

Post-anthesis water deficit in spring wheat: effects on yield components and relative water content

O Pérez¹, L Viega², L Gutiérrez², M Castro¹

The increase in atmospheric temperature and alteration of the hydrological cycle are the main threats of climate change to wheat crop (*Triticum aestivum* L.). Furthermore, feeding a population which annually grows 1.1 %, promotes the expansion of agricultural frontier to soils with restrictions for plant growth. In this context, when in South America La Niña events occur, the cold phase of the ENSO climate phenomenon, in a greater area of the wheat crop region increases the risk of drought stress during grain filling. The aim of this research was to study the different response of five spring wheat cultivars to two irrigation treatments applied after anthesis: well-watered (Control) and 50% of water relative to the Control (Stress). The experiment was conducted in a greenhouse using the bread spring wheat cultivars LE 2249, LE 2331, LE 2333, Baguette Premium 11 and Bointa 1001. Relative water content (RWC) was determined during the stress period, from anthesis to physiological maturity, and grain yield and its components at harvest. No significant interaction between cultivars and irrigation treatments was observed for yield per plant and RWC ($P=0.3086$ and $P=0.0589$, respectively), but it was significant for kernel weight and harvest index ($P=0.0188$ and $P=0.0405$, respectively). The cultivar LE 2333 was hardly affected by the Stress treatment, while Baguette Premium 11 and LE 2249 showed an intermediate response. In contrast, LE 2331 and Bointa 1001 were the most susceptible cultivars, decreasing their yield per plant 21.0 % ($P=0.0206$) and 21.2 % ($P=0.0284$), respectively. Earlier stress symptoms measured through stomatal adjustment in Bointa 1001, caused that kernel weight and RWC were not modified due to a decrease of number of kernels per plant, whereas late stress symptoms in LE 2331 caused that both, kernel weight and RWC were decreased. Cultivars with the latter type of response would be more suitable for regions with deep soils and/or with high probability of rain after anthesis.

¹Instituto Nacional de Investigación Agropecuaria (INIA), Estación Experimental La Estanzuela, CP 70006, Ruta 50 km 11, Colonia, Uruguay.

²Facultad de Agronomía, Universidad de la República (UdelaR), CP 12900, Garzón 780, Montevideo, Uruguay.
E-mail: operez@inia.org.uy