

Drought stress affecting physio- biochemical characters and yield attributes in wheat (*Triticum aestivum* L.)

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ABSTRACT

Experiment was carried out to study the induced water stresses at different crop developmental stages for physio-biochemical characters and yield attributes in two wheat cultivars at experimental area of Division of Bio chemistry and Physiology, SKUAST- J, in 2013. The experiment was laid-out with 02 wheat varieties i.e. PBW-343 and RSP-81 with 04 water stress levels. T₁ (without withholding of water), T₂ (10 days with-holding of water [WOW]), T₃ (15 days WOW) and T₄ (20 days WOW) were applied. Increased water stress significantly reduced the relative leaf water content (RLWC), partitioning coefficient (PC) to spike, harvest index (HI), chlorophyll content, spike length, number of grains/spike, weight of grains/spike and aphid incidence per spike in both wheat varieties. About 55.8 and 54.6% reduction in RLWC was noticed at 20 days WOW in variety PBW-343 and RSP-81, respectively as compared to control. PC to spike was reduced by 25.30 and 23.69% at highest drought condition in variety PBW-343 and RSP-81 respectively in comparison to control. Likewise, HI also reduced by 16.7 and 14% in variety PBW-343 and RSP-81, respectively. Chlorophyll content decreased from 44.7 in control to 34.7 in 20 days WOW with variety PBW-343 and 37.8 in control to 27.9 in 20 days WOW with RSP-81. Soluble sugar content increased significantly at maximum WOW in both varieties while PBW-343 accumulates 37.9% of soluble sugar content in comparison to control. Accumulation of proline was increased from 02 mg g⁻¹ in control to 37.7 mg g⁻¹ at 20 days WOW in variety PBW-343. Spike length, grains per spike and weight of grains per plant significantly decreased at maximum WOW in both varieties whereas the reduction was high in variety PBW-343 than in RSP-81. Aphid population decreased with increasing the water stress from 10 days WOW to 15 and 20 days WOW. Besides reduction in these parameters, RSP-81 showed some resistance to water stress as compared to PBW-343.

Key words: Wheat, water stress, physiological traits, soluble sugar, proline, aphids and yield attributes.

Wheat is one of the most important cereal crops and used as stable diet for more than one-third of the world population and contributes more calories and protein to the world diet than any other cereal crop (Abd-El-Haleem *et al.*, 2009). Productivity of many crops is largely influenced

by moisture stress either exposure is temporary or permanent under drought prone area of the world. Drought stress is one of the most important factors limiting plant growth and crops production worldwide more than any other biotic or abiotic stress (Zheng *et al.*, 2010 and Almeselmani *et al.*, 2011). Drought is a meteorological term that occurs when the accessible water in the soil is reduced and atmospheric conditions cause plant to lose water by transpiration or evaporation. Generally,

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