The International Society of Precision Agriculture in partnership with Kansas State University presents the

16th International Conference on Precision Agriculture

21–24 July 2024 | Manhattan, Kansas USA

CONFERENCE PROGRAM

Conference Chair
John Fulton, President, ISPA
Email: president@ispag.org

Conference Coordinator
PAQ Interactive, Inc
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Welcome to the 16th International Conference on Precision Agriculture.

We are pleased you can join us in Manhattan, Kansas USA. Our conference events begin on Sunday, 21 July with the pre-conference workshops hosted by Kansas State University. Join us in the evening on Sunday for a welcome reception at the Flint Hills Discovery Center. The Opening General Session on Monday morning will be the official start to the conference. The three day program includes concurrent sessions on a wide range of Precision Agriculture and Digital Agriculture topics, and opportunities to network and exchange information with exhibitors and attendees from across the globe. On Monday and Tuesday the program will conclude with a poster session and reception in the exhibit hall. This year the 16th ICPA is pleased to run in conjunction with the International Symposium on Robotics and Automation.

ISPA's Mission

The International Society of Precision Agriculture (ISPA) is a non-profit professional scientific organization. The mission of the ISPA is to advance the science of precision agriculture globally.

International Society of Precision Agriculture

ISPA Membership & Benefits

- **Exchange and Gain Knowledge** of Precision Agriculture innovations and applications through participation in annual conferences, webinars, and electronic access to the society's Precision Agriculture Journal.
- **Expand your Network of Precision Agriculture** collaborators and mentors through engagement and interactions during face-to-face and online ISPA sponsored events.
- **Increase Awareness of Precision Agriculture** adoption and applications, research activities, and Precision Ag events globally through the monthly ISPA newsletter.
- **Develop and Strengthen Relationships** with Precision Agriculture industry representatives taking part in ISPA sponsored events.
- **Increase Access to Precision Agriculture** education materials, expert knowledge, and ISPA communities.
- **Increase Education and Research** opportunities by becoming a Country Representative.
- **Post Job Listings and Events** – promote your Precision Agriculture job listing or event on the ISPA website.
- **Discounts** on registration fees to the biennial International Conference on Precision Agriculture and a number of events sponsored by ISPA.
- **Impact the Future of the Society** members can vote on the incoming ISPA board member(s) and on society specific topics that require a membership vote.

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GENERAL

ICPA WEBSITE

ISPAG.com/ICPA features additional program details including presentation descriptions, and speaker bios.

SCAN HERE FOR QUICK ACCESS TO THE DETAILED ORAL AND POSTER PROGRAMS.

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Poster Presentations

FOLLOW US!

MONDAY, 22 JULY ORAL PRESENTATIONS

TUESDAY, 23 JULY ORAL PRESENTATIONS

WEDNESDAY, 24 JULY ORAL PRESENTATIONS

Sunday, 21 July

PRE-CONFERENCE

WORKSHOPS

GIS-based Spatial Interpolation Methods

9:00am-12:00pm – 3014A Seaton Hall, 920 N M.L.K. Jr. Dr.
Carlos Hernandez, Shawn Hutchinson, Trevor Hefley

We'll examine spatial interpolation methods as one approach to predictive modeling that helps practitioners determine the value of an important agricultural or environmental variable where it hasn't been measured using a control point dataset of known values recorded at specific locations. Learning will take place for two one-hour studio sessions featuring both lecture discussion and practical hands-on work. A final practical exercise will be used to reinforce concepts and allow participants to work independently with a new dataset to produce predictions with cross-validated model performance metrics.

Carlos Hernandez

Shawn Hutchinson

Trevor Hefley

Object-Detection 101

10:00am-12:00pm – Agronomy Education Center, 2200 Kimball Ave.
Ivan Grijalva Teran, Brian Spiesman, Brian McCornack

This beginner-friendly crash course on developing deep learning models objects in agricultural spaces will equip you with essential skills to harness the power of object detection in the context of precision agriculture. In this workshop you will understand the basics of collecting high-quality data using sensors on mobile devices but with pathways to adopt similar strategies to data collected from drones, satellites, and ground-based sensors. Participants will also explore the capabilities of cutting-edge, open-source software like Roboflow to build your initial object detection models through hands-on activities and will gain practical experience in developing and fine-tuning object detection models. Participants will also learn how these tools are currently applied in addressing real-world challenges in precision agriculture and integrated into robotic systems.

Ivan Grijalva Teran

Brian Spiesman

Brian McCornack

Agricultural Robotics 101

10:00am-12:00pm – 1037 Seaton Hall, 920 N M.L.K. Jr. Dr.
Ajay Sharda, Nirajan Piya, Rahul Harsha Chepally, Jose Mateus Raitz Persch

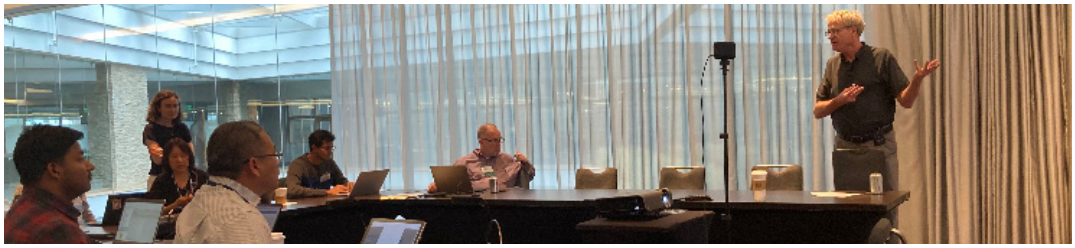
In this workshop, we will explore the exciting world of agricultural robotics, where technology meets farming to address the challenges of modern agriculture. We will delve into the core sub-systems that power these robotic solutions and understand how they seamlessly integrate to revolutionize farming practices. We will learn about the system built by the SIMPL Project and go through its various sub-components. We will jump on to essential hardware selection for Ag robots for real-time applications and present case studies on successful hardware implementations. Then we will learn the basic concepts of robotic operating systems and its tools. Finally, we will learn to integrate and collaborate to make real-time systems to address the current needs of agriculture.

Ajay Sharda

Nirajan Piya

Rahul Harsha Chepally

Jose Mateus Raitz Persch



Sunday, 21 July

PRE-CONFERENCE

WORKSHOPS

Bayesian Modeling for Agricultural Data

2:00pm-4:00pm – 407 Hale Library, 1117 Mid Campus Dr. N
Trevor Hefley, Francisco Palmero, Josefina Lacasa

Trevor Hefley

Francisco Palmero

Josefina Lacasa

Bayesian models are now used for applied data analysis almost as regularly as classic methods such as t-tests, regression, and ANOVA. Data generated from agricultural systems, whether from a designed experiment, on-farm trials, or opportunistic observations, can benefit from using Bayesian models.

Bayesian statistics enables researchers to build bespoke statistical models tailored to the specific research question or application. Furthermore, Bayesian models enable fully probabilistic and statistically valid inference not only on model components (e.g., slope parameters) but also on other indirect quantities of interest (e.g., probability yield is below a certain threshold). In this workshop, we aim to enable practitioners to understand the basics of Bayesian models, demystify standard Bayesian techniques such as Markov chain Monte Carlo, and provide real-world, hands-on agricultural data examples where Bayesian models enable new and essential insights.

R Shiny

2:00pm-4:00pm – 307 Hale Library, 1117 Mid Campus Dr. N
Ignacio Ciampitti, Carlos Hernandez, Gustavo Nocera Santiago, Pedro Henrique Magalhaes Cisdeli

Ignacio Ciampitti

Carlos Hernandez

Gustavo Santiago

Pedro Cisdeli

This 2-3 hour workshop will instruct the participants on the use of R Shiny Apps. This is an R software package that can be implemented with the aim of developing interactive tools. It doesn't matter if it is a simple web application that does just a couple of simple calculations or a complex application that processes and stores data, this promising package will allow us to achieve these results.

In this workshop, we aim to help researchers and practitioners understand the basics of creating a simple R Shiny application with geospatial data, providing the opportunity to transform this static data into interactive web tools and applications with practical applications for users.

16th ICPA SPONSORS

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Thank you to the Title Sponsors of the 16th International Conference on Precision Agriculture

We extend our sincere thanks to Dr. Raj Khosla, Professor of Precision Agriculture, Head of the Agronomy Department at Kansas State University, and the Founder of International Society of Precision Agriculture for successfully championing the "Title Sponsorship" from Kansas State University.

