

GENETIC STUDY OF DEENANATH GRASS (*PENNISETUM PEDICELLATUM*) FOR GREEN FODDER YIELD AND ITS COMPONENTS

B. SELVI¹ and SUKANYA SUBRAMANIAN²

ABSTRACT

Fifty eight Deenanath grass collections were studied for their yield attributes viz., plant height, tiller number, leaf number and green fodder yield. All the four characters had high heritability with high genetic advance as percentage of mean indicating the presence of additive gene action in controlling these traits. Plant height had significant, positive and strong correlation with green fodder yield both at phenotypic and genotypic level. Plant height, tiller number and leaf number influenced directly for green fodder yield.

Deenanath grass (*Pennisetum pedicellatum*) is an annual forage crop adopted to wide climatic and soil conditions. It is fairly a nutritious and highly succulent fodder that can be fitted in crop rotation. The genetic study of Deenanath grass is meagre. Hence the present study was undertaken to obtain information regarding nature of gene action for different traits and the association among the traits which will be useful for further improvement of the basic materials.

MATERIALS AND METHODS

Fifty eight ecotypes received from different parts of India were raised in randomised block design replicated twice. The row spacing of 30 cm was adopted and the seeds were sown continuously.

The crop was harvested at the time of 50 per cent flowering stage. The following parameters viz., plant height (cm), tiller number-meter length, leaf number-tiller and green fodder yield (t/ha) were recorded. The replicated data were analysed statistically.

Heritability (h^2) percentage (broad sense) were computed as suggested by Lush (1940). Genetic advance (GA) for each character was worked out as suggested by Johnson *et al.* (1955).

The phenotypic and genotypic coefficient of variation (PCV and HCV) were calculated as per the method suggested by Imam ad Krammer (1951).

Correlation coefficients were estimated using the formula suggested by Al-Jibouri *et al.* (1958) and path

-
1. Assistant Professor, Department of Agricultural Botany, Agricultural College and Research Institute, Madurai - 625 104
 2. Professor and Head, Department of Forage Crops, Tamil Nadu Agricultural University, Coimbatore - 641 003.

coefficients were calculated by the method formulated by Dewey and Lu (1959).

RESULTS AND DISCUSSION

Analysis of variance for different characters indicated significant differences for all the characters except for plant height.

All the characters recorded higher phenotypic co-efficient of variation than the genotype co-efficient of variation.

In general, the heritability values were high for all the characters ranged from 58.40 to 95.10 per cent. Among them, green fodder yield recorded high heritability value (95.10%) coupled with high genetic advance (54.64%, - Table 1). Sindhu and Dhul (1984) reported high heritability for plant height in pearl millet.

Character association studies revealed that the plant height alone had positive significant and strong correlation

Table 1 Mean, PCV, GCV, Heritability and genetic advance for different traits.

Sl. No.	Characters	Range	Mean	PCV	GCV	Heritability (%)	Genetic advance (%)
1.	Plant height (cm)	75.20-171.80	116.25 ± 11.84	15.80	12.08	58.40	19.03
2.	Tiller number	42 - 352	261.36 ± 16.34	19.04	17.98	89.20	34.99
3.	Leaf number	8 - 11	9.49 ± 0.29±	8.85	8.31	88.00	16.07
4.	Green fodder(t/ha)	17 - 79	37.97 ± 2.33	27.88	27.19	95.10	54.64

Table 2 Correlation coefficients for different traits.

	Tiller number	Leaf number	Green fodder yield
Plant height G	- 0.320*	0.140	0.630*
P	- 0.214	0.089	0.506*
Tiller number G		- 0.013	0.079
P	- 0.128	- 0.128	0.076
Leaf Number G			0.090
P			0.080

* Significant at 5 per cent level.

Table 3 Direct and indirect effects for different traits

	Plant height	Tiller number	Leaf number	Genotypic correlation with green fodder yield
Plant height	0.731	-0.100	0.005	0.630*
Tiller number	-0.023	0.320	-0.004	0.079
Leaf number	0.105	-0.038	0.034	0.090

Residual effect = 0.50

*Significant at 5%

with green fodder yield both at phenotypic (0.63) and genotypic level (0.506). But it was negative and significant with tiller number at genotypic level (-0.32, Table 2). The tiller number and leaf number had feeble positive correlation with green fodder yield at both level.

Plant height, tiller number and leaf number had positive direct effects with green fodder yield. Among them, plant height had high significant positive effects (0.731) followed by tiller number (0.32). Plant height and leaf number via tiller number recorded negative indirect effects of low magnitude (Table 3)

From the above study, it can be concluded as follows :

1. All these characters had high heritability value with high genetic advance as percentage of mean indicating the presence of additive gene action in controlling these traits.
2. The plant height, tiller number and leaf number were directly influenced the yield of green fodder.
3. Equal weightage should be given for these three yield components in breeding programme when selection is effected.

REFERENCES

- ALJIBOURI, H.A., MILLER, P.A. and ROBINSON, H.F. 1958. Genotypic and environmental variance and covariance in upland cotton crosses of interspecific origin. *Agron. J.*, 50 : 633 - 637.
- DEWEY, D.R. and LU, K.H. 1959. A correlation and path co-efficient analysis of components of crested wheat grain seed production. *Agron. J.*, 51 : 515-578.
- IMAM MOHAMUD and KRAMER, H.E. 1951. Segregation for yield, height and maturity following a soya bean cross. *Agron. J.*, 51 : 605-69.
- JOHNSON, H.W., ROBINSON, H.F. and COMSTOCK, R.E. 1955. Estimates of genetic and environmental variability in soyabeans. *Agron. J.* 47 : 314-318.
- LUSH, K.E. 1940. Intra-sire correlation and regression of offsprings on dams as a method of estimating heritability of characters. *Proc. Amer. Soc. Animal Production*, 33 : 293-301.
- SINDHU, S.S. and DHUL, P.S. 1984. Genetic variability and expected response to selection in pearl millet population. *Indian J. of Genetic and Plant Breeding*, 44 : 73-79.