

Interaction of sodium and magnesium on some growth characteristics and chlorophyll content of pistachio in perlite substrate

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(Received : December 10-2010 ; Accepted : July 30-2011)

Abstract

In calcareous and saline soils, the adverse effect of some ions such as bicarbonate, boron, magnesium, and especially sodium, and the imbalance of nutrients' concentrations are essential factors which reduce plant growth. A greenhouse experiment was conducted to study the effect of sodium (Na) and magnesium (Mg) on some growth traits and chlorophyll content of pistachio seedlings (cv. Badami Zarand) in perlite. The factorial experiment was carried out as a completely randomized design with four replications. Treatments were three levels of Na (0, 45 and 90 mM NaCl) and four levels of Mg (0, 0.5, 1 and 2 mM MgSO₄). Modified Hoagland solution was used for irrigation of the pots. The results showed that increasing Na level significantly reduced leaf dry weight, stem height, leaf area and chlorophyll a content. Increasing Mg level up to 0.5 mM (complete Hoagland) reduced leaf and root dry weight. When Mg concentration was increased to 2 mM, vigorous reduction in leaf dry weight happened, but it didn't affect significantly the root dry weight. Application of 2 mM Mg reduced the stem height, leaf number and area, chlorophyll a and total chlorophyll by 18, 25, 19, 42 and 41%, respectively. Interaction of salinity and Mg showed that at zero level of Na and with increasing the Mg concentration, the dry weight of aerial parts and roots, stem height and leaf area were reduced significantly. But when the Na concentration was 90 mM, not only they were not reduced, but also the leaf dry weight was increased more than 60%.

Keywords: Pistachio, Salinity stress, Sand substrate, Dry regions.

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