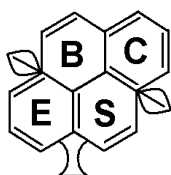


Journal

CHARACTERIZATION AND GENE EXPRESSION ANALYSIS OF ZINC FINGER RELATED GENES IN BREAD WHEAT (*TRITICUM AESTIVUM*)

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Journal

PERFORMANCE AND COMBINING ABILITY FOR GRAIN YIELD AND SOME AGRONOMIC TRAITS IN DIALLEL CROSSES OF WHITE MAIZE UNDER NITROGEN STRESS CONDITIONS

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ABSTRACT

The present study was undertaken during two successive growing seasons to evaluate 15 F₁ white maize crosses obtained from a half six parental diallel pattern along with the check hybrid S.C. 131 under low (60 kg N fed⁻¹) and normal (120 kg N fed⁻¹) nitrogen fertilization levels. Mean performance, combining ability and their interactions with environments were estimated for grain yield plant⁻¹, ear length, ear diameter, number of rows ear⁻¹, number of kernels row⁻¹, 100-kernel weight, plant height, ear height and days to 50% silking. Nitrogen mean squares were significant for all the studied traits except 100-kernel weight, indicating an overall difference between the two environments. Moreover, mean values for normal nitrogen level were higher than the corresponding ones under low N-level for the most traits under study. Hybrids mean squares were significant for all traits under both N-levels and the combined data. The two crosses; P₂ x P₄ and P₂ x P₆ insignificantly out-yielded the check hybrid at both N-levels in grain yield. Also, these two crosses exhibited significant increase in one or more of traits contributing to grain yield. Hence, it could be considered that these crosses offer possibility for improving grain yield of maize. Additive and non-additive genetic effects were involved in the inheritance of most traits. Additive genetic variance was predominant in the inheritance of plant height, ear height, ear length, ear diameter, No. of rows ear⁻¹, No. of kernels row⁻¹ and grain yield plant⁻¹ at both N-levels as well as 100- kernel weight at normal nitrogen level. Non-additive gene effects were prevailing for silking date at both N-levels and combined data as well as 100-kernel weight at low N-level and the combined data. Appreciable interaction effects for hybrids, GCA, SCA by N-levels were detected for the most traits, suggesting sensitivity of genetic effects to the variation in environmental treatments. These results indicated the importance of testing genotypes under various environments in order to evaluate genotypes performance and to

recognize the favorable conditions for exploiting both types of gene action in maize breeding programs. The inbred line P₁ was the best combiner for ear length, No. of kernels row⁻¹ and 100-kernel weight under normal N-level. The inbred line P₄ seemed to be the best combiner for grain yield plant⁻¹, ear length, no. of rows ear⁻¹ and no. of kernels row⁻¹ under low N-level. Inbred line P₆ was the best combiner for ear diameter and 100-kernel weight at both N-levels. Inbred P₅ was the best combiner for plant height, ear height and no. of rows ear⁻¹ at both N-levels. Inbred line P₂ appeared to be the best combiner for ear length, no. of rows ear⁻¹ and 100-kernel weight under low N-level. The most desirable SCA effects for grain yield plant⁻¹ were found in the crosses; P₁ x P₆, P₂ x P₄ and P₃ x P₆ at low N-level and P₂ x P₆, P₃ x P₅ and P₄ x P₆ at normal N-level. Thus, the previous crosses might be of prime importance in breeding programs for improving grain yield of maize.

Key words: Combining ability, Nitrogen fertilization, *Zea mays* L.