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Response of Barley Quality Traits, Yield and Antioxidant Enzymes to Water-Stress and Chemical Inducers

Authors : Emad Hafez, Mahmoud Seleiman

Abstract : Two field experiments were carried out in order to investigate the effect of chemical inducers [benzothiadiazole 0.9 mM L-1, oxalic acid 1.0 mM L-1, salicylic acid 0.2 mM L-1] on physiological and technological traits as well as on yields and antioxidant enzyme activities of barley grown under abiotic stress (i.e. water surplus and deficit conditions). Results showed that relative water content, leaf area, chlorophyll and yield as well as technological properties of barley were improved with chemical inducers application under water surplus and water-stress conditions. Antioxidant enzymes activity (i.e. catalase and peroxidase) were significantly increased in barley grown under water-stress and treated with chemical inducers. Yield and related parameters of barley presented also significant decrease under water-stress treatment, while chemical inducers application enhanced the yield-related traits. Starch and protein contents were higher in plants treated with salicylic acid than in untreated plants when water-stress was applied. In conclusion, results show that chemical inducers application have a positive interaction and synergetic influence and should be suggested to improve plant growth, yield and technological properties of water stressed barley. Salicylic acid application was better than oxalic acid and benzothiadiazole in terms of plant growth and yield improvement.

Keywords : antioxidant enzymes, drought stress, Hordeum vulgare L., quality, yield
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