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Correlation and path co-efficient analysis in pearl millet [*Pennisetum glaucum* (L.)]

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SUMMARY

A set of 64 genotypes comprising of 48 F_1s along with fertile counter parts of four male sterile lines and 12 pollinators were evaluated in randomized block design with three replications to study the correlation and path co-efficient analysis for ten quantitative characters in pearl millet at Pearl millet Research Station, Junagadh Agricultural University, Jamnagar during *Kharif* season of 2009-10. Correlation studies revealed that the characters *viz*., ear head weight, number of nodes per plant and plant height exhibited significant positive correlation with grain yield indicated major role of these traits in contribution of grain yield. Path co-efficient analysis showed that number of nodes per plant, ear head length, ear head weight and ear head girth were the most important characters manifesting large direct effects on grain yield. The high association of ear head weight and number of nodes per plant with grain yield and their inter-associations and also their large direct effect on grain yield suggest that ear head weight and number of nodes per plant merit maximum emphasis in selection for improvement of grain yield in pearl millet.

Key words : Correlation co-efficient, Path analysis, Pearl millet

Pearl millet [*Pennisetum glaucum* (L.)] is the fourth most food grain crop after rice, wheat and sorghum in India, and grown mainly in Rajasthan, U. P., Maharashtra, Gujarat and Haryana which account for 95 % of the area under this crop. Yield being a complex character is dependent on a number of characters. Knowledge of interrelationship between yield and its components and the relative weightage which should be given to different yield components to obtain maximum gain is most important. Though correlation studies are helpful in measuring the association between yield and component characters, they do not provide an exact picture of the direct and indirect causes of such an association which can be had through path coefficient analysis (Wright, 1923). Therefore, in the present investigation, correlation and path co-efficient analysis were carried out for ten quantitative characters of pearl millet during *Kharif* season of 2009-10.

MATERIALS AND METHODS

In the present investigation, four male sterile lines (ICMA-95444, ICMA-98444, JMSA-20072, JMSA-20073) and 12 diverse restorer lines (J-2290, J-2340, J-2405, J-2433, J-2454, J-2467, J-2474, J-2479, J-2483, J-2495, J-2498, H-77/833-2) were crossed in a line x tester mating design during summer-2009. The resultant 48 hybrids along with fertile counter part of four male sterile lines and 12 male parents were evaluated in randomized block design with three replications at Pearl millet Research Station, Junagadh Agricultural University, Jamnagar, Gujarat, during *Kharif* season of 2009-10. Each entry was grown in a single row of 5.0 m length each with inter and intra row spacing of 60 x 15 cm. The recommended agronomic practices and plant protection measures whenever necessary were adopted for raising the good crop. Observations were recorded on ten randomly selected competitive plants for each entry, in each replication for ten characters (Table 1). Mean values were subjected to standard statistical procedures namely, phenotypic and genotypic correlations (Falconer, 1964) and path co-efficient analysis (Dewey and Lu, 1959).

RESULTS AND DISCUSSION

The estimates of phenotypic and genotypic correlations of various components with grain yield and their direct and indirect effects contributing towards yield are presented in Table 1. The genotypic correlation co-efficients, in general, were higher in magnitude than their corresponding phenotypic estimates showing the efficiency of genotypic estimates over phenotypic ones. The higher magnitude of genotypic correlations observed in the present study was supported by Balakrishnan and

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