

PHYTOEXTRACTION OF LEAD FROM FIRING RANGE SOILS WITH VETIVER GRASS

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ABSTRACT

Vetiver grass (*Vetiveria zizanoides*) along with soil amendments were evaluated for phytoextraction of lead and other metals (zinc, copper, and iron) from the soil of an active firing range at the Savannah River Site, SC. Lead-contaminated soil (300–4,500 ppm/kg) was collected, dried, placed in pots, fertilized, and used as a medium for growing transplanted Vetiver grass plants in a greenhouse. The uptake of metals by the plants was evaluated in response to various fertilization and pre-harvest treatments.

Plants grew better when fertilized with Osmocote fertilizer in comparison to plants fertilized with 10-10-10 (NPK) fertilizer. Application of a chelating agent, EDTA, one week before harvest significantly increased the amount of lead that was extracted. Lead concentrations of up to 1,390–1,450 ppm/kg were detected in tissue samples. Maximum lead levels were observed in root tissues. The addition of nonlethal doses of a slow-release herbicide in combination with EDTA did not appear to significantly enhance phytoextraction or the translocation of lead into shoots.