

## **EFFECTIVENESS OF WETLAND-RIPARIAN VEGETATION IN REMEDICATION OF A DISTURBED SELENIFEROUS ENVIRONMENT**

**C.P. Skinner and G.F. Vance**

**Abstract:** Land disturbances can contribute dramatically to soil erosion processes. When seleniferous geologic materials are eroded, atmospheric oxidation and exposure to water have the potential to increase biological uptake of selenium (Se). Though Se is necessary in small amounts for adequate animal nutrition, at concentrations greater than established critical management levels (> 5 mg/kg in plants, > 0.5 mg/kg in soils, > 5 µg/L in waters) biological uptake can become an environmental concern. Terrestrial and wetland-riparian plants, soils, sediments and water samples from erosion control ponds were collected at the Fort Carson Military Installation in southeastern Colorado. Plant Se was determined using a perchloric nitric acid method followed with a hot-water digest using hydrogen peroxide and hydrochloric acid. Soil Se was extracted using di-basic potassium phosphate followed by a hot-water digest with hydrogen peroxide and hydrochloric acid. Water samples were filtered using Gelman membrane filter papers (0.45 µm), then digested using one treatment with the addition of hydrogen peroxide plus hydrochloric acid, and one treatment with no additions. Se concentration was analyzed using hydride generation/atomic absorption spectrometry. Results provide information for addressing three important aspects of Se distribution in the environment: 1) Comparisons between Se concentrations in terrestrial and wetland soils, sediments and plants; 2) Relationships between Se concentrations in wetland plants, sediments and waters; 3) Effectiveness of various wetland-riparian vegetation species in Se uptake compared to plants traditionally studied for this purpose.

**Additional Key Words:** Erosion Control, Bioremediation, Se Accumulation

Catherine P. Skinner, Ph.D. Candidate and Research Assistant, and George F. Vance, Professor, College of Agriculture, Department of Renewable Resources, University of Wyoming, Laramie, WY 82071-3354.  
[skinnerc@uwyo.edu](mailto:skinnerc@uwyo.edu)