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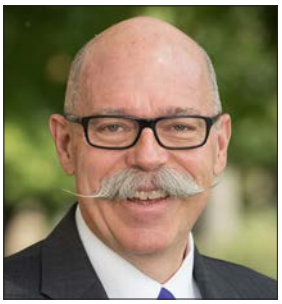

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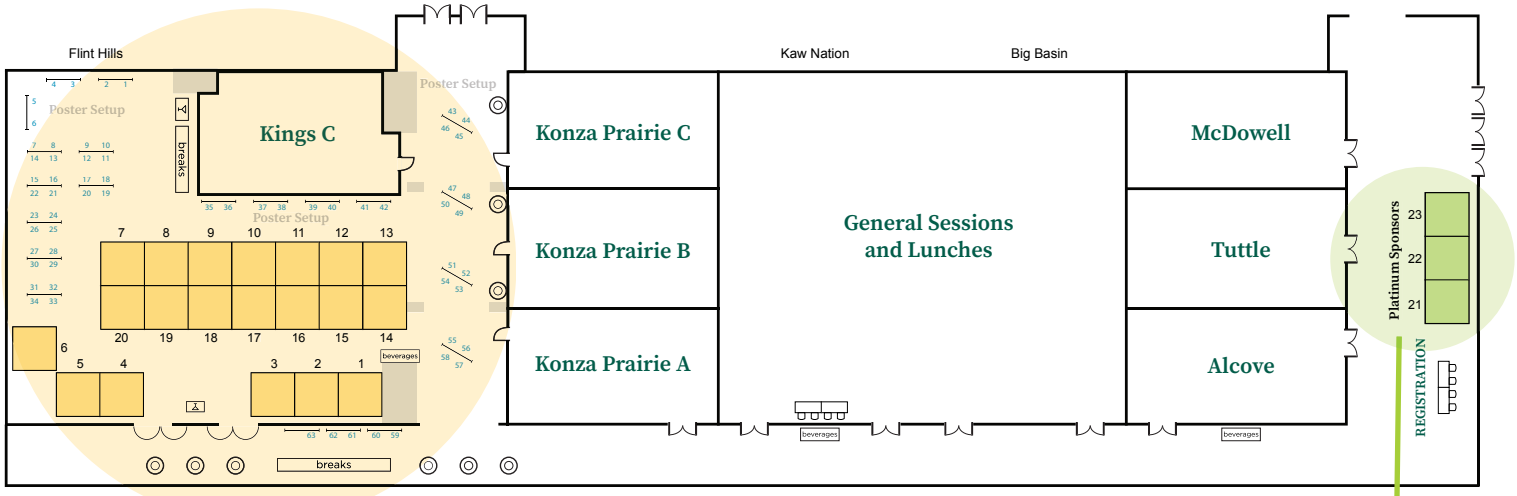
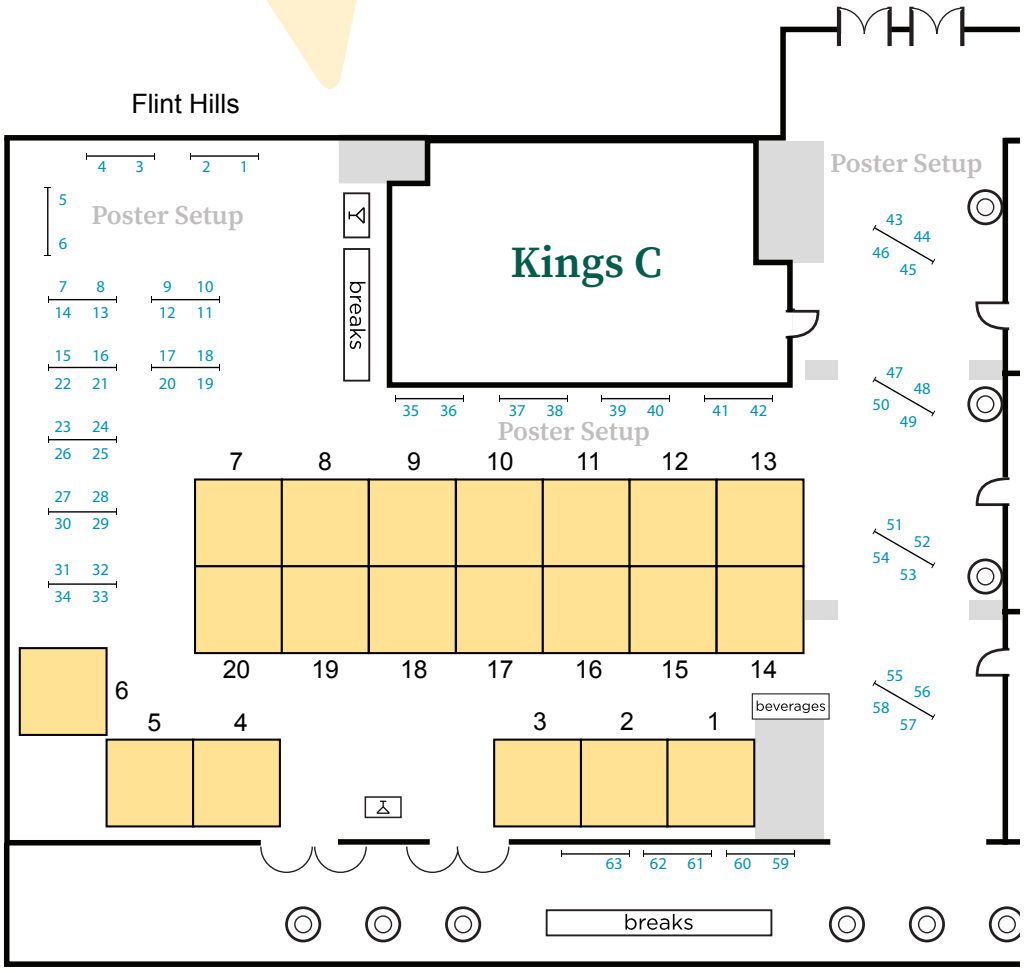
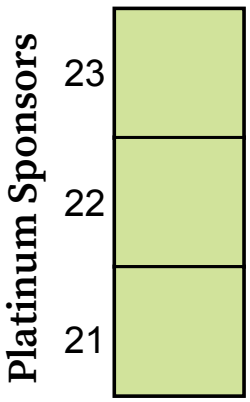
16th ICPA EXHIBIT HALL







16th ICPA EXHIBIT HALL

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PROGRAM OVERVIEW

Sunday, 21 June 2024

9:00am - 4:00pm	Pre-Conference Workshops at Kansas State University, see pages 4-5 for details
12:00pm - 6:00pm	On-Site Registration Open, Manhattan Conference Center
6:00pm - 8:00pm	Welcome Reception at the Flint Hills Discovery Center

Monday, 22 July 2024 Manhattan Conference Center

7:00am - 6:00pm	On-site Registration Open
8:00am - 10:00am	**Opening General Session** **Welcome to the 16th ICPA,** *John Fulton* **Welcome and Charge from ISPA Founder,** *Raj Khosla* **Welcome from Kansas State University,** *President Richard Linton* **The Evolution of AI-Driven AgTech,** *Scott Shearer*
10:00am - 10:30am	Break in Exhibit Hall
10:30am - 12:00pm	Concurrent Sessions **In-Season Nitrogen Management** **Precision Dairy and Livestock Management** **Weather, Models and DSS for Precision Agriculture** **Proximal and Remote Sensing for Soils, Crops and Phenotyping** **Vision and AI Technology in Agriculture** **International Symposium on Robotics and Automation**
12:00pm - 1:15pm	Luncheon
1:15pm - 3:00pm	Concurrent Sessions **In-Season Nitrogen Management** **Precision Livestock and Grassland Management** **Weather, Drainage Optimization, and Variable Rate Irrigation** **Proximal and Remote Sensing for Soils, Crops and Phenotyping** **Vision and AI Technology in Agriculture** **International Symposium on Robotics and Automation**
3:00pm - 3:30pm	Break in Exhibit Hall, *sponsored by:* Institute for Integrative Precision Agriculture, University of Georgia
3:30pm - 5:00pm	Concurrent Sessions **Strategies for Improving Nitrogen Management** **Precision Management for Horticulture Crops** **DSS and UAV for Crop Management** **Proximal and Remote Sensing for Soils, Crops and Phenotyping** **Vision and AI Technology in Agriculture** **International Symposium on Robotics and Automation**
5:00pm - 6:30pm	Poster Session and Reception in the Exhibit Hall **International Symposium on Robotics and Automation Student Poster Awards**, *sponsored by:* Mississippi State University Agricultural Autonomy Institute
6:30pm - 8:00pm	Regional Meetings

