ASABE Journals

Recent research from our publications

ASABE has been a trusted source of authoritative research for well over a century. Our peer-reviewed journals contain pioneering research in ag and bio engineering. Here are some highlights from our most recently published journals. All journal articles are available free of charge as a member benefit at elibrary.asabe.org/toc.asp. ***ASABE members are in bold type.***

APPLIED ENGINEERING IN AGRICULTURE

Leveraging Generative AI for Data Analysis in Farm Management

Joshua K. Bailey, Fabio A. Castiblanco, Andrew D. Balmos, Aarav S. Pai, Lionel Y. Loo, Sneha Jha, **Md. Samiul Basir, Dennis R. Buckmaster, James V. Krogmeier, Yaguang Zhang, Upinder Kaur**

Highlights

- Generative AI successfully analyzed data files related to machinery maintenance, financial health, and soil/yield.
- The complexities of APIs and custom GPT integration were demonstrated with live public and private data sources.
- With constrained prompts, Generative AI was able to analyze live weather data, field records, and IoT sensor readings.

Vol. 41(5): 505-519
doi.org/10.13031/aea.16429

Concise Review of the Evolution of Sustainable Nitrogen Fixation Technologies: From Natural Processes to Recent Plasma-Based Innovations

Cesar M. Moreira, Carola Sanchez, **Pratap Pullammanappallil, Bruce A. Welt**

Highlights

- Plasma-based nitrogen fixation offers sustainable alternatives to Haber-Bosch.
- Microwave induction plasma coupled torches achieve high efficiency using air and water.
- Biological fixation remains vital but limited in scalability and consistency.
- Review compares natural and artificial methods for nitrogen fixation.

Vol. 41(5): 573-585
doi.org/10.13031/aea.16424

JOURNAL OF THE ASABE

Positioning Accuracy of RTK-GNSS-Enabled Drones and Their Performance in Agricultural Crop Sensing

Pascal Izere, **Biquan Zhao,** James Schnable, **Yufeng Ge, Yeyin Shi**

Highlights

- The performance of RTK-GNSS-enabled drones without GCPs was assessed in agricultural applications.
- A centimeter-level positioning accuracy was achieved when drones were functioning with RTK-GNSS-enabled.
- RTK-GNSS-enabled drones without GCPs performed competitively with GCP-based methods in plant height estimation.
- Using RTK-enabled drones without GCPs provides a time- and labor-saving solution for agricultural practices.

Vol. 68(4): 559-571
doi.org/10.13031/ja.16306

Algorithms to Process Weighing Lysimeter Data

Paul D. Colaizzi, Gary W. Marek, Steven R. Evett, Karen S. Copeland, Brice B. Ruthardt

Highlights

- Weighing lysimeters can accurately determine water balance components.
- Algorithms were developed to automate processing of lysimeter water storage data.
- The algorithms were tested by comparing results to independent spreadsheet calculations.
- Discrepancies between spreadsheet and algorithm evapotranspiration were small.
- Longitudinal graphs were used to detect uncertain or spurious evapotranspiration.

Vol. 68(5): 729-752
doi.org/10.13031/ja.16404