

## PERFORMANCE OF FOUR POPULAR FODDER GRASSES IN WEST KHANDESH REGION OF MAHARASHTRA

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Four popular fodder grasses viz. Sudan grass, Neel grass, Para grass and Marvel grass were selected for cultivation and total performance at Vidhyanagari area of Dhule during summer season of 1988-89. On an average Neel grass was found to be highest in protein content i.e. up to 17.71, and also other nutrients were in adequate, but the green fodder yield was poor i.e. only 36.58 t/ha. While Sudan grass was moderate in protein content i.e. 14.76 and other nutrients and the yield performance was better i.e. 60.25 t/ha. Marvel, though found nutritive but the yield was lowest i.e. only 20.65 t/ha. Para grass was a coarse-grass, less nutritive and yield performance was moderate.

**Keywords:** Fodder; Nutritive; Performance; Yield.

### Introduction

In order to evaluate the performance of four popular fodder grasses of West Khandesh region, in view of their production potential and nutritive value present investigation was undertaken. The grasses selected were : 1. Sudan grass: *Sorghum sudanense* Stapf, 2. Neel grass : *Panicum antidotale* Retz, 3. Para grass : *Brachiaria nutica* Stapf, 4. Marvel grass : *Dichanthium annulatum* Stapf and were introduced in the year 1920, 1938, 1894 and 1980 respectively in India.

### Materials and Methods

Four fodder grasses viz : Sudan grass, Neel grass, Para grass and Marvel grass were cultivated at Vidhyanagari area during summer season of 1988-89. A piece of land, about 300 Sq.M., was divided into 7.53 m plots and crops were sown in 8 rows spaced 30.5 cm apart. Details of date of sowing, fertilizers used are described in Table 1.

The crops received fertilizers through either Urea or Suphala, 20 to 25 days after sowing. Harvesting was done at a preflowering stage and in the early morning hours. All the crops were allowed to grow after first harvest and their regrowths harvested. Samples of green fodder were immediately brought to the laboratory for analysis.

The samples were chopped into 2 to 3 cm pieces and dried in electric oven at  $90 \pm 5^\circ\text{C}$  till constant weight for dry matter (DM) was obtained. Fine powder of dried sample was used for estimation of crude protein, crude fibre, crude fat, ash, acid insoluble ash, nitrogen free extract, total carbohydrates, calcium and phosphorus. Nitrogen (N) content was determined in duplicate by micro-kjeldahl method.<sup>1</sup> The value of crude protein (CP) was extracted as  $N \times 6.25$ . Hanneberg acid-alkali gravimetric method outlined by Lees<sup>2</sup> was used for the estimation of crude fibre (CF). Crude fat was measured with chloroform-methanol

Table 1. Details of cultivation practices and harvesting of the four popular grasses grown during summer season of 1988 to 1989

Crop	Variety	Date of sowing	Seed rate Kg/ha	Total fertilizer Added			Type of cut	Date of Harvest
				N	P	K		
I	Sudan grass	20 Nov 1988	25	60	30	30	I Cut I regrowth II regrowth	27 Jan 1989 10 Apr 1989 10 May 1989
II	Neel grass	20 Nov 1988	--	60	30	30	I Cut I regrowth II regrowth III regrowth	27 Jan 1989 23 Mar 1989 16 Apr 1989 15 May 1989
III	Para grass	20 Jan 1989	--	60	30	30	I Cut I regrowth II regrowth	25 Feb 1989 25 Mar 1989 15 May 1989
IV	Marvel grass	20 Jan 1989	--	60	30	30	I Cut I regrowth II regrowth	25 Feb 1989 10 Apr 1989 15 May 1989

Table 2. The total yields of green fodder, dry matter and crude protein from the four popular fodder grasses.

Name of grass	Duration	Total days of cultivation	Green fodder		Total yield (kg/ha)		
			Average		Green Fodder	Dry Matter	
			% DM N% of DM				
I. Sudan grass	Nov-May	171	17.63	2.36	60256	10553	1497
II Neel grass	Nov-May	176	15.50	2.83	36584	5660	984
III Para grass	Jan-May	115	14.02	2.53	52810	7333	1103
IV Marvel grass	Jan-May	114	15.53	2.06	20659	3162	413

Table 3. Average nutrient composition of green fodder on DM basis from the four popular fodder grasses.

