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Stocking rate and supplementation for steers grazing bluestem pasture in early summer

Abstract

Native bluestem pastures were grazed from May 16 to July 14, 1983 by steers with an average beginning weight of 545lbs., at stocking rates of 1.82, 1.5, and 1.25 acres per steer. Daily gains for the high and low stocking rates were higher ($P < .01$) than for the medium stocking rate (2.22, 2.24 vs. 1.92 lb/day). Gains per acre were similar for the low and medium stocking rates, but was higher for the highest stocking rate (73, 75 vs 105 lb/acre). Half of the steers in each stocking rate were self-fed a salt-limiting sorghum grain-Rumensin® mixture at an average intake of 1.84 lb per head per day. Supplementation increased daily gain ($P < .01$) over non-supplemented (2.39 vs. 1.86 lb/day). Gain per acre was increased 22 lbs by supplementation. Herbage remaining following grazing decline with increased stocking rate. No regrowth occurred following livestock removal in mid July. Warm-season perennial grass composition and basal cover have not changed differentially in relation to stocking rate during the 3-year study period.

Keywords

Cattlemen's Day, 1984; Kansas Agricultural Experiment Station contribution; no. 84-300-S; Report of progress (Kansas State University. Agricultural Experiment Station and Cooperative Extension Service); 448; Beef; Stocking rate; Steers; Bluestem

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Stocking Rate and Supplementation for Steers Grazing Bluestem Pasture in Early Summer

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Summary

Native bluestem pastures were grazed from May 16 to July 14, 1983 by steers with an average beginning weight of 545 lbs., at stocking rates of 1.82, 1.5, and 1.25 acres per steer. Daily gains for the high and low stocking rates were higher ($P < .01$) than for the medium stocking rate (2.22, 2.24 vs. 1.92 lb/day). Gains per acre were similar for the low and medium stocking rates, but was higher for the highest stocking rate (73, 75 vs 105 lb/acre).

Half of the steers in each stocking rate were self-fed a salt-limiting sorghum grain - Rumensin® mixture at an average intake of 1.84 lb per head per day. Supplementation increased daily gain ($P < .01$) over non-supplemented (2.39 vs. 1.86 lb/day). Gain per acre was increased 22 lbs by supplementation. Herbage remaining following grazing declined with increased stocking rate. No regrowth occurred following livestock removal in mid July. Warm-season perennial grass composition and basal cover have not changed differentially in relation to stocking rate during the 3-year study period.

Introduction

Early season intensive stocking (May 1 - July 15) of native bluestem pastures has been shown to produce daily gains similar to those made during the same period at normal stocking rates season long. This trial continued to evaluate different intensive stocking rates and the value of self-fed Rumensin® in a salt-limiting sorghum grain mixture.

Experimental Procedure

One 63 acre and five 60-acre pastures were assigned randomly to one of three stocking rates: 1.82, 1.5, or 1.25 acres per steer from May 16 to July 14, 1983 with two pastures per rate. Steers in one pasture of each stocking rate received a Rumensin sorghum grain supplement (Table 6.2) while steers in the other pastures received only salt. The steers, primarily British breeding, averaged 545 lbs initially.

Results

Results are shown in Tables 6.1 and 6.2. Steers at the low and high stocking rates gained more ($P < .01$) than those grazing at the medium rate. Herbage yield on the medium rate, nonsupplemental pasture was significantly lower than that of other treatments which was likely responsible for the reduced animal performance. Economic returns from grain look excellent; supplemented steers gained more ($P < .01$) than nonsupplemented steers. Gains per acre were increased with both the highest stocking rate and with supplementation.

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Herbage remaining from mid July on was greater at the lowest stocking rate and decreased with increased rates (Table 6.3 and 6.4). The 1.5 acre, nonsupplemented pasture apparently has inherently lower production than the other units. For the first time during the 3-year period of this study, regrowth during the latter half of the season did not occur due to hot, dry weather. Next year's production may be reduced due to lack of regrowth and food storage.

No stocking rate has significantly changed botanical composition or basal cover of the major warm-season grasses (Table 6.5).

Table 6.1. Effect of Stocking Rate on Performance of Steers Grazing Intensive Early Stocked Bluestem May 16 - July 14, 1983 (59 days).

