Correlation and path analysis in bunch groundnut (*Arachis hypogaea* L.)

H.B. VEKARIYA, M.D. KHANPARA, J.H. VACHHANI, L.L. JIVANI, K.J. VAGADIYA AND H.J. REVAR

SUMMARY

Fifty diverse genotypes of bunch groundnut were evaluated during *Kharif* 2009 for genetic parameter *viz.*, correlation and path analysis. The magnitudes of genotypic correlation coefficients were higher as compared to the corresponding phenotypic correlation coefficients. The pod yield per plant had highly significant and positive correlations at phenotypic levels with number of mature pods per plant, 100-pod weight, 100-kernel weight, kernel yield per plant, biological yield per plant and harvest index. Path analysis revealed that the kernel yield per plant, biological yield per plant and harvest index had high and positive direct effects on pod yield per plant.

Key words : Correlation, Path analysis, Groundnut

Groundnut is an important oil seed crop. The knowledge of association among the yield and yield contributing characters would be of great help in constructing a suitable plant type and in planning breeding programme. However, the correlation coefficient does not give any indication about comparative magnitude of contribution made by various component characters. Therefore, genotypic path coefficient analysis was carried out to find the direct and indirect effects of yield components and their correlation with pod yield per plant. Pod yield, a polygenic trait, is influenced by its various components directly as well as indirectly via other traits, which create a complex situation before a breeder for making selection. Therefore, path coefficient analysis could provide a more realistic picture of the interrelationship, as it considers direct as well as indirect effects of the variables by partitioning the correlation coefficient.

MATERIALS AND METHODS

Fifty genotypes of groundnut were sown in a

Correspondence to:
J.H. VACHHANI, Main Oilseeds Research Station, Junagadh Agricultural University, JUNAGADH (GUJARAT) INDIA
Email : jivanvachhani@yahoo.in

Authors' affiliations:
M.D. KHANPARA, Regional Cotton Research Station, Junagadh Agricultural University, JUNAGADH (GUJARAT) INDIA

K.J. VAGADIYA AND H.J. REVAR, Department of Agricultural Botany, Junagadh Agricultural University, JUNAGADH (GUJARAT) INDIA

Randomized Block Design with three replications during *Kharif* 2009. Each entry was accommodated in a single row of 3.0 m length with a spacing of 45 cm between rows and 10 cm between plants within the row. The fertilizer in the experimental area was applied at the rate of 25.0 kg N and 50.0 kg P_2O_5 ha^{-1} as it is a recommended dose for *Kharif* cultivation of groundnut in the region. All the recommended package of practices were followed for raising healthy crop. Data were recorded for days to first flower, days to 50% flowering, days to maturity, plant height, primary branches per plant, number of mature pods per plant, number of immature pods per plant, 100-pod weight, 100- kernel weight, shelling out-turn, oil content, protein content, kernel yield per pod, pod yield per plant, biological yield per plant and harvest index. The phenotypic and genotypic correlation coefficients of all the characters were worked-out as per Al-Jibouri *et al*. (1958) and path coefficient analysis was carried-out as per the method suggested by Dewey and Lu (1959).

RESULTS AND DISCUSSION

Analysis of variance revealed that highly significant differences among the genotypes were observed for all the traits except oil content, which indicating the presence of good amount of genetic variability among the material studied. The genotypic correlations were higher than the phenotypic correlation for most of the character studied that indicating least environmental effects on the expression of the traits (Table 1). In the present study, pod yield per plant was found to be highly significant and positively correlated with number of mature pods per plant,