Influence of Salt Stress on Biomass Production, Nutrient Imbalance, Oxidative Stress and Yield of Barley (*Hordeum vulgare* L.) Crop

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Abstract

Salinity is a global eco-environmental and agricultural issue of the modern world. Of the total world land surface around one-third is the arid and semi-arid, of that one half is strained by salinity. To observe the harmful effect of salinity on four Barley (*Hordeum vulgare* L.) lines H-93, 14001, B-140007 and B-14003, a pot experiment was accomplished at Bio Park, Bahauddin Zakariya University, Multan under two salt regimes (0,150 mM) The drastic effects of salt was quantified by analyzing biomass, root length, shoot length chlorophyll, total soluble protein, amino acid, leaf relative water content, antioxidants including catalases, ascorbates, melondialdehyde and peroxidase and yield parameters including numbers of tillers and grain weight. Salt stress with the rate of 150mM reduced all the physiological and biochemical activities in barley lines. Salt stress reduced uptake of K^+,loss in biomass production, increase content of MDA, decrease content of chlorophyll molecule, protein and amino acids and yield parameters. But tolerant lines 14003 & B-14001 high performance in relation with all physiological and biochemical attributes and produce more antioxidant enzymes as compared to salt sensitive line H-93 & B-10007.

Image

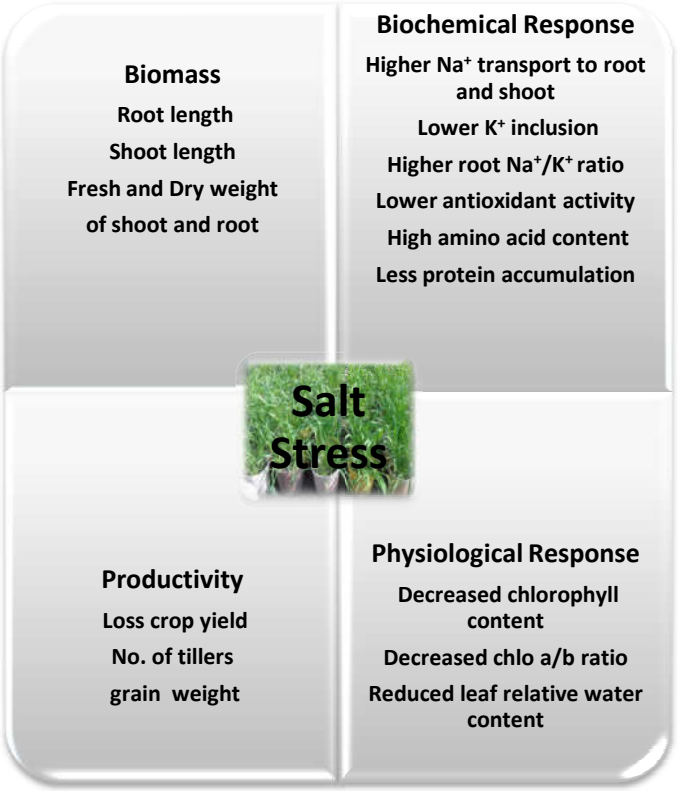


Figure 1: Effects of salt stress on Biomass, biochemical, physiological attributes and productivity of barley line (*Hordeum vulgare* L.)

Recent Publications

Acosta-Motos, J.R., M.F. Ortuño, A. Bernal-Vicente, P. Diaz-Vivancos, M.J. Sanchez-Blanco and J.A. Hernandez. 2017. Plant Responses to Salt Stress: Adaptive Mechanisms. *Agronomy*, 7: 18.

Astolfi, S. and S. Zuchi. 2013. Adequate S supply protects barley plants from adverse effects of salinity stress by increasing thiol contents. *Acta physiologiae plantarum*, 35: 175-181.

Castroluna, A., O. Ruiz, A. Quiroga and H. Pedranzani. 2014. Effects of salinity and drought stress on germination, biomass and growth in three varieties of Medicago sativa L. *Avances en Investigación Agropecuaria*, 18.

Choi, W.-G., M. Toyota, S.-H. Kim, R. Hilleary and S. Gilroy. 2014. Salt stress-induced Ca2+ waves are associated with rapid, long-distance root-to-shoot signaling in plants. *Proceedings of the National Academy of Sciences*, 111: 6497-6502.

Uddin, M.K., A.S. Juraimi, M.R. Ismail, M.A. Hossain, R. Othman and A.A. Rahim. 2011. Effect of salinity stress on nutrient uptake and chlorophyll content of tropical turfgrass species. *Australian Journal of Crop Science*, 5: 620.