Name of grass	%DM	CP	CF	C Fat	Ash	A/A	NFE	TC	Ca	P
I Sudan grass	17.63	14.76	26.3	8.5	10.1	1.8	40.27	66.57	0.77	0.34
II Neel grass	15.50	17.71	27.4	7.9	14.6	0.4	32.31	59.74	0.90	0.40
III Para grass	14.02	15.05	30.0	7.7	16.1	3.3	30.72	60.67	0.66	0.34
IV Marvel grass	15.53	12.85	28.4	6.8	14.0	6.6	37.81	66.35	0.79	0.30

was measured with chloroform methanol (2:1) as a solvent using Soxhlet extractor. A.O.A.C. methods<sup>3</sup> were followed for the determination of ash, acid insoluble ash (AIA), nitrogen free extract (NFE), total carbohydrates (TC) and calcium (Ca). A method of Fiske and Subba Row<sup>4</sup> described by Oser<sup>5</sup> was followed for the determination of phosphorus (P).

### Results and Discussion

*Crop : Sudan grass* — A variety SSG-59-3 of *Sorghum* called as Meethi Sudan was cultivated during November to May. It is a thin stemmed variety suitable for fodder. The crop yielded 60.25 tonnes green fodder per hectare with average 17.63% DM (Table 2). The green foliage had 14.76% crude protein, 26.3% crude fibre and 10.1% ash. Sudan grass was found to be rich in acid insoluble ash with lower levels of calcium and phosphorus. The data indicated the suitability of this crop for cultivation as fodder particularly during dry months (Table 3).

*Crop : Neel grass or Blue panic* -It is considered as a forage grass adapted to a wide range of soil and climatic conditions and cultivated during November to May. The yields of green fodder, dry matter and crude protein reached to 36.5 t/ha, 56.6 q/ha and 984 kg/ha respectively (Table 2). The nutrient composition of this crop (Table 3) revealed that the green fodder contained 17.71% crude protein (on DM basis). The fodder was adequate in all other nutrients to fulfill the needs of cattle<sup>6</sup> but the yield of green fodder from this grass was comparatively low, and needs further study for increased productivity.

*Crop : Para grass* - This grass prefers warm climate and moist situations and was cultivated during January to May. This crop yielded 52.8 t/ha green fodder in 4 cuts during the growth of 115 days. The green fodder was with average 14.02% dry matter (Table 2) and 15.05% crude protein (DM). It was rich in ash content, however the quantities of calcium and phosphorus were low (Table 3). On the basis of yield, this grass was found suitable as a fodder crop to be cultivated in summer under moderate irrigation but is coarse, and so advisable to feed it in mixture with other forages.

*Crop : Marvel grass* - A variety GMG-1 of this grass was cultivated during January to May. It yielded 20.6 t/ha green fodder with 15.53% DM (Table 2). The crop was with 12.85% average crude protein. The results on nutritive composition are not in agreement with those recorded by Prasad.<sup>7</sup> Although, all other nutrients were available in sufficient quantities, the fodder was found to be poor in calcium and phosphorus (Table 3). Lower yield was recorded in experimental field in comparison to other grasses.

### References

1. Bailey R L 1967, *Techniques in Protein Chemistry* II Edn., Elsevier Publishing Co., Amsterdam.
2. Lees R 1968, *Laboratory Handbook of Food Analysis*, Leonard Hill Books, London.
3. A O A C 1970, *Official and Tentative Methods of Analysis* XI Edn. Association of Official Analytical Chemists, Washington D.C.
4. Fiske C H and Subba Row Y 1925, *J. Biol. Chem.* 66 375
5. Oser B L 1979, *Hawk's Physiological Chemistry* XIV Edn. Tata McGraw-Hill Publishing Co. Ltd., New Delhi.
6. Sen K C and Ray S N 1964, *Nutritive Values of Indian Cattle Feeds and the Feeding Animals*, I.C.A.R. Bull. No. 25, New Delhi.
7. Prasad S 1993, *Environment & Ecology* 11(4) 976