Response of Yearling Steers to Burning and Fertilizing Bluestem Pasture and Intensively Stocking Early

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Summary

Six pastures totaling 328 acres were summer grazed by yearling steers. Four pastures were burned April 23, 1976; two were not burned. One of the burned pastures had 40 lbs. of nitrogen per acre applied aerially April 29, 1976. Another burned pasture was stocked at twice the normal rate (intensively stocked early) from April 28 to July 15. The other pastures were stocked from April 28 to October 6, 1976.

Stocking rates were based on herbage production data from experimental plots under similar treatments. Late spring burning increased daily gain, and nitrogen applied to a burned pastures increased gain per acre primarily by increasing carrying capacity. Intensive early stocking had no effect on daily gain but produced more gain per acre.

Pastures burned annually had better range plant composition than unburned pastures. The best range plant composition was on the intensively stocked early pasture.

Perennial grass left after grazing was comparable under all management schemes but weed and brush production was greater on unburned pastures than on burned ones. Weed and brush production was least on the intensive, early stocked pasture.

Introduction

Late spring burning has increased desirable warm season grasses in bluestem pastures and increased steer gains. Nitrogen fertilization has increased forage production but changed stand composition toward cool-season, lower producing species and weedy forbs. The above treatments have been used separately and in combination to study their effects on forage production and cattle performance. Effects of intensively stocking a burned pasture early are also being studied.

Experimental Procedure

Six native bluestem pastures, totaling 328 acres, five miles northwest of Manhattan were used in the study. All treatments were the same as the previous four years. One burned, nonfertilized pasture, and one nonburned, nonfertilized pasture have had the same treatment the last 26 years, to study long term effects. Burned pastures were burned April 23 and ammonium nitrate (34% nitrogen) was applied aerially April 29.

The pasture receiving nitrogen was stocked at a heavier rate in an

attempt to equalize forage utilization. Pastures grazed the entire summer season were stocked from April 28 to October 6. The pasture intensively grazed early was stocked from April 28 to July 15 at twice the normal rate. All were stocked with Hereford and Angus - Santa Gertrudis cross steers averaging 476 lbs. randomly distributed among the pastures. They were implanted with Ralgro April 28. All were gathered the first of each month, penned overnight without feed or water, and weighed the next morning.

Plant census was taken in early summer on loamy upland and breaks range sites in each pasture with modified step-point system. Perennial grass and weeds and brush remaining after grazing were estimated by clipping 15 randomly placed 1/10,000 acre plots in each pasture from loamy upland and breaks range sites.

Results and Discussion

Late spring burning increased daily gain, and nitrogen applied to a burned pasture increased gain per acre primarily by increasing carrying capacity. The intensively stocked-early pasture, stocked at twice the normal rate for only the first half of the season, produced the same daily gain as normal season long stocking, but more gain per acre.

Pastures burned annually had better range plant composition than unburned pastures did. The best range plant composition was on the pasture intensively stocked early.

Perennial grass left after grazing was comparable under all management schemes but weed and brush production was greater on unburned pastures than on burned ones. Weed and brush production was least on the pastures intensively stocked early.

Table 17.1. Effects on steer gains from burning and fertilizing native bluestem pasture and stocked intensively early.

	Daily gain per steer, lbs.	Gain per acres, lbs.	Acres per steer	Steer grazing days per acre
Not burned				
No nitrogen, non-burned for 26 years	1.28	61	3.4	45
No nitrogen	1.14	54	3.4	45
Burned April 23				
No nitrogen, same treatment 26 years	1.40	66	3.4	45
No nitrogen	1.34	63	3.4	45
40 lb. nitrogen per acre	1.47	108	2.2	70
Intensively stocked April 28 to July 15 (78 days)	2.03	93	1.7	46
Normal stocked April 28 to July 15 (78 days)	2.04	47	3.4	23

Table 17.2. Perennial grass and weeds and brush (lb dry matter/acre) remaining after grazing indicated range sites by yearling steers.

Treatment of bluestem range	Perennial grass (lb DM/acre)	Weeds and brush (lb DM/acre)
Unburned, 0-N		
loamy upland	1542	370
breaks	1492	449
Burned, 0-N		
loamy upland	1244	143
breaks	1267	169
Burned, 40 lb. of N		
loamy upland	1335	256
breaks	1664	448
Unburned, 26 years		
loamy upland	1413	349
breaks	746	396
Burned, 26 years		
loamy upland	1025	374
breaks	1392	182
Intensive stocking early (2X) (April 28 - July 15)		
loamy upland	1301	207
breaks	787	78

Table 17.3. Percentages of indicated plant species on bluestem pastures treated as indicated and grazed with yearling steers.

	Unburned 0-N (%)	Burned 0-N (%)	Burned 40#-N (%)	Unburned 26 years (%)	Burned 26 years (%)	Intensive[1] stocking (April 28-July 15)
Big bluestem						
loamy upland	17.9	26.6	21.8	10.7	22.7	30.8
breaks	18.1	26.0	26.6	16.6	33.2	35.8
Little bluestem						
loamy upland	14.6	10.7	6.8	6.2	10.4	9.0
breaks	20.4	17.7	10.6	8.1	11.7	9.6
Indiangrass						
loamy upland	8.4	13.0	12.6	8.9	15.6	20.7
breaks	11.1	18.8	14.1	11.3	19.3	14.8
Sideoats grama						
loamy upland	5.2	9.4	8.7	6.9	9.8	4.2
breaks	12.9	14.4	19.0	11.3	19.3	14.8
Kentucky bluegrass						
loamy upland	20.4	9.3	2.9	33.8	2.9	7.1
breaks	12.3	1.8	0.4	22.7	0.8	1.4
Perennial forbs						
loamy upland	9.7	9.3	5.9	7.7	8.9	5.7
breaks	8.8	7.8	7.9	9.4	3.0	4.6

[1]Twice normal rate for half the grazing season.