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Treated municipal wastewater irrigation effect on lead content and health risks of nickel in soil and pepper in Shahrekord, Iran

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ABSTRACT

Iran with an average annual precipitation of about 252 mm (413 BCM) and renewable freshwater resources of 130 BCM, has irregular distribution of water resources. Reuse of wastewater and treated effluents for agricultural irrigation has become an essential method to overcome the problems of water shortage, irrigation water supply and environmental pollution control. But wastewater irrigation could cause excessive accumulation of heavy metals in agricultural soils. Soil contamination with these elements leads to heavy metals uptake by crops and thus affects food chain. In this research we investigate the distribution of lead and nickel in pepper tissues after irrigation with wastewater. For this reason a pot experiment was carried out and a completely randomized design was used. Different percents of treated wastewater were applied for irrigation. Increasing the percent of wastewater had no significant effect on soil available lead and nickel concentrations. Soil available lead and nickel were still less than allowable. Wastewater irrigation did not and nickel tissue concentrations. Nickel health risk index values of less than 1 indicate a relative absence of health risks associated with the ingestion of fruits of pepper.

Keywords: Health risk index; Municipal wastewater; Lead; Nickel; Sweet chilli

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