pearl millet x napier hybrids, internode length showed maximum direct effect on green fodder yield (2.955) but its ultimate correlation was not significant (Table 7). Hence, in the next order, the number of tillers per clump recorded highest direct effect (1.967) on green fodder yield followed by dry fodder yield (1.515) and leaf area per clump (1.435) showing significant positive correlation.

REFERENCES

JOHNSON, H.W., ROBINSON, H.F. and COMSTOCK, R.E. (1955) Estimation of genetic variability and environmental variability in soybean. **Agron.J., 47**: 314-318.

STEBBINS, G.L. (1974) **Flowering Plants Evolution Above the Species Level.** The Belknap press of Harvard University Press, Cambridge, Massachusetts.

VIJENDRA DAS, L.D. and RATNAM NADAR, C. (1991) Correlation and path analysis in napier grass. **Orissa J. Agric. Res., 4**: 187-191.

(Received : August 1996 Revised : December 1996)

Madras Agric. J., 84(8): 469-470 August 1997
https://doi.org/10.29321/MAJ.10.A00898

VARIABILITY AND ASSOCIATION ANALYSIS OF YIELD COMPONENTS IN GREEN GRAM

S. GANESH RAM, R. RAJKUMAR, P. GOMATHI NAYAGAM and R. RATHNASWAMY

School of Genetics
Tamil Nadu Agricultural University
Coimbatore 641 003

ABSTRACT

Variability parameters were estimated for seed yield and seven other quantitative traits in 30 genotypes of green gram. Heritability estimates were high for all characters except for number of clusters and number of pods. High heritability coupled with high genetic advance were observed for plant height and seed yield. Path analysis revealed that all direct effects towards seed yield were positive and the maximum was observed in the case of pod yield and number of pods indicating they are important traits for selection.

KEY WORDS : Variability, heritability, association analysis, path analysis

Seed yield in green gram (*Vigna radiata* (L.) Wilczek) is a complex trait, mainly dependent on many genetically controlled components. The nature and association of such characters with yield and among themselves play a vital role in choosing superior genotypes. The magnitude of genetic variability present in the genetic stock is important for improvement of yield. Heritability and genetic advance serves as a tool to the breeder in determining the direction and magnitude of selection. The present study was carried out to study the extent of variability, to study association of yield components among themselves and with seed yield and to study the direct and indirect effects of the components on seed yield in green gram.

MATERIALS AND METHODS

The experimental material consisted of 30 genotypes of green gram collected from various ecogeographical regions of India. Seeds were sown in randomised block design with three replications at the Millets Breeding Station, TNAU, Coimbatore during *Kharif* 1992. Each genotype

Table 1. Estimates of different variability parameters in green gram

Characters	Mean	PCV	GCV	Heritability	Genetic advance as per cent of mean
Plant height	32.48	31.71	29.87	84.01	54.94
No.of branches	1.63	17.52	16.20	85.52	30.49
No.of clusters	6.29	22.87	21.12	43.38	28.68
No.of pods	23.31	25.08	18.44	54.08	27.97
Pod length	6.92	28.26	25.48	81.33	47.38
Seeds/pod	10.89	8.05	6.98	75.18	12.48
Pod yield/plant	13.81	12.02	11.12	85.82	21.27
Seed yield	7.55	29.23	26.77	83.88	50.55

Table 2. Path coefficient analysis showing direct (diagonal) and indirect effects different characters on seed yield

Characters	Plant height	No.of branches	No.of clusters	No.of pods	Pod length	Seeds/pod	Pod yield/plant	Genotypic correlation
Plant height	0.195	0.049	0.045	0.023	-0.004	0.016	0.114	0.438**
No.of branches	0.021	0.137	0.097	0.085	-0.002	- 0.006	0.154	0.498**
No.of clusters	0.039	0.068	0.171	0.147	-0.001	0.015	0.056	0.495**
No.of pods	0.094	0.048	0.078	0.197	-0.008	0.015	0.147	0.570**
Pod length	0.027	0.005	-0.022	-0.005	0.144	0.128	0.136	0.408**
Seeds/pod	0.033	0.005	-0.081	0.041	0.091	0.143	0.181	0.413**
Pod yield/plant	0.073	0.049	0.073	0.158	0.001	0.061	0.473	0.887**

Residual effect = 0.246; ** - Significant at one per cent level

was sown in a single row plot of 3 m long, spaced 45 cm apart and 30 cm between the plants. Ten randomly selected plants in each replication were used to record eight different metric traits *viz.*, plant height (cm), number of branches, number of clusters, length of pod (cm), number of seeds per pod, number of pods per plant, pod yield per plant (g) and seed yield per plant (g). Analysis of variance and covariance, GCV and PCV, heritability, genetic advance and path analysis were worked out as per standard methods.

RESULTS AND DISCUSSION

The results of variability, heritability and genetic advance are presented in Table 1. Higher estimates of GCV for the characters plant height, seed yield and pod length indicated that these characters were potentially variable offering scope for selection. In general, PCV estimates were greater than GCV indicating the influence environmental factors on all the traits studied. All the traits except number of clusters and number of pods showed high heritability. High heritability along with high genetic advance were observed for plant height and seed yield indicating substantial contribution of additive genetic variance to the expression of these characters. Giriraj (1973) and Malik and Singh (1983) reported similar such findings in green gram.

Significant positive correlation at genotypic level for all the traits with seed yield was observed in the present study indicating that the components has certain inherent relationship with seed yield. Further, the genotypic correlation coefficients were partitioned into direct and indirect effects of different traits on seed yield (Table 2). All the direct effects towards seed yield were positive and the maximum was observed in the case of pod yield, followed by number of pods revealing that these were major yield contributing traits in green gram. Similar opinion was expressed by Rathnaswamy *et al.* (1978) ; Khan and Rafiq Ahmed (1989). The indirect effects are either positive or negative but lower in magnitude except those shown by seeds per pod and number of branches via pod yield and pod yield via number of pods.

REFERENCES

GIRIRAJ, K. (1973). Natural variability in green gram (*Phaseolus aureus*). **Mysore J. Agric. Sci., 7 : 189-97.**

KHAN, J.A., and AHMED RAFIQ. (1985). Multiple correlation and regression analysis in mungbeen (*Vigna radiata.*) **Indian J. Agric. Res., 76 :** 15-18.

MALIK, B.P.S., and SINGH, V.P. (1983). Multiple correlation and regression analysis in greengram. **Indian J. Agric. Sci., 53 :** 400-403.

RATHNASWAMY, R., KRISHNASWAMY, S., IYAMPERUMAL, S. and MARAPPAN, P.V. (1978). Estimates of variability, correlation coefficients and path coefficient analysis in early maturing green gram (*Vigna radiata* (L.) Wilczek). **Madras Agric. J., 65 :** 188-98.

(Received : August 1996 Revised : March 1997).