

# INFLUENCE OF ELEMENTAL SULPHUR ON BORON CONTENT OF CALCAREOUS SOIL AND SUGAR BEET PRODUCTIVITY UNDER SALINE IRRIGATION WATER ENRICHED IN BORON.

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## ABSTRACT

Saline irrigation water is the main water resource for agriculture in Sinai, Egypt. Such water contains high levels of salinity and /or boron, which may cause soil deterioration from the long continued use in irrigation. Elemental sulphur is an amendment that has been applied to improve calcareous soil productivity under irrigation with saline water. Therefore, two field experiments on sugar beet were conducted at Wadi Suder experimental station of DRC at South Sinai, to evaluate the role of elemental sulphur for mitigation the hazards of saline ground water containing different levels of boron. Each experiment included 12 treatments namely; four levels of boron in saline irrigation water (1, 4, 7&10 mg l<sup>-1</sup>); three levels of elemental sulphur (0.0, 0.25, &0.50 ton fed<sup>-1</sup>) in a split plot design with four replicates for each treatment.

Results indicated that, the contents of total and water-soluble boron in the investigated calcareous soil increased with different magnitudes as a result of increasing boron level of the used saline irrigation water, however, the application of elemental sulphur reduced the concentrations of such ion, and increased the availability of Fe, Mn and Zn.

The obtained results also, reflect the positive effect of sulphur application on total yield of reducing sugar, non reducing sugars of beet roots, total soluble solids (TSS), total soluble sugars, total protein, sugar yield and juice purity of roots. On the other hand, the application of sulphur reduced the boron content of sugar beet roots & leaves. While the proline content of leaves and the uptake of Fe, Mn, and Zn increased as a result of sulphur application. Therefore, elemental sulphur could be successfully used to improve calcareous soil productivity and reduce the hazards of boron in saline irrigation water.

***Key words: Calcareous soil, Sulphur, Boron, Saline water, Sugar beet, Nutrients availability, Biochemical compositions.***