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UNIVERSITY OF WISCONSIN-MADISON

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UW – Madison Weed Science Renz Lab

HE21USAZBC – Rezilon grass tolerance on tall fescue

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Objective:

Determine crop tolerance of established tall fescue (*Schedonorus arundinaceus*) to applications of Rezilon (indaziflam).

Summary:

Applications of Rezilon did not result in increased visual injury of tall fescue compared to non-treated control plots at any time after herbicide application. However, biomass production at the first hay harvest in June was reduced by increasing rates of Rezilon. Rates of 2 oz/A reduced yields by 14-28 percent, while 3 oz/A reduced yield by 22-40 percent. Rezilon applications of 1.5 oz/a also showed reduced yield (0-28%) but it was not always significantly different than non-treated areas indicating potential for limited injury at this rate. In contrast to the first timing, biomass yields did not differ at the second hay harvest in July, even when additional treatments were applied after the first harvest. This suggests that grasses are most sensitive to Rezilon in early spring and reductions in yield may be minimal after spring. Overall yield for the season suggests that Rezilon applications at 2 oz or greater reduce biomass yields of tall fescue, but 1.5 oz/A applied once in the spring or twice throughout the year may have limited to no yield reductions. Further research is needed to confirm this observation and determine if effective annual grass control can be achieved with this approach.

Notes

- Some plots were under sprayed or not sprayed at all from low or depleted herbicide amounts during A-timing application
  - Treatment 5: one plot under sprayed
  - Treatment 3, 6: two plots not sprayed
  - Treatment 4: one plot under sprayed
  - Treatment 8: one plot under sprayed, one plot not sprayed
  - Treatment 9: one plot under sprayed, one plot not sprayed
- Boom height held at 18" due to high wind
- Field harvested 6/16/21, one day before B-timing application

Herbicide Treatments

Treatment Number	Treatment	Rate
A timing		
1	Untreated Control (UTC)	-
2	Rezilon	1.5 fluid ounces per acre (fl oz/A)
3	Rezilon	2 fl oz/A
4	Rezilon	3 fl oz/A
5	Rezilon	1.5 fl oz/A
6	Rezilon	2 fl oz/A
7	Rezilon	3 fl oz/A
8	Prowl H2O	4 qt/A
9	Prowl H2O	2 qt/A
B timing		
5	Rezilon	1.5 fl oz/A
6	Rezilon	2 fl oz/A
7	Rezilon	3 fl oz/A
8	Prowl H20	2 qt/A

Herbicide Application

Application Timing	A	B
Date	April 5th, 2021, 12:20pm – 1:00pm	June 17th, 2021, 10:45am – 11:00am
Regulator PSI	39	40
Equipment	CO_2 pressurized 10-foot boom sprayer (20 GPA)	
Nozzles & spacing	Eight Teejet 11002 VS nozzles with 15-inch spacing	

Weather Data		
Weather Station	KWIARLIN2	
Application Timing	A	B
Temperature	66.5°F – 66.4°F	76.4°F –77.4°F
Wind Speed and Direction	7.3 mph SW – 10.9 mph SW	10.5 mph SSW – 12.4 mph SSW
Relative Humidity	65% - 65%	46% - 45%
Cloud Cover	95%	40%
When ≥ 0.25 inches of precipitation occurred after treatment	April 10th, 2021, 11:55pm – 0.37 inches	June 18th, 2021, 3:15am – 1.44 inches

