

Genetic variability and characters association in barley (*Hordeum vulgare* L.)

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SUMMARY

An experiment comprising 19 genotypes of barley was conducted to collect the informations on various genetic parameters for improving grain yield through direct and indirect selections. Grain yield per plant showed positive and significant correlation coefficient with number of tillers per plant, number of grains per year, grain weight per year and 1000-grain weight at both genotypic and phenotypic level. Path analysis showed highest direct effect on grain weight per plant and number of tillers per plant. 1000-grain weight showed negative direct effect on yield. Positive indirect effect of grain weight per year *via* number of grains per year, 1000-grain weight, ear length and plant height was also considerable. High heritability was observed for all the characters with high genetic advance in percent of mean. Genetic advance for days to flowering and days to maturity were comparatively low.

Key words : Selection parameter, Heritability and Genetic advance, Correlation, Path analysis and Genetic variability.

Barley is an important feed, food and industrial crop of India. It is fourth most important cereal of the world. The informations on the nature and magnitude of variation in the available gene pool and knowledge of association among different economic characters is important for any crop improvement programme. Heritability and genetic advance of grain yield and its components is pre-requisite for the improvement through selection. Similarly studies on association of different traits helps to identify the real components of yield and provide an effective basis for selection. Therefore, the present investigation has been taken into consideration to know the heritability, genetic advance and association between yield and its contributing traits.

MATERIALS AND METHODS

Nineteen genetically diverse strains of barley, namely, RD2655, RD2656, RD2657, RD2658, BH638, BH639, BH640, BH641, K741, K742, K744, K750, JB20, JB23, PL750, PL751, RD2035, RD2552 and Jyoti were grown at Crop Research Farm, C.S. Azad University of Agriculture & Technology, Kanpur during *Rabi* 2002-03 in a Randomized Block design with three replications. The row to row and plant to plant distance was kept at 23 cm and 5 cm respectively. All the recommended package of practices were followed to raise a good crop. Five plants were randomly selected in each strain in each replication to record the observations on nine metric traits, viz., days to flowering, days to maturity, plant height (cm) number of tillers/plant, ear length (cm), number of grains per ear, grain weight per ear (g), 1000-grain weight (g) and grain yield per plant (g). Genotypic and phenotypic coefficient of variances were estimated as per Burton and Devane (1953). Character association and path analysis were estimated according to Miller *et al.* (1958) and Dewey and Lu (1959), respectively.

RESULTS AND DISCUSSION

Analysis of variances revealed highly significant differences among the tested genotypes in respect of all the traits. The maximum variability was found for plant height, number of grains per ear and 1000-grain weight. Therefore, more emphasis should be given for these traits while going for selection for the improvement of crop. Pal and Singh (1995) also reported the similar findings.

The maximum phenotypic and genotypic coefficients of variability (GCV) among the characters under study were exhibited by grain weight per ear (17.16%), grain yield per plant (17.01%), ear length (17.01%) and number of grains per ear (15.96%). Similar findings has also been reported by El-Hennawy (1997). It indicated that the simple selection for grain weight per ear, grain yield per plant, ear length and number of grains per ear may be more advantageous as compared to other components for improving grain yield.

Heritability in broad sense includes additive and epistatic gene effects and it is realized only when accompanied with genetic advance. It is also suggested that heritability along with GCV and extent of genetic advance would give the best picture for better selection.

High heritability estimates for plant height, ear length, number of grains per ear, 1000-grain weight and grain yield per plant accompanied by high genetic advance (per cent of mean) clearly indicated that the characters are under the due to control of additive gene effects and thus, selection would be effective for these traits.

At genotypic and phenotypic levels grain yield per plant showed positive and significant correlation with number of tillers per plant, number of grains per ear, grains weight per ear and 1000-grain weight. Similar findings have also been reported by Singh and Singh (1990).

Among characters themselves: days to flowering expressed positively significant association with days to maturity. The association of ear length with grain weight per ear was positive and significant while it was negatively

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