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Heavy Metal Content in Soils and Crops Irrigated with Untreated Sewage Water in Sangrur District of Punjab

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Abstract: Soil and plant samples collected from different sites receiving sewage and tube-well irrigation in Sangrur District of Punjab were analyzed for heavy metals to ascertain pollution potential. The sewage irrigated soils accumulated relatively higher amounts of Diethydene triamine penta acitic acid (DTPA) extractable and total heavy metals in surface as well as at all the depths as compared to tube-well irrigated soils and their content generally decreased with depth. The mean total contents of Pb, Ni, Cd, Zn, Cu, Fe and Mn in sewage irrigated soils were 56.7, 26.7, 2.15, 88.6, 48.4, 10990 and 272.8 mg kg^{-1} soil, respectively in the surface samples which were 3.02, 4.24, 1.12, 1.26, 1.70, 1.30 and 2.10 times their respective content in tube well irrigated soil. All the soil samples, in terms of pollutant elements of sewage irrigated were found within permissible limits. All the crops had higher amount of micro-nutrients and heavy metals in their above ground parts when grown in sewage irrigated soils than in the same plant species grown in tube well irrigated soils. Spinach accumulated highest amount of micronutrients and heavy metal among all the crops. The extent of accumulation of different pollutant metals were maximum for Pb followed by Ni and Cd in all crops. In the sewage irrigated soils, the content of Pb, Ni and Cd were below the critical limit in all the crops except for Cd in spinach.

Key Words: Heavy metals, Sewage irrigated soils, Vegetables, DTPA Extractable