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UTILIZATION OF SEWAGE WATER IN TREATMENT OF SANDY SOIL AND PRODUCTION OF FLAX OIL AND FIBER

Gendy O.S. ; Salwa S.Al-Sayied and T. H. M. A Dshesh

Soils, Water and Environment Research Institute, A.R.C.Giza,Egypt

ABSTRACT

This study focused on the most important issues of the 21st century. Water, food security and Energy. Utilizing primary treated sewage water in flax plant irrigation for use their oils product and its fiber as well as improvement of some sandy soil chemical properties

The usage of primary treated sewage water in this study achieve high environmental values which is exploited, it is one of the environmental stress, achieve the economic returns of oil and fibber production. The provision of traditional irrigation water to irrigate food crops, this exchange also has potential environmental benefits, reducing the release of wastewater effluent downstream, and allowing the assimilation of its nutrients into the soil.

The aim of this study is identify the suitability of primary treated sewage water alone or mixed with Nile water and their effects on sandy soil properties as well as oil and fiber yield of flax plant. So, A field experiments with Randomized complete block design were conducted in winter seasons of 2016/2017 for flax plant (*Linum usitatissium* L.), to study the effect of different water irrigation quality i.e. 100% Nile water (T_1), 50% Nile water + 50% treated sewage water (T_2) and 100% treated sewage water ((T_3) on soil properties as well as flax oil and fiber production.

Results revealed that 100% sewage water improve in most soil properties as decrease soil pH than initial soil, increase soil organic matter contents. Slight increase of soil salinity (E.C) as compared to the soil irrigated with freshwater. Increasing in nutrient elements, total and available N, P and K (mg kg^{-1}) compared with those irrigated by freshwater. Also, increase of micronutrients and heavy metals. It is worthy to mention that the contents of all values of total and available heavy metals in studied soil presented within safe or permissible limits and possible using these water sources for irrigation .

Also usage of 100% sewage water in soil irrigation resulting in increased most morphological flax characters, as well as seeds yield, straw yield, fiber yield, weight of 1000 seeds, oil yield, fiber (%) and seed oil (%).

Key words : environmental stress, flax characters, flax plant, irrigate food crops, morphological, sandy soil chemical properties, sewage water