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INFLUENCE OF SEASON ON SEED YIELD IN FIVE CLONES OF *CENCHRUS CILIARIS L.*

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From a field trial laid out with five clones of *Cenchrus ciliaris* four seed harvests were made within a period of 12 months. The seed yield differences were significant among clones as well as between harvests within each clone. Of the several factors that contributed towards seed yield, extent of seed set played a major role. Summer season and early monsoon period appear to be ideal for harvesting high seed yields.

C. ciliaris is an important pasture grass of Tamil Nadu. Preliminary observations indicated that seed set and seed yields vary from harvest to harvest and are influenced by environmental factors. According to Boonman (1971) low yields and poor quality of seed in forage grasses were due to varying combinations of prolonged heading per season, per plant or per clone, prolonged flowering within a given head, low seed set, low number of fertile tillers, low seed retention and damage by pests and pathogens. Therefore to estimate the influence of season on seed set and seed yield, studies were initiated.

MATERIAL AND METHODS :

A field trial was laid out with five clones of diverse origin viz, FS. 3108 (C1) FS. 280 (C2), FS. 339 (C3), Anjan (C4) and the 'Local' (C5) in randomised blocks with five replications. The crop was raised by planting slips on 19.8.79., in rows 60 cm apart with 30 cm interspace and fertilised with N, P and K at 20:50:30 kg/ha. Seed harvests were made on 23.12.79 (P1). 13.3 80 (P2), 20.6 80 (P3) and 10.9.80 (P4) respectively Observations were recorded from 25 plants selected at random from each replication on number of tillers and ear bearing tillers per clump, length of panicle, mean number of spikelet per panicle, number of seeds per 100 spikelet and seed yield per clump.

RESULTS AND DISCUSSION

Among the five clones compared, the mean number of tillers was significantly high in C5 followed by C4 No significant differenc was observed between P1 and P2. However, C3 at P1 and C5 at both P2 and P3 recorded the highest number. Though C3 ranked first at P1, it was third at P2 and P3 and again first at P4. In contrast C1 which was third at P1 came first at P2 and maintained the lead in the subsequent harvests. C5 recorded the highest number of tillers in all the harvests. At P1, C3 recorded the highest while being on par with other clones. The difference in the number of productive tillers varied significantly between clones and periods of cutting. The mean number of ear bearing tillers varied from 23.7 to 8.2.C1 and C3; C5 and C2, C5 and C3 and C1 and C4 respectively recorded the highest and lowest numbers in P1, P2, P3 and P4. A comparison made between the total number of tillers and of earbearing tillers harvestwise revealed wide differences thereby indicating the influence of season in the reproductive efficiency of the clones. For instance, the percentage of ear bearing tillers at P1, P2, P3 and P4 in C5 and C3 were respectively 13.2, 45.7 37.4 and 0 4, 38.0 1.9 and 34.0. Ramawsamy (1974) arrived at similar conclusions.

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Table 1 Influence of season on number of tillers, number of productive tillers and panicle length in [mm] five clones of *Cenchrus ciliaris*

Clone	Mean No. of tillers				Mean	Mean No. of productive tillers				Mean	Mean length of panicle (cm)				Mean
	(P1)	(P2)	(P3)	(P4)		(P1)	(P2)	(P3)	(P4)		(P1)	(P2)	(P3)	(P4)	
FS. 3108 (C1)	18.5	19.5	80.4	67.8	46.6	4.7	7.8	12.3	27.0	13.0	11.9	9.6	12.3	9.7	10.9
FS. 280 [C2]	15.4	14.6	69.9	92.1	48.0	1.8	3.8	39.1	15.8	15.2	11.4	10.9	13.6	7.4	10.8
FS. 339 [C3]	23.0	19.2	97.3	69.2	52.2	0.1	7.3	1.8	23.5	8.2	10.9	10.6	12.9	9.1	10.9
Anjan [C4]	14.4	17.5	139.6	106.1	69.5	0.4	5.8	17.2	11.8	8.8	12.0	10.8	11.1	9.0	10.7
Local [C5]	16.7	19.7	171.1	156.3	91.0	2.2	9.0	63.9	19.5	23.7	10.8	12.2	13.3	8.7	11.3

Comparison between :	SED	CD	SED	CD	SED	CD
i) Clones	4.26	8.92**	2.37	4.96**	—	NS
ii) Periods of cutting	3.80	7.95**	2.12	4.44**	0.85	1.78**
iii) Clones and periods of cutting	8.51	17.81**	4.74	9.93**	—	NS

Table 2 Influence of season on number of spikelets per panicle, seed set per cent, and seed yield/clump (mg) in five clones of *Cenchrus ciliaris*.

