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Correlation studies in pigeon pea [*Cajanus cajan* (L.) Millsp.]

S.S. SARSAMKAR, G.R. KADAM, B.P. KADAM, S.V. KALYANKAR AND S.B. BORGAONKAR*
Department of Agricultural Botany, Marathwada Agricultural University, PARBHANI (M.S.) INDIA

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The present investigation was undertaken with the objective to study correlation and path analysis among the population consisting of eight parents and twelve F2's of pigeon pea genotypes. Positive and significant associations were recorded between yield and yield contributing characters viz., days to maturity, 100 seed weight and pods per plant. The study indicated that the days to maturity, 100 seed weight and numbers of pods per plant should be given maximum weightage while making selections to improve the yield. Path analysis at phenotpic levels revealed that number of pods per plant and plant height had greater direct effects on seed yield, while the number of primary branches and days to maturity had direct effects on seed yield at genotypic level.

Key words : Correlation, Path analysis, Direct effects, Genotypes.

INTRODUCTION

Pigeon pea [*Cajanus cajan* (L.) Millsp.] is the second most important pulse crop in India. It can thrive well under rainfed conditions due to its deep root system and hence serve as an important companion crop under intercropping. Interest in this crop is growing day by day in many countries because of its multiple uses. Yield is a complex character and contributed by many component characters. Hence the information on the correlation between yield and its component characters is a prequisite for crop improvement. The path analysis determines whether the association of these characters is due to their direct effects on yield or as a consequence of their indirect effect through other component characters. The present study was, therefore, undertaken to find out the relative importance of degree of association different yield contributing traits and direct and indirect effects on yield.

MATERIALS AND METHODS

The experiment was conducted during kharif, 2003 at Experimental farm of College of Agriculture, Latur, Marathwada Agriculture University, Parbhani. The experimental material for the present investigation was comprised of ten parents and twelve F_2 crosses. The 22 treatments were grown in Randomized Block Design with three replications. Row to row spacing was kept 60 cm and that for plant to plant was 30 cm. Observations were recorded on five randomly selected plants for all character namely days to 50% flowering, days to maturity, plant height (cm), number of primary branches, number of secondary branches, number of pods per plant, 100 seed weight (g) and grain yield per plant. Mean values were subjected to analysis of variance and phenotypic correlations and path coefficients were computed by using the formula of Dewey and Lu (1959).

RESULTS AND DISCUSSION

The analysis of variance indicated highly significant differences among all the genotypes for all the characters studied. The estimates of phenotypic and genotypic correlation coefficient are presented in Table 1. Positive and significant phenotypic as well as genotypic correlations were observed between yield and days to maturity, pods per plant and 100 seed weight. The yield was negatively correlated with days to 50% flowering. The character days to 50% flowering showed negative correlation with days to maturity, plant height and 100 seed weight. The number of secondary branches per plant showed negative association with number of days to maturity. Plant height showed positive significant genotypic and phenotypic correlation with 100 seed weight. While it was negatively correlated with number of primary branches, number of secondary branches, number of pods per plant. Positive but non significant phenotypic and genotypic correlation was observed between number of primary branches with number of secondary branches per plant and number of pods per plant. The trait number of secondary branches per plant exhibited positive correlation coefficients with 100 seed weight and yield per plant. The character 100 seed weight

* Author for Correspondence

Table 1 : Estimates of genotypic and phenotypic correlation coefficients between yield and yield contributing characters.

Character		Days to 50 % flowering	Days to maturity	Plant height (cm)	No. of primary branches	No. of secondary branches	No. of pods/ plant	100 seed weight (g)	Yield /plant
Days to 50 % flowering	G	1.000	-0.205	-0.269	0.703**	0.390	0.300	-0.211	-0.094
	P	1.000	-0.168	-0.213	0.423*	0.303	0.280	-0.195	-0.058
Days to maturity	G		1.000	0.417	-0.234	0.216	0.002	0.375	0.854*
	P		1.000	0.394	-0.146	0.208	0.006	0.352	0.779**
Plant height (cm)	G			1.000	-0.241	-0.083	-0.086	0.475*	0.390
	P			1.000	-0.191	-0.093	-0.061	0.324*	0.358
Number of primary	G				1.000	0.197	0.136	-0.079	0.231
branches	P				1.000	0.125	0.076	-0.081	0.111
Number of secondary	G					1.000	-0.730**	0.243	0.299
branches	P					1.000	-0.563	0.232	0.281
Number of pods per	G						1.000	-0.113	0.044*
plant	P						1.000	-0.042	0.042*
100 seed weight (gm)	G							1.000	0.454*
	P							1.000	0.433*
Seed yield/plant (g)	G								1.000
	P								1.000