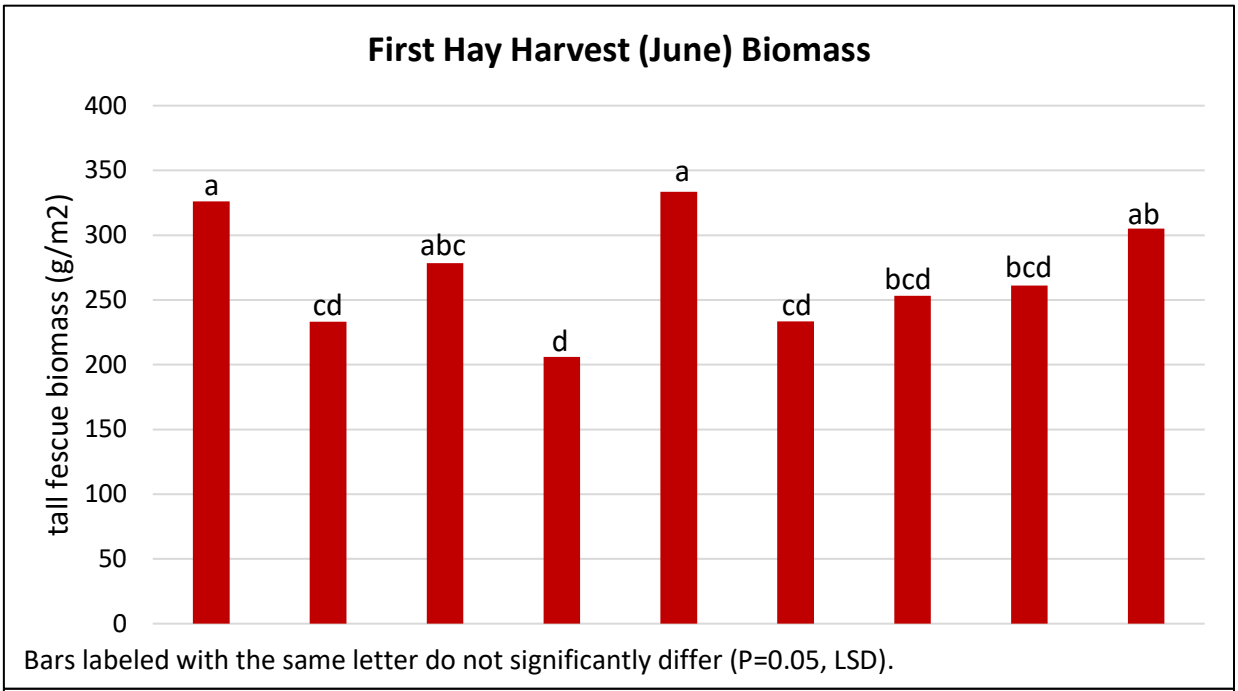
Research Plot Information	
Plot Dimensions	10 feet by 25 feet
Design	Randomized Complete Block, 4 blocks
Soil Type	Saybrook Silt Loam
Soil Characteristics	24.6% clay, 1% organic matter, 7.1 pH, 4% slope

Plants Present at Application – Developmental Stage		
Species	**Average Height (in)**	**Phenological Stage**
Tall fescue (*Festuca arundinacea*)	6.7	Vegetative
Kentucky bluegrass (*Poa pratensis*)	3.7	Vegetative