Tuesday, 23 July 2024 Manhattan Conference Center

7:00am - 6:00pm	On-site Registration Open
8:00am - 10:00am	**Plenary Session**
	Welcome from the Ohio State University, *John Fulton*
	16th ICPA Program Check In, *John Fulton*
	Building a Collaborative Future: Enhancing ISPA's Global Presence and Regional Impact *Steve Phillips, Lucas Amaral, Siva Balasundram, Yafit Cohen, Nicodeme Fassinou Hotegni, Joe Luck*
9:30am - 10:00am	Break in Exhibit Hall, *sponsored by:* OSU DEPARTMENT OF PLANT AND SOIL SCIENCES
10:00am - 12:00pm	Concurrent Sessions **On Farm Experimentation with Site-Specific Technologies** **Drivers and Barriers to Precision and Digital Agriculture** **Education of Precision Agriculture Topics and Practices** **Proximal and Remote Sensing for Soils, Crops and Phenotyping** **Wireless Sensor Networks and Farm Connectivity** **Vision and AI Technology in Agriculture** **Precision Crop Protection**
12:00pm - 1:15pm	**Conference Luncheon,** *sponsored by:* The Ohio State University
	Awards Ceremony
	Welcome from the University of Nebraska-Lincoln, *Joe Luck* **Outstanding Graduate Student Awards,** *Steve Phillips, sponsored by:* Institute of Agriculture and Natural Resources
	Pierre C. Robert Young Scientist Award, *Steve Phillips*
1:30pm - 3:00pm	Concurrent Sessions **Technologies on Planters and Variable Rate Seeding** **Precision Agriculture for Sustainability and Environmental Protection** **Extension Programming to Increase Precision Agriculture Adoption** **Remote Sensing Applications for Site-Specific Management** **IoTs and Data-based Networks and Solutions** **Vision and AI Technology in Agriculture** **Data Analytics for Production Ag**
3:00pm - 3:30pm	Break in Exhibit Hall
3:30pm - 4:45pm	Concurrent Sessions **Precision Ag Tools and Data for Site-Specific Management** **Precision Agriculture and Global Food Security** **Country Representative Reports** **Big Data, Data Mining and Deep Learning** **Automation and Robotics Applied to Crop Management** **Drone Spraying**
4:45 pm - 6:30pm	Poster Session and Reception in the Exhibit Hall
6:30pm - 8:00pm	Community Meetings

PROGRAM OVERVIEW

Wednesday, 24 July 2024 Manhattan Conference Center

7:00am - 12:00pm	On-site Registration Open
8:30am - 10:00am	Concurrent Sessions **Precision Agriculture and Global Food Security** **Site-Specific Nutrient Management** **AI Algorithms Applied to Crop Management** **Spatio-temporal Analysis for Precision Agriculture** **Robotics and Automation with Row and Horticultural Crops** **Drone Spraying**
10:00am - 10:30am	Break in Atrium
10:30am - 12:00pm	**Closing Plenary Session** **Student Poster Awards,** *sponsored by:* apni AFRICAN PLANT NUTRITION INSTITUTE KANSAS STATE UNIVERSITY
12:30pm - 8:30pm	**Post Conference Tour**

Monday
Robotics & Automation
SYMPOSIUM

INTERNATIONAL SYMPOSIUM ON ROBOTICS & AUTOMATION

BRIDGING GAPS IN PRODUCTION AGRICULTURE: ADVANCEMENT IN ROBOTICS AND AUTOMATION

Agricultural production is challenged by world food demand, the need to reduce agriculture's environmental footprint, the shortage of labor, and unprecedented variations in weather patterns. These stressors are accelerating the pace of innovation in automation and robotic systems which have benefited from the advancements made in machine vision, sensors and actuators, artificial intelligence (AI), and human–robot interactions.

This symposium provides a space where academia, industry, funding agencies, and other stakeholders can exchange knowledge on emerging trends and identify challenges along with opportunities in the fields of automation and robotics in agriculture.

Funding Agency

USDA NIFA

United States Department of Agriculture
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Monday, 22 July 2024

Opening General Session

8:00am Opening General Session

Welcome to the 16th ICPA, *John Fulton*

Welcome and Charge from ISPA Founder, *Raj Khosla*

Welcome from Kansas State University, *President Richard Linton*

The Evolution of AI-Driven AgTech, *Scott Shearer*

AI is poised to alter recent data-driven advancement in digital agriculture. When marrying real-time inferencing and autonomy, a new class of field machinery is emerging which is specifically tailored to crop care needs. Additionally, fields can be automated fields via control of water within the soil profile. Emerging carbon markets and increasing reliance on agriculture to provide the energy necessary to power our standard of living will increase pressure on our existing natural resource base. This presentation will highlight these new challenges and opportunities for digital agricultural professionals.

Tuesday, 23 July 2024

Plenary Session

8:00am Plenary Session

Welcome from the Ohio State University, *John Fulton*

16th ICPA Program Check In, *John Fulton*

Building a Collaborative Future: Enhancing ISPA's Global Presence and Regional Impact

Join us for a thought-provoking panel discussion on "Building a Collaborative Future," and discover the steps ISPA is taking to enhance its global presence and add value to regional precision agriculture organizations and events. Our panelists will address the current perceptions of ISPA around the world and discuss strategic initiatives to broaden its reach and impact.

Steve Phillips, Moderator

Lucas Amaral

Siva Balasundram

Yafit Cohen

Nicodeme Fassinou Hotegni

Joe Luck

10:30am - 12:00pm

Kings C **In-Season Nitrogen Management** *Moderator: Guillermo Balboa*	Konza Prairie C **Precision Dairy and Livestock Management** *Moderator: Jason Hartschuh*	Konza Prairie B **Weather, Models and DSS for Precision Agriculture** *Moderator: George Vellidis*
On-farm Evaluation of a Satellite Remote Sensing-based Precision Nitrogen Management Strategy *Junjun Lu*	Have Your Steak and Eat It Too: Precision Beef Management to Simultaneously Reduce Ech4 and Increase Profit *Karl Behrendt*	Assessing Soybean Water Stress Patterns and ENSO Occurrence in Southern Brazil: an in Silico Approach *Gabriel Hintz*
Effect of Terrain and Soil Properties on the Effectiveness of Crop-model Based Variable Rate Nitrogen in Corn *Pablo Paccioretti*	Relationship of Activity and Temperature of Dairy Calves As Measured by Indwelling Rumen Boluses *Jason Hartschuh*	Advancing Adaptive Agricultural Strategies: Unraveling Impacts of Climate Change and Soils on Corn Productivity Using APSIM *Harsh Pathak*
Exploring the Use of a Model-based Nitrogen Recommendation Tool and Vegetation Indices for In-season Corn Nitrogen Management in Alabama *Pablo Duarte*	Automated Sow Estrus Detection Using Machine Vision Technology *Jianfeng Zhou*	Evaluating the Potential of In-season Spatial Prediction of Corn Yield and Responses to Nitrogen by Combining Crop Growth Modeling, Satellite Remote Sensing and Machine Learning *Xiaoxing Zhen*
Crop Modeling-based Framework to Explore Region-specific Impact of Nitrogen Fertilizer Management on Productivity and Environmental Footprint *Laura Thompson*	Automatic Body Condition Score Classification System for Individual Beef Cattle Using Computer Vision *Md Nafiul Islam*	Predicting the Spatial Distribution of Aflatoxin Hotspots in Peanut Fields Using DSSAT CSM-CROPGRO-PEANUT-AFLATOXIN *Sara Maktabi*
In-season Nitrogen Prediction Evaluation Using Airborne Imagery with AI Techniques in Commercial Potato Production *Bilal Javed*	Drone Use Extension and Demonstrations Support Management of Riparian Areas, Grazing Land, and Water Quality *Will Boyer*	A Digital Twin for Arable Crops and for Grass *Frits van Evert*
Site-specific Evaluation of Sensor-based Winter Wheat Nitrogen Tools Via On-farm Research *Jose Cesario Pinto*		Machine Learning Approach to Study the Effect of Weather and Proposed Climate Change Scenarios on Variability in the Ohio Corn and Soybean Yield *Rajveer Dhillon*

1:15pm - 3:00pm

In-Season Nitrogen Management *Moderator: Raj Khosla*	**Precision Livestock and Grassland Management** *Moderator: Steve Phillips*	**Weather, Drainage Optimization, and Variable Rate Irrigation** *Moderator: Ben Craker*
Evaluating Different Strategies for In-season Potato Nitrogen Status Diagnosis Using Two Leaf Sensors *Seiya Wakahara*	Detection of Goat Herding Impact on Vegetation Cover Change Using Multi-season, Multi-herd Tracking and Satellite Imagery *Tarin Paz Kagan*	Changes in Soil Chemical and Physical Properties After a Flooding Event in Chile *Rodrigo Ortega*
Satellite-based On-farm Variable Rate Nitrogen Management on and Main Spatial Drivers of Cotton Yield, Nitrogen Use Efficiency, and Profitability *Leonardo Bastos*	A Multi-objective Optimisation Analysis of Virtual Fencing in Precision Grazing *Karl Behrendt*	Predicting Water Potentials of Wild Blueberries During Drought Treatment Using Hyperspectral Sensor and Machine Learning *Umesh Hodeghatta*
A Decision-support Tool to Optimize Mid-season Corn Nitrogen Fertilizer Management from Red, Green, Blue SUAS Images *Aurelie Poncet*	Extension Program Prioritization Guides Web-mapping Application Delivery to Ranchers *Will Boyer*	Spatio-temporal Analysis of Soil Moisture and Turfgrass Health to Investigate the Temporal Stability of Variable Rate Irrigation Zones *Ruth Kerry*
Evaluating Nitrogen Use Efficiency in Wheat Using UAV Multispectral Images *Jie Wang*	Profitability of Regenerative Cropping with Autonomous Machines: an Ex-ante Assessment of a British Crop-livestock Farm *James Lowenberg-DeBoer*	Apparent Soil Electrical Conductivity As an Indicator of Failed Subsurface Drains *Allan Andales*
Retrieving Nitrogen Levels in Almond Trees Using Hyperspectral Data at Leaf and Canopy Level *Momtanu Chakraborty*	Design of an Automatic Travelling Electric Fence System for Sustainable Grazing Management *Mohammad Ashik Alahe, James Kemeshi*	Assessing Precision Water Management in Cotton Using Unmanned Aerial Systems and Satellite Remote Sensing *Oluwatola Adedeji*
Comparing Profitability of Variable Rate Nitrogen Prescription Methods *Seowoo Lee*		Precision Irrigation Strategies for Climate-resilient Crop Production and Water Resource Management *Kelechi Igwe*
Sentinel Fertigation - Sponsor Presentation *Jackson Stansell*		Development and Evaluation of a Novel Variable-orifice Nozzle Flow and Droplet Size Control System *Joe Luck*

