

Pattern of genetic parameters in early generation selection in wheat (*Triticum aestivum* L.)

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SUMMARY

Hybridization is frequently used tool available for creating genetic variability which is expressed in F_2 of a cross and this genetic variability reduces in subsequent generation. Therefore, early generation selection has its own importance but sometimes it leads to diffusion of improvement expected in a trait particularly when the trait is govern by non-additive gene effects. Hence the study of heritability and genetic advance for different traits in segregating generations under different selection pressure is conducted in order to explore better selection criteria for improvement of wheat yield. The results indicated that selection based on plant height and number of grains per ear could be useful for getting high yielding genotypes in early segregating generations of wheat.

Key words : Wheat, *Triticum aestivum*, Early generation selection, Genetic parameters.

Wheat is one of the most important cereal crop, both in the national and global context. India is the second largest wheat producer of the world in area and production after China. The improvement of any crop depends upon the extent of genetic variability of economic characters present in the population. Hybridization followed by selection is an important step in crop improvement. The purpose of selection is to isolate desirable plant types from the segregating populations. Visual selection of individual plants in F_2 for yield is unreliable (De Pauw and Shebeski, 1973). However, theoretical evidences suggest that identification of the high yielding genotypes in the F_2 generation is imperative, if they are lost they can not be recovered in subsequent generations (Bhatt, 1980).

Effective selection depends upon the existence of genetic variability in the population. Heritability has been used as an index of transmissibility of a character from the parents to its off-springs (Lush, 1940). Heritability in addition to genetic advance is of utmost importance in early generation selection. Yield is a complex character and generally has low heritability, therefore, selection on the basis of its component characters would be more reliable. Whitehouse *et al.* (1958) and Graffius (1959) have suggested that there may not be genes for yield *per se* but for its component characters. Therefore, it is essential to have information on relationship between yield and its components. The effectiveness of early generation selection largely depends on the information about variability, character association, heritability and genetic

advance of the characters under study. Considering the above points, present investigation was undertaken with the objectives to study the estimates of variability, heritability and genetic advance for yield and yield contributing traits in F_2 and subsequent generations.

MATERIALS AND METHODS

The experimental materials comprised of ten diverse parents and their five F_2 crosses namely 96001 (CPAN 2044 / UP 2382), 96003 (CPAN 2063 / UP 2425), 96054 (HS 240 / K 9413), 96055 (HUW 355 / WH 533) and 96094 (WH 613 / UP 2425). Five selection procedures were adopted i.e. one per cent selection intensity, two per cent selection intensity, single ear selection, random sampling and bulk sampling in each cross in F_2 and F_3 generation to grow F_3 and F_4 generations, respectively. Each of five F_2 crosses and ten parents were space planted at 23×10 cm apart in a plot consisting of 10 rows, one row of P_1 (parent 1) on one side and one row of P_2 (parent 2) on another side, each 5 m long. F_3 generation was space planted, while F_4 with dense planting to evaluate the performance of different selection methods with three replications in randomized complete block design. The experiment was planted during 1997-98, 1998-99 and 1999-2000 during *rabi* at C.C.R. (P.G.) College Muzaffar Nagar (U.P.). All the observations were recorded on individual plant basis for twelve characters in each cross and parent in F_2 and subsequent generations. Observations were recorded for days to heading, days to

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