

GENOTYPIC RESPONSE, CORRELATIONS, AND PATH COEFFICIENTS IN GRAIN SORGHUM AS AFFECTED BY CONTRASTING WATER REGIMES.

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ABSTRACT

Understanding relationships among grain sorghum [*Sorghum bicolor* (L.) Moench] yield and yield components under water-deficit environments is critical to planning selection procedures and breeding superior cultivars for arid and semi-arid regions. This study was conducted to estimate the variance components under contrasting water regimes and to clarify the cause-and-effect relationships among grain yield and its components under such regimes. A collection of locally adapted land races from the southwest region of Saudi Arabia in addition to introduced entries were subjected to water regimes established on the basis of depleted soil moisture to 25% (stressful) and 65% (non-stressful) of plant-available water. Highly significant effects of the contrasted water regimes were prominent on the studied traits in addition to a considerable amount of variability existed among the studied genotypes. Genotype x water availability interaction revealed to be significant for most of the studied traits. The high magnitude of genetic variance for yield-related traits; head width, head weight, and kernel weight reflected the importance of the genetic variability and the effectiveness of selection for such traits. Furthermore, the phenotypic and genotypic correlations showed that head weight and