	Mean No. of spikelets/panicle					Seed set (%)					Meen seed yield/clump (mg)				
	P1	P2	P3	P4	Mean	P1	P2	P3	P4	Mean	P1	P2	P3	P4	Mean
FS. 3108 [C1]	197	207	214	170	197	43.5	30.5	3.5	34.0	27.6	282	367	68	1181	475
FS. 280 [C2]	177	139	133	171	155	11.5	4.0	14.5	13.5	10.9	29	15	566	274	221
FS. 339 [C3]	208	170	162	234	193	4.5	3.5	5.0	18.0	7.8	1	16	6	357	95
Anjan [C4]	162	125	91	140	129	12.0	5.5	18.0	33.5	17.3	6	30	802	828	417
Local [C5]	221	202	149	213	196	—	1.0	14.5	20.5	12.0	—	13	1240	565	455

Comparison between	SED	CD	SED	CD	SED	CD
i] Clones	8.94	18.71**	1.97	4.12**	70.59	147.74**
ii] Periods of cutting	7.99	16.72**	1.75	3.66**	63.14	132.15**
iii] Clones and periods of cutting	17.87	37.40*	3.93	8.23**	141.19	295.51**

Length of panicle though did not vary significantly between clones varied significantly between harvests. It was highest at P3 followed by P1. The length was significantly lower at P4 irrespective of the clones studied.

The mean number of spikelets per panicle varied significantly between clones and periods of cutting. The interaction between these two variants was also significant. Highest number of spikelets per panicle was recorded in C1 closely followed by C5. The spikelet production was the lowest in C4. The mean number of spikelets varied from 170 to 214, 133 to 177; 170 to 234, 91 to 162 and 149 to 221 in C1, C2, C3, C4 and C5 respectively. In general, though the clones generally produced a high number of spikelets during summer season, the highest number of spikelets in C1, C2, C3, C4 and C5 was recorded at P3, P1, P4 and P1 respectively. Ramaswamy (1964) recorded similar variation among clones in both, *C. ciliaris and C. setigerus*

The effect of environmental conditions on seed set was highly significant between clones. At P1, the highest seed set was recorded in C1 while 'nil' in C5. At P2, a general reduction in all the clones was evident except C5 which has recorded the minimum of 1 per cent set. At P3, highest seed set was observed in C4 followed by both C2 and C5, while C1 recorded the lowest. At P4, the highest was recorded in C1 while the lowest was in C2. A critical analysis between the number of spikelets per panicle and percentage of seed set at each picking revealed that it is not the number that decides the percentage. It may be both genetic and environmental factors. The significant clonal variation between harvests indicates the position response of the clones to the environmental conditions that prevailed during the flowering period. However, the poor performance of the clones during winter indicated the unfavourable climatic conditions for seed set.

The seed yield differences were significant among clones as well as harvests whithin each clone. The interaction between clones and periods of cutting was also significant. The yield differences were very wide and varied from 1 mg to 282 mg per clump in P1, 13 to 367 mg in P2, 6 to 802 mg in P3 and 274 to 1181 in P4 among the clones. C1 in P1 and P2, C4 in P3 and again C1, P4 recorded in highest yields. A critical comparison among seed yield attributing factors such as number of ear bearing tillers, length of panicle, mean number of spikelets/panicle, percentage of seed set and mean seed yield revealed that it is the extent of seed set which has influenced the yield to a considerable extent. Sharir (1978) reported in *Cenchrus ciliaris CV. Molopo* that seed

yield was significantly influenced by season. According to him the number of ripened inflorescence was maximum in the last two weeks of October.

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