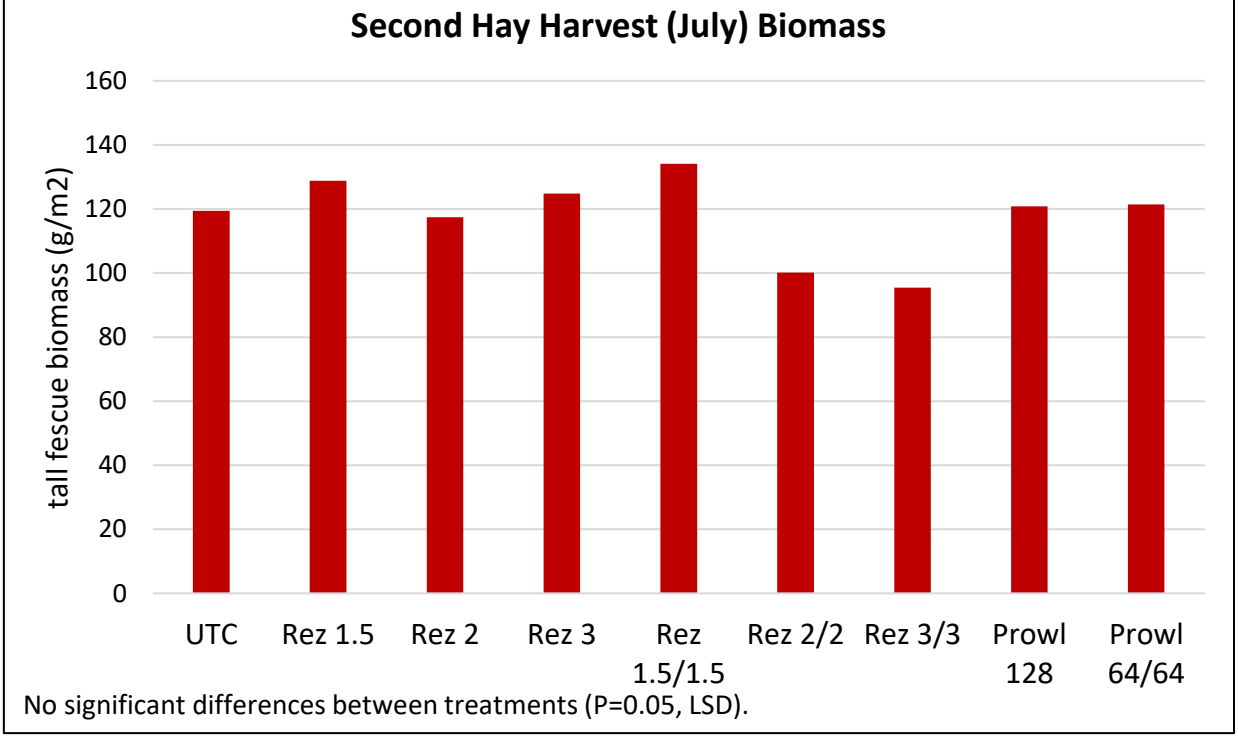
Tall fescue at A-timing application – April 5th, 2021.

Index of Ratings and Results

Results:



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



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

0 Days After Treatment (DAT) – April 5th, 2021						
Trt. No.	**App. Timing**	**Treatment**	**Rate**	**Kentucky Bluegrass Cover (%)**	**Tall Fescue Cover (%)**	**Bareground/ Litter Cover (%)**
1	A	UTC	-	15 -	18 -	68 bc
2	A	Rezilon	1.5 fl oz/A	15 -	11 -	74 abc
3	A	Rezilon	2 fl oz/A	9 -	15 -	76 ab
4	A	Rezilon	3 fl oz/A	6 -	14 -	80 a
5	A, B	Rezilon	1.5 fl oz/A	15 -	20 -	65 c
6	A, B	Rezilon	2 fl oz/A	14 -	18 -	69 bc
7	A, B	Rezilon	3 fl oz/A	9 -	15 -	76 ab
8	A, B	Prowl H2O	4 qt/A	9 -	16 -	75 ab
9	A	Prowl H2O	2 qt/A	15 -	13 -	73 abc
Statistics[1]						
Least Significant Difference (LSD) P=.05				9.23	11.75	9.27
Standard Deviation				6.32	8.05	6.35
Coefficient of Variation (CV)				53.69	52.24	8.72
Treatment Prob(F)				0.2768	0.8734	0.0494

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.

17 DAT – April 22nd, 2021							
Trt. No.	**App. Timing**	**Treatment**	**Rate**	**Tall Fescue Injury (%)**	**Kentucky Bluegrass Injury (%)**	**Broadleaf Weed Cover (%)**	**Grass Weeds Cover (%)**
1	A	UTC	-	0 -	0 -	0.5 -	0 -
2	A	Rezilon	1.5 fl oz/A	0.3 -	0 -	0.3 -	0 -
3	A	Rezilon	2 fl oz/A	0 -	0 -	0 -	0 -
4	A	Rezilon	3 fl oz/A	0 -	0 -	0 -	0 -
5	A, B	Rezilon	1.5 fl oz/A	0 -	0 -	0.3 -	0 -
6	A, B	Rezilon	2 fl oz/A	0 -	0 -	0 -	0 -
7	A, B	Rezilon	3 fl oz/A	0 -	0 -	0 -	0 -
8	A, B	Prowl H2O	4 qt/A	0 -	0 -	0 -	0 -
9	A	Prowl H2O	2 qt/A	0 -	0 -	0.3 -	0 -
Statistics							
LSD P=.05				0.24	.	0.51	.
Standard Deviation				0.17	0	0.35	0
CV				600	0	252.19	0
Treatment Prob(F)				0.4613	1	0.4123	1

