

COMPARATIVE STUDY OF FORAGE PRODUCTION AT KHAWARMUNG, AZAD KASHMIR

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Introduction: The Khawarmung study area is situated in the Subtropical humid zone (Champion et al, 1965) about 40 Km northwest of Muzafarabad along the left bank of river Neelum. The altitude is 1200 meters with an average rainfall of about 600 mm. Soil is mainly formed of shale and sandstone with a moderate amount of organic matter suitable for plant growth. *Pinus roxburghii* forms the major overhead storey with shrubs *Myrsine africana*, *Berberis lycium*, *Indigofera* spp. as understorey. The ground flora is occupied by grasses like *Digitaria* spp., *Agrostis gigantea*, *Agropyron dentatum*, *Cymbopogon* spp., *Eleusine compressa*, *Themeda anathera*, *Panicum antidotale*, *Heteropogon* spp., *Chrysopogon aucheri*, *Dicanthium annulatum*, whereas *Trifolium pratense*, *Taraxicum officinale*, *Plantago lanceolatus*, *Fragaria vesca* are among the major forbs present. The present study was aimed at to determine the affect of closure on forage production both inside and outside the exclosure.

Method. An exclosure of 0.6 hectares, established on 40% slope, was closed to grazing for one year in 1979. A similar area of 0.6 hectares having similar elevation, slope and vegetation type was selected outside the exclosure but opened to grazing for comparing forage production under grazed and ungrazed conditions. Two transects, each within and outside the exclosure, were selected at random for laying clip quadrats. On each transect five one m² quadrats were clipped at six metres intervals both within and outside the exclosure in August 1980. All the palatable grasses and forbs were clipped one cm above ground level with hand shears. The species completely avoided by the livestock were not clipped (Khan 1977). The clipped material was weighed green and then airdried. The airdried weights (gm/m²) were multiplied by ten to get the forage production of each species in Kg/ha (Hussain, 1968). The transect averages for grasses and forbs were worked out and the data was analysed by applying "t" test for comparison of forage production (Table-1). The degree of influence or dominance exerted by different species in the area, was determined by measuring per cent cover with the circular quadrat (Table-2).

Result and discussion: The average dry matter production was 1725 Kg/ha inside and 317 Kg/ha outside the exclosure. Thus a five times increase was recorded due to closure as shown in the table below.

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Table-1

Avg. forage production Kg/ha (sign. at 0.01 level)

Forage type	Inside excl.	Outside excl.
Grasses	844	138
Forbs	881	179
	1725	317

Forbs being succulent and moisture loving occupied places under and near the bunch grasses and hence showed some increase over grasses. There was significant decrease of forage in the grazed area which obviously reflected greater intensity and frequency of grazing.

Table 2

Avg. per cent cover of major forage species

Species	Inside excl.	Outside excl.
<i>Digitaria</i> spp.	20.42	—
<i>Agrostis gigantea</i>	26.45	9.28
<i>Eleusine compressa</i>	8.50	3.21
<i>Chrysopogon aucheri</i>	28.63	8.63
<i>sibirica</i>	7.34	3.56
<i>Themeda anathera</i>	15.49	16.37
<i>Med luplina</i>	3.72	2.09
<i>Plantago lanceolatus</i>	4.95	4.80
	11.78	9.64
<i>Taraxicum officinale</i>	0.67	1.84

The major forage species of this area *Digitaria* spp., *Agrostis gigantea*, and *Chrysopogon aucheri* spread vigorously after the area was protected from grazing as compared to species like *Themeda anathera*, *Plantago lanceolatus*, and *Taraxicum officinale* (Table-2). *Themeda anathera* and *Plantago lanceolatus* resisted heavy grazing while *Digitaria* spp. and *Agrostis gigantea* were sensitive to grazing.

Conclusion: Increase in forage production in protected as compared to unprotected area indicated that forage species grew best to the potential of the area when protected. Moreover, forage production and cover percent data suggested that a range occupied by *Themeda anathera* and *Plantago lanceolatus* can be converted to a better and preferred *Digitaria-Agrostis* range by protection.

References

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