10:30am - 12:00pm

Konza Prairie A **Proximal and Remote Sensing for Soils, Crops and Phenotyping** *Moderator: Ruth Kerry*	McDowell **Vision and AI Technology in Agriculture** *Moderator: Deepak Joshi*	Alcove & Tuttle **International Symposium on Robotics and Automation**
The Role of Imaging Spectroscopy in Monitoring Soil Quality for Precision Agriculture *Tarin Paz Kagan*	**Cotton Yield Estimation Using High-resolution Satellite Imagery Obtained from Planet SkySat** *Mahendra Bhandari*	**Symposium Welcome and Introductions** *James Lowenberg-DeBoer*
Botanix Explorer (BX1): Precision Plant Phenotyping Robot Detecting Stomatal Openings for Precision Irrigation and Drought Tolerance Experiments *Sainath Reddy Gummi, James Kemeshi*	**Estimating Real-time Soil Water Content (SWC) in Corn and Soybean Fields Using Machine Learning Models, Proximal Remote Sensing, and Weather Data** *Nipuna Chamara*	**Session 1. Machine Vision Systems, Data Fusion and AI Applied to Robotics for Row Crops Production** *Moderator: Brenda Ortiz*
Rapid Assessment of Yield Using Machine Learning Models and UAV Multispectral Imagery for Soybean Breeding Plots *Aashvi Dua*	**AI-enabled 3D Vision System for Rapid and Accurate Tree Trunk Detection and Diameter Estimation** *Congliang Zhou*	**How Does an Autonomous Tractor See the World** *Gaurav Bansal*
Enhancing Nutrient-related Stress Detection: High Throughput Phenotyping and Image Analysis for Improved Precision *Katie Bathke*	**AI Enabled Targeted Robotic Weed Management** *Amlan Balabantaray*	**Transforming Row Crop Agriculture: Harnessing Computer Vision and AI for Automation and Autonomy** *Ajay Sharda*
Using Remote Sensing to Benchmark Crop Coefficient Curves of Sweet Corn Grown in the Southeastern United States *Emily Bedwell*	**Machine Vision in Hay Bale Production** *Benjamin Vail*	**Swarm Farming is the Future** *Craig Rupp*
Dynamic Management Zones for Real-time Precision Agriculture Optimization *Ahmed Rabia*		**Q&A and General Discussion with Participants**

1:15pm - 3:00pm

Proximal and Remote Sensing for Soils, Crops and Phenotyping *Moderator: Yuxin Miao*	**Vision and AI Technology in Agriculture** *Moderator: Anita Dille*	**International Symposium on Robotics and Automation**
Remote and Proximal Sensing for Sustainable Water Use in Almond Orchards in Southeast Spain in a Digital Farming Context *Álvaro Sánchez Virosta*	**Active Learning-based Measurements Prediction in Sparsely Observed Agricultural Fields** *Aabila Tharzeen*	**Session 2. Panel Discussion - Evolving Nexus of Academia, Industry, and Government to Advance and Realize the Benefits of Robotics in Crop Production** *Moderator: J. Alex Thomasson* ***Panelists:*** *Edward Barnes* *Mariah Scott* *Scott Shearer*
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Accurately Mapping Soil Profiles: Sensor Probe Measurements at Dense Spatial Scales *Eric Lund*	**Supervised Hyperspectral Band Selection Using Texture Features for Classification of Citrus Leaf Diseases with YOLOv8** *Quentin Frederick*	**Session 3. Advances in Automation, Sensing, Design, and Deployment of Robots for Fruits and Vegetable Production** *Moderator: Brent Sams*
A Fusion Strategy to Map Corn Crop Residues *Asim Biswas*	**Spatial Predictive Modeling to Quantify Soybean Seed Quality Using Remote Sensing and Machine Learning** *Carlos Hernandez*	**Machine Vision, AI, and Robotics in Specialty Crop Production** *Manoj Karkee*
The Evaluation of NDVI Response Index Consistency Using Proximal Sensors, UAV and Satellites *Meryem Maatougui*	**Premier Strategy Consulting - Sponsor Presentation** *Chuanmei Zhu*	**Can AI and Automation Transform Specialty Crop Production?** *Yiannis Ampatzidis*
North Dakota State University - Sponsor Presentation *Leon Schumacher*		**Using AI to Estimate Vineyards and Vegetables Vigour and Yield** *Spyros Fountas*

MONDAY LATE AFTERNOON Oral Presentations

3:30pm - 5:00pm

Kings C **Strategies for Improving Nitrogen Management** *Moderator: Emmanuel Abban-Baidoo*	Konza Prairie C **Precision Management for Horticulture Crops** *Moderator: Davide Cammarano*	Konza Prairie B **DSS and UAV for Crop Management** *Moderator: Yafit Cohen*
Effects of Crop Rotation on In-season Estimation of Optimal Nitrogen Rates for Corn Based on Proximal and Remote Sensing Data *Ana Morales*	**Spatial Distribution of Dry Matter in Avocado Fruits and Its Relationship with Fruit Load** *Hugo Poblete*	**The Relationship Between Vegetation Indices Derived from UAV Imagery and Maturity Class in Potato Breeding Trials** *Stanislaw Marek Samborski*
Using Soil Samples and Soil Sensors to Improve Soil Nutrient Estimations *Chase Maxton*	**Cherry Yield Forecast: Harvest Prediction for Individual Sweet Cherry Trees** *Oliver Scholz*	**Assessing the Distribution Uniformity of Broadcast-interseeded Cover Crops at Different Crop Stages by an Unmanned Aerial Vehicle** *Alex Thomas*
Developing a Wheat Precision Nitrogen Management Strategy by Combining Satellite Remote Sensing Data and WheatGrow Model *Yue Li*	**Evaluation of a Single Transect Method for Collecting Grape Samples Based on Sentinel-2 Imagery for the Characterization of Overall Vineyard Performance** *Brent Sams*	**Obstacle-aware UAV Flight Planning for Agricultural Applications** *Kunjan Theodore Joseph*
Water Stress Assessment for a Better Within-field Nitrogen and Irrigation Management *Omran Alshihabi*	**Enhancing Precision Agriculture with Cosmic-ray Neutron Sensing: Monitoring Soil Moisture Dynamics and Its Impact on Grapevine Physiology** *Riccardo Mazzoleni*	**Decision Support Tools for Developing Aflatoxin Risk Maps in Peanut Fields** *George Vellidis*
Creating Value from On-farm Research: Efields Data Workflow and Management Successes and Challenges *Dena Wilson*	**Pineapple Growth Monitoring with Precision Agriculture Tools** *Kwame Frimpong*	**Coupling Macro-scale Variability in Soil and Micro-scale Variability in Crop Canopy for Delineation of Site-specific Management Grid** *Wubengeda Yilma*
Optimizing Nitrogen Application in Global Wheat Production by an Integrated Bayesian and Machine Learning Approach *Ziyang Liu*	**Monitoring the Effects of Weed Management Strategies on Tree Canopy Structure and Growth Using UAV-LiDAR in a Young Almond Orchard** *Tarin Paz Kagan*	**Sampling Bumble Bees and Floral Resources Using Deep Learning and UAV Imagery** *Brian Spiesman*

MONDAY EVENING

5:00pm – 6:30pm **Poster Session and Reception**

Join us for the Monday Evening poster session from 5:00 pm to 6:30 pm. Poster presenters are asked to be at their poster from 5:00 to 6:00 pm.

Please use your Monday drink ticket in your registration packet and take time to visit with colleagues about their research. Light hors d'oeuvres will be served.

The reception will take place in the exhibit hall so take advantage of connections with our industry supporters and visit with them about their offerings.

6:30pm – 8:00pm **Regional Meetings**

Regional meetings are a great opportunity for networking and sharing on initiatives complementary to the ICPA at the regional level. This meeting can also be used as time to share announcements and upcoming events.

