

Evaluation of water deficit stress tolerance induced by seed priming in wheat (*Triticum aestivum* L.) cultivars

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Abstract

To evaluate the effects of seed priming on inducing of water stress tolerance, an experiment was carried out under laboratory and field conditions in Satloo station of Agricultural and Natural Resources Research Center in West Azerbaijan province at 2008-9 seasons. A factorial experiment was formed, with the first factor including four cultivars Zarrin and Shahriar (irrigated cultivars), Sardary and Azar (rainfed cultivars) and the second factor, hydro-priming, osmotic solutions (10% polyethylene glycol (8000), 2.5% KCL, 5% NaCl, 10% Urea, 4/0% Micro nutrient), plant growth regulators (1000 ppm Cycocel and 20 ppm Auxin) and non priming as a control. Treatments were arranged at laboratory in Completely Randomized Design and two separate experiments with Randomized Blocks Design under normal and water stress at field conditions with five replications. Irrigation was held at booting stage in water stress experiment. Results of analysis of variance showed that there were statistically significant differences for traits of plumule and radical lengths and their dry weights, grain yield and its components, total dry matter and relative water content of large leaf ($P \leq 0.05$). Pretreatment of Cycocel was allocated maximum plumule (17.8cm) and radical (17.2cm) lengths and their dry weights (8.0 and 11.5mg, respectively). All priming treatments at four cultivars had more grain yield than control and at plant growth regulators were dominant and the highest variation percentage. Total dry matter (-10.7%), grain yield (-4.0%) and relative water content (-9.3%) at seed priming with potassium chloride had the lowest variation percentage under water stress than normal conditions. This pretreatment increased spike per square meter in Shariar, Zarrin and Azar. Within cultivars, Azar with 0.89 susceptibility index was the most tolerance to drought stress. Traits of total dry matter, grain per spike and spike per square meter observed positive significant correlations with grain yield at seed priming treatments, 0.91**, 0.92** and 0.79*, respectively. It seems that these traits could be used as an indirect criterion for selection of cultivars with high grain yield.

Keywords: *Osmo priming, Hormonal priming, Hydro priming, Water stress, wheat*