

COMPARISON OF UNGRAZED AND GRAZED RANGE VEGETATION

The comparison of the production of ungrazed and grazed range vegetation begun in the 1970 season was continued in 1971. Plots were clipped on the ungrazed and grazed vegetation at approximate 2-week intervals from mid-May to the end of August. The production on the two sites at selected comparable dates during the 1971 season is given in Tables 1 and 2. All clippings were made at ground level.

In the 1971 season actual grass production on both the ungrazed and grazed sites was at the maximum level at the August 2 clipping. On this date the yield of grass on the ungrazed site totaled 2,216 lbs. / acre and on the grazed site 1,824 lbs. / acre. Production of grass on the ungrazed site at maximum yield was thus 21.5% more than grass production on the grazed site. At this time production of forbs of all kinds totaled 488 lbs. / acre on the ungrazed site and only 188 lbs. / acre on the grazed site. The forbs on either site actually would have had very little grazing value.

The principal differences in the composition of the production on the sites in the 1971 season, as in the 1970 season, were in the much greater yield of needle-and-thread (Stipa comata) on the ungrazed site than on the grazed site, and the greater production of blue grama (Bouteloua gracilis) on the grazed site than on the ungrazed site. Needle-and-thread produced 1360 lbs. / acre on the ungrazed and only 516 lbs. / acre on the grazed site. In the case of blue grama maximum production was 572 lbs. / acre from the grazed vegetation and only 136 lbs. / acre from the ungrazed vegetation. Plains reedgrass (Calamagrostis montanensis) and prairie Junegrass (Koeleria cristata) contributed substantially to yield in the grazed vegetation but were of practically no significance in the ungrazed vegetation. White sagewort (Artemisia ludoviciana) constituted the major forb in the ungrazed vegetation with a production of 380 lbs. / acre, but was of minor importance in the grazed vegetation.

Table 1. Plant Material on the Ungrazed Site at Selected Dates in the 1971 Summer Season (Oven-Dry Weight – lbs. / acre)

Species	Dry Weight - Lbs. / Acre			
	June 9	July 6	Aug. 2	Aug. 23
Stipa comata	428	1020	1360	1120
Agropyron smithii	156	368	192	360
Calamagrostis montanensis	12	----	----	----
Calamovilfa longifolia	4	128	268	----
Koeleria cristata	----	----	12	4
Bouteloua gracilis	44	124	136	128
Carex eleocharis	24	60	88	136
Miscellaneous grasses	16	----	160	120
Artemisia ludoviciana	72	56	380	336
Other perennial forbs	64	68	92	16
Annual and biennial forbs	24	28	16	16
TOTAL STANDING CROP	844	1852	2704	2236

Table 2. Plant Material on the Grazed Site at Selected Dates in the 1971 Summer Season (Oven-Dry Weight - lbs. / acre)

Species	Dry Weight - Lbs. / Acre			
	June 9	July 6	Aug. 2	Aug. 23
Stipa comata	220	524	516	360
Agropyron smithii	20	100	188	116
Calamagrostis montanensis	280	316	264	208
Calamovilfa longifolia	----	----	----	----
Koeleria cristata	112	200	220	88
Bouteloua gracilis	268	380	572	472
Carex eleocharis	52	52	64	52
Miscellaneous grasses	4	8	----	----
Artemisia ludoviciana	4	----	----	20
Other perennial forbs	84	64	168	172
Annual and biennial forbs	8	24	20	8
TOTAL STANDING CROP	1052	1668	2012	1496

It was noted in the 1970 season that production in the early part of the season was greater on the grazed site than on the ungrazed site, and this same situation prevailed during the 1971 season. On the June 9 clipping the yield from the grazed vegetation was 1052 lbs. / acre and from the ungrazed vegetation 844 lbs. / acre. By June 20 production was approximately equal on both sites and by July 6 (Tables 1 and 2) production on the ungrazed site was substantially greater than on the grazed site. Soil temperatures are substantially higher on the grazed site than on the ungrazed site, and the more rapid growth on the grazed site seems to be a reflection of the more favorable temperature conditions on this site early in the season.

A comparison of the yields at peak standing crop in the 1970 and 1971 seasons is given in Table 3. Yields in both years were very good, with the 1971 peak yield on the ungrazed site being 20% greater than in the 1970 season, while the peak standing crop on the grazed site was 15% greater in 1971 than in 1970. For the most part the relative yields of the components of the vegetation on the ungrazed and grazed sites were quite similar between the two seasons.

Microclimatic conditions on both sites were closely monitored throughout the 1971 season, as was done in the previous season. It is apparent that the large accumulation of dead material (litter) on the soil surface in the ungrazed area has a considerable influence on microclimatic conditions. As previously mentioned, the soil is several degrees cooler on the ungrazed site than on the grazed site throughout the season. In addition, the use of soil moisture early in the season is appreciably less on the ungrazed area than on the grazed area. In both seasons wind movement has been substantially greater close to ground on the grazed vegetation than on the ungrazed vegetation.

Table 3. Comparison of Yields on Ungrazed and Grazed Sites at Peak Standing Crop During the 1970 and 1971 Summer Seasons (Yields - Oven-Dry Weight, lbs. / acre)

Species	Ungrazed			Grazed	
	1970	1971		1970	1971
Stipa comata	938	1360		400	516
Agropyron smithii	302	192		177	188
Calamagrostis montanensis	----	----		137	264
Calamovilfa longifolia	148	268		----	----
Koeleria cristata	----	12		150	220
Bouteloua gracilis	258	136		533	572
Carex eleocharis	92	88		103	64
Miscellaneous grasses	29	160		4	----
Artemisia ludoviciana	380	380		37	----
Other perennial forbs	56	92		163	168
Annual and biennial forbs	44	16		47	20
TOTAL STANDING CROP	2247	2704		1751	2012