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Effect of Brassinolide on Grain Filling and Qualitative Characteristics of Wheat Seed (*Triticum Aestivum* Cv. Sirvan) under End-season Drought Stress Conditions

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Abstract

Drought stress due to its occurrence step is one of the factors affecting the yield and other traits of wheat. On the other hand, brassinolide hormone is important in terms of affecting some plant traits under drought stress. The aim of this research was to investigate the effect of brassinolide hormone and spraying time of this hormone in two stages of applying drought stress on the quality of produced seed wheat cultivar Sirvan. The experiment was conducted as a split factorial in a randomised complete block design with three replications over 2014–2015 and 2015–2016 at the research station of Education and Research Center of Agricultural and Natural Resources of Fars Province in Zarghan County, Iran. Irrigation treatments were carried out as the main plot at three levels of irrigation interruption from the flowering step up to the grain filling, irrigation interruption from the grain filling stage to the ripening the seed and full irrigation, and the second factor was in six levels including factorial of concentrations of brassinolide (three concentrations of zero, 0.05 and 0.1mgL^{-1}) and time of application (including spraying before the flowering and the grain filling stages). The highest rate and the lowest period of grain filling were observed after drought stress in flowering stage and there was no significant difference between the drought stress after the flowering and grain filling stage for the maximum grain weight. All of the qualitative traits of the seed were affected by drought stress and concentration of the hormone applied to the parent plant. The lowest germination percentage and vigour longitudinal index of seedling were observed after drought stress at the flowering stage and no application of hormone. The highest seedling vigour index and the lowest electrolyte leakage from seed were obtained by using the 0.1mgL^{-1} brassinolide. In general, the drought stress decreased the quality of seed wheat cultivar Sirvan at the flowering and grain filling stages and the use of 0.1mgL^{-1} brassinolide improved the effect of stress on the quality of seed wheat.

Keywords: Antioxidant enzymes, brassinosteroids, Grain weight, Irrigation interruption, Seed germination

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