



Corn plant growth components response to soil chemical properties as consequence of irrigation with saline – hyper sodic water and leaching application

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Water scarcity is one of the most important issues of sustainable agriculture in arid and semi-arid regions. Using of marginal waters for irrigation in combination with proper management can be an alternative solution for dealing with this problem. A soil column experiment was conducted to investigate the effects of leaching fraction application for irrigation with saline – sodic waters on soil chemical properties, and growth performance of corn plant. A factorial experiment with 9 treatments including three levels of irrigation water salinity: 1, 4.7, and 9 dS/m (Sodium Adsorption Ratios: 5.27, 16.56, and 28.57) and three levels of leaching fraction: 0, 15, and 30 percent, with three replication was accomplished with sandy clay loam soil. Results show that application of 15 percent leaching fraction significantly reduced soil E_{Ce} (electrical conductivity) in first layer of soil profile only for irrigation with 9 dS/m saline-sodic water but increasing of leaching fraction from 15 to 30 percent did not significantly affect soil E_{Ce}. Application of leaching fraction reduced soil sodium adsorption ratio at first layer of the soil profile however its effect was not statistically significant. Statistical analysis show that corn growth components such as plant dry weight, IWUE (Irrigation Water Use Efficiency), stem height were significantly improved only for application 30 percent leaching fraction. Obtained results of this study indicate that in conditions which the only available water for irrigation is saline-sodic water, by controlling of salinity condition of sandy clay loam soil through application of 30 percent leaching fraction, high corn production can be achieved without significant difference in comparison with non-saline or non-sodic water. General trend of this study can be a clue for further investigations on finding of proper leaching management for irrigation with saline- high sodic water under corn cultivation.