iFAST: The International Forum on Advanced Environmental Sciences and Technology

A series of distinguished seminars by eminent scientists

8 a.m. CDT, 9 a.m. EDT, 1 p.m. GMT, 9 p.m. China
Wednesday, May 7, 2025

CHARLES W RICE

KANSAS STATE UNIVERSITY

https://www.agronomy.k-state.edu/about/people/faculty/rice-charles/

Charles W. Rice joined the Kansas State University faculty in 1988 and is a University Distinguished Professor and holds the Vanier University Professorship. Rice is a professor of soil microbiology in the Department of Agronomy. He earned his degrees from Northern Illinois University and the University of Kentucky. Rice teaches courses and conducts research on soil carbon and nitrogen, soil health, microbial ecology, and climate change impacts on agricultural and grassland ecosystems. He has received over $90 million in research grants, has advised over 50 graduate students and 18 post-doctorates, and has over 250 publications. Rice has also served in numerous capacities with professional societies, including president of the Soil Science Society of America in 2011. Internationally, he served on the United Nations Intergovernmental Panel on Climate Change to author a report on Climate Change in 2007 and 2014 and was among scientists recognized when that work won the Nobel Peace Prize in 2007. He is a Fellow of the Soil Science Society of America, the American Society of Agronomy, Sigma Xi and the American Association for the Advancement of Science. In 2020, Rice received the title of "National Associate" of the National Academies of Sciences, Engineering, and Medicine. Rice chaired the Board on Agriculture and Natural Resources of the U.S. National Academies of Science, Engineering, and Medicine from 2016-2022.

Valuing Long-term Experiments and Data Sets for Climate Resilience

Abstract Soils are a critical component of the global carbon (C) cycle since they are a source and a sink for atmospheric CO2. Studies suggest that 25–75% of soil C stocks have been lost from intensively tilled soils. Regenerative agriculture practices can restore soil C in response to increased C inputs and reduced soil disturbance. Organic amendments (compost) can further enhance carbon accrual. We measured extracellular enzyme activity, microbial community structure through phospholipid fatty acids (PLFA), aggregation, and key soil chemical properties under different tillage and fertilization regimes after 35 years. Soil β-glucosidase activity and microbial biomass plateaued at high soil C content. Less disturbance (no-till) enhanced mycorrhizal fungi. Both mineral and organic amendments reduced the abundance of arbuscular mycorrhizal fungi. A significant amount of C translocated to the underlying soil layers led to higher microbial biomass and activity of C-acquiring enzymes. To understand soil dynamics, we analyzed archived soil samples for 13C, soil C and N, and enzyme activity. Long-term experiments and datasets are critical to understanding soil processes, providing climate resilience.

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Zoom webinar ID: 934 8142 2012 (zoom.us/j/93481422012)

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Organizing Committee Chair: Jizhong Zhou (University of Oklahoma, USA; www.ou.edu/ieg)

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