The effect of wastewater on transfer coefficient of heavy metals from soil to plant and some soil properties (Case study: Potato under greenhouse-lysimeteric conditions)

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Abstract

Whenever good quality water is scarce, treated municipal wastewater will be considered for using in agriculture. In this research, raw and treated wastewater from Serkan Wastewater Treatment Plant, Hamadan province, Iran, were used to determine the transfer coefficient of Fe, Ni and Mn from soil to plant and some soil properties in potato cultivation under lysimetric conditions. Irrigation treatments were: raw wastewater, treated wastewater, tap water, combination of 50% raw wastewater and 50% tap water and combination of 50% treated wastewater and 50% tap water. Results showed that the effect of irrigation water quality on pH and EC was significant ($P<0.01$). The effect of soil depth on EC and pH was significant ($P<0.01$) and non-significant, respectively. The interaction on these parameters was not significant. pH was decreased and EC was decreased as soil depth increased. Maximum amounts of EC and pH of soil belonged to raw wastewater and tap water treatments, respectively. Higher EC in raw wastewater and pH in tap water was the reason for these high values in soil. The effect of treatments on transfer coefficient of Mn and Fe from soil to shoots was significant. In potato tubers, this effect was significant only for Mn. Maximum transfer coefficients from soil to potato shoots and tubers belonged to Ni, Fe and Mn, respectively. Also, coefficients of heavy metals transfer from soil to shoots were more than tubers.

Keywords: Water scarcity, Raw wastewater, Treated wastewater.

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