AGRICULTURAL REUSE OF TREATED WASTEWATER (WITH DIFFERENT LEVELS OF TREATMENT) FROM ABU-NSAIR TREATMENT PLANT

By

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In this study five different levels of wastewater treatment were used for the irrigation of corn (Zeamaysl. Var rugosa). These are; treated waste water (TWW), chlorinated-TWW (TWW/Cl), Disk filtered-TWW (TWW/D), Fresh water (FR), and Fresh water spiked with NPK (FR/NPK). All water types used in this study were analyzed for the following chemical and biological parameters; pH, EC, TDS, TSS, ESP, SAR, SO$_4^{2-}$, HCO$_3^-$, Cl$^-$, K$^+$, Na$^+$, Mg$^{2+}$, Ca$^{2+}$, Zn$^{2+}$, Pb$^{2+}$, Cd$^{2+}$, Cu$^{2+}$, NO$_3^-$, COD, BOD, and FC.

All these water quality parameters were found to be within the Jordanian Standards (893/2002) for reclaimed water to be used for irrigation purposes. Soil samples were collected from different depths (0-45 cm) every one-month. At the end of the experiment, no accumulation for heavy metals was found in the soil as a result of using TWW. However, higher concentrations for trace elements were found on the surface than at lower depths. In addition, no accumulations for the FC were observed in the soil.

Analysis of different parts of the corn indicated the following:
1. Higher concentrations of N were accumulated in the roots and cornstalk regardless of water type used.
2. Higher concentrations of P were accumulated in the seeds regardless of water type used.
3. Higher concentrations of K were accumulated in the cornstalk. Accumulation was higher when NPK water was used.

4. Larger fractions of Cu were accumulated in the roots followed by cornstalk regardless of water type used.

5. Higher concentrations of Cd were accumulated in the roots regardless of water type used.

6. No accumulation for FC was observed regardless of water type used.

7. The highest corn yield was obtained when NPK water was used, followed by fresh water and then TWW.

8. Corn dry weight was higher when NPK water was used followed by fresh water.

9. Number of corn ears per individual plant was higher when TWW/Cl was used followed by TWW.

10. Number of defected corn ears was higher when TWW/Cl was used followed by TWW.