Effect of Sequestering Agents on Bioavailability of Inorganic Contaminants. (S11-knox105238-Oral)

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Abstract:

This study evaluated the efficacy of various soil amendments in reducing metal bioavailability in an ultisol Appling silt loam. Metals were added to the soil at two levels (mg kg-1): Cd - 20, 40; Cu - 500, 1000; Ni - 350, 700; Pb - 1500, 3000; and Zn - 1000, 2000, from various sources (40% sulfate, 25% carbonate, 20% oxide, and 15% chloride). After soil equilibration, one of five amendments was added: lime, apatite, natural zeolite (phillipsite), Fe-richTM (a commercially available synthetic Fe oxide), and N-viro (an alkaline stabilized sewage sludge). Lime was added to adjust soil pH to a value of 6.5 and the zeolite, apatite, Fe-richTM, and N-viro were added at a rate of 25 g kg-1. Early plant mortality resulted from metal-treated soils receiving no amendment. In contrast, each of the soil amendments reduced metals uptake by plants. Based on plant yield, tissue concentrations, and extractability of metals in treated soils, Fe-richTM, apatite, and N-viro appear to be more effective in reducing metal bioavailability than either lime or zeolite.

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