Kings C	Konza Prairie C	Konza Prairie B	Konza Prairie A	McDowell
North America Regional Meeting *Athyna Cambouris, Kenneth Sudduth*	Africa Regional Meeting *Kwame Frimpong*	Asia and Oceania Regional Meeting *Siva Balasundram*	Europe Regional Meeting *Emilio Gil*	Latin America and the Caribbean Regional Meeting *Rodrigo Ortega*

3:30Pm - 5:00pm

Konza Prairie A **Proximal and Remote Sensing for Soils, Crops and Phenotyping** *Moderator: Athyna Cambouris*	McDowell **Vision and AI Technology in Agriculture** *Moderator: Ignacio Ciampitti*	Alcove & Tuttle **International Symposium on Robotics and Automation**
Nitrogen Stress Detection in Irrigated Corn Using Multispectral Imagery and Machine Learning Algorithms *Binita Ghimire*	**Sparse Coding for Classification Via a Locality Regularizer: with Applications to Agriculture** *Abiy Tasissa, Lukai Li a*	**Session 4. Human-Robot Interactions, Stakeholder Engagement and Adoption, Economics of Robot-Aided Agriculture** *Moderator: James Lowenberg-DeBoer* **I Call Shotgun: Uncovering Human-System/ Robot Gaps in Emerging Technologies** *Yael Salzer* **Stakeholder Inclusion for Responsible Robotics: Who, How, and Why?** *David Rose* **Field Crop Robots - Adoption and Farm Level Economics** *Markus Gandorfer* **Q&A and General Discussion with Participants**
Detecting Nitrogen Deficiency and Leaf Chlorophyll Content (LCC) Using Sentinel-2 Vegetation Indices *Xuefeng Xu*	**Enhancing Agricultural Stand Count Accuracy in Moroccan Sugar Beet Farms Through AI-assisted Drone-based Remote Sensing** *Noura Ouled Sihamman*	
Evaluation of Soil Health and Grain Quality of Soybean Under Different Soil Treatments and Cropping Systems Using UAV Imagery *Manoj Gadhwal, Jianfeng Zhou*	**Towards a Digital Peanut Profile Board: a Deep Learning Approach** *Mailson Freire de Oliveira*	
Predicting, Mapping, and Understanding the Drivers of Grain Protein Content Variability – Utilising John Deere's New Harvestlab 3000 Grain Sensing System *Miss Mikaela Tilse*	**Using Machine Vision to Build Field Maps of Forage Quality and the Need for Agriculture-specific Machine Vision Networks** *Paul Nugent*	
Yield Monitoring System for Radish and Cabbage Under Korean Field Conditions *Sun-ok Chung*	**Combining Remote Sensing and Machine Learning to Estimate Peanut Photosynthetic Parameters** *Thiago Orlando Costa Barboza*	
Delineation of Yield Zones Using Optical and Radar Remote Sensing *Isabella da Cunha*	**Leveraging UAV-based Hyperspectral Data and Machine Learning Techniques for the Detection of Powderly Mildew in Vineyards** *Subodh Bhandari*	

Thank You to the Organizers of the
INTERNATIONAL SYMPOSIUM ON ROBOTICS AND AUTOMATION

Brenda Ortiz
Professor & Precision Ag Extension Specialist
Auburn University

Jess Lowenberg-DeBoer
Professor
Harper Adams University

J. Alex Thomasson
Professor, Department Head, and William B. and Sherry Berry Endowed Chair
Mississippi State University

John Fulton
Professor, Food, Agriculture and Biological Engineering
The Ohio State University

Organized by ISPA International Society of Precision Agriculture

Funding Agency USDA NIFA United States Department of Agriculture National Institute of Food and Agriculture

TUESDAY MORNING Oral Presentations

10:00am - 12:00pm

Kings C **On Farm Experimentation with Site-Specific Technologies** *Moderator: Louis Longchamps*	Konza Prairie C **Drivers and Barriers to Precision and Digital Agriculture** *Moderator: Ruth Kerry*	Konza Prairie B **Education of Precision Agriculture Topics and Practices** *Moderator: Rob Proulx*	Konza Prairie A **Proximal and Remote Sensing for Soils, Crops and Phenotyping** *Moderator: Kenneth Sudduth*
UAV-based Phenotyping of Nitrogen Responses in Winter Wheat: Grain Yield and Nitrogen Use Efficiency *Jingcheng Zhang*	**R2B2 Project: Design and Construction of a Low-cost and Efficient Autonomous UGV For Row Crop Monitoring** *James Kemeshi*	**Ohio State Food, Agricultural and Biological Engineering (FABE) Certificate Program for Digital Agriculture-moving from the Classroom to Online.** *John Fulton*	**Use of Crop and Drought Spectral Indices to Support Harvest Decisions of Peanut Fields in Alabama** *Brenda Ortiz*
Harnessing Farmers', Researchers' and Other Stakeholders' Knowledge and Experiences to Create Shared Value from On-farm Experimentation: Lessons from Kenya *Joses Muthamia*	**Decision Making Factors of Precision Agricultural Practices in South Dakota** *Peter Kovacs*	**Using the Open Data Farm As a Digital Twin of a Farm in an Innovative School Setting to Increase Data Literacy and Awareness** *Daniel Eberz-Eder*	**Leaf Spectral Traits Help Quantify Crop Senescence at Different Nitrogen Rates** *Kang Yu*
Assessment of Soil Spatial Properties and Variability Using a Portable VIS-NIRS Soil Probe for On-farm Precision Experimentation *Athyna Cambouris*	**Barriers and Adoption of Precision Ag Technologies for Nitrogen Management Nebraska** *Guillermo Balboa*	**University of Nebraska-Lincoln - Sponsor Presentation** *Joe Luck*	**Automated Pipeline for Research Plot Extraction and Multi-polygon Shapefile Generation for Phenotype and Precision Agriculture Applications** *Aashvi Dua*
Evaluating Different Strategies to Analyze On-farm Precision Nitrogen Trial Data *Yuxin Miao*	**Who Are the Data Stewards: Moving Data Driven Agriculture Forward** *Benjamin Craker*	**University of Georgia's Institute for Integrative Precision Agriculture - Sponsor Presentation** *Ramaraja Ramasamy*	**Predicting Soil Chemical Properties Using Proximal Soil Sensing Technologies and Topography Data: a Case Study** *Felippe Hoffmann Silva Karp*
Determining Site-Specific Soybean Optimal Seeding Rate Using On-Farm Precision Experimentation *Marina Dalla Betta*	**Comparing Global Shutter and Rolling Shutter Cameras for Image Data Collection in Motion on a UGV** *James Kemeshi, Mohammad Ashik Alahe*	**The Ohio State University - Sponsor Presentation** *John Fulton*	**Comparing Hyperspectral and Thermal UAV-borne Imagery for Relative Water Content Estimation in Field-grown Sesame** *Maitreya Mohan Sahoo*
Are Pulses Really More Variable Than Cereals? a Country-wide Analysis of Within-field Variability *Thomas Bishop*	**Precision Agriculture: Forage Chopper Noise Level As an Estimator of Corn Silage Production in Small Farms** *Wilson Souza*	**Cultivating Future Leaders in Sustainable Agriculture: Insights from the Digital Agriculture Fellowship Program at the University of California, Riverside** *Elia Scudiero*	**Integrating Nonlinear Models and Remotely Sensed Data to Estimate Crop Cardinal Dates** *Caio dos Santos*
Operationalization of On-farm Experimentation in African Cereal Smallholder Farming Systems *Ivan Adolwa*	**Developing Geospatial Method for Autopilot Harvester Trampling Evaluation in Colombian Sugarcane Fields** *Juan Valencia-Correa*	**History of Crop Canopy Sensors** *James Schepers*	**Influence of Ground Control Points and Processing Parameters on UAS Image Mosaicking for Plant Height Estimation** *Chenghai Yang*
All for One and One for All: a Simulation Assessment of the Economic Value of Large-scale On-farm Experiment Network *Xiaofei Li*	**National Agricultural Producers Data Cooperative - Sponsor Presentation** *Ben Craker*	**Fostering Student Engagement and Leadership Development in Integrative Precision Agriculture Across Borders** *Lorena Lacerda*	**Veris Technologies - Sponsor Presentation** *Tyler Lund* **Oklahoma State University - Sponsor Presentation** *Raedan Sharry*

