

THE IMPACTS OF REDUCED IRRIGATION ON ITALIAN DURUM WHEAT CULTIVARS' POLYMERIC AND MONOMERIC PROTEIN DISTRIBUTION

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Reduced irrigation and drought are a polygenic stress and are considered as the most important factors limiting crop quality and yield around the world. Inadequate irrigation causes changes in protein content and protein distribution which contributes to wheat quality. These quality characteristics are very important in durum wheat for pasta and bread-making quality as well.

The variability of protein quantity and quality of eight Italian durum wheat (*Triticum turgidum* L. var. *durum*) cultivars was examined in this study. Polymeric and monomeric protein fractions were determined by size exclusion high performance liquid chromatography (SE-HPLC). The trial was conducted at Ciudad Obregon, Sonora (Mexico) during the 2014-2015 cropping season. Control, i.e. the irrigated trial received >500 mm rainfall, while reduced irrigation had 180 mm as a simulation of drought stress condition.

The average values of examined eight cultivars show that the reduced irrigation had significant effect on soluble large monomeric proteins (LMPS), insoluble large (LPPU) and small (SPPU) polymeric proteins, and insoluble large monomeric (LMPU) proteins. Percentage of small insoluble polymeric proteins (%SUPP) and large insoluble monomeric proteins (%LUMP) also significantly changed under simulated drought conditions. The highest decline was observed in LMPU with 24.5%, and in %LUMP (25%), respectively.

Reduced irrigation had notable impacts on protein fractions in the examined Italian cultivars in this study. These results could be useful in the generation of varieties to improve quality parameters or produce dual-purpose cultivars for both pasta and bread production.