

Short Communications

A Note on Screening of Grass Species Under Rainfed Condition

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Arid Zones are marked by hostile agro-climatic conditions and frequently recurring famines due to scanty and erratic rainfall. The local people in these Zones obtain their subsistence from livestock to ameliorate their plight. Livestock is dependent mostly on native rangelands which are degraded and denuded due to high pressure of livestock grazing. Mann and Singh (1978) tested four grass species viz., *Cenchrus ciliaris*, *C. setigerus*, *Panicum antidotale* and *Lasiurus indicus* under rainfed condition at Jodhpur. In this experiment *C. ciliaris* gave the highest yield of green forage (87.79 q/ha) when fertilised. This suggests that grasses can be a preferable proposition in arid zones. In the State of Gujarat 88 per cent of the total area is under dry-land conditions. Kheda district constitutes 100 per cent semi-arid climate and is very well known for its dairy industry. Keeping this in view experiments were conducted to screen different types of grasses which can withstand drought condition and produce profitable yields.

A field experiment was conducted during 1973, 1974 and 1975 on the research farm of the All India Co-

ordinated Research Project on Dry-land Agriculture, Gujarat Agricultural University, Anand. Six grass species viz. 1. Hybrid Napier (Dharwar-4 and New Pusa-1); 2. Anjan (*Cenchrus setigerus*); 3. Dhaman (*Cenchrus ciliaris*); 4. Blue panic (*Panicum antidotale*); 5. Guinea grass (*Panicum maximum*); and 6. Marvel grass (*Dilchanthium annulatum*) were tried in a randomized block design with four replications. The tussocks of all the species were planted at the spacing of 45 cm x 45 cm on 18-7-73 and fertilised with 40 kg N and 40 kg P_2O_5 /ha in the year 1973 and only 30 kg N/ha each in 1974 and 1975. The tussocks of Hybrid Napier (Dharwar-4) and (New Pusa-1) and Guinea grass were replanted during monsoon, 1975 as they could not survive due to low rainfall (345 mm) in the year 1974. The total cuttings obtained during 1973, 1974 and 1975 were 2, 4 and 4, respectively from each crop.

The total rainfall received during the years 1973, 1974 and 1975 was 1074, 345 and 909 mm, respectively.

The green and dry forage yield of different grass species and their nutritive values are presented in Table 1 and 2, respectively.

During 1973, green and dry forage yield of various grass species showed significant differences (Table 1). Dharwar-4 variety of Hybrid Napier out yielded all the other grass species and

TABLE 1

Green and dry forage yield of different grass species.

Species/Varieties		Green forage, Q/ha			Dry forage/ Q/ha			Pooled	
		1973	1974	1975	1973	1974	1975		
1.	2.	3.	4.	5.	6.	7.	8.	9.	
1.	Hybrid Napier-Dharwar-4	625.0	164.7	94.4	261.6	132.5	30.3	33.2	61.1
2.	Hybrid Napier-New Pusa-1	263.6	65.5	40.5	156.3	51.4	17.7	13.7	31.8
3.	<i>C. setigerus</i> (Anjan)	93.9	80.6	115.7	96.7	26.2	22.9	63.0	37.3
4.	<i>C. ciliaris</i> (Dhaman)	32.2	67.7	104.2	68.0	8.8	21.0	53.2	27.7
5.	<i>Panicum antidotale</i> (Blue panic)	204.7	68.0	85.5	119.4	48.9	21.5	48.5	39.7
6.	<i>Panicum maximum</i> (Guinea grass)	126.8	70.8	49.4	82.3	18.5	16.5	20.7	18.6
7.	<i>Dichanthium annulatum</i> (Marvel grass)	73.3	82.5	95.5	83.8	26.2	23.9	56.4	35.5
C.D. at 5%		206.1	62.8	41.6	59.2	11.4	N.S.	16.7	14.5

TABLE 2

TABLE 2

Crude protein and NDF content of different grass species/varieties (1973, 1974 & 1975).

