

Interactive Effect of Soil Salinity and Water Stress on Growth and Chemical Compositions of Pistachio Nut Tree

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ABSTRACT

The effects of three sodium chloride (NaCl) levels (0, 1200, and 2400 mg kg⁻¹ soil) and three irrigation intervals (3, 7, and 14 d) on the growth and chemical composition of two *Pistacia vera* rootstocks ('Sarakhs' and 'Qazvini') were investigated under greenhouse conditions. Eight-week-old pistachio seedlings were gradually exposed to salt stress which afterward, water stress was initiated. At any irrigation interval, plant height and shoot and root dry weights of both rootstocks were reduced with increasing salinity. However, increasing irrigation intervals alleviated the adverse effects of soil salinity. A negative relationship observed between relative shoot growth and electrical conductivity of soil saturation extract (EC_e) confirmed the above findings. Under 3-d irrigation interval, the EC_e required to cause a 50% growth reduction was lower than those under 7- and/or 14-d irrigation intervals. Shoot and root chemical analyses indicated that the salinity as well as irrigation regime affected the concentration and distribution of sodium (Na⁺), potassium (K⁺), and chloride (Cl⁻) in pistachio. The concentration of Na⁺, K⁺ and Cl⁻ ions increased with a rise in NaCl level, and was generally declined with increasing irrigation interval. Based on plant height, shoot and root dry weights and the concentrations of Na⁺, K⁺, and Cl⁻ in the plant tissues, at lowest irrigation intervals 'Sarakhs' shows a higher sensitivity to soil salinity than 'Qazvini', but with increasing irrigation interval, 'Sarakhs' and 'Qazvini' can be classified as resistant and sensitive to salinity, respectively.

Keywords: 'Sarakhs', 'Qazvini', Salinity stress, Water stress, Na⁺, K⁺, Cl⁻

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