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Short Communication

SCREENING OF *Cenchrus ciliaris* AND *Cenchrus setigerus* GENOTYPES FOR FORAGE YIELD

N. K. SHARMA, Agricultural Research Station, Keshwana, Jalore 343 001 (Rajasthan)

Twenty genotypes of *Cenchrus ciliaris* and 19 genotypes of *Cenchrus setigerus*, collected through exploratory survey in 1997, were evaluated for forage yield in a field trial during 1998 and 1999. Differences for forage yield were found to be significant in both the species. Forage yield ranged between 0.78 kg to 3.12 kg/line (2.5 meter in length) in *Cenchrus ciliaris* and between 0.89 kg to 2.65 kg/line in *Cenchrus setigerus*. In general, *Cenchrus ciliaris* was found to be more forage yielder than *Cenchrus setigerus*.

Key words : *Cenchrus ciliaris, Cenchrus setigerus*, forage yield, genotypes

The genus *Cenchrus* has two important species viz., *C. ciliaris* and *C. setigerus* suitable for pasture in arid and semi-arid regions. These are drought tolerant, hardy, perennials, nutritive and palatable to all kind of animals. The grasses have very deep as well as very developed extensive root system, therefore, if planted on the soil, will act as very good sand binder. Thus, besides forage production, these grasses can also be planted for sand dune stabilization and erosion control. In India, these grasses are widely distributed in the plains of Rajasthan, Punjab, western Uttar Pradesh, extending to the foot hills of Jammu. These are also found in Madhya Pradesh, Andhra Pradesh, Haryana, Gujarat, Tamil Nadu and Karnataka (Sharma *et al.*, 1999). These grasses are adapted to varying edapho-climatic conditions and can be raised with as low rainfall as 150 mm to as high as 1250 mm per annum. These grasses have very high degree of drought tolerance and can withstand temperature upto 48°C. A wide range of variability in terms of plant type and growth habitat has been observed in these two grasses (Patil and Singh, 1963; 1965; 1969; Pandeya *et al*, 1977; Whyte, 1964; Chakravarti *et al*, 1970; Yadav, 1981; Annon, 1997). Eight chromosome races with 2n = 32, 34, 36, 38, 40, 52, 54, and 56 in *Cenchrus ciliaris*; and three chromosome races in *Cenchrus setigerus* with 2n = 34, 36 and 54 have been reported (Ramaswamy *et al*, 1969). Thus, grasses offer a very wide scope of selective breeding. Because, variety of genotypes varying in morphometric traits and in production potential are expected from the collection of germplasm through exploratory survey of natural habitat. Evaluation of germplasm for high yielding genotypes through field trials is the fundamental step of crop improvement programme. Hence, high yielding genotypes, if identified through field trials, will be able to enhance the forage production. Therefore, keeping the importance and utility of the grasses in view, the present study was carried out with the following objectives:

1. Collection of vigorous genotypes of *Cenchrus ciliaris* and *Cenchrus setigerus* from natural habitat through exploratory survey, and

2. Selection of high yielding genotypes through field trial

During 1997, 20 genotypes of *Cenchrus ciliaris* (listed in Table 1) and 19 genotypes of *C. setigerus* (listed in Table 2) were collected through exploratory survey from the locality of Agricultural Research Station, Keshwana, Jalore. In 1998, collected germplasm were planted in randomised complete block design with three replications. Sowing was done in rows of 2.5 meter length. Row to row distance was maintained as 50 cm. At the time of sowing, a fertilizer dose of 30 kg nitrogen and 30 kg phosphorus per hectare was applied as basal. Experiment was irrigated during establishment period to assure germination of the grasses. During 1999, experiment was maintained as per standard agronomical practices. Green forage yield received in both the years was used for statistical analysis.

