

CHEMICAL FRACTIONS AND PLANT UPTAKE OF CADMIUM FROM LONG TERM SEWAGE SLUDGE AND METAL-SALT AMENDED SOILS

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ABSTRACT

Heavy metals applied to agriculture soils as soluble salts are usually considered more plant available in short term than equivalent amounts of metals applied to soil in sewage sludge. Slow chemical processes over several years, however may change the forms, extractability, and bioavailability of metals. To determine the long-term changes in forms of Cd added to a soil, Cd was extracted with [KNO₃, H₂O, NaOH, Na₂-EDTA, HNO₃] from clay loam soil, after application of sewage sludge and CdCl₂ at Land Reclamation Directorate. Cadmium was applied at the rate of 19 kg ha⁻¹ as sewage sludge or as CdCl₂ in 1993 and 1994, used to grow wheat (*Triticum aestivum* L.). The salt amended soils have a higher percentage of Cd in the soluble and exchangeable form (6.7% vs. 3%) and lower percentages in the residual fraction (42% vs. 54%) as compare to sludge amended soils. The grain/straw availability of Cd was higher from the salt-amended soils as compared to sludge amended soil (0.068/1.1 vs. 0.057/0.8 grain/straw mg kg⁻¹). In control pits (soil parent material/background levels), higher percentage of Cd (79%) was in the residual fraction as compare to salt-amended and sludge amended soils and support the view that metal from anthropogenic sources are more mobile than those from soil parent materials.