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Research Notes

Variability and Heritability Analysis in Pearl millet *(Pennisetum glaucum* (L.)R. Br.)

B. MEENA KUMARI AND P. NAGARAJAN
Dept. of Millets, Centre for Plant Breeding and Genetics, Tamil Nadu Agrl. Univ., Coimbatore-3.

Pearl millet *(Pennisetum glaucum* (L.) R. Br.) is an major coarse cereal crop of India and Africa. Its importance as a source of food and feed would continue in marginal lands situated in low rainfall areas. The development of superior varieties / hybrids depends on the magnitude of genetic variability and heritability present in the source material. The extent of variability is measured by GCV and PCV which provides information about relative amount of variation in different characters. To have a better knowledge about the amount of genetic advance to be expected by phenotypic selection, genotypic coefficient

Table 1. Variability and heritability in Pearl millet

Characters	Mean	Range	Variance		PCV (%)	GCV (%)	Herita-bility(%)	Genetic advance	GA (% of mean)
			Phenotypic	Genotypic					
Plant height	108.75 cm.	59.15-183.10 (cm.)	214.74	206.63	13.47	13.22	96.23	29.05	26.71
Days to 50% flowering	48	44.50-57.5	13.36	11.28	7.61	7.00	84.43	6.36	13.25
No. of tillers	5.27	3.5 -8.1	1.25	1.20	21.22	20.79	96.00	2.21	41.94
No. of prod, tillers	3.48	2.0-5.2	0.56	0.54	21.50	21.12	96.43	1.49	42.82
Spike length	17.45 cm.	14.23 -23.06 (cm.)	6.79	5.89	14.93	13.91	86.75	4.66	26.70
Spike thickness	5.59 cm.	4.29-8.35 (cm.)	1.68	1.64	23.19	22.91	97.62	2.61	46.69
Spike yield/plant	29.60 g.	24.42 - 32.92 (g.)	187.11	185.47	46.21	46.01	99.12	27.93	94.36
Grain yield/plant	21.52 g.	17.26-29.55 (g.)	134.23	132.54	53.84	53.50	98.74	23.57	109.53
1000 grain weight	9.96 g.	6.10- 10.42 (g.)	2.41	2.33	15.59	15.33	96.68	3.09	31.02

of variation with heritability estimates is needed (Burton, 1952). Since the estimates of heritability alone will not be of much use for selection based on phenotypic basis, genetic gain should also be considered.

The experiment was undertaken with twenty diverse genotypes of Pearl millet at Millet Breeding Station, Tamil Nadu Agricultural University, Coimbatore during *kharif* 2003 in randomized block design with three replications. Each entry was sown in two rows of 4m length and 45cm apart by adopting a spacing of 45 x 15cm. The observations were taken from five randomly selected plants in each entry for nine characters. Statistical analysis was carried out for estimating GCV, PCV, broad sense heritability and genetic advance as given by Johnson *et al.* (1955).

The analysis of variance revealed highly significant differences among the genotypes for all the characters studied indicating the very high variability within the genotypes. It was also observed that phenotypic and genotypic variances exhibited almost similar trend of variability for most of the traits studied, indicating their stability and minor influence by environment (Table 1). The maximum range of variation was observed for plant height, spike yield per plant and grain yield per plant indicating the scope for genetic improvement in these characters through selection and other breeding methods. The extent of coefficient of variance indicated that GCV was maximum for grain yield per plant, spike yield per plant, spike thickness and number of productive tillers. All the characters had moderate to high heritability values ranged from 84.43 for days to fifty percent flowering to 99.12 percent for spike yield per plant. The knowledge on heritability of traits is helpful to decide the selection procedure to be followed to improve the trait in a situation. Grain yield per plant

though being a complex trait, expressed 98.74 per cent of heritability. Higher estimates of heritability with genetic advance was observed for plant height, spike yield per plant and grain yield per plant indicating the presence of additive gene action and so selection can be easily done for these traits. Since other traits expressed low genetic advance values, non additive gene action would be predominant and so heterosis breeding would be recommended.

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Research Notes

Character association and path analysis of yield components in pearlmillet (*Pennisetum glaucum* L. R.Br.)

B. MEENA KUMARI AND P. NAGARAJAN
Dept. of Millets, Centre for Plant Breeding and Genetics, Tamil Nadu Agrl. Univ., Coimbatore-3.

Pearl millet (*Pennisetum glaucum* L.R.Br.) is the most important food and fodder crop of dryland agriculture in India and Africa. In order to realize the substantial production and improvement in this allogamous crop, information on the type, nature and magnitude of association between yield and its components is essential. Also, path analysis helps in identifying the yield components which directly and indirectly influence the yield. Selection for the improvement of particular trait will be effective, when a thorough knowledge about inter relationship existing among the yield traits is known.

Hence, the present research work was undertaken to study the correlation and path coefficients and to formulate the selection criteria for evolving high yielding genotypes in pearlmillet.

The parental materials consisted of eight lines from diverse cytoplasmic sources of Al, A4, unclassified source and twelve testers, which were obtained from ICRISAT, Patancheru and Millet Breeding Station, Tamil Nadu Agricultural University, Coimbatore. Each of the eight male sterile lines was crossed with twelve testers in Line x Tester mating design, by which, 96 hybrids were obtained. These hybrids were raised with their parents in randomized block design with two replications during *kharif* 2003 at Millet Breeding Station, Tamil Nadu Agricultural University, Coimbatore.