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Assessment of genetic variability in wheat genotypes

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ABSTRACT : An experiment was conducted to study the variability parameters for eleven (11) traits in the 169 genotypes of wheat by simple lattice design. All the genotypes exhibited significant differences for all the traits. In the present study the phenotypic and genotypic coefficient of variation was found to be moderate for days to 50 per cent flowering, days to maturity, plant height, peduncle length, number of productive tillers per meter, spike length, number of spike lets per spike and number of grains per spike, except 1000 grain weight. Results obtained from present investigation has revealed moderate GCV and PCV indicating still there is possibility of improvement of genotypes through these characters. Heritability values for all the characters were found to be high for most of the characters viz., number of days to 50 per cent flowering, days to maturity, plant height, peduncle length, number of productive tillers per meter length, spike length, number of spikelets per spike, number of grains per spike and grain yield per plot, had shown high heritability and genetic advance as per cent mean, however, the same character exhibited moderate GCV and PCV hence direct selection of genotypes can be done through these characters for further improvement of genotypes.

Key Words : Wheat, GCV, PCV, Heritability, Genetic advance

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Wheat (*Triticum aestivum* L.) is the world most cultivated food crop known as the king of all cereal crops as its cultivation is easier, ecologically suitable and contain high amount of nutrients. It is rich in protein (7-22%), carbohydrate, calcium, lysine, iron, glutenin, vitamin and minerals. Wheat is cultivated over an area of 230.16 million ha with a production of 673.09 million ton in the world (FAOSTAT, 2003). In India it is the second important crop after rice and covers an area over 27.75 million hectares which is about 20 per cent of the total cultivated area under cereal. India has attained a record of 80.58 million tons of wheat production in 2008-2009 and continues to remain as the second largest producer of wheat in the world (USDA, 2009).

Analysis of variability among the traits and the association of a particular character in relation to other traits contributing to yield of a crop would be great importance in planning a successful breeding programme. Development of high-yielding varieties requires a thorough knowledge of the existing genetic variation for yield and its components. The observed variability is a combined estimate of genetic and environmental causes, of which only the former one is heritable. However, estimates of heritability alone do not provide an idea about the expected gain in the next generation, but have to be

considered in conjunction with estimates of genetic advance, the change in mean value between generations. Success in crop improvement generally depends on the magnitude of genetic variability and the extent to which the desirable characters are heritable.

RESEARCH PROCEDURE

The material for the present investigation consisted of 169 wheat genotypes along with checks DWR 162 and Kalyansona, collected from Directorate of wheat research, Karnal. The experiment was laid out in an Simple lattice design with two replications. Each genotype in each replication was grown in a plot of 3 rows of 2 meter length each with a spacing of 23 cm between rows, at Wheat Improvement Project, Main agricultural Research station Dharwad. Both genotypic and phenotypic coefficients of variability were computed as per the method suggested by Burton and Devane (1953). The heritability was categorized as low, moderate and high as given by Robinson *et al.* (1949). Genetic advance as per cent mean was categorized as low, moderate and high as given by Johnson *et al.* (1955).

All the agronomic practices were followed during the crop