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Productivity and nutrient composition of four popular varieties of fodder Jowar

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ABSTRACT

Plant cultivar of Sorghum viz. Harasona, Sweet Sorhum (local), Ruchira and Phule Yashoda were cultivated during 1999-2000, for the measurement of yield and to evaluate nutrient status. The overall results indicated that Harasona cultivar of Sorghum was more productive and could yield 64.60 t. green fodder per hectare in 83 days and also found suitable in nutrient composition.

KEYWORDS

Sorghum, Cultivation, Cultivar, Productivity Nutrient Composition

INTRODUCTION

Indian agriculture has made spectacular advances since independence in achieving self sufficiency in food grain production, however, in respect to the production of milk and other animal products the country is lagging behind, despite having a huge livestock population. In this context, proper feeding and management of farm animals through developing livestock industry will play an important role. Under present situation supply, position of good quality nutritious animal feed is not satisfactory. In general, the farmers fulfill bulk requirement of animals through readily available, nutritionally inferior and cheap agricultural residues.

Jowar: *Sorghum bicolor* (L) Moench is an important fodder crop able to grow over a very wide range of climate and soil conditions. As a fodder crop, it is convenient to grow in different months for cutting and feeding as green forage. A researcher at I.A.R.I during the last decade has resulted in the release and notification for general cultivation, an array of varieties for countrywide circulation. In order to evaluate the suitability of selected varieties of Jowar for fodder in view of their production potential and nutritive value present investigation was undertaken.

MATERIALS AND METHODS

Four popular varieties of fodder Jowar viz Harasona, sweet Sorghum (local), Ruchira and Phule Yashoda were cultivated at "Maharashtra Sheli va Mendhi Vikas Prakshetra", Bilakhed (Chalisgaon). The cultivation was undertaken during summer, kharif and rabi season of 1999-2000. The soil was analyzed by Govt. Soil-Analyzing laboratory, Jalgaon (1998) of its nutrient 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. (15m x 18m) was prepared by ploughing and cross ploughings. 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 plots were arranged in Randomized Block Design. The crops were sown in rows, each plot bearing 10 rows spaced 30.5 cm part. The fertilizers were applied only at the time of sowing as recommended does by agriculture department. All crops were raised under irrigated conditions.

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The crops were harvested from three replica every time, at pre-flowering stages as shown in Table.1 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 over at 75 $\pm$ 5^0 C 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 Lee (1968) was used for the estimation of crude fibre (CF). Crudefat 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).

RESULTS AND DISCUSSION

Four cultivars of *Sorghum* including one local variety were cultivated (Table 1). Two in all three seasons, and two each in one season only as per the availability of seeds. It is an important forage crop of Maharashtra State due to its desired qualities like quick growing habit,. high yield potential, better palatability, digestibility and hay making. In Maharashtra it is main source of fodder for animal and bullock (Shinde *et al.,* 1994). Like maize this crops was also found to be highly productive. The results on the productivity of different cultivars of *Sorghum* are presented in Table 2. A local variety of this crop, Sweet sorghum yielded 62.4 t. green fodder per hectare in 83 days in a single cut, harvested during the June to Sept. 1999.

Lower values of C.V. in sweet sorghum variety indicates its stability (Table 2). Harasona cultivar of *Sorghum* yielded 64.6 t. green fodder per hectare in 83 days. In other two varieties, the yield was below 56 t green fodder per hectare. A cultivar of *Sorghum*, ruchira (R.S. 11-4) was also found productive as it could yield 53.8 t. green fodder in 80 days during Feb. to May 1999. The results obtained are comparable to those recorded by Shinde *et al*., (1994), Hazra (1996), Bhagmal (1998) and Vasanthi *et al.,* (1998).

Percent dry matter (DM) in the crop showed large variation due to the cultivars as well as seasons. The N% of DM ranged from 1.45 to 1.76%. Table 3 gives chemical composition of the green fodder obtained from *Sorghum* harvested at various times. The crude protein content in the fodder ranged from 9.06 to 11%. This variation was mainly due to the season and variety. Ruchira (R.S.11-4), which was harvested on 10th May, 1999 showed maximum protein content. The Harasona cultivar was also found rich in protein. The crop was found to be inadequate in the Ca and P content as has been also observed by Dakore (1985) and Vasanthi *et al.,* (1998).

