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RESEARCH ARTICLE :

Biplot analysis of combining ability in elite *Rabi* sorghum genotypes under irrigated and drought situations

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SUMMARY : Sorghum is a fifth most important cereal grown extensively in the arid and semi arid tropics. Among sorghum growing countries, India ranks first in acreage and second to the USA in total production. In India sorghum is cultivated as *Kharif* and *Rabi* season crop. *Rabi* sorghum is predominantly consumed for food purposes but its productivity is much lower (784kg/ha) as compared to *Kharif* sorghum (1023kg/ha). The main reason for lower productivity of *Rabi* sorghum is post-flowering drought stress as the crop is predominantly cultivated in receding soil moisture. Understanding the genetics of drought tolerance is a prerequisite of their deployment in breeding programme. With this goal complexity of eight traits of eight sorghum lines were studied. A set of 8 ´ 8 diallel cross was evaluated in well watered and water stressed conditions and analyzed using GGE biplot. The biplot depiction of the interaction among the parents helped easy and fast interpretation of the combining abilities. Under well watered condition, the best general combiner for Plant yield, Plant height, SPAD, leaf number, panicle weight, seed weight, days to flowering, dry weight were CSV22, CSV22, P. Anuradha, IS40772, CSV22, IS40752, IS40772 and IS40752 respectively. Under water stressed condition IS 23514 found to be best combiner for plant yield while CSV22,M35-1, IS40772, P. Chitra, IS40752, IS4578, IS23514 were best combiners under this situation for plant height, SPAD, leaf number, panicle weight, seed weight, days to flowering and dry weight respectively. The GGE biplot aided to identify genotypes with highest specific combining abilities. For example, IS23514 found to be the best specific combiner in well watered condition while IS40752 found to be the best specific combiner in water stressed condition for the trait plant height. The biplot also helped in identifying promising specific combiners, like P. Anuradha x IS40752 for the trait Days to flowering. Identified parents and crosses with better specific combining abilities can be successfully be deployed in drought resistance breeding programme.

KEY WORDS :
Genotypes, Sorghum, Combining ability, Drought situations

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