Chelate-Assisted Phytoremediation of Soil with Heavy Metals in Biosolids. (A05-kirkham181119-Poster)

Authors:

- M.S.Liphadzi - *Kansas State University*
- M.B.Kirkham - *Kansas State University*

Abstract:

A field experiment was conducted at the Manhattan, Kansas, Biosolids Farm in 2001 to determine if the chelate, EDTA, can increase uptake of heavy metals in the soil during phytoremediation. Two sunflower (Helianthus annuus L.) populations (20,000 plants/ha and 60,000 plants/ha) and hybrid poplar (Populus sp. x Populus sp.) (10,000 plants/ha) were grown in a field that had received biosolids for 25 years. The tetrasodium salt of EDTA (dihydrate) was added at 0, 0.5, 1.0, and 2.0 g/kg soil. Essential heavy metals (Cu, Fe, Mn, Zn) and toxic heavy metals (Cd, Ni, Pb) were analyzed in roots, stems, and leaves at harvest. In general, EDTA had little effect on concentration of any of the seven heavy metals in roots, stems, or leaves of poplar. At 20,000 plants/ha, leaves of sunflower accumulated more Cd, Pb, Ni, and Cu than stems of sunflower at all EDTA concentrations except the highest. At 60,000 plants/ha, stems of sunflower accumulated more Cd, Pb, Ni, and Cu than leaves of sunflower at all EDTA concentrations except the highest. Maximum accumulation for these four metals occurred in sunflower stems grown at the 60,000 plants/ha density and with 1.0 g/kg EDTA salt in the soil.

Corresponding Author Information:

M.B. Kirkham
Kansas State University
Dept. Agronomy, 2004 Throckmorton Hall
Manhattan, KS 66506-5501

phone: 785-532-0422
fax: 785-532-6094
e-mail: mbk@ksu.edu

Presentation Information:

Presentation Date: Wednesday, November 13, 2002
Presentation Time: 9:00-11:00 am
Poster Board Number: 531

Keywords:

phytoremediation, chelate, poplar, sunflower