

عنوان مقاله:

Evaluation of Crop Water Stress Index, Canopy Temperature and Grain Yield of Five Iranian Wheat Cultivars Under Late Season Drought Stress

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خلاصه مقاله:

Abstract In order to evaluate crop water stress index (CWSI) and canopy temperature of wheat cultivars under terminal drought stress, a field experiment was conducted at the Agricultural Research Station of Shiraz University, Shiraz, during ۲۰۰۹ growing season. Five wheat cultivars including Shiraz, Bahar, Pishtaz, Sistan and Yavaros and four levels of water regime including well watering [Irrigation according to ۱۰۰% field capacity (FC)], excess watering (۱۲۵% FC), and mild (۷۵% FC) and severe drought (۵۰% FC) stress were used in a split plot design experiment with three replicates. Results showed that Yavaros and Shiraz cultivars with ۷.۳۶ and ۶.۸۱°C had the highest canopy-air temperature differences (Tc-Ta), respectively, while in Bahar this difference was ۳.۹°C. In all cultivars, slope (a) and intercept (b) of lower base line equation between Tc-Ta and vapour pressure deficit (VPD) were increased significantly due to more limitation in water and increasing VPD. Yavaros and Shiraz cultivars with higher a value were found to be more sensitive to increasing VPD. Shiraz and Yavaros cultivars with ۰.۷۳ and ۰.۷۱ had the highest seasonal mean CWSI, respectively, while CWSI in Bahar, Pishtaz and Sistan ranged from ۰.۶۱ to ۰.۶۴ under severe drought. A negative relationship was found between CWSI and amount of water supply and net photosynthesis of flag leaf. Maximum grain yield was obtained in Shiraz and Yavaros under well and excess watering and CWSI in these cultivars ranged from ۰.۳۱ to ۰.۳۶, whereas by decreasing water supply and increasing CWSI, grain yield in these cultivars decreased significantly. Bahar, Pishtaz and Sistan cultivars with lower Tc-Ta, water supply and CWSI had better performance than Shiraz and Yavaros cultivars, especially when exposed to water stress conditions. The role of these traits should be further investigated as potential indirect selection criteria for grain yield of wheat cultivars in semi-arid conditions.

کلمات کلیدی:

Canopy temperature, CWSI, Net Photosynthesis, Water supply

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