

Genotypic Response Differences among Faba Bean Accessions under Regular Deficit Irrigation (RDI)

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Abstract : Limited amount of irrigation water is an alarming threat to arid and semiarid agriculture. However, genotypic response differences to water deficit conditions within species have been reported frequently. Present study was conducted in order to measure the genotypic differences among faba bean accessions under Regular Deficit Irrigation (RDI). Five seeds from each accession were sown in 135 silt filled pots (30 x 24 cm). Experiment was planned under split plot arrangement and replicated thrice. Treatments consisted of three RDI levels (100% (control), 60% and 40% of the field capacity) and fifteen faba bean accessions (two local accessions as reference while thirteen from different sources around the world). Irrigation treatment was started from the very first day of sowing. Plant height, shoot dry weight, stomatal conductance and total chlorophyll contents (SPAD reading) were measured one month after germination. Irrigation, faba bean accessions and the all possible interactions has stood significantly high for all studied parameters. Regular deficient irrigation has hampered the plant growth and associated parameters in decreasing order (100% < 60% < 40%). Accessions have responded differently under regular deficient irrigation and some of them are even better than local accession. A highly significant correlation among all parameters has also been observed. It was concluded from results that above parameters could be used as markers to identify the genotypic differences for water deficit stress response. This outcome encouraged the use of superior faba bean genotypes in breeding programs for improved varieties to enhance water use efficiency under stress conditions.

Keywords : accessions, stomatal conductance, total chlorophyll contents, RDI, regular deficient irrigation

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