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Yield and Chemical Composition of Common Roadside Grasses Available in Bangladesh

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Abstract: This experiment was conducted to estimate the yield and nutritive value of common roadside grasses available in Bangladesh. A land was developed as an experimental plot and made for growing roadside grasses and was partitioned into four quarters each of 200 sq.m. Pasture was established as a grazing land. The average herbage yield (DM and OM) recorded in the month of November was significantly ($P<0.05$) higher than that of August, September or February. The fresh yield ($P<0.05$) and CP yield of *Phaseolus mungo* were significantly higher than that of other grass species. The OM content of *Imperata cylindrica* was significantly ($P<0.05$) than other grasses. The DM content of *Cynodon dactylon* and *Imperata cylindrica*, NDF content of *Cynodon dactylon* and CP content of *Phaseolus mungo* were significantly ($P<0.01$) higher than other grass species.

Key words: Roadside grasses, grazing land, herbage yield, chemical composition

Introduction

Bangladesh is densely populated agricultural country. Agriculture is the only component to fulfil the food demand of enrising people. All the cultivable land and most of the fallow land is now being used for crop production. As a result no pastureland is available to use as a grazing land. According to Saadullah (1990) due to shortage of grazing land, small ruminants in Bangladesh are suffering from malnutrition. In such a venerable situation, rearing small ruminants obviously depends upon availability of roadside grasses. Autumn harvested grasses contained considerably higher nitrogenous compound than those of spring harvested grasses (Ribeiro *et al.*, 1991). Ranjhan and Katiyar (1969) observed higher CP% in grasses grown in monsoon. Tareque (1985) observed that grasses in dry season showed higher DM content. Native grasses contain 19.7% DM and 8-10% CP (Alam, 1990) which are almost similar to those of important hybrid grasses (Ranjhan, 1980). Common grasses are the major source of livestock feed grown in roadside, river embankment, fellow land, cropland and high way track (Akbar, 1991). The nutritive value of basal grasses is needed to know the supply of nutrients as per requirement in animal production. The main object of this study was to know:

- The yield and nutritive value of roadside grasses.
- The availability and supply of nutrients to the animals.
- The types and best grasses.

Materials and Methods

The experiment was conducted at Bangladesh Agricultural University, Animal Nutrition Field Laboratory, Mymensingh for 212 days during the period from July, 1999 to February, 2000.

Pasture establishment and management: An area of 0.08-hectare plane land was surrounded by fancy materials and made for growing common roadside grasses available in Bangladesh. Maticali (*Phaseolus mungo*) seeds @ 42 kg ha^{-1} were sown in the pastureland. Pasture was established to estimate the yield and nutrient composition of grasses available in the grazing land. Intercultural operation like fertilizer and irrigation were done.

Experimental design: The experimental plot were partitioned into four quarters each of 200 sq.m. and pasture was established under the same management.

Measurements and procedures: During the experimental period herbage yield and proportion of different grasses in the grazing land were estimated in four occasions. In every case, three patches each of 0.25 sq. m. were made randomly in the grazing land and grasses within the patches were harvested at the ground level using sickles and weighed. The mixed grasses were then separated and weighed individually to estimate the yield and proportion of different grasses available in the pastureland. The collected grass samples from the pastureland were then subjected to chemical analysis following the method of AOAC (1980).

Statistical analysis: The experimental data related to yield and chemical composition of grasses were analyzed using "MSTAT" statistical program to compute analysis of variance (ANOVA) following randomized block design (RBD). Moreover, Duncan's new multiple range test (DMRT) was applied to identify significant differences among the treatment means.

Results and Discussion

Herbage yield and proportion of different grasses: Average yields of DM and OM at the middle of the experiment (Nov. 1999) were significantly higher ($P<0.05$) than those recorded either at the beginning (Aug. 1999 and Sept. 1999) or at the end of the experiment (Feb. 2000) (Table 1). However, fresh grass and CP yields during the experimental period were not significantly different ($P>0.05$). The probable reasons for higher yields of DM and OM in Nov. 1999 are the availability of optimum nutrient and suitable environment required for proper growth of herbage. Tareque and Saadullah (1988) reported that the yield of grasses varies in different seasons and their availability was not uniform all over the year. They also reported that the plant grew slowly in winter and rapid in summer. It should be noted that herbage yield was not uniform in different locations of the grazing land. As a result, DM yield ranged from 0.33 to 0.50 kg/sq. m. and OM yield ranged from 0.30 to 0.46 kg/sq.m. in the grazing land irrespective of harvesting time between August and February. These variations may be due to differences in soil fertility and other macro and micro environmental factors.

It is evident that DM concentrations (w/w) of *Phaseolus mungo* was the highest (32.8%) in the grazing land followed by *Cyperus rotundus* (19.5%), *Imperata cylindrica* (16.7%), *Axonopus compressus* (15.4%), *Panicum repens* (9.7%) and *Cynodon dactylon* (5.8%). The nutrient availability (DM, OM and NDF) from different grasses in the grazing land did not differ significantly ($P>0.05$). However, fresh yield ($P<0.05$) and CP yield ($P<0.01$) of *Phaseolus mungo* were significantly higher than that of other grass species (Table 2).

