

## Character association among some quantitative traits in barley (*Hordeum vulgare* L.)

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### SUMMARY

Twenty-five genetically diverse strains were studied for correlation among nine characters i.e. days to flowering, plant height, number of productive tillers per plant, ear length, number of grains per ear, grain weight per ear, 1000-grain weight and seed hardness. The higher genotypic and phenotypic correlations were found for days to flowering, plant height and number of productive tillers per plant. Path co-efficient analysis revealed that grain weight per ear and number of productive tillers per plant had maximum direct effect on grain yield. However, the direct influence of plant height on grain yield was negative.

**Key words :** Barley, Correlations, Path analysis, Direct effect, Indirect effect.

Grain yield is a complex character influenced by several genetic factors interacting with the environment. However, a few studies have been undertaken to access the correlation among the exotic genotypes. Knowledge of character association among quantitative traits help in identification of real components of yield and effective basis of selection. Path coefficient analysis provides a better index for selection rather than correlation coefficient, by separating the correlation coefficient of yield and its components into direct and indirect effects. Therefore, the present investigation was undertaken to study the phenotypic and genotypic correlations and their direct and indirect effects on yield of barley.

### MATERIALS AND METHODS

Twenty-five genetically diverse genotypes were laid out in randomized complete block design with three replications during *rabi* season of 2002-03 at Crop Research Farm, Nawabganj, C.S.A. University of Ag. & Tech., Kanpur. The plot size of each treatment was maintained at 3 m long two rows each with a spacing of 23 cm. The data were recorded on 10 randomly selected plants from each plot in each replication for nine quantitative characters viz. days to flowering, plant height (cm), number of productive tillers per plant, ear length (cm), number of grains per ear, grain weight per ear (g), 1000-grain weight (g), seed hardness (kg/grain) and grain yield per plant (g). The mean data were utilized to estimate the correlation coefficient and their direct and indirect effects. Path coefficient analysis was done as per the method suggested by Dewey and Lu (1959).

### RESULTS AND DISCUSSION

The phenotypic and genotypic correlation coefficients among yield and its components revealed that grain yield per plant had positive and significant correlation with days to flowering, plant height, number of productive tillers per plant, number of grains per ear, grain weight per ear and 1000-grain weight. The results are in accordance with the findings of Sethi and Singh (1972) and Mandal and Dana (1993). Observations revealed that the genotypic correlations coefficients were similar in direction but higher in magnitude than respective phenotypic correlation coefficients, indicating the inherent association between traits (Falconer, 1989).

The correlation with the yield were further partitioned into direct and indirect effects to establish the cause and effect relationship, among the yield and its component characters. Path analysis revealed that the grain weight per ear had maximum direct effect on grain yield per plant (0.615) followed by number of productive tillers per plant (0.609) and days to flowering (0.240). These parameters could therefore be considered for use as selection criteria in barley breeding. Similar findings were reported by Ganusheva and Lozanov (1992) and Huang and Pan (2000). The direct influence of plant height on grain yield was negative which suggested that selection of dwarf genotypes will be effective for improving grain yield. Negative association of plant height with yield was also reported by Prasad and Singh (1980). So, from the present investigation it is concluded that the grain yield in barley may be improved by selection of dwarf plants having more number of tillers with more grain weight per ear.

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