

SHORT DURATION GRAZING TRIAL

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Summary

Short duration (SD) and repeated seasonlong (SL) grazing trials were initiated at the Dickinson Experiment Station Ranch Headquarters in 1981. Forage production has generally been greater on the SL treatment, yet forage disappearance has been similar despite a greater stocking rate on the SD treatment. Plant basal cover has increased between 1981 and 1987 on each range site regardless of grazing treatment. Cows have maintained approximately 15 pounds more seasonal weight gain on the SL treatment when compared to the SD treatment. Average daily gain of calves has been similar between treatments; therefore, the increased average calf gain/acre on the SD treatment is a reflection of the prior greater stocking rate on this treatment.

Introduction

The mixed grass prairie comprising approximately 30% of the land area of the state is dominated by cool and warm-season midgrasses, shortgrasses and sedges. The principle effects of previous unrestricted, heavy grazing in the mixed grass prairie is a marked decrease of tall and midgrasses and an increased coverage of short grasses and sedges, with a subsequent decrease in total forage yield. Considered to be below their potential for forage hence livestock production, North Dakota's rangelands warrant research into more efficient management systems such as short duration grazing.

Short duration grazing is a rotation system using multiple pastures and generally one herd. Stocking rate increases appear necessary and combined with a large number of smaller sized pastures results in a high stocking density (animals/area). The grazing period of a pasture is short, usually 7 days or less, to eliminate grazing of new plant regrowth. The rest period, generally 30 to 90 days, allows plants to recover from grazing and is short enough to allow animals to graze plant regrowth before it matures. Graze and rest period lengths should vary according to the growth rate of the vegetation.

Study Area and Methods

A trial comparing short duration (SD) to repeated seasonlong (SL) grazing was initiated June 25, 1981 on typical mixed grass prairie. Section 16 of the Ranch Headquarters was divided into one 320 acre pasture grazed seasonlong and eight 40 acre paddocks grazed rapidly in rotation. Twenty and 35 cow/calf pairs were allocated to SL and SD treatments, respectively, in June 1981, 1982 and 1983. From 1984 through 1986 an additional 5 cow/calf pairs were added to the SL treatment. In 1987 ten additional cow/calf pairs were allocated to the SL treatment for a total of 35 pairs on the SL treatment also. Cattle were rotated every 5 days on the SD trial and paddocks rested 35 days throughout the grazing season. Grazing seasons totalled 70, 112, 131, 131, 126, 140, and 140 days between 1981 and 1987. Average annual precipitation for the study area is 16 inches. Precipitation recorded for 1981 through 1987 was 8.5, 25, 15.5, 14, 24 and 14 inches, respectively. Forage production and disappearance was determined utilizing portable cages and the paired-plot technique. Fifty paired, caged and uncaged quadrats were clipped at the beginning of trials and approximately every 40 days thereafter until termination of trials. Caged plots were used to estimate growth and total annual production while comparison of paired, caged and uncaged quadrats allowed estimation of forage disappearance (use). Plant basal cover was estimated using the point contact method on permanent transects. Livestock were weighed on and off grazing trials and every 28 days throughout the trials.

Results and Discussion

Annual herbaceous production on grazing treatments has ranged from 678 to 1766 lbs./ac (Table 1). Although forage availability has been consistently greater on the SL treatment, year-to-year variation in forage production within treatments has been much greater, exceeding 100%. Forage disappearance estimates between treatments have been very similar each year. Disappearance differences have not exceeded 5 percentage points any year of the study.

Plant basal cover increased on all range sites across both grazing treatments between 1981 and 1987 (Table 2). Basal cover was initially higher on the SD treatment but by 1987 basal cover was similar between corresponding range sites on the two grazing treatments. Increasing basal cover of plants is a reflection of improved management of the grazing resources.

Livestock performance is summarized in Table 1. In 4 out of 7 years, cows grazing the SL treatment maintained more weight than those grazing the SD treatment. However, no differences in average cow gains were found between grazing treatments in 1984, 1985 and 1987. Calf average daily gains exceeded 2 lbs./day on both treatments each year with the exception of 1984. Differences in calf daily gains between annual grazing treatments were insignificant. Calf production per acre was higher on the SD treatment between 1981 and 1986 which is a reflection of the greater stocking rate on this treatment. Calf production per acre was similar between treatments in 1987.

