ECOLOGICAL SCIENCES & ENGINEERING
INTERDISCIPLINARY GRADUATE PROGRAM

PURDUE UNIVERSITY | Agronomy

THESIS DEFENSE

April 10, 2025
1:00 PM
LILY 2425

Occurrence, Fate and Transport of Per- and Polyfluoroalkyl Substances (PFAS) in Agricultural Systems

Beneficial reuse of biosolids is a sustainable approach to improve soil fertility and address over reliance on inorganic fertilizers. However, active research within the past two decades have revealed that land application of biosolids introduces PFAS – a diverse group of several thousand synthetic chemicals, into agricultural systems. The presence of PFAS in biosolids have garnered considerable attention due to mounting evidence of their environmental persistence and potential to redistribute from soils to water sources and plants. Continuous application of biosolids could result in substantial contamination that permanently renders agricultural lands unsuitable for food production which poses challenges to food security and local economies.

This study evaluated PFAS occurrence, fate and transport in agricultural systems relative to biosolids application on a watershed and field scale. Overall results from the study show that PFAS fate and transport following biosolids application is largely determined by site-specific source and transport factors. Coupled biogeochemical processes within prevailing climatic conditions govern long-term transport outcomes, therefore the risk of environmental contamination from biosolids application can only be accurately assessed within a local context. In addition, PFAS was observed to substantially persist in biosolids-applied soils which is of great concern given the role of soils in environmental cycling of PFAS. Meanwhile, blending biosolids with non-biowaste organic materials prior to land-application has shown promise as a pragmatic strategy to dilute PFAS loads and leachability in biosolids-applied soils.

LYNDA PETER

Ph.D. Candidate, ESE Student

Department of Agronomy

DR. LINDA LEE

Advisor

APRIL 10, 2025
1:00 PM
LILY 2425

ZOOM