

Rhizosphere Science for the 21st Century: Meeting Global Challenges

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Developing a better understanding of the role of rhizosphere processes in meeting the global challenges of sustainable food and energy production in the face of global climate change and population growth while also maintaining environmental quality is one of the most important science frontiers of this century. For many plants more than half of their total biomass exists below ground as roots. Roots not only anchor the plant, but actively forage for nutrients and water, and in the process contribute 10-40% of their total photosynthetically fixed C to the soil. Physical action of the roots creates unique hydrologic pathways, and the quantity and diversity of organic and inorganic root products released produces extreme pH, Eh and chemical gradients around the roots that shape a diverse consortia of microorganisms ranging in function from symbionts to pathogens. This keynote will provide a broad overview of the importance of these interactions in driving carbon and nutrient cycling, metal reactivity, mineral weathering, and contaminant dynamics in terrestrial environments.