RESEARCH ARTICLE

Performance of some popular fodder grasses in east Khandesh region of Maharashtra, India

Bendre KB and Rathod MM*

Department of Botany, Nansaheb Y N Chavan Arts, Science and Commerce College, Chalisgaon 424101(MS), India
*Department of Botany, S.S.M.M. Arts, Science and Commerce College, Pachora 424201 (MS), India

Manuscript details:

Received: 29.04.2017
Accepted: 29.06.2017
Published : 07.07.2017

Editor:
Dr. Arvind Chavhan

Cite this article as:
Bendre KB and Rathod MM (2017) Performance of some popular fodder grasses in east Khandesh region of Maharashtra, India*; International J. of Life Sciences*, 5 (2): 259-263.

ABSTRACT

In India crop livestock integration which is also known as 'Mixed Farming' is common practice. On such a farm the livestock husbandry provides supplementary income to the farmers. For which they rear cattle, cows, buffalos, goats and poultry. Therefore, it is necessary for the farmer to obtain fodder either from grasslands or by cultivating forage crops to feed the animal.

So in order to evaluate the suitability in view of their production potential and nutritive value present investigation was undertaken by using some popular fodder grasses viz. Marvel grass ,Sudan grass Neel grass and Deenanath grass; are selected for cultivation and total performance at Maharashtra sheli Va Mendhi Vikas Prakshetra Bilakhed, Tal-Chalisgaon, East Khandesh Region of Maharashtra, during kharif season of 2010-11. On an average Neel grass was found to the highest in protein content i.e. upto 9.8% and also other nutrients were in adequate, but the green fodder yield was poor i.e. only 17.9 t/ha. While Deenanath grass was moderate in protein content i.e. 8.6% and the other nutrients and yield performance was better i.e. 33 t/ha. Marvel grass though found nutritive, but the yield was lowest i.e. only 15.6 t/ha. Sudan grass less nutritive and yield performance was moderate.

Key words:- Fodder, performance, Nutritive, yield, Livestock.

INTRODUCTION

Even if range/forage is not serving as a direct source of food for man, still it serves the mankind in a number of indirect ways. Solar energy which is transformed into food energy by the green cover of the range is available to primary consumers (grazers-domesticated or wild) as food, where in a part of it is converted into meet. Of considerable importance to man are those herbivores, and their products such as meat, milk, skins, hides, horns, wool, etc. It can thus be said that at the root of all biological resources that man utilizes is the forage. Robinson(1921) aptly wrote that "Grass is King". It rules and govern the world, it is the very foundation of all commerce.

Livestock keeping in India has a great significance in the economy of small and marginal farmers. The production potential of the farming system depends upon the quantum and quality of in daily ration of animal in off season. We are surplus in food grains due to green revolution or improved food situation. However, in terms of human nutrition, food supply needs supplementation with products of animal origin for better nutrition such as milk, meat and eggs. These products are known to be in short supply. With a view of improving the production of animal products, livestock improvement projects are in operation in the country since the beginning of last decade. Adequate supply of fodder is a prerequisite in all livestock improvement programme (Todkari, 2012). India is fourth in livestock production. The total production of livestock in our country in1992 was 446 million and nearly 475 million livestock's in the year 2002 (Shrotria2002). So in order to evaluate the suitability in view of their production potential and nutritive value present investigation was undertaken by using some popular fodder grasses viz. Marvel grass, Sudan grass, Neel grass and Deenanth grass were selected for cultivation and total performance at Maharashtra Sheli Va Mendhi Vikas Prakshetra, Bilakhed Tal- Chalisgaon, East Khandesh Region of Maharashtra during Kharif season in 2010-11.