Table 1: Details of cultivation practices and harvesting of Jowar (*Sorghum bicolor* (L) moench) grown during 1999-2000

Crop	Cultivar	Date of Sowing	Seed rate (kg/ha)	Total fertilizers added (kg/ha)			Date of harvest
				N	P	K	
Jowar	Harasona	20 Feb. 1999	45	100	50	40	10 May 1999
		20 Jun. 1999	45	100	50	40	10 Sept. 1999
		15 Oct. 1999	45	100	50	40	05 Jan.2000
	Sweet Sorghum (Local)	20 Feb. 1999	50	100	50	40	10 May 1999
		20 Jun. 1999	50	100	50	40	10 Sept. 1999
		15 Oct. 1999	50	100	50	40	05 Jan.2000
	Ruchira	20 Feb. 1999	50	100	50	40	10 May 1999
	Phule – Yashoda	15 Oct. 1999	50	100	50	40	05 Jan 2000

Table 2: Yield of Green fodder, dry matter and crude protein from Jowar (*Sorghum bicolor* (L) moench)

Cultivar	Duration	Age of the Crop (Days)	Green Fodder		Yield (kg/ha)		
			%DM	N%of DM	Green fodder	Dry matter	Crude protein
Harasona	Feb-May	80	16.0	1.56	55971	8955	873
	Jun-Sept	83	13.0	1.60	64582	8395	839
	Oct-Jan	82	14.0	1.60	15069	2109	211
		Mean			**45207**	**6485**	**6406**
		S.D.			**21600**	**3103**	**1752**
		C.V.(%)			**47.77**	**47.84**	**27.35**
Sweet-Sorghum	Feb-May	80	22.5	1.53	43055	9687	926
	Jun-Sept	83	13.0	1.52	62430	8116	771
	Oct-Jan	82	18.0	1.53	38749	6975	667
		Mean			**48078**	**8258**	**778**
		S.D.			**6932**	**1112**	**106**
		C.V.(%)			**14.41**	**13.46**	**13.54**
Ruchira	Feb-May	80	14.0	1.76	53819	7535	829
Phule-Yashoda	Oct-Jan	82	17.0	1.45	27985	4757	431

Table 3: Nutrient content of green fodder from Jowar (*Sorghum bicolor* (L) Moench)

Crop	Cultivar	Date of Harvest	% Dry Matter (DM)	% of DM								
				CP	CF	EF	ASH	AIA	NEF	TC	Ca	P
Jowar	Harasona	10 may 1999	16.0	9.80	29.0	8.3	10.1	2.9	42.8	71.8	0.95	0.38
		10 Sept. 1999	13.0	10.00	34.0	6.5	7.4	2.8	42.1	76.1	0.69	0.20
		05 Jan. 2000	14.0	10.00	34.3	6.4	8.1	2.4	41.1	75.4	0.50	0.26
	Sweet Sorghum (Local)	10 May 1999	22.5	9.60	28.3	7.5	11.3	3.6	43.3	71.6	0.81	0.42
		10 Sept. 1999	13.0	9.50	33.8	6.2	7.1	2.6	43.3	77.1	0.73	0.16
		05 Jan. 2000	18.0	9.06	27.1	11.3	9.3	0.7	43.2	70.3	0.87	0.39
	Ruchira	10 May 1999	14.0	11.00	26.0	8.1	10.8	3.1	44.1	70.1	0.97	0.43
	Phule Yashoda	05 Jan 2000	17.0	9.10	36.0	4.32	11.4	3.1	39.1	75.1	0.53	0.27

CONCLUSION

The overall result indicates that all the four cultivar of fodder Sorghum *viz. Harasona, Sweet Sorhum (local), Ruchira and Phule Yashoda* performed well. However the *Harasona* cultivar proved better in productivity and nutrition, hence it can be recommended for cultivation.

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