Effects of Long Term Irrigation with Treated Waste Water in a Clay Soil. (S06-levy082317-Oral)

Authors:

- G.J.Levy* - *ARO, Bet Dagan, Israel*
- U.Shani - *Hebrew University of Jerusalem, Rehovot, Israel*

Abstract:

Treated waste water (TWW) is of poorer quality than fresh water (FW). It is important, therefore, to asses the impact of long term irrigation with treated waste water on the soil. We studied the effects of irrigation with TWW (compared to FW), and method of irrigation (subsurface vs. surface drip irrigation) on the following parameters characterizing soil structural stability: electrical conductivity and pH of the soil solution, percent exchangeable Na, aggregate stability and saturated hydraulic conductivity (HC). The experiment was carried for 5 years in a clay soil in the Yizreel valley, Israel. Water quality and irrigation method had no effect on soil salinity. Irrigation with TWW increased the pH of the soil solution and soil sodicity of the upper soil layer (0-300 mm), and decreased aggregate stability, compared with FW. Subsurface drip irrigation maintained lower percent exchangeable sodium and higher percent stable aggregates in the upper soil layer than surface drip irrigation. Saturated HC obtained from field measurements using FW gave higher than expected values for a clay soil (>100 mm h-1). When TWW was used, phenomena suggesting water repellency and soil hydrophobicity were noted, which can be ascribed to the presence of organic matter in the irrigation water.

Corresponding Author Information:

Guy Levy
Agricultural Research Organization
P.O. Box 6
Bet Dagan 50250
Israel

phone: 972-3-9683502
fax: 972-3-9604017
e-mail: vwguy@agri.gov.il

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