MATERIAL AND METHODS:-

Four popular fodder grasses viz. Marvel grass, Sudan grass, Neel grass and Deenanath grass recommended by Mahatma Phule Krishi Vidyapeeth, Maharashtra were cultivated at Maharashtra Sheliva Mendhi Vikas Prakshetra Bilakhed (chalisgaon) East Khandesh Region of Maharashtra during kharif in 2010-2011. The soil was analyzed by Govt. Soil Analyzing Laboratory, Jalgaon (1998) of its nitrogen content before sowing. The soil was poor in phosphorous, moderate in nitrogen and potash with a normal pH 7.8. A piece of land measuring about 270 sq.m.(15cm 18cm) was prepared by plugging and cross plugging. While preparing the land "Compost" prepared on the farm was added at the rate of 3000 kg./ ha. The land was than divided into 18 plots each with an area of 15 sq.m. for sowing the crops. Each crop was sown in nine replicates. The plot were arranged in Randomized Block Design. The crops were sown in rows, each plot bearing 10 rows spaced 30.5 cms. Part. The fertilizer was applied only at the time of sowing as recommended does by agriculture department. All crops were raised under irrigated conditions.

The crops were harvested from three replica every time, at preflowering stages as shown in Table. I the weight of the green fodder obtained from each plot was measure and the samples of green fodder were immediately brought to the laboratory for analysis. The samples were chopped into 2 to 3 cm. piece and dried in an electric oven at 75± 5^0C till constant weight for dry matter (DM) determination. Dried samples were ground to a fine powder and are used for estimation of crude protein. Nitrogen (N) content was determined in duplicate by Microkejeldahl method (Bailey. 1967). The value of crude protein (CP) was expressed as N x 6.25. Hanneberg acid alkali gravimetric method outlined by Lees (1968) was used for the estimation of crude fibre (CF). Crude fat was measured with chloroform: Methanol (2:1) as a solvent using soxhlet extractor. A.O.A.C. (1970) methods were followed for the determination of ash, acid insoluble ash (AIA), nitrogen free extract (NFE), total carbohydrate (TC) and calcium (Ca) Method of fiske and Subbha Row (1925) describe by Oser (1979) was followed for the determination of phosphorus (P)

RESULT AND DISCUSSION:-

Marvel Gras *Dichanthium annulatum* Forsk Stapf
This is one of the best known grass of India. It is the major perennial grass of *Sehima- Dichanthium* grass cover of India. It gives high yield palatable nutritious forage and is suitable for insitu grazing as well as cut and carry system and as hay. Its fodder value was first recognized in Pune.

A variety of Marvel 8 of this grass was grown for 112 days from June 2010 to Oct 2010. It was harvested two times (Table 1) where it yielded 312.11q/ha green fodder with 28 to 29% DM (Table 2). The crop was with 7.5% crude protein when harvested for first time. The protein content slightly increased to 7.87% at the first regrowth. Although all other nutrients were available in sufficient quantities, the fodder was found to be decrease in calcium and phosphorous (Table 3). Though this crop grew luxuriously on field but, it fails to grow on experimental field resulting in lower yield in comparison to other grasses.

Table 1 : Details of Cultivation Practices and harvesting of some Popular grasses.

Crop	Date of Sowing	Seed rate kg/ha / slips/ha	Total Fertilizer added (kg/ha)			Type of Cut	Date of Harvest
			N	P	K		
Marvel Grass	20 Jun 2010	70000 Slips	50	20	20	Ist cut Ist regrowth	10 Sept 2010 10 Oct 2010
Sudan Grass	20 Jun 2010	50	100	40	40	Ist cut Ist regrowth	25Aug 2010 30 Sept 2010
Neel Grass	20 Jun 2010	6	100	40	40	Ist cut Ist regrowth IInd regrowth	10 Sept 2010 10 Oct 2010 10 Nov 2010
Deenanath Grass	20 Jun 2010	8	100	40	40	Ist cut Ist regrowth IInd regrowth	10 Sept 2010 10 Oct 2010 12 Nov 2010

Table 2 : Yield of Green Fodder, dry matter and Crude Protein from some popular grasses