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

28 DAT – May 3rd, 2021						
Trt. No.	**App. Timing**	**Treatment**	**Rate**	**Tall Fescue Injury (%)**	**Kentucky Bluegrass Injury (%)**	**Broadleaf Weed Cover (%)**
1	A	UTC	-	2 -	2 -	1 -
2	A	Rezilon	1.5 fl oz/A	3 -	3 -	1 -
3	A	Rezilon	2 fl oz/A	2 -	3 -	1 -
4	A	Rezilon	3 fl oz/A	3 -	3 -	0 -
5	A, B	Rezilon	1.5 fl oz/A	4 -	1 -	2 -
6	A, B	Rezilon	2 fl oz/A	2 -	2 -	1 -
7	A, B	Rezilon	3 fl oz/A	3 -	3 -	0 -
8	A, B	Prowl H2O	4 qt/A	3 -	3 -	0.3 -
9	A	Prowl H2O	2 qt/A	3 -	2 -	0 -
Statistics						
LSD P=.05				1.71	3.18	1.34
Standard Deviation				1.17	2.18	0.92
CV				44.29	99.22	164.77
Treatment Prob(F)				0.6218	0.8815	0.218

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

49 DAT – May 24th, 2021											
Trt. No.	App. Timing	Treatment	Rate	Tall Fescue Injury (%)	Kentucky Bluegrass Injury (%)	Annual Broadleaf Cover (%)	Annual Grass Weed Cover (%)	Perennial Broadleaf Cover (%)	Bareground /Litter Cover (%)	Tall Fescue Cover (%)	Kentucky Bluegrass Cover (%)
1	A	UTC	-	1 -	0 -	0 -	0 -	4 -	3 -	51 -	43 -
2	A	Rezilon	1.5 fl oz/A	1 -	1 -	0 -	0 -	1 -	4 -	32 -	63 -
3	A	Rezilon	2 fl oz/A	1 -	1 -	0 -	0 -	2 -	7 -	25 -	67 -
4	A	Rezilon	3 fl oz/A	1 -	1 -	0 -	0 -	0.3 -	6 -	28 -	65 -
5	A, B	Rezilon	1.5 fl oz/A	1 -	0 -	0 -	0 -	2 -	5 -	40 -	53 -
6	A, B	Rezilon	2 fl oz/A	0.3 -	0 -	0 -	0 -	3 -	4 -	38 -	55 -
7	A, B	Rezilon	3 fl oz/A	1 -	1 -	0 -	0 -	2 -	4 -	39 -	54 -
8	A, B	Prowl H2O	4 qt/A	1 -	0.3 -	0 -	0 -	0.3 -	4 -	58 -	38 -
9	A	Prowl H2O	2 qt/A	1 -	0.3 -	0 -	0 -	1 -	4 -	42 -	53 -
Statistics											
LSD P=.05				1.09	1.06	.	.	3.32	2.81	23.91	23.27
Standard Deviation				0.63	0.61	0	0	1.92	1.62	13.81	13.45
CV				65.53	137.78	0	0	120.39	35.06	35.22	24.63
Treatment Prob(F)				0.6714	0.2149	1	1	0.449	0.2222	0.1747	0.2068

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

71 DAT – June 15th, 2021				
Trt. No.	**App. Timing**	**Treatment**	**Rate**	**Biomass (g/m^2)**
1	A	UTC	-	326 a
2	A	Rezilon	1.5 fl oz/A	233 cd
3	A	Rezilon	2 fl oz/A	278 abc
4	A	Rezilon	3 fl oz/A	206 d
5	A, B	Rezilon	1.5 fl oz/A	333 a
6	A, B	Rezilon	2 fl oz/A	233 cd
7	A, B	Rezilon	3 fl oz/A	253 bcd
8	A, B	Prowl H2O	4 qt/A	261 bcd
9	A	Prowl H2O	2 qt/A	305 ab
Statistics				
LSD P=.05				57.099
Standard Deviation				32.988
CV				12.22
Treatment Prob(F)				0.0021

