

Cd AND Zn AVAILABILITY IN SEWAGE SLUDGE-TREATED SOILS

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Abstract

A growth experiment to compare the availability of Cd and Zn to ryegrass (*Lolium perenne* L.) was conducted at 15 °C and 25 °C. Two soils, which represent a range of chemical and physical properties and three rates of sewage sludge (0, 10 and 50 t ha⁻¹) were used in an experiment lasting for one year, during which samples of soil and plant were taken at regular intervals. Extractions with 5 mM DTPA and 0.05M CaCl₂ solutions were used as availability indices. DTPA-extractable Zn tended to decrease, while the CaCl₂-extractable forms of both elements increased over time. The same increasing trend was observed in the concentrations of these metals digested from the plants. Soil and plant samples taken from the higher temperature treatments had greater concentrations of Cd and Zn than samples taken from the temperature treatments. This may be attributed to the organic matter, which tended to decompose more rapidly at the higher temperature. Both DTPA and CaCl₂ proved reliable indices for predicting heavy metal availability, but CaCl₂ followed the plant concentration trends more precisely. Temperature had a marked effect on Cd and Zn, enhancing their availability, especially at the higher sewage sludge application rates.