Crop	Duration	Type of Cut and age of Crop In days	Green Fodder		Yields (kg/ha)		
			% DM	N% of DM	Green Fodder	Dry matter	Crude Protein
Marvel Grass	Jun- Oct	Ist Cut (82)	20	1.20	15069	4370	328
		Istregrowth (30)	28	1.26	16145	4520	356
		Total			**32214**	**8890**	**684**
		Mean			15600	4450	340
		SD			500	50	10
		C V %			3.20	1.12	2.94
Sudan Grass	Jun- Sept	IstCut (66)	21	0.86	23680	4973	267
		Istregrowth (40)	19	0.88	30138	5726	317
		Total			**53818**	**10699**	**584**
		Mean			26900	5350	295
		S.D.			3200	380	25
		C V %			11.89	7.10	8.47
Neel Grass	Jun- Nov	IstCut (82)	23	1.60	12916	2971	297
		Istregrowth (30)	14	1.56	25833	3617	297
		IIndregrowth (31)	20	1.52	15079	3016	286
		Total			**53828**	**9604**	**880**
		Mean			17930	3190	297
		S.D.			5635	290	4.7
		C V %			31.48	9.09	1.58
Deenanath Grass	Jun - Nov	IstCut (82)	17	1.44	47361	8051	725
		Istregrowth (30)	23	1.46	30139	6932	633
		IIndregrowth (33)	23	1.17	21528	4951	362
		Total			**99028**	**19934**	**1720**
		Mean			33009	6645	574
		SD			10700	1282	154
		C V %			32.42	19.29	27

Table 3: Nutrient Content of Green Fodder from some popular grasses

Crop	Date of Harvest and type of cut	% Dry Matter DM	% of DM								
			CP	CF	EE	Ash	AIA	NFE	TC	Ca	P
Marvel Grass	10 Sept 2010 Ic	29.00	7.50	25.4	1.7	11.9	3.20	53.5	78.9	0.27	0.35
	10 Oct 2010 Ir	28.00	7.87	27.3	1.4	11.5	3.00	51.0	78.3	0.83	0.32
Sudan Grass	25 Aug 2010 Ic	21.00	5.40	26.1	8.9	10.3	1.50	49.3	75.4	0.60	0.25
	30 Sept 2010 Ir	19.00	5.50	25.1	8.5	10.0	1.60	50.5	76.0	0.70	0.31
Neel Grass	10 Sept 2010 Ic	23.00	10.00	28.0	7.3	14.2	0.40	40.5	68.5	0.80	0.37
	10 Oct 2010 Ic	14.00	9.80	29.3	8.4	13.2	0.35	39.3	68.6	0.91	0.36
	10 Nov 1020 IIr	20.00	9.56	30.2	8.1	13.5	0.12	38.6	68.8	0.87	0.33
Deenanath Grass	10 Sept 2010 Ic	17.00	9.00	27.2	2.5	14.9	-	46.4	73.6	0.44	0.46
	10 Oct 2010 Ir	23.00	9.12	28.9	2.6	14.2	-	45.0	73.9	0.42	0.37
	12 Nov 2010 IIr	23.00	7.31	28.9	5.8	19.0	1.40	39.0	67.9	0.74	0.16

Sundan Grass: *Sorghum sudanensis* Piper Stapf
The value of this grass was first hated in Sudan in 1909. It was introduced in India in 1920 and now has proved in valuable addition to interbreed fodder grass in the country. It is relative of *Sorghum* and Paragrass.

Sudan grass is an important forage crop having best tolerance to heat and drought than Jowar, maize or teosinte. It has succulent leaves with juicy and sweet stem (Choubey et. al. 1999) Table 2 gives the yield of Sudan grass when it was cultivated during June to Sept 2010. The crop yielded 538 t green fodder per hectare. When harvested twice in 106 days (1 cut +1 regrowth) the percentage DM ranged between 19 to 21% the nutrient composition of Sudan grass is given in Table No. 3. The green fodder has 5.4 to 5.5 % crude protein 25.5 to 26.1 % crude fibre and 10.0 to 10.3 % ash. As with *Sorghum*, Sudan grass was also found rich in AIA with lower levels of calcium and phosphorus. The data indicates sustability of this grass for cultivation as fodder during Kharif Season.

