SOIL SCIENCE COLLOQUIUM

Guest speaker

Tuesday 17th October 2023, 4.15 pm – 5.15 pm
Room 002, GIUB, Hallerstrasser 12

The Impact of Climate Change on Rice Arsenic Uptake and Implications for Global Nutritional Security

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ABSTRACT. Climate change presents a major threat to global food security. While much research has been done to quantify crop yield loss due to climate change, much less work has been done to understand its impact on food nutritional quality. A key component of nutritional quality is the concentration of toxic contaminants that foods contain. Arsenic is one such contaminant and is almost ubiquitously found in rice, a staple food crop for roughly half the world's population. At present, rice is a major global contributor to dietary arsenic exposure and therefore represents an important threat to food quality and human health. In recent years, several studies have emerged to show that elevated temperatures similar to those expected from climate change can increase rice arsenic.

In this talk, I summarize recent advancements in our understanding of temperature-driven increases in rice arsenic and include my own research which utilizes temperature-controlled growth chambers to simulate future levels of warming as predicted by the International Panel on Climate Change (IPCC). Using biogeochemical and plant ecophysiological principles, my research attempts to gain a more mechanistic understanding of the underlying processes driving temperature-fueled increases in rice arsenic uptake along the entire soil-water-plant uptake system. I will delve in-depth into the importance of the intensity of warming, the significance of increased plant transpiration, and the timing of temperature relative to plant development. All these factors have important implications in predicting and mitigating the risks of dietary arsenic exposure in rice-dependent communities due to climate change.

BIO. Yasmine Farhat is a biogeochemist with a deep passion for global food security and sustainable development. She received her Bachelor of Science from the University of Nebraska, USA, in 2015, where she began her research career investigating biological and chemical components of environmental quality. In 2022, she obtained her PhD in Environmental Engineering from the University of Washington, USA. At UW her research focused on understanding the impact of climatic and hydrologic changes on mineral micronutrient and toxin uptake in rice, one of the most important staple food crops, in both laboratory and international field experiments. Driven by a desire to engage more deeply with scientists and stakeholders from the global south, she relocated to Beirut, Lebanon, in the fall of 2022 as a post-doc at the American University of Beirut. She currently co-leads the Lebanese Team on an EU-sponsored project to develop and implement Water-Energy-Food-Ecosystem (WEFE) Nexus solutions in seven different Mediterranean countries. She collaborates with other physical scientists to understand the material trade-offs of agricultural interventions and social scientists to determine stakeholders' interest and ability to adopt new technologies.