10:30am - 12:00pm

McDowell **Wireless Sensor Networks and Farm Connectivity** *Moderator: Ajay Sharda*	Tuttle **Vision and AI Technology in Agriculture** *Moderator: Rajveer Dhillon*	Alcove **Precision Crop Protection** *Moderator: Anita Dille*
Hardware Design, Validation & Integration of Wireless Data Communication Platform for Site Specific Liquid Application System *Ketan Shende*	**Incorporating Return on Investment for Profit-driven Management Zones** *M. Etienne Lord*	**Integration of Precision Agriculture Tools for Variety Optimization and Crop Management Focused on Increasing Productivity in Sugarcane** *Carlos Mosquera*
Long-range Bluetooth Smart Stakes and High-gain Receivers for High-density Sensing in Precision Agriculture *Samuel Craven*	**Utilizing Hyperspectral Field Imagery for Accurate Southern Leaf Blight Severity Grading in Corn** *Grace Vincent*	**Design and Development of a Spraying System for Under Canopy Rover and Its Integration with Computer Vision System** *Nirajan Piya*
OATSmobile: a Data Hub for Underground Sensor Communications and Rural IoT *Fabio Castiblanco Rubio*	**A Growth Stage Centric Approach to Field Scale Corn Yield Estimation by Leveraging Machine Learning Methods from Multimodal Data** *Luke Waltz*	**Application Strategies for Coverage Optimization During Site-specific Chemical Spray Using Robotic Sprayer** *Prashanta Pokharel*
Nystrom-based Localization in Precision Agriculture Sensors *Abiy Tasissa*	**Real-time Seed Mapping Using Direct Methods** *Rahul Harsha Chepally*	**Variable Rate Application to Improve Crop Protection in Orchards and Vineyards. Prescription Maps and Satellites to Accomplish EU Farm to Fork Strategy** *Emilio Gil*
Data Gator: a Provisionless Network Solution for Collecting Data from Wired and Wireless Sensors *Garrett Wells*	**Optimal Placement of Soil Moisture Sensors in an Irrigated Corn Field** *Dipankar Mandal*	**Machine Learning Model to Predict Total Nozzle Volume Delivery for Pulse Width Modulated Flow Controllers** *Simran Dua*
LoRa Flood-messaging Sensor-data Transport *Peter Raeth*	**HOPSY: Harvesting Optimization for Production of Strawberry Using Real-time Detection with YOLOv8** *Zijing Huang*	**Quantifying Boom Movement in Agricultural Sprayer Booms Using Neural Networks for Real-world Field Scenarios** *Treman Singh Kaloya*
Field Validation of Airblast Spray Advisor Decision Support Web App for Citrus Applications *Peter Larbi*	**Multi-sensor Remote Sensing: an AI-driven Framework for Predicting Sugarcane Feedstock** *Marcelo Barbosa*	**Hyperspectral Sensing to Estimate Soil Nitrogen and Reduce Soil Sampling Intensity** *Wubengeda Admasu*
	AI-based Precision Weed Detection and Elimination *Hovannes Kulhandjian*	**Development of Standard Protocols for Soil Tilth Assessment As an Essential Component of Tillage Tool Automation to Improve Soil Health** *Christopher Dean*

NOTES

TUESDAY AFTERNOON Oral Presentations

1:30pm - 3:00pm

Kings C **Technologies on Planters and Variable Rate Seeding** *Moderator: Simerjeet Virk*	Konza Prairie C **Precision Agriculture for Sustainability and Environmental Protection** *Moderator: Elia Scudiero*	Konza Prairie B **Extension Programming to Increase Precision Agriculture Adoption** *Moderator: Peter Kovacs*
Effective Furrow Closing Systems for Consistent Corn Seed Placement *Jose Peiretti*	**Performance Evaluation of Auto-steering System for Precise Sowing to Increase Crop Productivity** *Tahir Iqbal, Qamar Zaman*	**Citizens Perspectives on Robot-based Crop Farming – a Cluster Analysis Using Unsupervised Machine Learning** *Hendrik Zeddies*
Field-scale Evaluation of Corn Yield Response on Varying Planter Downforce Settings and Soil Apparent Electrical Conductivity Zones *Sylvester Badua*	**Simulating Climate Change Impacts on Cotton Yield in the Texas High Plains** *Bishnu Ghimire*	**Pesticide Application Management Toolset for Improved Worker Protection** *Chathurika Narayana*
The Impact of Row Unit Position on Planter Toolbar on Corn Crop Development: an Experimental Study *Jose Peiretti*	**Modelling Hydrological Processes in a Wadi Basin in Egypt: Wadi Kharouba Case Study** *Eman Eldeeb*	**Participatory Irrigation Extension Programs to Increasing Adoption of Best Irrigation Strategies** *Brenda Ortiz*
Enhancing Seeding Efficiency: Evaluating Row Cleaners with Computer Vision in Precision Agriculture *Sidharth Rai*	**Opportunity Cost of Precision Conservation** *Seowoo Lee*	**A Case for Increased Precision Pesticide Application Adoption in California Perennial Specialty Crop Production** *Peter Larbi*
On-farm Evaluation of the Potential Benefits of Variable Rate Seeding for Corn in Minnesota *Ayoub Kechchour*	**Mapping Marginal Crop Land on Millions of Acres in the Canadian Prairies** *Steve Shirtliffe*	**Transforming Precision Agriculture Education, Research and Outreach in Sub-Saharan Africa Through Intra-Africa Cooperation** *Kwame Frimpong*
Prescription Map Creation for Optimal Variable-rate Seeding in Arkansas Fields *Wesley France*		**Global Adoption of Precision Agriculture: an Update on Trends and Emerging Technologies** *Jonathan McFadden*

3:30pm - 4:45pm

Kings C **Precision Ag Tools and Data for Site-Specific Management** *Moderator: Brenda Ortiz*	Konza Prairie C **Precision Agriculture and Global Food Security** *Moderator: Vaishali Sharda*	Konza Prairie B **Country Representative Reports** *Moderator: Kwame Frimpong*
Enhancing On-farm Rice Yields, Water Productivity, and Profitability Through Alternate Wetting and Drying Technology in Dry Zones of West Africa *Jean-Martial Johnson*	**X-ray Imaging in Breeding and Harvesting Processes** *Mareike Weule*	**Report on Research and Extension of Precision Agriculture in Japan** *EIJI Morimoto*
Hierarchical Zoning: Targeted Sampling for Soil Attribute Mapping *Derlei Melo*	**Precision Agriculture to Develop Cowpea Cultivation in Louga and Guarantee Sovereign Food Security in Senegal** *Magatte Diaw*	**Capacity Building of African Young Scientists in Precision Agriculture Through Cross-regional Academic Mobility for Enhanced Climate-smart Agri-food System: an Intra Africa Mobility Project on Precision Agriculture** *Nicodeme Fassinou Hotegni*
Analysis of Yield Gaps in Sub-Saharan African Cereal Production Systems *Steve Phillips*	**Emerging Megatrends of Sustainable Nutrient Management Research in Sub-Saharan Africa** *Vincent Aduramigba-Modupe*	**The State of Precision Agriculture in Ghana: Challenges and Opportunities** *Martin Bosompem*
Using Informative Bayesian Priors and On-farm Experimentation to Predict Optimal Site-specific Nitrogen Rates *Wade Brorsen*	**Securing Agricultural Imaging Data in Smart Agriculture: a Blockchain-based Approach to Mitigate Cybersecurity Threats and Future Innovations** *Sainath Reddy Gummi, Mohammad Ashik Alahe, James Kemeshi*	**Report from Finland** *Associate Professor Hannu Haapala*
Drought Tolerance Assessment with Statistical and Deep Learning Models on Hyperspectral Images for High-throughput Plant Phenotyping *Md Hasibur Rahman*	**AgGateway Traceability API – The Foundation to Track Raw Agricultural Commodities** *Scott Nieman, Ben Craker*	

1:30pm - 3:00pm

Konza Prairie A **Remote Sensing Applications for Site-Specific Management** *Moderator: Gaurav Jha*	McDowell **IoTs and Data-based Networks and Solutions** *Moderator: Xiaomao Lin*	Tuttle **Vision and AI Technology in Agriculture** *Moderator: Tanzeel Rehman*	Alcove **Data Analytics for Production Ag** *Moderator: Thomas Bishop*
High Throughput Phenotyping of the Energy Cane Crop UAV-based LiDAR, Multispectral and RGB Data *Mahendra Bhandari*	**Enabling Field-level Connectivity in Rural Digital Agriculture with Cloud-based LoRaWAN** *Joshua Bailey*	**Algorithm to Estimate Sorghum Grain Number from Panicles Using Images Collected with a Smartphone at Field-scale** *Sr. Gustavo Nocera Santiago*	**Almonds and Pistachios: Sustaining Legacy, Innovations, and Nutritional Advancements in California** *Serhat Asci, Hovannes Kulhandjian*
Land Cover and Crop Types Classification Using Sentinel-2A Derived Vegetation Indices and an Artificial Neural Network *Bere Benjamin Bantchina*	**Increasing the Resilience and Performance of AI-based Services Through Hybrid Cloud Infrastructures and the Use of Mobile Edge in Agriculture** *Daniel Eberz-Eder*	**A High-throughput Phenotyping System Evaluating Salt Stress Tolerance in Kale Plants Cultivated in Aquaponics Environments** *Md Hasibur Rahman*	**Assessing Plant Spacing Inequality and Its Impact on Crop Yield Using Lorenz Curves and Gini Index** *Bhaskar Aryal*
Yield Potential Zones and Their Relationship with Soil Taxonomic Classes and Management Zones *Lucas Amaral*	**Securing Agricultural Data with Encryption Algorithms on Embedded GPU Based Edge Computing Devices** *Mohammad Ashik Alahe, James Kemeshi*	**In-Field and Loading Crop: A Machine Learning Approach to Classify Machine Harvesting Operating Mode** *B. Eng. Sean Harkin*	**Interoperability As an Enabler for Principled Decision-making in Irrigation: the Precision Agriculture Irrigation Language (PAIL)** *R. Andres Ferreyra*
Spatio-temporal Variability of Intra-field Productivity Using Remote Sensing *Emmanuela van Versendaal*	**Avena: an Event-driven Software Framework for Informed Decisions and Actions in Cropping Systems** *Fabio Castiblanco Rubio*	**Digital Agriculture Driven by Big Data Analytics: a Focus on Spatio-temporal Crop Yield Stability and Land Productivity** *Kwabena Nketia*	**Yield Analysis in Sugarcane Harvesters Using Design of Experiments (DoE) Methodology** *Matheus Da Silva, Jeovano Alves de Lima*
Within Field Cotton Yield Prediction Using Temporal Satellite Imagery Combined with Deep Learning *Rupak Karn*	**Integrated Data-driven Decision Support Systems** *Laila Puntel*	**TEG Automation Solutions - Sponsor Presentation** *Vinicius Oliveira*	**System-based Precision Agriculture for Sustainable Crop Production** *Davide Cammarano*
	A Flexible Software Architecture for General Precision Agriculture Decision Support Systems *Walter Neils*		**Enhancing Agricultural Feedback Analysis Through VUI and Deep Learning Integration** *Sahaj Kaushal*

