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VARIABILITY AND CORRELATION STUDIES FOR CERTAIN METRIC TRAITS IN FRENCH BEAN (*Phaseolus vulgaris*)

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French bean is one of the most important leguminous vegetables. It is grown for the tender green pods, shelled green bean and dry bean (*rajmah*). Genetic improvement of yield is a basic requirement for any crop breeding programme. But it is a complex trait and dependent on several related attributes. The success of breeding programme depends on the magnitude of genetic variability in respect to yield, and its interrelationship among them. Keeping in view the above fact, the present investigation has been undertaken.

The present investigation was carried out at HPKV, Regional Research Station, Dhaulakuan during spring season of 1997 with eighteen genotypes of French bean in augmented block design. Each genotype was planted in single row of 3 m length placed 45 cm apart plant to plant spacing. Observation were recorded on plant height, branches/ plant, clusters/plant, pods/plant, pod length, days to 50 per cent flowering and green pod yield/plant from five randomly selected competitive plants in each genotype. Genotypic and phenotypic coefficient of variation were calculated according to Burton (1952). Heritability estimates in broad sense were obtained following the method of Hanson *et al.*, (1956). The genetic advance and correlation coefficients were obtained following Johnson *et al.*, (1955 a, b).

The genotypic and phenotypic coefficient of variation, heritability and genetic advance indicated wide differences between the genotypes under study (Table 1). The highest genotypic coefficient of variation was recorded for plant height (37.40) and the lowest for days to 50 per cent flowering (15.06). Heritability estimates in general were high for all the traits, being the highest for days to 50% flowering (88.38%) and the lowest for pod length (25.80). The highest genetic advance was noticed for plant height (75.20%) followed by

Pods/plant, pod yield/plant and cluster/plant (48.25, 35.20 and 34.30 per cent respectively). High heritability coupled with high genetic advance were recorded for plant height followed by pods/plant and cluster/plant and therefore, these traits might be useful to select genotypes for making improvement in this crop. These findings are in close conformity with that of Agarwal and Singh (1973), Sharma *et al.*, (1971) and Shete and Kale (1988).

TABLE 1
ESTIMATES OF GENOTYPIC (G) AND PHENOTYPIC (P) CORRELATIONS AMONG DIFFERENT YIELD CONTRIBUTING TRAITS IN FRENCH BEAN

Character	Coefficient of variation		Heritability (%)	Genetic advance as per cent of mean
	Genotypic	Phenotypic		
Pod yield / plant	30.50	46.30	40.20	35.20
Plant height	37.40	40.50	85.6	75.20
Branches / plant	15.65	20.25	36.80	16.45
Clusters / plant	25.08	37.30	45.20	34.30
Pods / plant	34.20	42.65	57.20	48.25
Pod length	20.12	41.30	25.80	20.10
Days to 50% flowering	15.06	16.30	88.38	28.40

TABLE 2
GENOTYPIC (G) AND PHENOTYPIC (P) CORRELATIONS AMONG DIFFERENT YIELD CONTRIBUTING TRAITS IN FRENCH BEAN

		Branches/ plant	Cluster/ plant	Pods/ plant	Pod length flowering	Days to 50%	Yield/ plant
Plant height	G	0.196	0.824**	0.867**	-0.198	0.869**	0.719**
	P	0.150	0.495**	0.590**	-0.092	0.698**	0.453**
Branches/plant	G		0.115	0.109	0.134	-0.053	0.063
	P		0.080	0.085	0.067	-0.023	0.085
Clusters/plant	G			0.945**	-0.356*	0.840**	0.650**
	P			0.468**	-0.078	0.489**	0.485**
Pods/plant	G				-0.461**	0.745**	0.643**
	P				-0.145	0.487**	0.412**
Pod length	G					0.061	0.264
	P					0.021	0.072
Days to 50% flowering	G						0.768**
	P						0.443**

Significant at * P = 0.05, ** P = 0.01

Information on correlation coefficient helps the breeder for indirect selection. The genotypic and phenotypic correlations between yield and its components indicated that the magnitude of genotypic correlation coefficients were higher than the corresponding phenotypic coefficients for all the traits (Table 2). This revealed the inherent association among various characters studied. Green pod yield/plant was positively correlated with plant height, clusters/plant, pods/plant and days to 50% flowering indicating that selection for these traits might lead to production of high yielding genotypes. It was noteworthy that these characters also had high heritability values. Therefore, high degree of correlated response is expected. These findings are in agreement with that of Agarwal and Singh (1973).

REFERENCES

- Agarwal, V. D. and Singh, T. P. (1973). Genetic variability and interaction in agronomic traits in Kidney bean (*Phaseolus vulgaris* L.). *Indian J. Agric. Sci.*, **43** : 845-48.
- Burton, G. W. (1952). Quantitative inheritance in grasses. *Proc. 6th Int. Grassland Cong.*, **1** : 227-83.
- Hanson, C. H., Robinson, H. F. and Comstock, R. E. (1956). Biometrical studies of yield in segregating population of Korean lespedaza. *Agron. J.*, **48** : 268-72.
- Johnson, H. W., Robinson, H. F. and Comstock, R. E. (1955a). Estimation of genetic and R.K environmental variability in soybean. *Agron. J.*, **47** : 314-18.
- Johnson, H. W., Robinson, H. F. and Comstock, R. E. (1956). Phenotypic and genotypic correlations in soybean and their implications in selection. *Agron. J.*, **47** : 477-83.
- Sharma; Tiwari, R. N. and Pachauri, D. (1971). Genetic variability in French bean *Prog. Hort.*, **9**(3) : 57-64.
- Sete, B. J. and Kale, D. N. (1988). Genetic variability and correlation studies in French bean. *J. Maharashtra Agric. Univ.*, **13**(1) : 31-34.