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## Effects of half- vs three-quarterseason grazing of native grass pastures

### Abstract

Mixed-breed steers (563 lbs) grazed burned, native-grass pastures (1990 to 1998). Steers were allotted randomly to graze native grass pastures for either 1/2 season (1/2) from April to July 15 (81 days, at 1 steer to 2 acres) or for 3/4 season (3/4) from April to August 15 (112 days, at 1 steer per 3 acres). The grass composition was measured in the first, fourth, and eighth years of the study. The economics of steers grazing the two systems were determined by calf and feeder cattle prices at Dodge City adjusted to southeast Kansas. The steers grazing 1/2 gained more per day (2.78 lb vs 2.48 lb,  $P < .01$ ) but gained less ( $P < .01$ ) per season (225 lb vs 278 lb). No changes in percentage composition occurred between systems for big bluestem, little bluestem, switchgrass, total perennial grass, or total perennial forbs. However, Indiangrass increased more ( $P < .05$ ) while managed under 1/2 than 3/4 grazing. The 1/2 system had a higher return per acre, but the 3/4 system had a higher return per head. Grazing system did not appear to have a negative effect on grass composition during the 9-year period.

### Keywords

Cattlemen's Day, 1999; Kansas Agricultural Experiment Station contribution; no. 99-339-S; Report of progress (Kansas State University. Agricultural Experiment Station and Cooperative Extension Service); 831; Beef; Native grass; Stocker cattle; Grazing systems

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## EFFECTS OF HALF- VS THREE-QUARTER- SEASON GRAZING OF NATIVE GRASS PASTURES

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### Summary

Mixed-breed steers (563 lbs) grazed burned, native-grass pastures (1990 to 1998). Steers were allotted randomly to graze native grass pastures for either 1/2 season (1/2) from April to July 15 (81 days, at 1 steer to 2 acres) or for 3/4 season (3/4) from April to August 15 (112 days, at 1 steer per 3 acres). The grass composition was measured in the first, fourth, and eighth years of the study. The economics of steers grazing the two systems were determined by calf and feeder cattle prices at Dodge City adjusted to southeast Kansas. The steers grazing 1/2 gained more per day (2.78 lb vs 2.48 lb,  $P < .01$ ) but gained less ( $P < .01$ ) per season (225 lb vs 278 lb). No changes in percentage composition occurred between systems for big bluestem, little bluestem, switchgrass, total perennial grass, or total perennial forbs. However, Indiangrass increased more ( $P < .05$ ) while managed under 1/2 than 3/4 grazing. The 1/2 system had a higher return per acre, but the 3/4 system had a higher return per head. Grazing system did not appear to have a negative effect on grass composition during the 9-year period.

(Key Words: Native Grass, Stocker Cattle, Grazing Systems.)

### Introduction

The cost of renting native grass and the economics of the stocker cattle business have dictated consideration of different grazing times and stocking rates. In addition, flexibility in marketing times also is needed to reduce risks

associated with the volatility of the cattle market. Our purpose was to compare two grazing systems (1/2 season and 3/4 season) in terms of steer gains, steer economics, and the effect of grazing on grass compositions.

### Experimental Procedures

Mixed breed steers (average starting weight = 563 lb) grazing native grass pastures were allotted each year (1990 to 1998) to either 1/2-season or 3/4-season grazing systems. The 1/2-season system entailed grazing from late April to July 15 (1 steer/2 acres, 81 days), and the 3/4-season system entailed grazing from late April to August 15 (1 steer to 3 acres, 112 days). The pastures were burned every year except 1996, when only the east four pastures were burned because of dry weather. Four pastures were used per treatment per year. The steers were weighed individually at the start and end of the grazing periods.

To evaluate the economic returns, the various costs associated with each grazing system were compared. Direct costs per animal included start-up costs (drugs, veterinary, starter feed, trucking, processing labor), death loss, mineral, salt, and interest. Pasture costs included labor of looking after cattle on grass and cost of renting grass (*Bluestem Pasture Report* by Kansas Department of Agriculture). The monthly average prices for the weight range at Dodge City were adjusted to southeast Kansas prices.

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The step point method (300 to 400 points per pasture) was used to take actual plant inventories (1990, 1994, 1998). The pastures were sampled each year after animals were removed and again in November by clipping small areas to determine how much dry matter remained compared to caged areas that excluded animals.

## Results and Discussion

We observed a greater increase in Indian-grass ( $P < .05$ , Table 1) and a greater increase in percentage basal cover of perennial grass ( $P < .05$ ) for 1/2-season grazing compared with 3/4-season grazing. Change in percent of total perennial grasses was the same for both systems after 9 years of grazing. Little bluestem declined (percentage of composition) in both grazing systems but was not different by system. Neither of the grazing systems had a negative effect on the grass composition. In the 3/4-season pastures, only 350 lb of dry matter per acre were produced after cattle were removed; in 1/2-season grazing pastures, 1,100 lb of dry matter were produced per acre.

The steers that grazed the 1/2-season pastures for 81 days gained faster (2.78 vs. 2.48 lb per day,  $P < .01$ ) than the steers that grazed the 3/4-season pastures for 112 days. However, allowing the steers to graze until August 15 resulted in more total pounds gained per animal (278 lb vs 225 lb; Table 2).

Average costs during the 0-year period were: pasture/acre, \$16.43; labor/hd, \$10.00; mineral \$0.05/hd/day; interest/hd, \$10.70; veterinary charges/hd, \$10; handling/hd, \$4.00; and processing/hd, \$1.00. Death loss averaged 1.25%.

The 1/2-season grazing system had the highest return per acre (\$33.31/acre vs \$29.98/acre). The 3/4-season grazing had the highest return/animal (\$30.61 vs \$23.75, Table 3). The economic desirability of a particular system will depend on the perspective of the individual producer. For example, producers who own both land and cattle likely will prefer the 1/2-season grazing.

However, the producers who own cattle but rent pasture and hire labor likely will favor the 3/4-season grazing system because of cattle costs and the additional total gain. However, this analysis considers only selling cattle at the end of the grazing period. If cattle are owned and graze on other forages prior to native grass or owned during the feedlot phase, this could change the overall view of the economic desirability of a particular system.

**Table 1. Effect of Grazing System on Plant Composition, 1990 to 1998**

	Change in Percentage Composition, 1990 to 1998	
	1/2 Season	3/4 Season
Big bluestem	+ 7	+ 6
Little bluestem	! 5	! 3
Indiangrass	+ 9 <sup>a</sup>	+ 4 <sup>b</sup>
Switchgrass	0	+ 2
Total perennial grass	0	+ 1.3
Perennial grass % basal cover	+ 14.7 <sup>a</sup>	+ 11.5 <sup>b</sup>

<sup>a,b</sup>Means in the same row with unlike superscripts are different ( $P < .05$ ).

**Table 2. Effect of Grazing System on Animal Performance (9-Yr Summary)**

Item	1/2 Season	3/4 Season
No. steers	1,354	915
Pastures/9 yr	36	36
Starting wt, lb	562.3	562.1
Average days	81	112
ADG, lb	2.78 <sup>a</sup>	2.48 <sup>b</sup>
Gain/animal, lb	225 <sup>a</sup>	278 <sup>b</sup>

<sup>a,b</sup>Means in the same row with unlike superscripts are different ( $P < .01$ ).

**Table 3. Effect of Grazing System on Economics (Dollars per Steer)**

Item	1/2 Season	3/4 Season
Direct costs	\$38.38	\$44.97
Pasture/labor costs	42.86	59.29
Return to land, labor, management	66.61	89.91
Return to management	23.75	30.61