Species/Varieties	Crude protein (%)				N.D.F. (%)			
	1973 2.	1974 3.	1975 4.	Average 5.	1973 6.	1974 7.	1975 8.	Average 9.
Hybrid Napier, Dharwar-4	5.2 (7.0)	6.0 (1.8)	7.5 (2.5)	6.2 (3.8)	46.8	58.6	73.1	59.5
—do— —New Pusa-1	4.1 (2.1)	9.6 (1.7)	7.1 (2.0)	6.9 (1.6)	37.1	57.7	72.9	55.9
<i>C. setigerus</i> (Anjan)	3.8 (0.9)	5.4 (1.2)	6.7 (4.2)	5.3 (2.1)	41.7	60.6	70.8	57.7
<i>C. ciliaris</i> (Dhaman)	4.0 (0.4)	5.2 (1.1)	6.0 (3.2)	5.1 (1.6)	33.4	61.3	73.4	56.0
<i>Panicum antidotale</i> (Blue panic)	6.8 (3.4)	5.2 (1.1)	7.2 (3.5)	6.4 (2.7)	47.1	60.9	77.9	62.0
<i>Panicum maximum</i> (Guinea grass)	6.8 (1.3)	7.0 (1.2)	5.6 (1.2)	6.5 (1.2)	49.4	59.3	75.2	61.3
<i>Dichanthium annulatum</i> (Marvel grass)	3.9 (1.0)	4.4 (1.1)	6.8 (3.8)	5.0 (2.0)	43.8	63.4	72.5	59.9
C.D. at 5%	1.3	0.8	0.1	—	N.S.	N.S.	4.6	—

Figures in paranthesis indicate crude protein yield (g/ha).

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gave 625.0 and 132.5 q/ha green and dry forage yield, respectively. New Pusa-1 variety of Hybrid Napier and Blue panic were next in the order of their performance, which yielded 263.6 and 204.7 q/ha green and 51.4 and 48.9 q/ha dry forage, respectively. Dhaman (*C. chiliaris*) produced the lowest amount of green (32.2 q/ha) as well as dry forage (8.8 q/ha) while Anjan, Guinea grass and Marvel grasses were statistically at par with Blue panic.

Data on green forage yield in the year 1974 were also significant. Dharwar-4 was found the best amongst the grasses tested. It gave 164.7 q/ha green forage which was significantly higher than other grass species which were at par. Dry forage yields were not significant, however, Dharwar-4 gave the highest yield (30.3 q/ha) followed by Marvel grass (23.9 q/ha). In the year 1975, the grass species, viz. Hybrid Napier var, Dharwar-4, Anjan, Dhaman, Marvel and Blue panic were statistically at par in respect of green forage yield while in the case of dry forage yield, Anjan, Dhaman, Blue panic and Marvel grasses were at par. Anjan (115.7 q/ha), Dhaman (104.2 q/ha) and Marvel grass (95.5 q/ha) gave higher yields while Guinea grass (49.4 q/ha) and Hybrid Napier var. New Pusa-1 (40.5 q/ha), gave lower yield of green grass. Anjan gave the highest dry forage of 63.0 q/ha.

The pooled analysis of the yield data on green and dry forage showed that Hybrid Napier variety Dharwar-4 was significantly superior to all the other grass species in respect of both green and dry forage yield. It produced 261.6 q/ha green forage and 61.1 q/ha dry forage followed by New Pusa-1 variety of Hybrid Napier in

green forage (156.3 q/ha) and Blue panic in dry forage (39.7 q/ha) production.

The data on crude protein content, crude protein yield and NDF content are presented in Table-2. The average data of 3 years showed that the crude protein content was higher in New Pusa-1, while protein yield was higher in Dharwar-4 as compared to other grass species. NDF content increased with the time and was higher in the year 1975 as compared to other years in all the grass species.

The yields of grass species were low in the year 1974 and 1975 as compared to 1973 because of the long drought in the year 1974 and new planting of Dharwar-4 and New Pusa-1 varieties of Hybrid Napier and Guinea grass on the same hill in the monsoon 1975. Some grass species viz. Blue panic, Anjan, Dhaman and Marvel grass survived during low rainfall (345 mm) year of 1974 and gave green and dry forage yields ranging from 68.0 to 119.4 q/ha and 27.7 to 39.7 q/ha, respectively. Thus, these species can resist the drought conditions also.

The findings are of importance, which indicate that the grass species, viz., Blue panic, Anjan, Dhaman and Marvel can be grown during low rainfall years while during the years of adequate rainfall Hybrid Napier (Dharwar-4) is promising. Considering the total yield as well as crude protein yield q/ha Dharwar-4 is beneficial over other grass species. In the low rainfall areas Blue Panic can be raised as perennial grass but Dharwar-4 and New Pusa-1 perform well in the assured adequate rainfall areas only.

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