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Evaluation the effect of using effluent and irrigation methods on salinity and moisture distribution of soil profile in the semi-arid region of Corbal

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As Iran suffers from fresh water scarcity and water crisis is growing as a great problem, using unconventional waters such as sewage, saline and brackish waters is unavoidable. This research was conducted to evaluate the effect of pressurized and surface (furrow) irrigation methods with sewage on distribution of salinity and soil moisture. The experiment was carried in a split plot design with three irrigation methods (furrow, surface drip and subsurface drip) and two water qualities (sewage and fresh water) in the Corbal plain corn field in 2006. Soil sampling was carried out prior to irrigation commencement and after the harvesting from depths of 0-20, 20-40 and 40-60 cm with 15 sampling points in each plot around the water leakage. Variance analysis showed that in both soil sampling times the soil salinity in three layers was significantly affected by the irrigation methods and water quality ($p< 0.01$). The most salinity of 1.55 dS/m was measured at layer 0-20 cm in subsurface irrigation and the lowest was measured 0.72 dS/m at depth 20-40 cm in subsurface irrigation method respectively. The moisture and the salinity distribution pattern in the soil profile showed that the lowest moisture and the highest salinity occurred in the top ridge of furrows. As moving from top ridge into the bottom of furrows the soil moisture increased and soil salinity decreased. In the pressurized methods the soil moisture around the emitters was the highest while the salinity was the lowest. The soil salinity increased as distance from emitters increased. Soil leaching, adjacent cultivation to the emitters up to 10 cm away, cultivation on the sloping parts of the furrows and carrying out more researches are the recommendations given in this research when wastewater is about to be used .

Keyword: Effluent, Salinity, Moisture, Irrigation methods

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