

Hatch-1922: Short Term Grazing Systems – Dickinson Experiment Station

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Short duration grazing systems use: (1) multiple pastures, 3 to 60, (2) 1 to 15-day grazing periods, (3) 30 to 60 day rest periods, and (4) 1 herd stocked at a heavier rate when compared with recommended season-long stocking rates. It has been suggested that this system will maintain or improve range condition and increase carrying capacity over conventional rangeland management systems. This project was initiated to test this hypothesis.

The grazing trial began in June, 1981 by dividing Section 16, Dickinson Experiment Station, Ranch Headquarters, into a 320 acre season-long (SL) pasture and 8-40 acre short duration grazed (SDG) pastures. On June 25, 1981 and June 22, 1982, 20 cow-calf pairs and 1 bull were allocated to the SL pasture and 35 cow-calf pairs and 1 bull allocated to the SDG system. Cattle were rotated every 5 days on the SDG system as pastures received 35 days rest between grazings. Drought, causing low forage production, forced removal of livestock from both systems on September 3 in 1981. In 1982, cattle were removed October 12, concluding a 112-day grazing season.

Forage production and utilization and livestock performance are summarized in Table 1. Forage produced and utilized was similar between grazing treatments despite a 75% greater stocking rate on the SDG system. Over one-third of the forage produced were Forbs, which were avoided by the cattle. Livestock performance per head was similar, but production per acre was higher for the SDG system, which reflects the increased stocking rate.

Cow diets indicated seasonal decreases in % crude protein and % in vitro dry matter digestibility, but little to no decreases in these nutrients over the 5-day grazing period (Table 2).

Botanical composition (%) of cow diets indicated cattle select more grasses throughout the grazing season (Table 3). However, selectivity among warm and cool season grass components varied considerably over the grazing season. Forbs were an important part of diet in early summer, while Browse increased in diets as the grazing season progressed. Over the 5-day grazing period on selected pastures, the grass component of the diet decreased, while the Forb component increased and Browse showed mixed results (Table 4).

Preference, as determined by forage availability and composition of the diets, is summarized in Table 5. Grass was a preferred class of forage throughout the grazing season while Forbs were preferred only in early summer and Browse was mainly avoided by the grazing cattle. Cool season and warm season grasses as groups were preferred throughout the season. Western wheatgrass, a cool season grass and Blue grama, a warm season grass were the only species preferred throughout the grazing season. Needle-and-thread and Junegrass, cool season grasses, were also preferred in early summer, while Plains muhly, a warm season grass, was preferred in the later portions of the grazing season.

Table 1. Forage Production and Utilization and Livestock Performance on Short Duration Grazing and Season-Long Systems on the Dickinson Experiment Station

		Forage		Livestock			
				Cows		Calves	
Year	System	Production (lbs/ac)	Utilization (%)	ADG (lbs)	AG/ac (lbs)	ADG (lbs)	AG/ac (lbs)
1981	Short duration	678	55	0.4	3	2.2	16
	Season-long	679	51	0.7	3	2.3	10
1982	Short duration	1645	37	0.3	4	2.1	25
	Season-long	1766	36	0.5	4	2.1	15

Table 2. Percent Crude Protein and In Vitro Dry Matter Digestibility in Forage Ingested by Cows Seasonally and Over a 5-Day Grazing Period on a Short Duration Grazing System, Dickinson Experiment Station, Ranch Headquarters – 1981

Season	5-Day Grazing Period	Crude Protein %	In Vitro Dry Matter Digestibility (%)
Early Summer	Before	9.3	52
	After	8.7	52
	Mean	9.0	52
Summer	Before	8.7	41
	After	8.3	37
	Mean	8.5	39
Early Fall	After	6.8	36

Table 3. Botanical Composition (%) of Cow Diets on a Short Duration Grazing System, Dickinson Experiment Station, Ranch Headquarters – 1981

Forage Class and Species	Season		
	Early Summer	Summer	Early Fall
Grass	86.7	92.3	85.2
Western wheatgrass	33.1	28.5	22.7
Needle-and-thread	16.5	7.4	1.1
Junegrass	9.5	--	--
Carex spp.	2.1	--	--
Other cool season	1.5	4.2	--
Total cool season	62.7	40.1	23.8
Blue grama	21.8	43.3	55.7
Plains muhly	--	2.7	3.4
Buffalo grass	--	1.5	--
Other warm season	--	2.6	--
Total warm season	21.8	50.1	59.1
Unknown grasses	2.2	2.1	2.3
Forb	12.5	3.6	1.1
Browse	0.8	4.2	13.6

Table 4. Botanical Composition (%) of Cow Diets Over a 5-Day Grazing Period Under Short Duration Grazing on the Dickinson Experiment Station, Ranch Headquarters – 1981

Season	Forage Class	% of Diet			
		Before		After	
Early Summer	Grass				
	Cool Season	64.4		61.1	
	Warm Season	24.2		20.3	
	Unknown	2.7		1.7	
	Total Grass		92.3		83.1
	Total Forb		6.0		16.6
	Total Shrub		1.7		0.3
Summer	Grass				
	Cool Season	44.2		35.8	
	Warm Season	50.5		49.7	
	Unknown	----		4.2	
	Total Grass		94.7		89.7
	Total Forb		1.7		5.5
	Total Shrub		3.7		4.8
Early Fall	Grass				
	Cool Season			23.8	
	Warm Season			59.1	
	Unknown			2.3	
	Total Grass				85.2
	Total Forb				1.1
	Total Shrub				13.6

Table 5. Seasonal Forage Preferences for Cows Grazing a Short Duration Grazing System, Dickinson Experiment Station, Ranch Headquarters – 1981

Forage Class and Species	Season		
	Early Summer	Summer	Early Fall
Grass	+	+	+
Western wheatgrass	+	+	++
Needle-and-thread	++	+	-
Junegrass	+	--*	--*
Carex spp.	--	--	--*
Other cool season	--	-	--*
Total cool season	+	+	+
Blue grama	+	++	++
Plains muhly	--*	++	++
Buffalo grass	--*	-	--*
Other warm season	--	+	--*
Total warm season	+	++	+
Forb	+	-	--
Browse	--	--	--

++ highly preferred

-- mainly avoided

+ preferred

- non preferred

*not found in the diet