

SHORT DURATION GRAZING IN THE MIXED GRASS PRAIRIE OF NORTH DAKOTA

Project No. 1922

D.R. Kirby, W.T. Baker, T. Conlon, P. Nyren and D.O. Erickson

Summary

Short duration (SD) and repeated seasonlong (SL) grazing trials were initiated on the Dickinson Experiment Station Ranch Headquarters and Central Grasslands Research Station in 1981 and 1982, respectively. 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 at both locations. Cows have maintained seasonal weight gains better on the SL treatment, while calf average daily gains have been similar between treatments at each location. Increased calf gains/acre on the SD treatment at both locations is a reflection of greater stocking rates on this grazing 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. 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 totaled 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.

Central Grasslands Research Station

Similar grazing trials were begun in June 1982 at the CGRS. Section 25 was divided into one 320 acre repeated seasonlong (SL) pasture and eight 40 acre short duration (SD) grazing paddocks. Paddocks in the SD treatment were grazed 5 days and rested 35 days throughout the grazing season. Cow/calf pairs allocated were 30 and 45, and 40 and 60 for the SL and SD treatments, respectively, in 1982 and 1983. Since 1984, 45 and 65 cow/calf pairs have been allocated to the SL and SD treatments. Grazing seasons totaled 139, 153, 153 and 160 days in 1982 through 1985. Precipitation recorded annually from 1982 through 1985 was 23, 19, 20, and 17.9 inches which compares favorably with the long-time average of 17.6 inches. Forage production and disappearance was

estimated using 30 paired quadrats per treatment as outlined for the Dickinson Experiment Station. Livestock weights were recorded as explained for the Dickinson Experiment Station.

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. 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 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.

Central Grasslands Research Station

Good growing conditions were evident the first two years of the grazing trials as forage production exceeded 2000 lbs/ac on both treatments (table 2). Annual forage production was similar between grazing treatments until 1985. No explanation is readily available for the difference noted in 1985. Forage disappearance was similar each year differing an average of 2 percentage points between grazing treatments (table 2), despite 45 to 50% more cow/calf pairs grazing the SD treatment.

As was evident at the Dickinson Experiment Station, cows generally maintained more weight gain on the SL treatment when compared to the SD treatment (table 2). Calf gains were low on both treatments the first two years of the study due to the fact these calves were from first calf heifers and cows. By the third year average calf gains exceeded 2 lbs/day. Since individual calf gain has been similar each year between the grazing treatments, gains/acre is a reflection of stocking rate. Stocking rates were 40 to 50 % greater gain/acre on this treatment.

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

Year	System	Forage		Livestock			
				Cows		Calves	
		Production (lbs/ac)	Disappearance %	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	0	2.2	21

Table 2. Forage Production and Disappearance and Livestock Performance on Short Duration (SD) and Seasonlong (SL) Grazing Treatments, Cereal Grasslands Research Station

Year	System	Forage		Livestock			
				Cows		Calves	
		Production (lbs/ac)	Disappearance %	ADG (lbs)	AG/ac (lbs)	ADG (lbs)	AG/ac (lbs)
1982	SD	2194	41	0.7	14	1.6	31
	SL	2453	41	0.8	11	1.6	21
1983	SD	2202	59	0.7	19	1.8	51
	SL	2267	67	0.9	17	1.9	35
1984	SD	1690	55	0.5	16	2.0	52
	SL	1649	42	0.4	9	2.1	38
1985	SD	1446	62	0.6	19	2.1	58
	SL	2932	58	0.7	15	2.1	40

[Back to 1985 Research Reports Table of Contents](#)

[Back to Research Reports](#)

[Back to Dickinson Research Extension Center \(http://www.ag.ndsu.nodak.edu/dickinso/\)](http://www.ag.ndsu.nodak.edu/dickinso/)

[Email: drec@ndsuent.nodak.edu](mailto:drec@ndsuent.nodak.edu)