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This presentation is part of: Symposium--Revisiting Metal Behavior in Biosolids Amended Soils: Applying Knowledge Gained to an Understanding of Behavior of Metals in Soils Systems: I

Fate and Transport of Arsenic in Delaware Soils.

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The Delmarva Peninsula is one of the most concentrated areas of poultry production in the United States. The poultry industry uses an arsenical organic acid, hydroxyphenl-arsonic acid, Roxarsone, which is used as a dietary supplement to control coccidiosis disease, enhance growth, and improve feed conversion. Data are needed to understand the impacts that litter amendments have on the sandy soils of this region and the effects, if any, on water quality. The main objectives of the study are: i) to determine arsenic status, retention and release in poultry litter impacted Delaware soils, and ii) to fully characterize As status of poultry litter. Total arsenic was determined using an overnight nitric acid digestion. Water soluble and Melich-3 bioavailable extractions were completed for both the litter and impacted soils. The total arsenic levels in the amended soils were not much greater than background soils of similar soil series, indicating As transport may be occurring within this system. The As concentration in both amended and background soils ranged from 2-8 mg kg-1. Preliminary studies involving poultry litter have indicated As levels around 10 mg kg-1 and greater. This mass balance would indicate that the applied As is taking another route through the soil profile. Isotherms and sorption edges were conducted upon the soils in order to determine the soils' ability to retain arsenic under varying environmental conditions.