Dissolution of Cu in a Cu-Contaminated Orchard Sandy Loam as Affluenced by Dissolved Organic Matter. (S09-zhou025427-Poster)

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Abstract:

Dissolved organic matter derived from green manure, rice residue, pig manure, peat, and sludge were fractionated and chemically characterized. The percentage of total DOM with a molecular size fraction <3500 Da was 91% for green manure and pig manure, 84% for rice residue, 61% for peat, and 48% for sludge. The sorption of DOM onto the soil was negatively correlated with the amount of small molecular size fraction and carboxyl-containing substance occurring in DOM. Addition of DOM from the organic wastes caused an increase in soil soluble Cu. The ability of DOM in mobilizing Cu follows the the sequence: green manure = pig manure >rice residue > peat = sludge. This ability was positively correlated with the amount of the lower molecular size or hydrophilic fraction in DOM, and negatively with the affinity of DOM itself onto the soil. However, biodegradation of DOM increased with incubation time elapsed, which reduced Cu dissolution significantly. Nevertheless, the soluble Cu in soil receiving DOM still exceeded that of the control after 20 to 50 days. Therefore, sludge and peat moss would likely be the more suitable amendment materials for the Cu-contaminated orchard soil.

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Presentation Information:

Presentation Date: Wednesday, November 13, 2002

Presentation Time: 4:00-6:00 pm
Poster Board Number: 1314

Keywords:
Dissolved organic matter, Orchard soils, Copper, Mobilization