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## Comparative effects of different soil amendments on amelioration of saline-sodic soils

A.M. Mahdy

<https://doi.org/10.17221/11/2011-SWR>

Citation: Mahdy A.M. (2011): Comparative effects of different soil amendments on amelioration of saline-sodic soils. *Soil & Water Res.*, 6: 205-216.

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A greenhouse experiment was conducted to test the potential of different soil amendments in saline-sodic soils reclamation; to affect the growth response of alfalfa (*Medicago sativa* L.) plants grown on two saline-sodic soils; and to evaluate the comparative efficiency of different soil amendments for their effects on salinity, sodicity, and pH levels of the soils. To achieve these objectives, two highly saline-sodic soils were selected (Abees, Typic torrifluvents and Elhammam, Typic calciorthids). Different soil amendments were used (compost, anthracite coal powder, water treatment residuals, ferrous sulphate, and a combination of them). The results of the study indicated that pH of Elhammam soil was less affected than pH of Abees soil after the amendment application because of the high calcium carbonate content which acted as a buffer and resisted any appreciable change in soil pH in the alkaline range. The positive effects of all treatments followed the order: T16 > T12 > T13 > T14 = T5 > T11 = T15 > T7 > T8 > T4 = T6 > T9 = T10 > T2 > T3 > T1 > T0. The most effective amendment in reducing SAR<sub>e</sub> in the experimental soils was T16. This was due to the presence of Al in WTRs and Fe in ferrous sulphate which enhanced the leaching process, and the presence of high adsorptive capacity materials like WTRs and compost which adsorb more sodium. The positive effects of all treatments for reducing SAR<sub>e</sub> in Abees soil followed the order: T16 > T15 > T14 > T13 > T11 > T12. While, in Elhammam soil, the order was: T16 > T15 > T14 > T13 = T11 > T12 = T5. The removal sodium efficiency (RSE) or percentage of Na-removed from the soils at the end of the experiment was significantly reduced after the application of the amendments. RSE of T16 proved the highest value (76%) among the treatments for the two soils used, followed by T15 and T14. The yield of biomass at T16 significantly increased, the increase being 959% in comparison with T0 in Abees soil, while the increase in biomass yield was 1452% in comparison with T0 in Elhammam soil. However, field tests are necessary to draw the final conclusions.

**Keywords:**

amendments; plant salinity; sodicity; soil; yield

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