3:30pm - 4:45pm

Konza Prairie A **Big Data, Data Mining and Deep Learning** *Moderator: Joby Czarnecki*	Tuttle **Automation and Robotics Applied to Crop Management** *Moderator: Luan Oliveira*	Alcove **Drone Spraying** *Moderator: Simerjeet Virk*
Design of an Autonomous Ag Platform Capable of Field Scale Data Collection in Support of Artificial Intelligence *James Krogmeier*	**Advancements in Agrivoltaics: Autonomous Robotic Mowing for Enhanced Management in Solar Farms** *Shaswati Behera*	**Optimizing Vineyard Crop Protection: an In-depth Study of Spraying Drone Operational Parameters** *Spyros Fountas*
An Open Database of Crop Yield Response to Fertilizer Application for Senegal *Federico Gomez*	**Automated In-field Ornamental Nursery Plant Counting and Quality Assessment with End-to-end Deep Learning for Inventory Management** *Hamid Syed*	**Deposition Characteristics of Different Style Spray Tips at Varying Speeds and Altitudes from an Unmanned Aerial System** *Alan Leininger*
On Data-driven Crop Yield Modelling, Predicting, and Forecasting and the Common Flaws in Published Studies *Patrick Filippi*	**Enhancing Precision Agriculture Through Dual Weed Mapping: Delineating Inter and Intra-row Weed Populations for Optimized Crop Protection** *Søren Skovsen*	**Spray Deposition Characterization of Uniform and Variable-rate Applications with Spray Drones** *Coleman Byers*
Deep Learning for Predicting Yield Temporal Stability from Short Crop Rotations *M. Etienne Lord*	**SurePoint Ag Systems - Sponsor Presentation** *Bo Downing*	**Comparative Analysis of Spray Nozzles on Drones: Volumetric Distribution at Different Heights** *Thiago Orlando Costa Barboza*
Wheat Spikes Counting Using Density Prediction Convolution Neural Network *Chee Town Liew*		

TUESDAY EVENING

4:45pm – 6:30pm **Poster Session and Reception**

Join us for the Tuesday Evening poster session from 4:45pm to 6:30pm. Poster presenters are asked to be at their poster from 4:45pm to 6:00pm.

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The reception will take place in the exhibit hall so take advantage of connections with our industry supporters and visit with them about their offerings.

6:30pm – 8:00pm **Community Meetings**

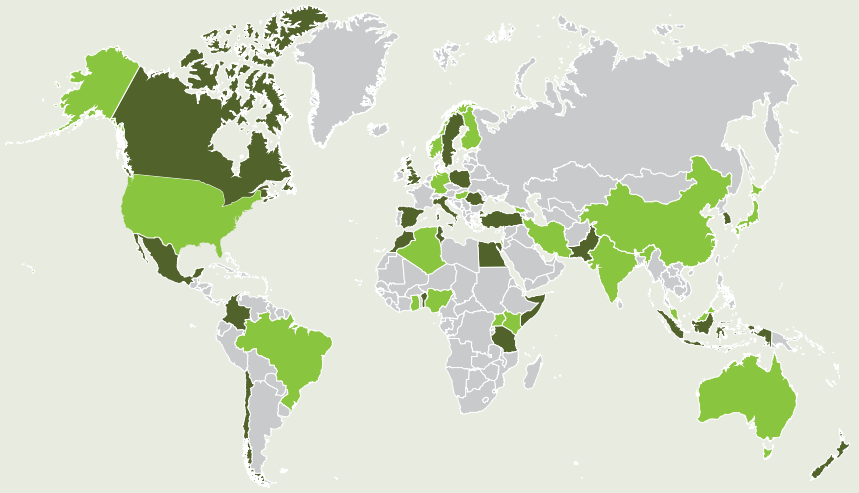
Community meetings are a great opportunity for networking and sharing on initiatives complementary to the ICPA. This meeting can also be used as time to share announcements, upcoming events, and welcome incoming community leadership.

Konza Prairie C	Konza Prairie B	McDowell	Tuttle	Alcove
On-Farm Experimentation Community Meeting *Louis Longchamps*	Precision Agriculture Economics, Profitability, Adoption, and Risk Community Meeting *Karl Behrendt* *Marius Michels*	Precision Nitrogen Management Community Meeting *Brenda Ortiz* *Laila Puntel*	African Association for Precision Agriculture Community Meeting *Kwame Frimpong* *Vincent Aduramigba-Modupe* *Nicodeme Fassinou Hotegni*	Agriculture Data Coalition (ADC) Meeting *Ben Craker*

ISPA
International Society of Precision Agriculture

Country Representatives serve to help promote ISPA by championing the ISPA mission and purpose globally, and in particular, the country they represent.

Country Representatives



Algeria	Salim Lamine
Australia	David W Lamb
Brazil	Ricardo Yassushi Inamasu
Brazil	José Paulo Molin
Canada	Asim Biswas
Canada	Athyna Cambouris
Chile	Rodrigo A Ortega
China	Chunjiang Zhao
China	Wei Deng
China	Yuxin Miao
Colombia	Carlos Mosquera
Egypt	Abdel-Aziz Belal
Finland	Hannu E. S. Haapala
Georgia	Kakha Nadiradze
Germany	Manuela Zude-Sasse
Hungary	Gabor Milics
India	Prem Pandey
Indonesia	Bayu Taruna Widjaja Putra
Iran	Hossein Navid
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New Zealand	Ian J Yule
Nigeria	Femi Adekoya
Norway	Krzysztof Kusnierek
Pakistan	Ejaz Ashraf
Pakistan	Shoaib Rashid Saleem
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Republic of Benin	Nicodeme Fassinou
Republic of Korea (South Korea)	Sun-Ok Chung
Romania	Marcel Ionescu
Somalia	Osman Ahmed
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Sweden	Björn Ringselle
Sweden	Mats Söderström
Tanzania	Musa Mishamo
Tunisia	Mouna Mechri
Turkey	Arif Behiç Tekin
Uganda	Erion Bwambale
United Kingdom	Jim Wilson
United States	Jose A Hernandez

8:30am - 10:00am

Konza Prairie C **Precision Agriculture and Global Food Security** *Moderator: Siva Balasundram*	Konza Prairie B **Site-Specific Nutrient Management** *Moderator: Tina Sullivan*	Konza Prairie A **AI Algorithms Applied to Crop Management** *Moderator: Wade Brorsen*
Single-strip Spatial Evaluation Approach: a Simplified Method for Enhanced Sustainable Farm Management *Subha Srinivasagan*	**Sensor Based Fertigation Management** *Jackson Stansell*	**Explainable Neural Network Alternatives for Ai Predictions: Genetic Algorithm Quantitative Association Rule Mining** *Mary Everett*
Data-driven Agriculture and Sustainable Farming: Friends or Foes? *Yafit Cohen*	**Within-field Spatial Variability in Optimal Sulfur Rates for Corn in Minnesota: Implications for Precision Sulfur Management** *Renzo Negrini*	**Assessing the Variability in Cover Crop Growth Due to Management Practices and Biophysical Conditions Using a Mixed Modeling Approach** *Kushal KC*
Bio-Effectors As a Promising Tool for Precision Agriculture and Integrated Plant Nutrition *Klara Bradacova*	**Optimizing Experimental Design for Determining Economic Nitrogen Levels: Insights on the Use of Monte Carlo Simulations** *Custodio Efraim Matavel*	**Can Soil Fertility Data and Topography Predict Yield Stability Zones for Corn Fields in New York?** *Manuel Marcaida*
Finnish Future Farm Speeding Up the Uptake of Precision Agriculture *Hannu Haapala*	**Quantifying Constant Rate and Sensor-based Variable Rate Nitrogen (N) Fertilizer Response on Crop Vigor and Yield** *Rahul Singh*	**Standards for Data-driven Agrifood Systems, One Year After the ISO Strategic Advisory Group for Smart Farming** *R. Andres Ferreyra*
Farming for a Greener Future: the Behavioural Drive Behind German Farmers' Alternative Fuel Machinery Purchase Intentions *Marius Michels*	**Sampling-based on Plant Vigor Zones As a Strategy for Creating Soil Attribute Maps** *Derlei Melo*	**Deep Learning to Estimate Sorghum Yield with Uncrewed Aerial System Imagery** *Md Abdullah Bari*
	Balancing Water Productivity and Nutrient Use Efficiency: Evaluation of Alternate Wetting and Severe Drying Technology *Jean-Martial Johnson*	**Automating Severity Assessment of Southern Leaf Blight in Maize Leaves Using Machine Learning** *Chanae Ottley*

