

Interaction of potassium and boron on yield and uptake of micronutrients in radish (*Raphanus sativus* L.) under salinity stress

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Abstract

Due to wasteful use of low-quality irrigation water, many agricultural lands in arid and semi-arid regions of Iran are confronted with salinity phenomenon. Salinity decreases growth and yield of plants, therefore, ways to combat deleterious effects of soil salinity on plant growth should be sought. One of these strategies is physiological prevention of salt accumulation in plants and increasing their resistance to salinity. In this greenhouse study, the main objective was to investigate the interaction effects of potassium (K) and boron (B) on yield and uptake of some micronutrients by roots and shoots of radish under salinity conditions. The experiment was carried out as factorial, based on completely randomized design with three replications, at 3 levels of K (1, 4 and 8 mM), 3 levels of B (0.1, 0.2 and 0.3 mg/L) and 3 levels of salinity (1, 4 and 8 dS/m) in quartz sand culture medium. Results showed that interaction of K and B on fresh and dry weight of shoots, fresh weight of roots and uptake of B, Fe, Cu, Zn and Mn was significant at different levels of salinity. Maximum fresh and dry weight of roots and shoots was observed in 8 mM K treatment. Also, maximum B, Fe and Mn uptake in shoots, and maximum B, Fe and Cu uptake by roots was observed at 4 mM K level. Uptake of B, Fe, Mn and Cu in roots was higher at salinity of 4 dS/m than 8 dS/m. At 4 dS/m salinity, maximum shoot yield and B uptake in roots, Zn uptake in shoots, and Mn uptake in roots and shoots, was observed at 8 mM K and 0.3 mg/L B. At salinity level of 8 dS/m, maximum B and Mn uptake in shoots and B and Fe uptake in roots was observed at 4 mM K and 0.3 mg/L B. According to the results this study, different levels of salinity and concentration of K and B, due to the interaction of these two elements, affect yield and uptake of plant micronutrients.

Keywords: Boron, Nutrition, Potassium, Radish, Salinity.

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