Fate and Transport of Agricultural Antibiotics in Soil Amended with Land-Applied Manure. (S11-wight091154-Poster)

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Abstract:

Antibiotics are commonly added to cattle, swine, and poultry feed for growth promotion. In general, up to 200 mg/kg of antibiotic in feed may be given to animals daily as a dietary supplement. Studies have shown that significant quantities of these antibiotics are not metabolized and are excreted in their active form. Further, studies have linked the presence of agricultural antibiotics in waterways to application of manure to nearby land. In order to better understand the adverse effects involved in using antibiotic-laden manure as a soil amendment, the fate and mobility of three common agricultural antibiotics (chlortetracycline, sulfamethazine, and tylosin) in the soil system were studied. Sorption was characterized using batch adsorption-desorption isotherms as a function of antibiotic concentration, dissolved organic matter, soil type, and time. Preliminary sorption data, characterized using the Freundlich model, yielded sorption coefficients (Kf) indicating chlortetracycline sorption is affected by soil type (clay and organic carbon content) and background electrolyte. Kf values ranged from 1,850 L/kg in K-saturated surface soil to 14,820 L/kg in K-saturated subsoil.

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