

Research
Paper

Deciphering traits association pattern in imparting drought tolerance in durum wheat

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ABSTRACT

A study was conducted during *Rabi* 2006-07, to understand association of yield and yield attributes with traits implicated in drought tolerance in Durum wheat (*Triticum durum* Desf.). 25 genotypes were grown under two environments *viz.*, stressed (rainfed) and non stressed (irrigated). Correlation studies indicated that grain yield had significant negative correlation at genotypic and phenotypic level with days to 50 per cent flowering and days to maturity, where as it showed positive significant correlation with root length, root to shoot length ratio and harvest index under rainfed condition at both levels. While under irrigated condition days to 50 per cent flowering, 1000 grain weight and days to maturity showed significant positive correlation with grain yield at both genotypic and phenotypic levels. Plant height showed significant negative association with grain yield, while grains per spike and 1000 grain weight had significant positive effect on grain yield only at genotypic level.

Giriyanavar, Santosha A., Danaraddi, C.S., Biradar, Shilpa B., Tattimani, Manjunath and Dandagi, Mohan R. (2011). Deciphering traits association pattern in imparting drought tolerance in durum wheat, *Adv. Res. J. Crop Improv.*, 2 (2) : 224-227.

KEY WORDS : Durum wheat, Drought tolerance, Correlation, Stressed, Non stressed

Wheat (*Triticum* sp.), one of the largest cereal crop of the world, is the second most important source of staple food and income after rice in India. It is unique in several features. It is the only crop to have produced more than 500 million tonnes in a single year and to contribute more calories and more protein to world's diet than any other food crop.

In peninsular India comprising of Karnataka, and Maharashtra, durum wheat is cultivated in more than 60 per cent of the total area under wheat cultivation. Drought is the most common factor that limits the productivity of durum wheat as it is predominantly grown as rainfed crop. The response of plants to moisture stress conditions, essentially reflects on the adaptive mechanism which in turn is a complex trait. Hence, even at the same level of moisture stress condition different genotypes show characteristically different responses which in turn related to their genetic potential for expression of traits concerning to mechanism of adaptation. However, from the point of plant breeding, the adaptive traits of the plant for drought should also be combined with grain yield. Keeping this in view, the present investigation was undertaken to evaluate proven source of drought tolerance along with newly

developed lines at Wheat Improvement Project, MARS, UAS Dharwad under rainfed and irrigated conditions for studying the performance of the genotypes to identify traits that could be associated with the tolerance to drought.

RESEARCH PROCEDURE

25 genotypes were grown under two environments *viz.*, stressed (rainfed) and non stressed (irrigated). The experiment in each environment was laid out in Complete Randomized Block Design with two replications at Wheat Improvement Project, Main Agricultural Research Station, Dharwad during 2006-2007. Observations were recorded on five plants randomly selected for the characters field emergence per cent, coleoptile length, root length, shoot length, root to shoot length ratio, days to 50 per cent flowering, days to maturity, spike length, plant height, number of spikelets per spike, number of effective tillers per plant, number of grains per spike, grain yield (g/plot), 1000 grain weight, harvest index, stress susceptibility index. Genetic parameters and correlations were computed as per standard statistical procedures given by Weber and Moorthy (1952).