

## **SHORT DURATION GRAZING IN THE MIXED GRASS PRAIRIE OF SOUTHWESTERN NORTH DAKOTA**

**BY**

D. R. Kirby and T. J. Conlon

The mixed grass prairie comprising approximately 30% of the land area of the state is dominated by cool- and warm-season mid-grasses, short-grasses and sedges. The principle effects of previous unrestricted, heavy grazing in the mixed grass prairie is a marked decrease of tall and mid-grasses 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 stock density (animals/area). The grazing period of a pasture is short, usually seven 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.

A trial comparing short duration (SD) to repeated season long (SL) grazing was initiated June 25, 1981 on typical mixed grass prairie at the Dickinson Experiment Station. Section 16 of the Ranch Headquarters was divided into one 320 acre pasture grazed season long and eight 40 acre pastures grazed rapidly in rotation. Twenty and 35 cow/calf pairs were allocated to SL and SD treatments, respectively, in June 1981, 1982 and 1983. Since 1984 an additional five cow/calf pairs have been added to the SL treatment. Cattle were rotated every five days on the SD trial and pastures rested 35 days throughout the grazing season. Grazing seasons totalled 70, 112, 131, 131 and 126 days between 1981 and 1985. Average annual precipitation for the study area is 16 inches. Precipitation recorded for 1981 through 1985 was 8.5, 25, 15.5, 14, and 14 inches respectively. Forage production and disappearance was determined utilizing portable cages and the paired-plot technique. Fifty paired, caged and uncaged quadrats (18.6 inches) 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). Livestock were weighed on and off grazing trials and every 28 days throughout the trials.

Annual 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 five percentage points any year of the study despite 40 to 75% more cow/calf pairs annually grazing the SD treatment.

Livestock performance is summarized in Table 1. From 1981 to 1983 cows grazing the SL treatment maintained more weight than those grazing the SD treatment. However, no differences in average cow gains were found the last two years of the study. Calf average daily gains exceeded two 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 consistently higher on the SD treatment which is a reflection of the greater stocking rate on this treatment.

**Summary:**

Short duration (SD) and repeated season long (SL) grazing trials were initiated on the Dickinson Experiment Station in 1981. Forage production has generally been greater on the SL treatment when compared to the SD treatment, yet forage disappearance has been similar despite greater stocking rates on the SD treatment. Cows have maintained seasonal weight gains better on the SL treatment, while calf average daily gains have been similar between treatments. Increased calf gains/acre on the SD treatment is a reflection of greater stocking rates on this grazing treatment.

**Table 1. Forage Production and Disappearance and Livestock Performance on Short Duration (SD) and Season Long (SL) Grazing Treatments, Dickinson Experiment Station**

Year	System	Forage		Livestock					
		Production (lbs./ac)	Disappearance %	Cows		Calves			
				ADG (lbs.)	Ag/ac (lbs.)	ADG (lbs.)	AG/ac (lbs.)		
1981	SD	678	55	0.4	3		2.2	16	
	SL	679	51	0.7	3		2.3	10	
1982	SD	1645	41	0.3	4		2.1	25	
	SL	1766	36	0.5	4		2.1	15	
1983	SD	1057	46	0.3	5		2.1	30	
	SL	1720	43	0.5	5		2.2	18	
1984	SD	919	60	0.0	0		1.9	26	
	SL	1371	60	0.0	0		1.9	19	
1985	SD	702	61	0.1	2		2.1	28	
	SL	865	61	0.1	1		2.2	21	

## 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. Cows have maintained approximately 20 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 calf gain/acre on the SD treatment is a reflection of the 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 (Figure 1). Twenty and 35 cow/calf pairs were allocated to SL and SD treatments, respectively, in June 1981, 1982 and 1983. Since 1984 an additional 5 cow/calf pairs have been added to the SL treatment. 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 and 140 days between 1981 and 1986. Average annual precipitation for the study area is 16 inches. Precipitation recorded for 1981 through 1986 was 8.5, 25, 15.5, 14, 14 and 24 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). Livestock were weighed on and off grazing trials and every 28 days throughout the trials.

