



## **Effect of some amendments on leachate properties of a calcareous saline-sodic soil: A laboratory experiment**

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Soil salinity and sodicity are escalating problems worldwide, especially in Iran since 90 percent of the country is located in arid and semi-arid. Reclamation of sodic soils involves replacement of exchangeable Na by Ca. While some researches have been undertaken in the controllable laboratory conditions using soil column with emphasis on soil properties, the properties of effluent as a measure of soil reclamation remain unstudied. In addition, little attention has been paid to the temporal variability of effluent quality. The objective of this study was to investigate the effect of different amendments consist of gypsum, manure, pistachio residue, and their combination for ameliorating a calcareous saline sodic soil. Temporal variability of effluent properties during reclamation period was studied, as well. A laboratory experiment was conducted to evaluate the effect of different amendments using soil columns. The amendment treatments were: control, manure, pistachio residue, gypsum powder (equivalent of gypsum requirement), manure+gypsum and pistachio residue+gypsum, which were applied once in the beginning of the experiment. The study was performed in 120 days period and totally four irrigation treatments were supplied to each column. After irrigations, the effluent samples were collected every day at the bottom of the soil columns and were analyzed. The results show that for all treatments, cations (e.g. Ca, Mg, Na and K) in the outflow decreased with time, exponentially. Manure treatment resulted in highest rate of Ca, Mg, Na leaching from soil solution, in spite of the control which had the lowest rate. In addition, pistachio residue had the most effect on K leaching. Manure treatment showed the most EC and SAR in the leachate, while gypsum application leads to the least rate of them. The findings of this research reveal different rates of cations leaching from soil profile, which is important in environmental issues.

**Keywords:** Saline sodic soil, Reclamation, Organic Matter, Gypsum, Leachate.