

EFFICIENCY OF SOIL CONDITIONERS UNDER CALCAREOUS SOIL AND IRRIGATION FREQUENCY WITH HIGHLY SALINE WATER.

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ABSTRACT

An experiment was carried out at Ras Suder experimental station of the DRC, South Sinai. The aim of this experiment is to study the efficiency of natural and synthetic soil conditioners under different irrigation frequencies (14 Vs 21-day intervals), with highly saline water (7300 ppm), and their effect on sugar beet production in calcareous soil. The conditioners tested were; Poudrette (0, 10 and 20 ton/fed.), ploy acrylamide (0.0, 0.2 and 0.4%), and Bituminous emulsion (0.0, 0.2 and 0.4Lm⁻²) in a split split plot design with five replicates.

Soil properties have been affected by applying soil conditioners under the two studied irrigation periods. The values of water stable aggregates; soil moisture retention, i.e., field capacity, wilting percentage and available water were greatly increased with different magnitudes due to the application of soil conditioners. In contrast the bulk density decreased. Also, soil pH, EC, SAR and ESP values decreased with different magnitudes in the conditioner treatments under both irrigation frequencies. Types & rates of soil conditioners and/or irrigation intervals positively affected the availability of N, P, K, Fe, Mn & Zn in the studied calcareous soil.

Sugar beet production responded significantly either to irrigation frequency, or to the type and rate of soil conditioners. The addition of Poudrette, ploy acrylamide or bituminous emulsion was effective in increasing significantly the yields of both roots and leaves of sugar beet plants. The T.S.S. percent and N, P, K, Fe, Mn & Zn contents of sugar beet roots & leaves were also increased. The highest yield was obtained by treating the soil with 20 ton/fed. Poudrette under 14 days irrigation interval. This was actually reflected in increasing use efficiency values for both water and NPK by sugar beet plants.

Key words: Soil conditioners, Saline water, Calcareous soil, Irrigation frequency, Sugar beet, Water and NPK use efficiencies.