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

88, 15 DAT – July 2nd, 2021								
Trt. No.	**App. Timing**	**Treatment**	**Rate**	**Tall Fescue Injury (%)**	**Kentucky Bluegrass Injury (%)**	**Annual Broadleaf Cover (%)**	**Annual Grass Weed Cover (%)**	**Perennial Broadleaf Cover (%)**
1	A	UTC	-	0.3 -	0 -	0 -	0 -	1 -
2	A	Rezilon	1.5 fl oz/A	1 -	0.3 -	0 -	0 -	0.3 -
3	A	Rezilon	2 fl oz/A	1 -	0 -	0 -	0 -	2 -
4	A	Rezilon	3 fl oz/A	1 -	0 -	0 -	0 -	1 -
5	A, B	Rezilon	1.5 fl oz/A	0 -	0 -	0 -	0 -	0 -
6	A, B	Rezilon	2 fl oz/A	1 -	0 -	0 -	0 -	1 -
7	A, B	Rezilon	3 fl oz/A	0 -	0 -	0 -	0 -	0 -
8	A, B	Prowl H2O	4 qt/A	1 -	0 -	0 -	0 -	0 -
9	A	Prowl H2O	2 qt/A	1 -	0 -	0 -	0 -	0.3 -
Statistics								
LSD P=.05				1.58	0.33	.	.	1.8
Standard Deviation				0.91	0.19	0	0	1.04
CV				129.36	519.62	0	0	200.3
Treatment Prob(F)				0.4414	0.4726	1	1	0.4179

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

101, 28 DAT – July 15th, 2021							
Trt. No.	App. Timing	Treatment	Rate	Tall Fescue Injury (%)	Kentucky Bluegrass Injury (%)	Annual Broadleaf Cover (%)	Annual Grass Weed Cover (%)
1	A	UTC	-	2 -	0 -	0 -	0 -
2	A	Rezilon	1.5 fl oz/A	2 -	0.3 -	0 -	0 -
3	A	Rezilon	2 fl oz/A	3 -	0 -	0 -	0 -
4	A	Rezilon	3 fl oz/A	2 -	0 -	0 -	0 -
5	A, B	Rezilon	1.5 fl oz/A	2 -	0 -	0 -	0 -
6	A, B	Rezilon	2 fl oz/A	2 -	0 -	0 -	0 -
7	A, B	Rezilon	3 fl oz/A	4 -	1 -	0 -	0 -
8	A, B	Prowl H2O	4 qt/A	2 -	0.3 -	0 -	0 -
9	A	Prowl H2O	2 qt/A	2 -	0.3 -	0 -	0 -
Statistics							
LSD P=.05				2.66	0.88	.	.
Standard Deviation				1.54	0.51	0	0
CV				65.85	274.95	0	0
Treatment Prob(F)				0.6559	0.7041	1	1

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

105, 32 DAT – July 19th, 2021					
Trt. No.	**App. Timing**	**Treatment**	**Rate**	**Biomass (g/m^2)**	**Total Biomass Yield (June + July) (g/m^2)**
1	A	UTC	-	119 -	445 ab
2	A	Rezilon	1.5 fl oz/A	129 -	362 cd
3	A	Rezilon	2 fl oz/A	117 -	396 a-d
4	A	Rezilon	3 fl oz/A	125 -	331 d
5	A, B	Rezilon	1.5 fl oz/A	134 -	468 a
6	A, B	Rezilon	2 fl oz/A	100 -	333 d
7	A, B	Rezilon	3 fl oz/A	95 -	349 d
8	A, B	Prowl H2O	4 qt/A	121 -	382 bcd
9	A	Prowl H2O	2 qt/A	121 -	427 abc
Statistics					
LSD P=.05				58.329	92.657
Standard Deviation				33.699	53.531
CV				28.54	13.8
Treatment Prob(F)				0.8922	0.051

Note: Means followed by same letter or symbol do not significantly differ (P=0.1, LSD).

