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Relationship between physiological traits and grain yield in wheat (*Triticum aestivum* L.) under heat-stress environments

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The effects of heat stress on wheat are dependent on the intensity, type and duration of the stress. High temperature represents a major constraint affecting wheat, particularly at the reproductive stage, in many parts of the world. While a systematic understanding of the physiological basis of differences in heat tolerance of wheat cultivars are lacking, a number of physiological traits are associated with performance under heat stress and may be used to increase selection efficiency. Therefore, the present study was aimed to investigate the relationship between canopy temperature depression, membrane thermo-stability and other physiological traits with grain yield and yield-contributing traits under heat stress environments in wheat and identification of suitable genotypes for higher production and productivity in the target environments. An experiment was conducted during winter season of 2015-16 using 48 diverse wheat genotypes with three dates of sowing (15 November, 15 December and 5 January) to assess the relationship of physiological parameters with grain yield under heat-stress environments. The analysis of normal, late and very late sowing, revealed that all the characters showed sufficient amount of variability in all three environments among all the genotypes under study and gives ample scope for further selection of the traits under consideration. Maximum variation was observed for characters, like canopy temperature depression and membrane injury. Most of the characters had high heritability (broad sense) in pooled analysis. Traits, like canopy temperature depression (at anthesis), canopy temperature depression (10 days after anthesis), membrane injury, had high heritability estimates and which can be utilized as selection criteria in stress environments. Grain yield showed positive and significant genotypic correlation coefficients with canopy temperature depression at anthesis, canopy temperature depression at 10 days after anthesis and membrane injury per cent. Based on the genotypic coefficient of variation, phenotypic coefficient of variation, genetic advance and heritability, the traits canopy temperature depression at anthesis, canopy temperature depression at 10 days after anthesis, membrane injury percent and relative water content can be used as selection criteria for improving the grain yield heat stress environment.

Biography

Pooran Chand has expertise in teaching and development of wheat and rice varieties with reference to heat and drought tolerant through conventional and non-conventional methods. He has published more than 50 research papers in different reputed research journals and associated in the development and releasing of 14 varieties in different crops.

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