Effect of salinity and vermicompost application on nutrients concentration and yield of spinach cv. Virofly in a calcareous soil

J. Sheikhi[1]* and A. Ronaghi[1]

(Received: Jan. 27-2012 ; Accepted: may 11-2012)

Abstract

To evaluate the effect of salinity (S) and vermicompost (V) on yield and concentration of nitrogen (N), phosphorus (P), potassium (K), iron (Fe), manganese (Mn), zinc (Zn), copper (Cu), calcium (Ca), magnesium (Mg), sodium (Na) and chlorine (Cl) of spinach shoots cv. Virofly, a pot experiment was conducted in greenhouse, and arranged as factorial in a completely randomized design with three replications. Treatments included three V levels (0, 1 and 2%, w/w) and four S levels (0, 1, 2 and 3 g NaCl per kg soil). Electrical conductivity of the soil for these four S levels was 0.7, 4.5, 8 and 11.5 dS/m, respectively. Results showed that the highest yield of spinach shoots was obtained in 10% V treatment. Application of sodium chloride (NaCl) had no significant effect on shoot yield. Therefore, under the present experimental conditions, S threshold level for "Viroflay" cultivar was at least 11.5 dS/m, which is much higher than the level reported in literature for spinach (2 dS/m). Application of V increased concentration of N, P, K, Fe and Mg in spinach shoots, but decreased concentration of Mn, Zn, Cu, Ca, Na and Cl. Application of NaCl had no significant effect on the concentration of P, Fe, Mn, Ca and Mg. But, with the addition of NaCl, concentration of N, Zn, Cu, Na and Cl was increased in spinach shoots. In the absence of NaCl, application of V had no significant effect on Na concentration, but increased Cl concentration. Whereas, at 3 g NaCl level, application of V significantly decreased Na and Cl concentrations of shoots, compared to the application of NaCl alone. Therefore, application of V not only can increase plant growth, but also could be an effective solution to mitigate the negative effects of high concentrations of Na and Cl on growth of spinach, cv. Virofly, in saline soils.

Keywords: Shoots yield, Nutrients, Salinity threshold.

1. Dept. of Soil Sci., College of Agric., Shiraz Univ., Shiraz, Iran.
*: Corresponding Author, Email: sheikhi.jamal@yahoo.com