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Component characters influencing seed yield in moongbean (*Vigna radiata* L. Wilczec)

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ABSTRACT
The study was undertaken to estimate correlations and partition these correlations into direct and indirect contribution of different component characters towards seed yield in moongbean from the data recorded on 38 diverse genotypes grown at PAU, Regional Research Station, Bathinda during *Kharif* 2003.Observations were recorded on days to flowering, days to maturity, plant height (cm), pods per plant, seeds per pod,100 seed weight (g) and seed yield per plant (g) .Positive association of seed yield per plant was observed with pods per plant and 100 seed weight whereas seed yield per plant showed negative association with days to flowering, days to maturity and plant height. Path coefficient analysis revealed that pods per plant had maximum positive direct effect (0.456) followed by 100 seed weight (0.316) upon seed yield where as days to maturity and plant height had negative direct effect on seed yield. It is concluded that seed yield in moongbean may be improved by selection of early flowering/ maturing, short genotypes with more number of pods having bold seeds.

Key words: *Vigna radiata* L. Wilczec, Correlation, Path coefficient

INTRODUCTION

Moongbean is an important pulse crop grown in *Kharif* season in the Punjab State. Besides providing protein rich diet, it is also beneficial by way of maintaining soil fertility. Cultivation of moongbean can add to diversification from the conventional paddy-wheat cycle prevailing in the state. In order to encourage the farmers to shift from paddy to moongbean, development of high yielding varieties of moongbean is an important challenge to the breeders. Yield in moongbean as in other crops is a complex character controlled by many components. The components are usually less susceptible to environmental fluctuations than yield per se and are thus relatively more amenable to improvement. The efficiency of selection procedures will increase if the nature of relationships among yield and its components is understood. Path analysis further unravels these correlations into direct and indirect contributions of different characters. The present study was therefore, undertaken to estimate correlations and path coefficients for important characters in moongbean.

MATERIAL AND METHODS

Thirty eight diverse lines of moongbean were grown in a randomized block design with three replications during *kharif* season of 2003 at Punjab Agricultural University, Regional Station, Bathinda. Row to row and plant to plant spacing was kept at 30 cm and 10 cm ,respectively. Data were recorded on five randomly taken plants for seed yield (g) days to flowering, days to maturity, plant height (cm), pods per plant, seeds per pod and 100 seed weight (g). Analysis of variance for all characters was carried out to test the significance of differences among the genotypes for different characters. Phenotypic correlations between characters were calculated from the means of different characters following Panse and Sukhatme (1985). The significance of phenotypic correlation coefficients was tested against table values at n-2 degrees of freedom as given by Fisher and Yates (1938). Path coefficient analysis was performed according to Dewey and Lu (1959) using phenotypic correlation coefficients.

RESULTS AND DISCUSSION

Significant differences among genotypes were observed for all characters studied. So all possible phenotypic correlation coefficients were calculated which are presented in table 1. Significant positive association of seed yield per plant was observed with pods per plant and 100 seed weight. Pods per plant and 100 seed weight were also identified to be positively correlated to seed yield by Satyanarayana *et.al* (1991) and Singh *et. al* (1991). Significant negative association of seed yield per plant was observed with days to flowering, days to maturity and plant height indicating thereby that selection of late flowering / maturing, tall genotypes should be discouraged. As further shown by the significant negative association of days to maturity and plant height with 100 seed weight such genotypes tend to reduce seed weight, which is the main contributor to seed yield.

Partitioning of total phenotypic correlation coefficients of various component characters with seed yield revealed that pods per plant followed by 100 seed weight had high positive direct effects (0.456 and 0.316, respectively) upon seed yield (Table 2.) Joseph and Kumar (1999) and Niazi *et.al* (1999) also identified pods per plant as the main contributing characters towards seed yield. Direct contribution of seeds per pod to seed yield was negligible (0.008) indicating thereby that this is not a reliable trait for selection. The direct influence of days to flowering, days to maturity and plant height was negative which again suggests that selection of early flowering / maturating, short genotypes will be effective for improving seed yield in moongbean. It is concluded that seed yield in moongbean

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Table 1: Phenotypic correlations among different characters in moongbean

Character	Seed yield per plant	Days to flowering	Days to maturity	Plant height	Pods per plant	Seeds per pod	100 seed weight
Seed yield per plant	1.000	-0.375*	-0.594**	-0.518**	0.322*	0.112	0.504**
Days to flowering		1.000	0.568**	0.597**	0.162	-0.174	0.243
Days to maturity			1.000	0.831**	0.085	-0.144	-0.412*
Plant height				1.000	0.270	-0.089	-0.395*
Pods per plant					1.000	-0.027	0.078
Seeds per pod						1.000	0.149
100 seed weight							1.000

* Significant at 5% level ** Significant at 1% level

Table 2: Path coefficient analysis of seed yield versus other characters in moongbean

Character	Days to flowering	Days to maturity	Plant height	Pods per plant	Seeds per pod	100 seed weight	PCC with seed yield per plant
Days to flowering	-0.074	-0.123	-0.174	0.074	-0.001	-0.077	-0.376
Days to maturity	-0.042	-0.217	-0.242	0.039	-0.001	-0.130	-0.594
Plant height	-0.044	-0.181	-0.291	0.123	-0.001	-0.125	-0.518
Pods per plant	-0.012	-0.018	-0.079	0.456	-0.001	-0.025	0.322
Seeds per pod	0.013	0.031	0.029	-0.013	0.008	0.047	0.112
100 seed weight	0.018	0.090	0.115	-0.036	0.001	0.316	0.504

Bold means direct effect PCC stands for phenotypic correlation coefficient
Residual variation= 0.620

may be improved by selection of early flowering/maturing, short genotypes having more pods with bold seeds. Singh *et. al* (1991) had also reported that selection based on pods per plant and 100 seed weight can improve seed yield in moongbean by more than 80 percent.

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