Item	Stocking rate (acres per steer)		
	1.82	1.5	1.25
Steers per treatment	60	76	90
Avg. beginning wt., lb	546	542	547
Avg. gain per steer, lb	132 ^a	113 ^b	131 ^a
Daily gain per steer, lb	2.24 ^a	1.92 ^b	2.22 ^a
Gain per acre, lb	73	75	105

^{a b} Values in same row with different superscripts differ significantly (P<.01).

Table 6.2. Effect of Grain Supplementation on Performance of Steers Grazing Intensive, Early Stocked Bluestem.

Stocking rate (acres/steer)	Supplemented			Nonsupplemented		
	1.82	1.5	1.25	1.82	1.5	1.25
Steers per treatment	31	38	46	29	38	44
Supplement consumed Per head daily (self-fed)						
Ground sorghum grain, lb	1.79	1.74	1.49	0	0	0
Salt, lb	.20	.19	.17	0	0	0
Rumensin, mg	197	191	163	0	0	0
Avg gain per steer, lb	144	131	150	119	103	111
Daily gain per steer, lb	2.44	2.22	2.54	2.02	1.75	1.88
Gain per acre, lb	79	87	120	65	69	89
Supplemented vs. Nonsupplemented						
Avg gain per steer, lb		141 ^a			110 ^b	
Daily gain per steer, lb		2.39 ^a			1.86 ^b	
Gain per acre, lb		98			76	

^{a,b} Values in same row with different superscripts differ significantly ((P<.01).

Table 6.3. Grass (lb/A) Remaining in Mid July and Early October Following Grazing at Indicated Stocking Rates From May 16 to July 14, 1984.

	Grass Yield					
	Supplemented			Nonsupplemented		
Stocking rate (acres/steer)	1.82	1.50	1.25	1.82	1.50	1.25
<u>Range Site</u>				<u>Mid July</u>		
Loamy Upland	1809	1161	670	1476	567	1054
Breaks	1513	1154	727	1077	631	892
				<u>Early October</u>		
Loamy Upland	1844	948	981	950	609	832
Breaks	1308	971	763	865	524	741

Table 6.4. Forbs (lb/A) Remaining in Mid July and Early October Following Grazing at Indicated Rates From May 16 to July 14, 1984.

	Forb Yield					
	Supplemented			Nonsupplemented		
Stocking rate (acres/steer)	1.82	1.50	1.25	1.82	1.50	1.25
<u>Range Site</u>				<u>Mid July</u>		
Loamy Upland	282	182	150	139	161	52
Breaks	155	73	80	107	30	107
				<u>Early October</u>		
Loamy Upland	332	259	311	83	193	154
Breaks	100	77	174	76	41	70

Table 6.5. Botanical Composition (%) and Basal Cover (%) of Big Bluestem (*Andropogon Gerardi*), Indiangrass (*Sorghastrum Nutans*) and Little Bluestem (*A. Scoparius*) on Pastures Stocked at Indicated Rates From 1981-83; 1980 Data Represent Pretreatment Levels.

Species	Stocking Rate (acres/steer)											
	1.82				1.50				1.25			
	1980	1981	1982	1983	1980	1981	1982	1983	1980	1981	1982	1983
Big Bluestem												
% Comp.	28.4	23.6	29.4	28.2	28.7	27.0	30.6	28.1	22.1	22.7	25.1	24.4
% Basal Cover	2.27	1.18	2.10	2.16	3.40	1.32	2.02	2.07	2.23	1.26	1.78	1.40
Indiangrass												
% Comp.	15.9	13.5	19.2	19.4	20.3	17.0	21.6	18.8	21.8	16.3	21.0	21.7
% Basal Cover	1.32	0.70	1.37	1.50	2.38	0.78	1.43	1.4	2.20	0.88	1.50	1.26
Little Bluestem												
% Comp.	8.8	12.0	11.4	12.1	13.2	11.7	13.8	17.4	7.8	7.6	8.4	10.2
% Basal Cover	0.72	0.59	0.82	0.92	1.59	0.64	0.92	1.17	0.78	0.38	0.6	0.6

