Rezilon Rezilon	3 fl oz/A 3 fl oz/A	12.5 a	84.5 -	18.8 -	42.5 -	1.0 -
Statistics[3]								
LSD P=.05				8.65	41.30	9.88	9.54	0.56
Standard Deviation				6.06	28.94	6.93	6.69	0.39
CV				39.66	51.85	44.73	17.29	34.96
Treatment Prob(F)				0.0055	0.0531	0.1775	0.0775	0.2079

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.

32 DAT C – July, 29, 2022 2/2							
Trt. No.	**App. Timing**	**Treatment**	**Rate**	**Yellow Foxtail Cover (%)**	**Smooth Brome Cover (%)**	**Bareground/ Litter (%)**	**Tall Fescue Injury (%)**
1	-	NTC	-	13.8 -	19.5 -	13.8 -	3.0 -
2	A	Rezilon	5 fl oz/A	4.0 -	28.8 -	19.8 -	5.0 -
3	B	Rezilon	2 fl oz/A	11.3 -	16.3 -	16.5 -	6.8 -
4	B	Rezilon	3 fl oz/A	5.0 -	17.0 -	14.5 -	3.5 -
5	B	Rezilon	5 fl oz/A	4.5 -	9.5 -	21.5 -	8.8 -
6	B	Prowl	3 qt/A	11.3 -	12.0 -	21.8 -	3.0 -
7	C	Rezilon	2 fl oz/A	13.0 -	20.0 -	18.3 -	6.8 -
-8	C	Rezilon	3 fl oz/A	8.8 -	23.8 -	18.5 -	5.3 -
9	C	Rezilon	5 fl oz/A	6.3 -	24.5 -	18.8 -	4.3 -
10	C	Prowl	3 qt/A	3.0 -	9.8 -	21.3 -	3.0 -
11	A C	Rezilon Rezilon	3 fl oz/A 3 fl oz/A	8.3 -	18.0 -	19.8 -	6.5 -
12	A C	Rezilon Rezilon	2 fl oz/A 2 fl oz/A	10.3 -	15.0 -	24.5 -	4.0 -
13	B C	Rezilon Rezilon	2 fl oz/A 2 fl oz/A	8.3 -	20.0 -	18.3 -	5.0 -
14	B C	Rezilon Rezilon	3 fl oz/A 2 fl oz/A	7.0 -	25.0 -	12.5 -	3.0 -
15	B C	Rezilon Rezilon	3 fl oz/A 3 fl oz/A	2.8 -	15.8 -	19.3 -	9.3 -
Statistics[4]							
LSD P=.05				9.51	13.72	7.85	6.30
Standard Deviation				6.66	9.62	5.50	4.41
CV				85.21	52.5	29.62	85.95
Treatment Prob(F)				0.3482	0.2109	0.2095	0.5824

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

63 DAT C – August, 29, 2022 1/2							
Trt. No.	**App. Timing**	**Treatment**	**Rate**	**Tall Fescue Cover (%)**	**Yellow Foxtail Cover (%)**	**Smooth Brome Cover (%)**	**Kentucky Bluegrass Cover (%)**
1	-	NTC	-	8.8 -	38.8 -	11.3 -	32.0 -
2	A	Rezilon	5 fl oz/A	13.8 -	8.0 -	30.0 -	40.3 -
3	B	Rezilon	2 fl oz/A	10.0 -	31.3 -	7.5 -	41.0 -
4	B	Rezilon	3 fl oz/A	17.5 -	13.3 -	13.8 -	44.0 -
5	B	Rezilon	5 fl oz/A	17.5 -	13.8 -	10.3 -	48.0 -
6	B	Prowl	3 qt/A	15.0 -	26.8 -	15.0 -	36.0 -
7	C	Rezilon	2 fl oz/A	12.5 -	23.0 -	15.0 -	38.3 -
8	C	Rezilon	3 fl oz/A	11.3 -	18.8 -	23.8 -	38.5 -
9	C	Rezilon	5 fl oz/A	13.8 -	18.8 -	21.3 -	38.3 -
10	C	Prowl	3 qt/A	17.5 -	13.0 -	8.8 -	49.5 -
11	A C	Rezilon Rezilon	3 fl oz/A 3 fl oz/A	12.8 -	14.5 -	11.3 -	51.5 -
12	A C	Rezilon Rezilon	2 fl oz/A 2 fl oz/A	6.3 -	27.5 -	15.8 -	42.5 -
13	B C	Rezilon Rezilon	2 fl oz/A 2 fl oz/A	13.8 -	17.8 -	21.3 -	39.0 -
14	B C	Rezilon Rezilon	3 fl oz/A 2 fl oz/A	20.0 -	21.3 -	17.5 -	33.3 -
15	B C	Rezilon Rezilon	3 fl oz/A 3 fl oz/A	13.8 -	13.0 -	18.8 -	47.8 -
Statistics[5]							
LSD P=.05				8.16	21.74	15.67	16.25
Standard Deviation				5.72	15.24	10.98	11.39
CV				42.02	76.37	68.36	27.57
Treatment Prob(F)				0.1100	0.3278	0.2732	0.4230

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

63 DAT C – August, 29, 2022 2/2						
Trt. No.	**App. Timing**	**Treatment**	**Rate**	**Red/White Clover Cover (%)**	**Bareground/ Litter (%)**	**Yellow Foxtail Control (%)**
1	-	NTC	-	5.0 -	4.3 -	0.0 -
2	A	Rezilon	5 fl oz/A	3.0 -	5.0 -	71.3 -
3	B	Rezilon	2 fl oz/A	5.3 -	5.0 -	23.8 -
4	B	Rezilon	3 fl oz/A	6.5 -	5.0 -	56.3 -
5	B	Rezilon	5 fl oz/A	5.5 -	5.0 -	55.0 -
6	B	Prowl	3 qt/A	5.8 -	4.0 -	36.3 -
7	C	Rezilon	2 fl oz/A	6.3 -	5.0 -	46.3 -
8	C	Rezilon	3 fl oz/A	2.8 -	5.0 -	42.5 -
9	C	Rezilon	5 fl oz/A	3.5 -	4.5 -	46.3 -
10	C	Prowl	3 qt/A	6.3 -	5.0 -	57.5 -
11	A C	Rezilon Rezilon	3 fl oz/A 3 fl oz/A	5.0 -	5.0 -	52.5 -
12	A C	Rezilon Rezilon	2 fl oz/A 2 fl oz/A	2.5 -	4.3 -	36.3 -
13	B C	Rezilon Rezilon	2 fl oz/A 2 fl oz/A	3.3 -	5.0 -	47.5 -
14	B C	Rezilon Rezilon	3 fl oz/A 2 fl oz/A	3.0 -	5.0 -	37.5 -
15	B C	Rezilon Rezilon	3 fl oz/A 3 fl oz/A	3.5 -	4.5 -	61.3 -
Statistics[6]						
LSD P=.05				3.99	1.35	37.93
Standard Deviation				2.80	0.95	26.58
CV				62.62	19.84	59.51
Treatment Prob(F)				0.4235	0.8670	0.1039

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