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**Arsenic Status in Delaware Soils.**

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The Delmarva Peninsula is one of the most concentrated poultry production areas in the United States. Through land application of poultry litter it is estimated that between 20-50 metric tons of arsenic are introduced into the soil environments. The source of the arsenic in litter is an organic arsenical, roxarsone. Roxarsone degrades into both organic and inorganic As species with the dominant species being arsenate (As(V)). Poultry litter amended soils and background soils having never received litter amendments, were collected and analyzed for total, water soluble, and bioavailable As. The arsenic concentrations in the litter amended soils were not significantly higher than the background soils. Adsorption envelopes and isotherms were conducted on eight soils in order to assess arsenic's ability to be retained on the soil surface. As most readily adheres to the soils at low pH and at the natural pH of the soil. The isotherms indicate that the soils have the ability to retain a significantly high amount of As, which could indicate that these soils could withstand years of poultry litter additions. As(V)-PO<sub>4</sub> binary systems with selected soils were studied at soil pH values typical of soil profiles and at different As:PO<sub>4</sub> ratios (1:1, 1:50, 50:1). The objective is to account for the effect of the presence of one oxyanion on the sorption of the other. In most cases the soils retained more PO<sub>4</sub> than As(V). As(V)-PO<sub>4</sub> desorption studies were also conducted on these soils. At 1:50 As(V) to PO<sub>4</sub> ratios very little As was retained. When As(V) and PO<sub>4</sub> were introduced at a 50:1 ratio, PO<sub>4</sub> sorption was noted. These results indicate that the presence of PO<sub>4</sub> in the poultry litter may impact the soils' ability to retain As.

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