Science Societies

Revolutionizing Nutrient Management With AI

Symposium in San Antonio Looks at Opportunities, Challenges

By Hardeep Singh, Agronomy Department, University of Florida/IFAS; and Jagmandeep Dhillon, Department of Plant and Soil Sciences, Mississippi State University

October 1, 2024



Artificial intelligence in agriculture: An uncrewed ground vehicle and drone working together in a cornfield to optimize crop management and increase efficiency. Illustration created by Copilot.

At the 2024 Annual Meeting (acsmeetings.org) in San Antonio, TX, a groundbreaking symposium titled “Revolutionizing Nutrient Management With AI: Opportunities and Challenges” (https://bit.ly/4dX1pBi) will take center stage on November 11, 1:30–3:00 pm CST. The symposium is organized by the ASA Nutrient Management Professionals Community and Sensor‐Based Nutrient Management Community.

What to Expect

The symposium aims to bring together researchers, practitioners, and policymakers to share insights, experiences, innovative solutions, and challenges in the intersection of artificial intelligence (AI) and nutrient management. As agriculture continues to evolve in response to global demands, AI is increasingly becoming a vital tool for optimizing nutrient management, improving crop yields, and enhancing environmental sustainability. The symposium will delve into nuances of how AI can revolutionize nutrient management by enabling precise, efficient, and environmentally friendly farming practices.

Featured Speakers

We are excited to feature a diverse lineup of speakers who are leaders in the field:

Dr. Yiannis Ampatzidis is an Associate Professor and leads a research and extension precision agriculture engineering program in the Southwest Florida Research and Education Center (SWFREC) in Immokalee, FL. His presentation will cover AI‐enhanced precision nutrient management for tree crops. Dr. Ampatzidis works in mechanization and automation of specialty crop production. He focuses on the design, development, and testing of sensors and control systems for optimal management of inputs, resources, and products. Dr. Ampatzidis’ current research focuses on mechanical

harvesting of specialty crops, mechatronics, artificial intelligence, machine vision, precision agriculture, smart machines (e.g., smart spraying technologies), UAVs, and machine systems.

Dr. Laila Puntel, Syngenta Group, will represent the industrial perspective and will speak on "AI in Agribusiness: Transforming Nutrient Management Practices." She will discuss Syngenta's innovative AI‐driven solutions that are helping farmers maximize yields while minimizing environmental impact. Dr. Puntel's research focuses on improving efficiency and profitability of soil nutrient management, particularly through precision ag technologies and data‐driven tools.

Dr. Pavlos Tsouvaltzis is an Assistant Professor in Vegetable Horticulture in the Southwest Florida Research and Education Center (SWFREC), University of Florida. Dr. Tsouvaltzis will discuss "Non‐Destructive Plant‐Derived Data Integration for Optimizing Nutrient Use Efficiency." His expertise in data‐driven approaches will illuminate plant data collection using non‐destructive portable equipment to assess the physiological status of plants, focusing on nutrient assimilation and water uptake.

Dr. Alex Thomasson is Professor, Department Head, and Williams B. and Sherry Berry Endowed Chair in the Department of Agricultural and Biological Engineering at Mississippi State University (MSU). Dr. Thomasson is also Director of MSU' Agricultural Autonomy Institute (AAI). His research focuses on agricultural autonomy, precision agriculture, remote sensing, drones, image analysis, optoelectronic sensors, and cotton production and processing. Dr. Thomasson will cover several AI‐enhanced applications of autonomous systems in cotton with a focus on nutrient management and yield prediction.

Dr. Manoj Karkee is Professor at Washington State University in the Department of Biological Systems Engineering Agricultural Automation Engineering research emphasis area. Dr. Karkee will cover application of RGB-D and hyperspectral cameras in orchards and vineyards to develop precise nutrition management tools. He has devoted his career to developing mechanization and automation solutions for farming that would reduce the use of labor, water, fertilizer, and other inputs while increasing the yield and quality of agricultural products. His research primarily focuses on automated and autonomous agricultural machinery systems, field robotics, and machine intelligence for production agriculture.

Why You Should Attend

Whether you're a student, academic, researcher, or industry professional, this symposium will offer valuable insights into how AI is shaping the future of agriculture. Attendees will leave with a clearer understanding of how AI technologies can be practically applied to increase efficiency, profitability, and sustainability in agriculture. In addition, the discussions on overcoming the challenges related to AI integration will provide valuable takeaways for those looking to implement these systems in their own operations.

Join us in San Antonio for a thought-provoking and forward-looking session that aims to revolutionize how we think about and manage nutrients in agriculture. This symposium will be an excellent opportunity to network, learn from experts, and discover how AI can play a key role in addressing the challenges of modern agriculture.

Text © . The authors. CC BY-NC-ND 4.0. Except where otherwise noted, images are subject to copyright. Any reuse without express permission from the copyright owner is

prohibited.