116, 43 DAT – July 30th, 2021							
Trt. No.	App. Timing	Treatment	Rate	Tall Fescue Injury (%)	Kentucky Bluegrass Injury (%)	Broadleaf Weed Cover (%)	Annual Grass Weed Cover (%)
1	A	UTC	-	2 -	5 -	1 -	0 -
2	A	Rezilon	1.5 fl oz/A	5 -	3 -	1 -	0 -
3	A	Rezilon	2 fl oz/A	4 -	5 -	1 -	0 -
4	A	Rezilon	3 fl oz/A	4 -	4 -	1 -	0 -
5	A, B	Rezilon	1.5 fl oz/A	3 -	4 -	1 -	0 -
6	A, B	Rezilon	2 fl oz/A	3 -	5 -	1 -	0 -
7	A, B	Rezilon	3 fl oz/A	3 -	4 -	1 -	0 -
8	A, B	Prowl H2O	4 qt/A	3 -	6 -	0.3 -	0 -
9	A	Prowl H2O	2 qt/A	3 -	7 -	1 -	0 -
Statistics							
LSD P=.05				2.6	4.16	0.88	.
Standard Deviation				1.5	2.4	0.51	0
CV				45	48.78	62.49	0
Treatment Prob(F)				0.4272	0.6732	0.7041	1

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

128, 55 DAT – August 11th, 2021								
Trt. No.	**App. Timing**	**Treatment**	**Rate**	**Tall Fescue Injury (%)**	**Kentucky Bluegrass Injury (%)**	**Annual Broadleaf Cover (%)**	**Annual Grass Weed Cover (%)**	**Perennial Broadleaf Cover (%)**
1	A	UTC	-	1 -	3 -	0 -	0 -	1 -
2	A	Rezilon	1.5 fl oz/A	0 -	5 -	0 -	0 -	1 -
3	A	Rezilon	2 fl oz/A	0 -	4 -	0 -	0 -	2 -
4	A	Rezilon	3 fl oz/A	0 -	4 -	0 -	0 -	1 -
5	A, B	Rezilon	1.5 fl oz/A	1 -	3 -	0 -	0 -	2 -
6	A, B	Rezilon	2 fl oz/A	1 -	4 -	0 -	0 -	2 -
7	A, B	Rezilon	3 fl oz/A	0.3 -	6 -	0 -	0 -	1 -
8	A, B	Prowl H2O	4 qt/A	1 -	5 -	0 -	0 -	1 -
9	A	Prowl H2O	2 qt/A	0.3 -	4 -	0 -	0 -	1 -
Statistics								
LSD P=.05				1.01	3.88	.	.	2.23
Standard Deviation				0.59	2.24	0	0	1.29
CV				143.67	52.69	0	0	96.42
Treatment Prob(F)				0.378	0.7455	1	1	0.799

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

157, 84 DAT – September 9th, 2021						
Trt. No.	**App. Timing**	**Treatment**	**Rate**	**Tall Fescue Injury (%)**	**Kentucky Bluegrass Injury (%)**	**Annual Grass Weed Cover (%)**
1	A	UTC	-	2 -	0 -	4 -
2	A	Rezilon	1.5 fl oz/A	1 -	1 -	2 -
3	A	Rezilon	2 fl oz/A	1 -	1 -	2 -
4	A	Rezilon	3 fl oz/A	1 -	0.3 -	0.3 -
5	A, B	Rezilon	1.5 fl oz/A	1 -	1 -	1 -
6	A, B	Rezilon	2 fl oz/A	0.3 -	3 -	1 -
7	A, B	Rezilon	3 fl oz/A	0 -	2 -	0 -
8	A, B	Prowl H2O	4 qt/A	1 -	0.3 -	0 -
9	A	Prowl H2O	2 qt/A	0.3 -	1 -	0 -
Statistics						
LSD P=.05				1.39	2.18	3.12
Standard Deviation				0.81	1.26	1.81
CV				108.69	117.49	168.08
Treatment Prob(F)				0.3962	0.2141	0.1544

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