Using of Some Filters in Dercreasing Water Salinity and Boron Toxicity of Satt Al-Arab River and Basra Southern Wells and Reuse of Tomato Plant(*Lycoperscion esculentum Mill)* Irrigation.

Summary

Thirteen water sample of Shatt Al-Arab river and its tributaries were collected starting with Madania at north and ending with Al-Fao at south, according to the following areas (Medania , Gurna , Sharesh, Deyar \ near paper plan, Hartha (near thermal electric station), Garmat Ali (Basrah university), Tenoma \ Sahehia , near teaching hospital, Abul-Khaseeb\ Hamdan, Abul-Khaseebl Abu-Floose, Sebha, Al-dora, and Al-Fao. Fifteen well's water sample were collected from Al-Zubair , Al-Berjesia and Safwan during Dec.2014. Chemical and physical properties of water samples were conducted (EC_{iw}), soluble ions (Calcium, Mangnesium, sodium, potassium, chloride, sulphate, carborate, bicarbonate, boron, and nitrate), total dissolved solids (TDS), and total hardness. After water sample propenties determination, they were classified to three classes according to electrical conductivity (1-4, 4-8, and 8-12) dsm^{-1} , and three classes of boron concentrations (< 0.7, 0.7-3.0, and > 3.0) mg L^{-1} . For the purpore of study of studies filter efficiency, two type of filter were used, mineral filter (Sand, Charcoal, Porcelin, and Clint dust) and organic filters (Rice hust ash, barley straw, sawdust, plam leaf, and poultry rnanure). Twe experiments were conducted, one of them laboratory experiment in soil science and water resources laboratories \ college of Agriculture \University of Basrah) other was biological experiment in wooden canopy to achieve the objectives of the study.

Laboratory experiment

Nine type of mineral and organic types of filters were selected for studying their efficiencies in decreasing water salinity and boron toxicity of Shatt Al-Arab river and Wells, after passing water through them. Chemical and physical properties of water were determined after passing water through filters and water quality was calculated. A number of criteria and international standards were used for evaluation water quality after and before passing through filters.

Biological experiment

For studying the efficiency of water treatment by the most efficient filters according to laboratory experiment results were rice husk ash, cement clint dust, sand, and control treatment. Biological experiment was conducted by using olastic pots with capacity 15 kg soil according to factorial experiment with three replicates for each treatment with 24 empirial units (2×3×3) (soil * No. of filters * replicates) besides control treatment and six classes of water to be 144 ernprical units. Two soils were used from of them from Agricultural field of Agricultural Research Station, and the other from Garmat Ali field during Agricultural season 2014-2015. Mineral fertilizers were used with rates, 320 Kg N ha^{-1} as urea (46 % N) at two doses, phosohate fertilizer was applied at rate 90 Kg pha^{-1} as concentrated supper phosphate (20-12 5 P), Potassium at rate 120 Kg kha^{-1} as potassium sulfate (43 % K) one dose at planting. Peatmose fertilizer was applied at rate 2% for all treatment mixing with soils. For getting erough water for irrigation, plastic coloumns were used for filters duplicated in their dimentions. Shatt Al-Arab and wells water were passed through most efficient filter besides sand filter separately with equal quantities. Water was collected of laboratory experiment.

Tomato plants (*Lycopersicon esculintium* M.) were planted on 22\9\2014 and irrigated with water treated with filters besides control treatment at field capacity (20 % for Berjesia Research station soil) and (30 % for Garmat Ali soil). Leaching requirement was calculated for each treatment. After 176 days, plants were harvested with space 2 cm from soil surface avoiding contamination. Tomato plants were fractionated to three plants, roots, shoots, and fruits. Dry matter of roots and shoot was calculated. Boron concentrion of (roots, shoots and fruits) was determined. Fruits yied of tomato was calculated. Electrical conductivity and available boron of residual soils in pots were determined after tomato plants harvested.

Results obtained could be summarized as:

1. Adoption of rice husk ash and cemenent dust in treatment of Shatt Al-Arab and wells water because of their high efficiency in decreasing boron concentration and water salinity and reuse for tomato plant irrigation.

2. Plants irrigated with water treated with rice husk ash were surpassed over other plants in dry matter and yield, and gave lowest boron concentration in tomato plant tissues for all parts roots, shoots, and fruits. Same treatment gave the lowest concentration residual boron in soil and lowest value of soil salinity as compared with water treated with cement dust filter and sand filter besides control treatment.

3. loamy sand soil was surpassed over clay loam soil in dry matter and yield of tomato and lowest concentration of boron in their tissues, while clay loam soil was surpassed over loam sand soil in residual boron concentration and soil salinity.

4. Results indicated that there were significant differences between type of filters and soil texture in dry matter, yild , boron concentration in roots , shoots, and fruits of tomato plants. Residual boron concentration and soil salinity.

5. Results indicated that there was no boron contamination in both studied soils treated with treated with two filters (rice husk ash and cement dust) water of Shatt Al-Arab and wells.