Table 1. Green forage yield (kg/line) of *Cenchrus ciliaris* during 1998 and 1999

Genotypes	Green forage yield kg per line		
	1998	1999	Mean
CCT-1	2.23	1.67	1.95
CCT-2	1.73	2.12	1.93
CCT-3	2.23	1.98	2.11
CCT-4	1.07	2.08	1.58
CCT-5	1.58	1.47	1.53
CCT-6	2.25	2.40	2.33
CCT-7	2.58	2.97	2.78
CCT-8	2.85	2.40	2.63
CCT-9	2.92	3.00	2.96
CCT-10	0.43	1.13	0.78
CCT-11	2.63	2.63	2.63
CCT-12	3.05	3.18	3.12
CCT-13	2.00	2.93	2.47
CCT-14	1.48	1.47	1.48
CCT-15	2.08	1.83	1.96
CCT-16	3.08	2.67	2.88
CCT-17	2.05	2.18	2.12
CCT-18	0.85	2.20	1.53
CCT-19	2.58	3.08	2.83
CCT-20	2.20	2.62	2.41
CAZRI-358	1.17	2.13	1.65
Mean	2.05	2.29	2.17
SEm ±	0.26	0.35	
CD (p = 0.05)	0.73	0.96	

Table 2. Green forage yield (kg/line) of *Cenchrus setigerus* during 1998 and 1999

Genotypes	Green forage yield kg per line		
	1998	1999	Mean
CST-1	2.62	1.47	2.05
CST-2	2.53	2.38	2.46
CST-3	1.00	0.78	0.89
CST-4	1.50	1.75	1.63
CST-5	1.72	1.97	1.85
CST-6	1.58	1.42	1.50
CST-7	1.50	1.67	1.59
CST-8	1.88	1.83	1.86
CST-9	2.33	1.72	2.03
CST-10	2.38	1.50	1.94
CST-11	3.42	1.87	2.65
CST-12	1.50	1.17	1.34
CST-13	2.50	1.97	2.24
CST-14	2.70	2.00	2.35
CST-15	2.08	2.18	2.13
CST-16	1.42	1.67	1.55
CST-17	1.67	2.08	1.88
CST-18	1.70	1.75	1.73
CST-19	2.08	1.67	1.88
CAZRI-76	2.08	1.25	1.67
Mean	2.01	1.71	1.86
SEm ±	0.22	0.25	
CD (p = 0.05)	0.62	0.70	

Differences in green forage yield of the genotypes of *Cenchrus ciliaris* and *C. setigerus* were found to be significant in both the years. In case of *Cenchrus ciliaris*, forage yield ranged between 0.43 kg per line to 3.08 kg per line in first year with the mean of 2.05 kg per line, and between 1.13 kg per line to 3.18 kg per line in second year with the mean of 2.29 kg per line. The yield of check (CZARI-358) was 1.17 kg per line in first year and 2.13 kg per line in second year (Table 1). On the basis of the performance of 1998 and 1999, genotype CCT-12 holds the rank first which is followed by CCT-9, CCT-16 and CCT-19 with the forage yield of 3.12, 2.96, 2.88 and 2.83 kg per line, respectively. In case of *Cenchrus setigerus*, first year's forage yield ranged

between 1.0 kg per line to 3.42 kg per line with the mean of 2.01 kg per line. In second year, yield ranged between 0.78 kg per line to 2.38 kg per line with the mean of 1.71 kg per line, whereas, the yield of check (CAZRI-76) was 2.08 kg per line in first year and 1.25 kg per line in second year (Table 2). On the basis of two years data, genotype CST-11 ranked first, which is followed by CST-2, CST-14, and CST-13 with the forage yield of 2.65, 2.46, 2.35 and 2.24 kg per line, respectively.

A persual of yield data of both the species revealed that production potential of *Cenchrus ciliaris* is higher than *Cenchrus setigerus*. Further, to get the higher forage supply in long run, *Cenchrus ciliaris* is better than *Cenchrus setigerus* because in case of *Cenchrus setigerus* forage yield showing a decreasing trend in second year, whereas, *Cenchrus ciliaris* yields higher than the first year. In second year, average forage yield of *Cenchrus ciliaris* was found to be 33.92 per cent higher than *Cenchrus setigerus*. Therefore, in general, the growing of *Cenchrus ciliarus* is more beneficial than *Cenchrus setigerus* in Jalore region.

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