*, ** indicates significant at 5 % and 1 % level, respectively.

was found to be significantly correlated with plant height and yield. While it was negatively correlated with days to 50 % flowering, number of primary branches and number of pods per plant. Similar results were reported by Jagdish Singh and Singh (1999) and Basavarajaiah *et al.* (1999).

Path analysis of yield and yield contributing characters showed that the number of pods per plant and plant height had greater direct effect on seed yield (Table 2). The days to 50 % flowering and number of secondary branches per plant had positive direct effect on seed yield. This indicates that selection for number of pods per plant, plant height, number of primary branches per plant and days to maturity would prove better in increasing the yield. This indicates that the selection for number of pods per plant, plant height, number of primary branches per plant and days to maturity would prove better in increasing the yield. Number of days to 50 % flowering and days to maturity had indirect positive effect on seed yield through plant height and number of nodes per plant while it had negative indirect effect via 100 seed weight. The plant height had positive indirect effect via number of primary branches per plant. The number of primary and number of secondary branches per plant via number of pods per plant and 100 seed weight had positive indirect effects on seed yield.

The trait number of pods per plant had positive indirect effects on seed yield via number of secondary

Table 2 : Phenotypic path analysis for direct (diagonal) and indirect effects of yield components on yield.

Character	Days to 50 % flowering	Days to maturity	Plant height (cm)	No. of primary branches	No. of secondary branches	No. of pods/ plant	100 seed weight (g)	Yield / plant (g)
Days to 50 % flowering	0.001	-0.074	0.039	-0.005	-0.004	0.173	-0.073	1.000
Days to maturity	0.001	-0.095	0.043	0.006	-0.014	0.128	-0.630	0.854
Plant height (cm)	0.001	-0.037	0.110	0.008	-0.017	-0.057	-0.067	0.390
Number of primary branches	0.001	0.014	-0.021	-0.041	0.033	0.077	0.015	0.131
Number of secondary branches	0.001	0.016	-0.023	-0.016	0.082	0.187	0.035	-0.094
Number of pods per plant	0.001	-0.020	-0.010	-0.005	0.025	0.615	-0.042	0.299
100 seed weight (gm)	0.001	-0.033	0.041	0.003	-0.016	0.143	-0.180	0.454

Residual effect – 0.633.

branches, days to 50 % flowering and 100 seed weight. Path analysis studied and indicated that the number of pods per plant, plant height and number of primary branches should be given maximum weightage while practicing selection.

The above results are in agreement with the results reported by Angadi *et al.* (1988), Holkar *et al.* (1991) and Viramgama and Goyal (1994)

REFERENCES

Angadi, S.P., Kulkarni, R.S. and Rao, M.R.G. (1988). Note on character association and path analysis in pigeon pea. *Legume Research*, **11**(2) : 99-100.

Basavarajaiah, D., Gowda, M.B., Kulkarni, R.S. and Ramesh, S. (1999). Character association and path coefficient analysis in pigeonpea.*Crop Res.* Hissar, **17**(3):386-389.

Dewey, D.R. and Lu, K.H. (1959). A correlation and path coefficient analysis of components of crested wheat grass seed production. *Agronomy Journal*, **51** : 515-518.

Holkar, S., Nigam, P.K. and Mishra, V.K. (1991). Note on path analysis in pigeonpea. *International Pigeonpea Newsletter*, **14** : 4-5.

Jadish Singh and Singh, J. (1999). Correlation coefficient analysis for yield in pigeonpea. *Crop Research* Hissar, **17**(3) : 381-385.

Viramgama, A.V. and Goyal, S.N. (1994). Correlation and path analysis in pigeonpea production traits. *Gujarat Agric. Univ. J.*, **19**(2):133-136..