Effects of Plants and Fertilizer on the Remediation of Crude Oil-Contaminated Soil. (S03-wolf164835-Poster)

Authors:

- P.M.White, Jr.* - *University of Arkansas, Fayetteville*
- D.C.Wolf - *University of Arkansas, Fayetteville*
- G.J.Thoma - *University of Arkansas, Fayetteville*
- C.M.Reynolds - *USA-CRREL, Hanover, NH*
- E.E.Gbur - *University of Arkansas, Fayetteville*

Abstract:

Phytoremediation uses plants and agronomic techniques to enhance biodegradation of hydrocarbons in contaminated soil. The objective of the field study was to evaluate fertilizer addition and vegetation establishment on remediation of crude oil-contaminated soil. Four replications of the following treatments were used: vegetation-free non-fertilized control; fescue (Festuca arundinacea Schreb.) - ryegrass (Lolium multiflorum L.) mixture + fertilizer; or bermudagrass (Cynodon dactylon (L.) Pers.) - fescue mixture + fertilizer. Soil chemical properties were analyzed at 0, 6, and 17 mo and soil microbial levels at 6 and 17 mo after initiation of the experiment. After 17 mo, total petroleum hydrocarbon (TPH) levels were 42% lower across all treatments, and the vegetated fertilized plots had 27% lower TPH levels than the control. The vegetated fertilized plots had lower levels of recalcitrant polycyclic aromatic hydrocarbons (PAH) than the control. Fertilizer addition and vegetation establishment also increased total bacterial and PAH degrader numbers. The data show that the phytoremediation treatments increased microbial populations and reduced contaminant levels.

Corresponding Author Information:

Duane Wolf
University of Arkansas
Department of Crop, Soil, Environmental Sciences
Fayetteville, AR 72701

phone: 479-575-5739
fax: 479-575-7465
e-mail: dwolf@uark.edu

Presentation Information:

Presentation Date: Tuesday, November 12, 2002
Presentation Time: 9:00-11:00 am
Poster Board Number: 2212

Keywords:

Phytoremediation, Biodegradation, Crude Oil-Contamination