

STUDY OF BC₃F₂ POPULATION FOR VARIABILITY PARAMETERS, GENETIC ADVANCE AND HERITABILITY IN MAIZE (ZEA MAYS L.)

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ABSTRACT

BC₃F₂ population of maize derived from cross between UMI 79 and UMI 936(w) and repeated backcrossing with UMI 79 was used in the study for variability parameters, genetic advance and heritability. The data on days to tasseling, days to silking, days to maturity, plant height, cob length, cob diameter, number of rows per cob, number of grains per row, cob weight, shelling %, hundred grain weight and grain yield per plant for BC₃F₂ plants were recorded. The plants recorded moderate variability (GCV-10% to 20%) for plant height, cob diameter, number of grains per row and cob weight. However, it recorded low variability (GCV<10) for remaining traits. The moderate to high GCV gives an indication of justifiable variability among the genotypes with respect to these characters and therefore gives scope for further improvement of these traits through selection. For traits cob diameter, number of grains per row, cob weight and grain yield per plant, the PCV was higher than the corresponding GCV showing the role of environment in these characters. Minor variations between PCV and GCV values for rest of the traits under study shows the limited role of environment in these characters and they were mostly governed by the genetic factors. Selection for improvement of such characters will be rewarding. The variability parameters of BC₃F₂ progenies revealed that the traits viz., plant height, days to tasseling, days to silking, cob length, cob diameter, number of rows per cob, cob weight, shelling %, 100 grain weight and grain yield per plant have exhibited high to moderate heritability followed by high to moderate genetic advance. This clearly denoted that these traits are governed largely by additive gene effect which may be favourably exploited for further improvement by selection. Low heritability followed by moderate to high genetic advance was observed for number of grains per row indicating that the traits are governed by additive gene effects. The low heritability being exhibited may be attributed to high environmental effects. Intensive selection may be effective in such cases. Moderate heritability but low genetic advance observed in BC₃F₂ progenies for days to maturity indicates epistasis and dominant gene action and selection for this trait may not be rewarding. The traits could be exploited through heterosis breeding once the introgression is complete.

KEYWORDS: Maize, Variability Parameters, Genetic Advance, Heritability

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