Chemical composition of grasses: The results showed that *Cynodon dactylon* and *Imperata cylindrica* contained significantly ($P<0.01$) higher DM than that of other grasses. However, DM

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Table 1: Average herbage yield during the experimental period

	Months						
Parameter	Aug. `99	Sept. `99	Nov. `99	Feb. `2000	CV%	SEM	Level of significance
Fresh grass (kg/sq.m.)	2.17	2.47	2.84	2.21	13.54	0.19	NS
Dry matter (kg/sq.m.)	0.33^{b}	0.38^{b}	0.50^{a}	0.37^{b}	14.31	0.03	*
Organic matter (kg/sq.m.)	0.30^{b}	0.30^{b}	0.46^{a}	0.34^{b}	15.73	0.03	*
Crude protein (g/sq.m.)	44.23	45.60	45.35	38.87	12.07	3.03	NS

Table 2: Proportion and different parameters (g/sq.m.) of grasses available in the grazing land

	Grass species								
Parameter	*Axonopus compressus*	*Panicum repens*	*Imperata cylindrica*	*Cynodon dactylon*	*Cyperus rotundus*	*Phaseolus mungo*	CV%	SEM	Level of significance
Fresh grass	165.00^{b}	85.00^{b}	135.00^{b}	48.75^{b}	182.50^{b}	380.00^{a}	74.78	62.80	*
Dry matter (DM)	25.92	16.35	28.02	9.83	32.87	55.2	69.98	9.81	NS
Organic matter (OM)	23.50	14.70	25.75	8.91	29.97	49.52	70.32	8.93	NS
Crude protein (CP)	2.64^{b}	1.60^{b}	3.68^{b}	0.87^{b}	3.35^{b}	11.37^{a}	86.08	1.69	**
Neutral detergent fibre (NDF)	16.7	10.48	17.62	6.66	20.82	33.63	69.45	6.13	NS

Table 3: Chemical composition of grasses

	Grass species									
Parameter	*Axonopus compressus*	*Panicum repens*	*Imperata cylindrica*	*Cynodon d Cyperus*	*actylon rotundus*	*Phaseolus mungo*	Mixed grass	CV%	SEM	Level of significance
DM (g/100g Sample)	15.77^{cd}	19.39^{ab}	20.90^{a}	21.17^{a}	17.53^{bc}	14.73^{d}	16.68^{cd}	7.53	0.68	**
CP (g/100g DM)	10.33^{bc}	9.88^{bc}	9.50^{c}	9.19^{c}	9.77^{bc}	20.13^{a}	11.15^{b}	7.63	0.44	**
OM (g/100g DM)	90.45^{b}	90.50^{b}	91.90^{a}	90.23^{b}	90.80^{ab}	89.75^{b}	90.58^{b}	0.86	0.39	*
NDF(g/100g DM)	64.75^{b}	63.75^{bc}	63.35^{bc}	68.30^{a}	63.05^{bc}	61.40^{c}	62.70^{bc}	2.46	0.78	**

Data having dissimilar superscripts differ significantly; *P < 0.05; **P < 0.01, NS = Non significant

content between *Cynodon dactylon* and *Imperata Cylindrica* did not differ significantly (Table 3). The average DM content of *Panicum repens, Cyperus rotundus* and mixed grass was almost similar. The mean value for CP content of *Phaseolus mungo* was significantly (P < 0.01) higher than other grasses. However, *Axonopus compressus, panicum repens, Imperata cylindrica, Cynodon dactylon, Cyperus rotundus* and mixed grass contained almost similar amounts of CP. Alam (1990) obtained 19.7 % DM and 8-10% CP in native grasses which is similar to this experiment. The OM content of *Imperata cylindrica* was significantly (P < 0.05) higher than that of other grasses. The OM content of *Axonopus compressus, Panicum repens, Cynodon dactylon, Cyperus rotundus, Phaseolus mungo* and mixed grass did not differ significantly from each other. Ranjhan (1980) mentioned that *Imperata cylindrica* contained 92.2% OM which is similar to this study. The average NDF content of *Cynodon dactylon* was significantly (P < 0.01) higher than other grasses. However, the NDF content of *Axonopus compressus, Panicum repens, Imperata cylindrica, Cyperus rotundus, Phaseolus mungo* and mixed grass was almost similar. The variation in chemical composition found in this study for the same species of grass may be due to differences in soil fertility, stage of maturity, light intensity, season and other macro and micro environmental factors (Ranjhan, 1980). On the other hand, Norton, (1984) reported that the nutritive value of browse varied considerably, not so much with season, mainly with species.

From this study it is evident that both qualitative and quantitative growth *Phaseolus mungo, Imperata cylindrica* and *Cynodon dactylon* are better than the other grasses. It is also observed that *Phaseolus mungo* is the best for yield, nutritive value as well as adaptability.

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