



Banavasi selection, yield per plant and nitrogen use efficiency showed complementary gene action which indicated the need for heterosis breeding. Yield per plant is governed by duplicate gene action in the cross Bettasanna × Navali, indicating improvement of the trait through biparental mating or reciprocal recurrent selection. High genotypic coefficient of variability and phenotypic coefficient of variability values with less difference were observed for nitrogen use efficiency in the cross Kaduvakalongi × Banavasi selection indicating less influence of environmental factor on their expression. Moderate genotypic coefficient of variability and phenotypic coefficient of variability values with less difference observed for nitrogen use efficiency. In the cross Bettasanna × Navali, indicated the influence of both additive and non-additive gene action in the inheritance of these traits. High heritability coupled with high genetic advance was recorded for yield per plant, nitrogen use efficiency in both the crosses. This indicated that these traits were predominantly controlled by additive gene action and amenable for selection. Significant positive correlation of nitrogen use efficiency with grain yield in both the crosses was observed.

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Maternal effect on grain iron and zinc densities in pearl millet

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Genetic variation and inheritance of micronutrients in pearl millet has largely been studied in recent years as part of biofortification initiatives. Both iron (Fe) and zinc (Zn) densities are highly heritable and determined by additive genetic variances. In this context, genetics of maternal (cytoplasmic) effect on inheritance of grain Fe and Zn was studied using a set of diverse breeding material, consisting of inbreds, hybrids and OPVs. Entries were paired for low and high for Fe density to produce direct and reciprocal crosses. Parents and their crosses were evaluated for two contrast seasons (summer and rainy). Over two seasons, highly significant variation exhibited by parents and hybrids. Fe density among parents varied from 31 to 64 mg kg⁻¹ and Zn density varied from 28 to 43 mg kg⁻¹. The differences of direct and reciprocal hybrids for both micronutrients were non-significant indicate that genetics of both the micronutrients controlled by nuclear determinants and cytoplasmic or maternal gene cannot modify inheritance of these traits. Difference between each direct and reciprocal crosses for both Fe (1 to 4 mg kg⁻¹) and Zn (0 to 2 mg kg⁻¹) were negligible. These results indicate the high Fe/Zn inbreds can be used either female or male parent in seed and restorer parent breeding program. In addition, the highly significant and high positive association between Fe and Zn, suggesting, both could be enhanced simultaneously.