Table 1. Forage Production and Disappearance and Livestock Performance on Short Duration (SD) and Seasonlong (SL) Grazing Treatments at the Dickinson Experiment Station Ranch Headquarters, 1981-1987

			Forage			Livestock				
System			Production lbs./ac	Disappearance %		Cows			Calves	
						ADG lbs.	AG/ac lbs.		ADG lbs.	AG/ac lbs.
SD	1987		1286	65		0.7	11		2.4	37
	Avg.		1136	55		0.3	3.9		2.1	28
	Range		678-1667	41-65		0-0.7	0-11		1.9-2.4	16-37
SL	1987		1310	63		0.7	11		2.5	38
	Avg.		1324	53		0.4	3.7		2.2	21
	Range		679-1766	36-63		0-0.7	0-11		1.9-2.5	10-38

Table 2. Mean Basal Cover (%) of Plants on Five Grazed Range Sites between 1981 and 1987 At the Dickinson Experiment Station Ranch Headquarters

	Sa		Si		Sh		Cl		TCp	
	81	87	81	87	81	87	81	87	81	87
	----- Seasonlong -----									
Cool-season Graminoids	9.0	12.6	4.8	12.7	2.8	13.5	3.5	7.8	1.7	6.0
Warm-season Graminoids	5.4	14.4	6.1	14.1	5.7	7.2	9.0	19.0	5.9	7.2
Forbs	0.2	0.5	0.1	1.0	0	0.7	0.1	1.1	0.5	3.9
Shrubs	0.7	2.1	0.3	1.4	.4	0.9	0.5	0.8	0.3	0.6
Total	13.3	29.6	11.3	29.2	8.9	22.3	13.1	28.7	8.4	17.7
	----- Short duration -----									
Cool-season Graminoids	5.5	14.9	7.9	11.4	3.9	10.8	4.3	7.9	2.8	3.8
Warm-season Graminoids	13.9	7.0	11.6	18.1	13.6	10.0	13.3	21.9	7.1	15.5
Forbs	0	0.5	0	0.9	0.1	2.1	0.1	0.6	0.2	1.5
Shrubs	.6	2.9	0.5	0.5	0.7	0.4	0.2	0.8	0.2	2.4
Total	20.0	25.3	20.0	30.9	18.2	23.3	18.6	31.2	10.5	22.2

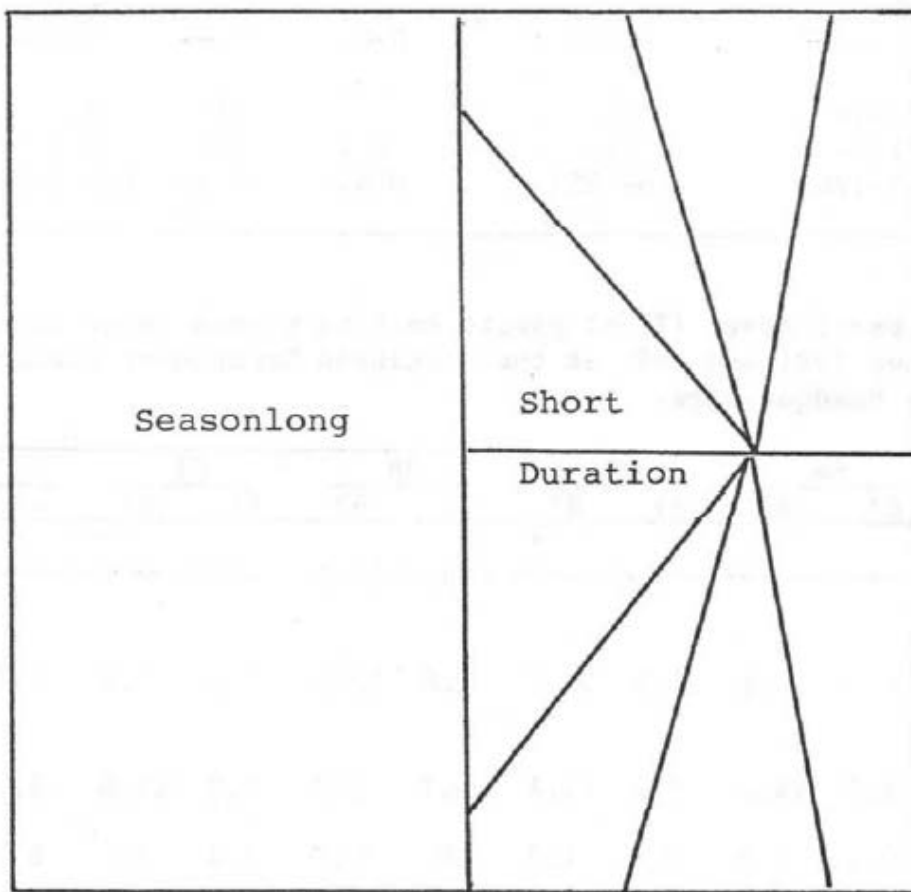


Figure 1. Section 16 (T143N, R96W) Dickinson Experiment Station Ranch Headquarters illustrating the short duration (SD) and repeated seasonlong (SL) grazing treatments.