

International Journal of Agricultural Sciences Volume **8** |Issue 2| June, 2012 | 479-482

Genetic variability for quantitative traits in line x tester crosses of pearl millet

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Abstract : Sixty genotypes comprising of 45 F₁s along with five male sterile lines, nine testers and one standard check hybrid (GHB-744) were evaluated for grain yield and eight component traits, to study genetic variability, heritability and genetic advance in pearl millet at Jamnagar during *Kharif* season of 2011-12. The analysis of variance revealed highly significant differences among the genotypes for all the nine characters studied. The relative magnitude of phenotypic co-efficient of variation (PCV) was slightly higher than corresponding genotypic co-efficient of variation (GCV) for all the characters studied which indicated that these characters had interactions with environment to some extent. The variability analysis revealed that ear head weight, number of effective tillers per plant, fodder yield per plant and grain yield per plant had high magnitude of phenotypic co-efficient of variation, phenotypic co-efficient of variation, heritability and genetic advance expressed as percentage of mean thereby suggesting the importance of additive gene action. Hence, these characters can be improved through simple selection process.

Key Words : Pearl millet, GCV, PCV, Heritability, Genetic advance

View Point Article : Chaudhary, V.P., Dhedhi, K.K., Joshi, H.J. and Sorathiya, J.S. (2012). Genetic variability for quantitative traits in line x tester crosses of pearl millet. *Internat. J. agric. Sci.*, **8**(2): 479-482.

Article History : Received : 03.03.2012; Revised : 30.04.2012; Accepted : 26.05.2012

INTRODUCTION

Pearl millet is the fourth most important food grain after rice, wheat and sorghum in India and producing 9.5 m t from an area of 9.3 m ha, with average grain yield 1000 kg/ha (AICPMIP, 2011). The major pearl millet growing states in India are Rajasthan, Maharashtra, Gujarat, Haryana, U.P., Tamil Nadu, Karnataka, A.P. and M.P., with fist five states accounting for more than 90 per cent of pearl millet acreage in the country (AICPMIP, 2011). Crop improvement depends on the magnitude of genetic variability and the extent to which the desirable characters are heritable. To improve yield, information on genetic variability and heritability of these characters is necessary. Grain yield is a complex character being governed by a large number of minor genes with cumulative, duplicate and dominant effect and highly influenced by environment. This necessitates a through knowledge of variability owing to genetic factors, actual genetic variation heritable in the

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progeny and the genetic advance that can be achieved through selection. Therefore, the present investigation was undertaken to estimates the genetic variability, heritability and genetic advance for grain yield and its eight components in pearl millet during *Kharif* season of 2011-12.

MATERIALS AND METHODS

Five cytoplasmic-genetic male sterile lines (ICMA-98444, JMSA-20081, JMSA-20091, ICMA-65550, ICMA-841)and nine diverse restorer lines (J-2340, J-2405, J-2433, J-2480, J-2482, J-2495, J-2496, J-2507, J-2526) were crossed following line x tester mating design during summer-2011. A set of 60 genotypes comprising of 45 F_1 s along with fertile counter parts of five male sterile lines, nine pollinators and one standard check hybrid (GHB-744) were sown on 13th July during rainy season of 2011-12 in a randomized block design replicated thrice at Pearl millet Research Station, Junagadh Agricultural University,