

## **Should Soil Properties be Considered In Assessing Human Health Risk Resulting from Exposure to Arsenic-enriched Soils?**

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Widespread use of arsenical pesticides has resulted in increased background arsenic in agricultural soils. Since arsenic is a Group-A carcinogen, an elevated health risk is associated with human exposure to these soils. Encroachment of suburban development on former agricultural lands has tremendously increased the potential for human contact with arsenic. The importance of considering soil ingestion from incidental hand-to-mouth activity by children has been emphasized in several recent studies. Reports indicate that arsenic bioavailability is much higher in water than in soils, indicating that the current practice of health risk assessment using the "water model" overestimates the risk, and hence, soil-cleanup costs. Although studies have been conducted to assess arsenic bioavailability in highly contaminated media, a universal model for assessing arsenic bioavailability in low-contamination soil systems is lacking. A laboratory incubation study is currently in progress to identify the relationship between geochemical speciation and in-vitro bioavailability of arsenic in soils as a function of soil and pesticide properties. Five different soils were chosen based on their potential differences in arsenic reactivity. The soils were amended with two inorganic and one organic arsenic pesticide at three rates. A sequential extraction scheme was developed to identify the various geochemical forms of arsenic in these soils. Concentrations of these operationally defined soil-arsenic forms are being correlated with the in-vitro bioavailable fractions to identify the arsenic species that are most bioavailable. This study will provide realistic starting points in site- and composition-specific health risk assessment associated with exposure to low doses of soil arsenic.