Neel Grass: *Panicum antidotale* Retz.
It is a tall perennial grass with greeping stockroot, multicut, early maturing high yielding native of India drought resistance, adopted to variety of soil and climate conditions (Patunkar, 1980). This grass growth wild in Rajasthan and North Western region of India. Its fodder value was first recognized in Australia, from where seed were obtained for tails at Coimbatore 1938. Since then it has been recognized as a very drought resistance well suited for arid and semi-arid region (Singh et al 1985). The grass is very productive, nutritious and palatable. (Narayanan and Dabadghao,1972).

The Neel grass was raised during kharif season of the year 2010 (Table-1). The maximum yield of green fodder, dry matter and crude protein reached to 538.28 q/ha 96.04 q/ha and 880 kg/ha respectively (Table-2) In 143 days the crop was harvested thrice the nutrient composition of this crop (Table 3) revealed that the green fodder contained 9.56 to 10 % crude protein on dry matter basis with the fodder had adequate quantities of all other nutrients to fulfill need of cattle. The result are in a greenent those reported be Sen and Ray (1964)

Deenanath Grass – *Pennisetum Pedicellatum* Trin
It had been growing wild in Chota Nagpur and Gaya districts of Bihar as well as some part of peninsular India. Its fodder value was first recognized in Africa and Australia from where seeds are obtained for trials at IARI, New Delhi in 1950 (Narayanan & Dabadghao, 1972) since then trials carried out in different parts of the country have shown the fodder potential of this grass and has been named 'Deenanath' in Bihar and 'Deenbandhu grass' i.e. friend of the poor later on from Jodhpur.

Deenanath grass was grown for 145 days from June to Nov 2010 (Table-1), During this period it was harvested three times (1 cut + 2 regronths) when it yield 990.2 q/ha green fodder with 17 to 23%

DM(Table-2) higher c.v. value indicate its poor stability. The crop was with 9.0 % crude protein when harvested for the 1st time the protein content slightly increased to 9.12% at the first regrowth. Although all other nutrients were available in sufficient quantities, the fodder was found to be deficient in calcium and phosphorous (Table-3). However, the crop had higher productivity potential than other three fodder grasses. The overall results are in agreement with those reported by Patil (1990).

Conflicts of interest: The authors stated that no conflicts of interest.

REFERENCES

AOAC (1970) '*Official and Tentative Methods of Analysis*' IInd Edn. Association of official analytical chemists Washington DC.

Basley RL (1967) '*Techniques in Protein Chemistry*' IInd Edn, Elsevier publishing Co., Amsterdam.

Chaoubey S, Bhagat RK, Shrivastava (1999) *Journal of Research* (BAV) 11(1):49.

Lee R (1968) *'Laboratory handbook of food analysis'* London Hills books, London.

Narayanan TR and Dabadghao DM (1972) *'Forage Crops of India'*, ICAR, New Delhi.

Oser BL (1979) *'Hawks Physiological Chemistry'*, XIV Edn. Tata McGrew Hill Publishing Co. Ltd, New Delhi.

Patil PR (1990) *'Studies in Nutrient Content and Conservation of Forage crops from Khandesh Region of Maharashtra'*, PhD thesis, Dr. BAMU, Aurangabad (MS).

Patunkar BW (1980) *'Grasses of Maharashtra'* Scientific Publisher, Jodhpur.

Robinson (1921) *A handbook of Some South Indian Grasses'*, (Achariyar K.R. and Mudaliyar C.T.Deharadun Publication, Deharadun.

Sen KC and Ray SN (1964) *'Nutritive value of Indian Cattle Feed and Feeding of Animals'.* ICAR Bull No.25, New Delhi.

Shrotria PK, Singh R, Singh V, Pandey PK and Baskheti DC (2002) *Indian farmers digest* 35(6):23.

Singh KA, Premchandran MW and Handa (1985) *Indian J.Agron* 30(4):45

Toolkari GU (2012) *A note on Jowar Cultivation in Solapur District of Maharashtra, review of Research* I (6):1.