



zabol University

Department of Agronomy

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for the degree of Ph.D in Agronomy**

**Effects of water deficient stress of
seasonal late on some physiological,
morphological characteristics of bread
wheat cultivares (*Triticum aestivum*)**

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Abstract

In order to investigate the effect of drought stress of seasonal late on some physiological characteristics and grain yield of wheat cultivars, field experiments were carried out in split plots based on randomized complete block design with three replications at the research station located 20 km north of the city of Aq Qala (Anbaralum), in Two years 2016 to 2017. Water deficient stress was considered as the main factor in three levels including full irrigation until the end of the season, interrupt of irrigation from flowering stage and interrupt of irrigation from the beginning of seed filling. Bread wheat cultivars as sub-factors in four levels including Kuhdasht, Karim (drought tolerant), Gonbad and Ehsan (drought sensitive). The results of combined analysis of the data showed that the Water deficient stress significantly reduced the length of the grain filling period. Kuhdasht and Karim had a shorter grain filling period and with increasing the severity of Water deficient, the ripening periods in them decreased more than Ehsan and Gonbad cultivars. The relative water content was affected by Water deficient stress. With the interrupt of irrigation from the flowering stage and the beginning of seed filling, the relative water content of the leaves decreased by 8.2 and 3.8%, respectively, compared to full irrigation. that show Results stomata opening decreased significantly with increasing of water deficient. In the interrupt irrigation treatment from the flowering stage, Kuhdasht and Karim cultivars showed that they are able to keeping more the stomata open, keep 9.3 and 9.2 μm , respectively, respectively, compared to Ehsan and Gonbad cultivars, 8.3 and 8.7 μm , respectively. Simultaneously perform more transpiration and photosynthesis and have higher performance. The results also showed that in full irrigation treatment, Ehsan and Gonbad cultivars with the average of 8.7 mg / g fresh leaf weight had the highest amount of chlorophyll a. In this treatment, there was no significant difference between cultivars in carotenoid content. With increasing stress intensity in irrigation cut-off treatments, the rate of loss of pigments (chlorophyll a and carotenoids) in Ehsan and Gonbad cultivars was higher than Kuhdasht and Karim. The results showed that the share of remobilization increased by 72 and 64% compared to full irrigation with interrupt of irrigation from the flowering stage and the beginning of seed filling, respectively, and the share of current photosynthesis decreased significantly. According to the comparison results, the tolerant cultivars of Kuhdasht and Karim with 57.4% and 60.7%, respectively, have a significantly higher remobilization share than Ehsan and Gonbad (with an average of 50.3% and 47.7%, respectively). interrupt of irrigation from the beginning of grain filling did not have a significant effect on grain yield of tolerant cultivars of Kuhdasht and Karim, but grain yield significantly reduced Ehsan and Gonbad cultivars. There was a significant decrease in grain yield in all studied cultivars in the cut-off treatment from the flowering stage. Kuhdasht and Karim cultivars showed higher yield stability. Positive and significant relationship between grain yield with grain filling rate ($r=0.80^{**}$), harvest index ($r=0.75^{**}$), stomata opening ($r=0.51^{**}$), relative water content Leaf ($r=0.49^{**}$), chlorophyll a, b and carotenoids as well as higher values of these characteristics in cultivars with higher yield stability can be expressed that these characteristics can be used as an index of drought resistance in the selection of resistant cultivars.