ECOLOGICAL SCIENCES
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DISSERTATION DEFENSE

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Exploring Risk Perceptions and Management of Soil Contaminants Among Indiana Urban Farmers

Increased interest in urban agriculture has grown throughout the United States and Indiana to support local food production, food security, and improve the health of community residents. As urban farmers grow crops on former industrial, residential, and vacant land, they encounter soil conditions from decades of land use changes and industrial activity. Soil contamination exposure is often perceived as a threat, particularly heavy metals (e.g., lead and arsenic), with lower concern and awareness of other contaminants (e.g., pesticides and PFAS). Despite the presence of these contaminants on some urban farms and the potential for public health risks, they are often invisible and difficult to detect without laboratory testing. The perceived threat of soil contaminants is influenced by farmer knowledge of testing procedures, interpretation of test results, and management of soils to reduce future exposure pathways. Many farmers grow crops in raised beds and purchase soils and amendments from commercial nurseries hoping these materials provide a safe alternative for crop production relative to their native soils. However, soil testing remains limited, and farmers often rely on local knowledge, visual assessments, and community knowledge to influence their perceptions of contamination. This dissertation explores gap between contamination awareness and protective behavior among Indiana urban farmers by integrating the Psychometric Paradigm, the Health Belief Model, the Theory of Planned Behavior, and the Norm Activation Theory frameworks in a qualitative study and the Protection Motivation Theory framework in a subsequent quantitative study, as well as applying multi-stressor approaches to urban farmer soil contamination management. This research provides insight into how urban farmers perceive, interpret, and respond to complex contamination risks.

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Bio

Nathan Shoaf serves as the Purdue Extension Agriculture and Natural Resources Assistant Program Leader and Urban Agriculture Specialist. He earned his M.S. in Ecological Sciences and Engineering from Purdue University, specializing in horticulture and soil microbiology. With over 20 years of experience, he partners with stakeholders in urban agriculture, specialty crop production, and environmental remediation. His work centers on collaborating with farmers, Extension staff, and faculty to enhance Purdue Extension's statewide programs and resources.

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