

Correlations coefficient among 11 characters in parental, F₁ and F₂ populations of pigeonpea [*Cajanus cajan* (L.) Millsp.]

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SUMMARY

Genotypic and phenotypic correlations were studied for 11 quantitative characters in parental, F₁s and F₂s populations derived from 16 x 3 – line x tester analysis. The improvement in grain yield per plant could be achieved by exercising selection simultaneously for number of pods per plant, pod length (cm) and 100 – seed weight (g), owing to their positive and significant relationship with grain yield in parents, F₁s and F₂s.

Key words : Correlations, Coefficient, Pigeonpea, *Cajanus cajan*.

The nature of associations among yield and its components in advanced generations would be of practical value to the plant breeder for exercising selection because selection among particular traits might bring about change in other traits associated with it. However, when the segregating generations are handled by different breeding methods, the character association are likely to be changed.

MATERIALS AND METHODS

The experimental material comprised of 19 parents (16 lines and 3 testers), their 48 F₁s and 48 F₂s derived from line x tester mating design. The experiment was planned in RBD with 3 replications. Each genotype was planted in a single-row plot of 5m length spaced 45cm apart during 2002. Data were recorded on 10 randomly taken plants in each parent and F₁ and on 20 plants in each F₂ in each replication. All possible genotypic (rg) and phenotypic (rp) correlation coefficients among 11 characters were worked out separately for parental, F₁ and F₂ populations as per formula suggested by Robinson *et al.* (1951).

RESULTS AND DISCUSSION

On perusal of the results (Table 1 and 2), it was observed that genotypic correlations coefficients were slightly higher in magnitude than phenotypic ones. It

suggested that there was a strong inherent association between these traits. Similar trends were also reported by Brar (1993) and Gowda *et al.* (1996).

The data further revealed that in all the three populations (parents, F₁s and F₂s), grain yield per plant was found to be positively and significantly associated with number of pods per plant, pod length and 100-seed weight. This indicated that these three characters are genetically associated with grain yield and by increasing the number of pods per plant or pod length or 100-seed weight, grain yield per plant may be considerably pushed-up. Balyan and Sudhakar (1985), Marekar and Nerkar (1987), Ganesamurty and Dorairaj (1990), Salunke *et al.* (1995) and Gowda *et al.* (1996) reported similar type of results. Negative and significant correlation were observed between protein content and grain yield per plant in F₁ and F₂ populations. This suggested that simultaneous increase in the protein content and grain yield cannot be achieved.

Among the other traits, positive and significant correlations were observed between number of seeds per pod with pod length in all the three generations; 100 seed weight and pod length in parents and F₂s; number of primary branches with plant height in F₁s and F₂s. This suggested that these characters are correlated with each other and change in any one may ultimately result into a change in the other character(s). These findings are in conformity with the results of Ganesamurty and Dorairaj (1990) and Salunke *et al.* (1995).

Thus, yield in pigeonpea can possibly be improved by emphasizing characters *viz.*, number of pods per plant, pod length and 100-seed weight.

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