



Long term irrigation with treated wastewater (TWW) – how sustainable is it?

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Use of treated wastewater (TWW) for irrigation of cultivated fields has grown considerably in recent years, especially in areas suffering from shortage in fresh water (e.g., arid and semi-arid regions). For instance, In Israel 50% of the water used for irrigation is TWW. With this increased necessity to use TWW, farmers are faced with unique and unfamiliar problems among which is the possible degradation in soil structure and stability. Probable risks for adverse changes in the structure and stability of soils and their hydraulic properties following irrigation with TWW, may stem from the higher levels of dissolved organic matter, suspended solids, sodium adsorption ratio (SAR) and salinity in the TWW compared with its fresh water of origin. Results from numerous studies conducted in Israel over the last 15 years show that the effects of long-term irrigation with TWW on different indices representing soil-structure stability were inconsistent. In the cases where long-term irrigation with TWW led to some deterioration in soil-structure stability, the magnitude of the deterioration seemed to be not very severe. Most of these studies concentrated, however, only on the upper soil layer (0-30 cm). Recently, there is growing evidence that point toward the possible buildup of undesired sodicity levels (exchangeable sodium percentage of 6-10), especially in clay soils, at depths >30 cm in orchards subjected to long term irrigation with TWW. Such sodicity levels can, under certain conditions, negatively affect water flow and aeration in this and above-lying soil layers. These preliminary findings suggest that long term irrigation with TWW may not be a sustainable practice. Attention should be given to developing irrigation practices that will alleviate subsoil sodification following irrigation with TWW.