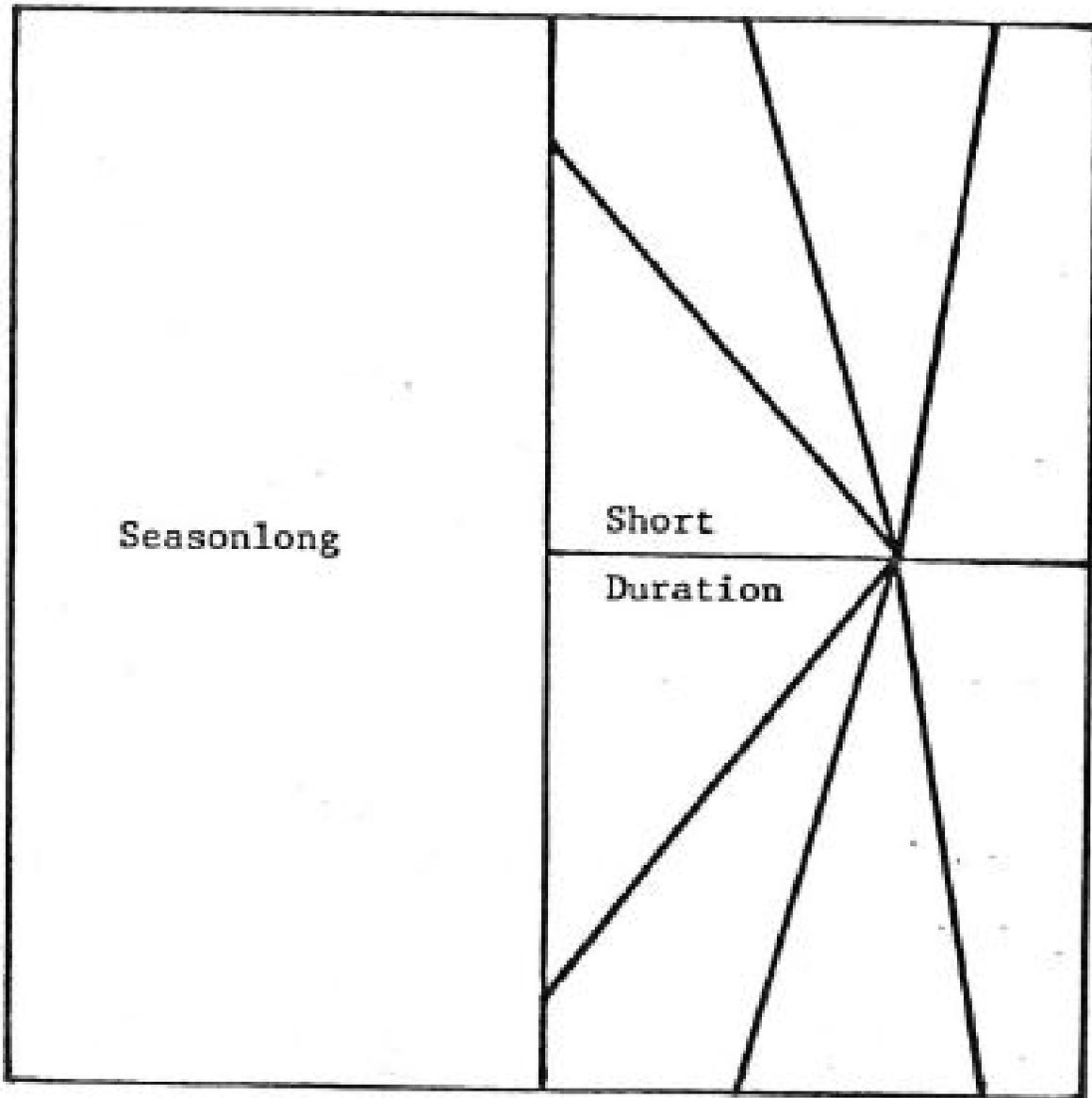
**Results and Discussion:**

Annual 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 despite 40 to 75% more cow/calf pairs annually grazing the SD treatment.

Livestock performance is summarized in Table 1. Between 1981 and 1983 and in 1986, 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 and 1985. 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 consistently higher on the SD treatment which is a reflection of the greater stocking rate on this treatment.

**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, 1981-1986**

System		Forage		Livestock				
		Production lbs./ac	Disappearance %	Cows		Calves		
				ADG lbs.	AG/ac lbs.		ADG lbs.	AG/ac lbs.
SD	Avg.	1111	53	0.2	2.7		2.1	26
	Range	678-1667	41-61	0-0.4	0-5		1.9-2.2	16-33
SL	Avg.	1327	52	0.3	2.5		2.2	18
	Range	679-1766	36-61	0-0.7	0-5		1.9-2.3	10-24



**Figure 1.**

**Section 16 (T143N, R96W) Dickinson Experiment Station Ranch Headquarters**

**illustrating the Short Duration (SD) and Repeated Seasonlong (SL) Grazing Treatments**