8:30am - 10:00am

McDowell **Spatio-temporal Analysis for Precision Agriculture** *Moderator: Lorena Lacerda*	Tuttle **Robotics and Automation with Row and Horticultural Crops** *Moderator: Elia Scudiero*	Alcove **Drone Spraying** *Moderator: Joby Czarnecki*
A Data Retrieval System to Support Observational Research of On-Farm Experimentation *Phillip Lanza*	**AI-based Pollinator Using a Robotic Arm** *Hovannes Kulhandjian*	**Static and In-field Validation of Application Accuracy of Commercial Spray Drones at Varying Rates and Speeds** *Ravi Meena*
Method to Optimize Soil Survey for Multiple Soil Property *Diego Sandoval*	**Real Time Application of Neural Networks and Hardware Accelerated Image Processing Pipeline for Precise Autonomous Agricultural Systems** *Jose Mateus Raitz Persch, Rahul Harsha Chepally, Nirajan Piya*	**Spray Deposition and Efficacy of Pesticide Applications with Spray Drones in Row Crops in the Southeastern US** *Simerjeet Virk*
Soybean Production Components As Indicators of Soil Variability As a Subsidy for Precision Agriculture *Eduarda Apolinário*	**Partial Fruitlet Cutting Approach for Robotic Apple Thinning** *Ranjan Sapkota*	**Onboard Weed Identification and Application Test with Spraying Drone Systems** *Yeyin Shi*
Predicting Forage Performance with Geospatial Tools in Low Nutrient Tropical Soils Amended with Biochar Co-compost *Kwame Frimpong*	**Automation of Tractors with GPS Autosteering Systems for Controlled Rows of Horticultural Crops** *Musa Mishamo*	**Treetop Tech: Uplifting German Foresters' Drone Perspectives Through the Technology Acceptance Model** *Hendrik Wever*
Field-level Zoning at Regional Scale Using Remote Sensing and GIS: Lessons Learned from the Desert Agriculture Region of Southern California *Amir Verdi*	**Voronoi-based Ant Colony Optimization Approach: Autonomous Robotic Swarm Navigation for Crop Disease Detection** *Sainath Reddy Gummi, Mohammad Ashik Alahe*	**Content Analysis of the Challenges of Using Drones in Paddy Fields in the Haraz Plain Watershed, Iran** *Giuliano Vitali*
	AI-based Fruit Harvesting Using a Robotic Arm *Hovannes Kulhandjian*	

Wednesday, 24 July 2024

Closing Plenary Session

10:30am **Closing Plenary Session**

Conference Summary
John Fulton

Announcement of the Student Poster Award Winners
presented by:

Upcoming Events
John Fulton

Introduction to the European Precision Application Task Force (EUPAF)
Emilio Gil

ISPA Officer Election Results
John Fulton

The Passing of the Gavel
John Fulton, James Lowenberg-DeBoer, Steve Phillips

Remarks from President Steve Phillips
Steve Phillips

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International Society of Precision Agriculture

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POST CONFERENCE TOUR

Wednesday, 24 July 2024

16th ICPA Post Conference Tour Itinerary

Time	Itinerary
12:30pm	Board the Buses at the Manhattan Conference Center (box lunch on board)
2:00pm	Arrive at Veris Technologies, Inc. for a tour and demonstrations
4:15pm	Arrive at Brian and Lori Martin's Farm for discussion and demonstrations
6:15pm	Arrive at Liquid Art Winery and Estate for tour and reception
8:30pm	Return to Manhattan Conference Center

Veris Technologies, Inc.

While touring the Veris facilities, attendees will learn about real-time soil sensors currently deployed in over 55 countries around the world. They will also see demonstrations of new soil profile scanning technology and get a glimpse into Veris' R&D pipeline.

Brian and Lori Martin's Farm

At Brian and Lori Martin's farm in Clay Center, KS we will have a discussion and Q&A about the tie between research, industry and the farmer. Following the discussion, Kansas State University will lead a series of demonstrations.

The Martins use no-till practices to grow soybeans, corn and wheat on dryland and utilize irrigation as needed. Brian's background with Natural Resources Conservation Services (NRCS) with the USDA has set the foundation for his use of crop rotation practices on his 2,000 acre farm.

As third-generation stewards of the land, the Martins pay close attention to soil quality and use technology to make smart choices. Keeping crop rotation at one-third to one -fourth of each crop works well with their grid Nutri-Track™ system by MFA to optimize nutrient management in crop production. The Martins have always been open to new approaches to farming. In 1985 they introduced terraces, waterways and ponds into their crop land and became 100% no-till in the 1990s.

Liquid Art Winery and Estate

Liquid Art Winery and Estate will be our third and final stop on the post-conference tour. While at Liquid Art, attendees will take a tour of the vineyard, bottling center, and winery. The tour will give an overview of the history of the company and why they chose Kansas as the location of their vineyard. It will also cover the varieties of grapes on the property, the soil chemistry and growing conditions needed for their specialty crops, and the journey from vine to bottle.

The evening will wrap up with a reception in the Liquid Art Event Center. Each tour attendee will receive two drink tickets to try the wine and cider made on-site, and food will be provided.

MONDAY EVENING POSTER SESSIONS

Monday 5:00pm to 6:30pm. See poster locations on page 8.

TOPIC	#	TITLE	PRESENTER
Robotics and Automation Symposium	51	Advancements in Agricultural Robots for Specialty Crops: a Comprehensive Review of Innovations, Challenges, and Prospects	*Marcelo Barbosa - University of Georgia* *Luan Oliveira - University of Georgia*
	50	AgDataBox-IA – Web Application with Artificial Intelligence for Agricultural Data Analysis in Precision Agriculture	*Claudio Bazzi - Technological Federal University of Parana*
	45	Agrosense: AI-enabled Sensing for Precision Management of Tree Crops	*Congliang Zhou - University of Florida* *Yiannis Ampatzidis - University of Florida*
	46	AI Tools in Agri DSS Pipeline - the Case of Irrigated Sugarbeet	*Giuliano Vitali - University of Bologna*
	48	AIR-N: AI-Enabled Robotic Precision Nitrogen Management Platform	*Ankita Kalra - University of Nebraska-Lincoln*
	57	Automated Detection and Length Estimation of Green Asparagus Towards Selective Harvesting	*Yuzhen Lu - Michigan State University*
	44	Creating a Comprehensive Software Framework for Sensor-driven Precision Agriculture	*Oliver Scholz - Fraunhofer Development Center X-Ray Technologies*
	53	Develop Portable Near-infrared Sensing Devices for Rapid Seed Moisture Measuring in Grass Seed Crops	*Jing Zhou - Oregon State University*
	58	Development of a Multispectral Vision-based Automated Sweetpotato Grading System	*Yuzhen Lu - Michigan State University*
	52	Evaluation of a Commercial Robotic Spraying System for Specialty Crops	*Luan Oliveira - University of Georgia* *Marcelo Barbosa - University of Georgia*
	54	Implementation of Autonomous Material Re-filling Using Customized UAV for Autonomous Planting Operations	*Kunjan Theodore Joseph - University of Nebraska-Lincoln*
	55	Integrating Collected Field Machine Vibration Data with Machine Learning for Enhanced Precision in Agricultural Operations	*Shaghayegh Janbazialamdari - Kansas State University*
	49	Portable Soil EC - Development of an Electronic Device for Determining Soil Electrical Conductivity	*Claudio Bazzi - Technological Federal University of Parana*
	56	Utilizing ArUco Markers to Define Implement Boundaries	*Riley Sleichter - John Deere*
Artificial Intelligence (AI) in Agriculture	1	Advanced Classification of Beetle Doppelgängers Using Siamese Neural Networks and Imaging Techniques	*Ronnie Serfa Juan - USDA-ARS/ORISE, Kansas State University*
	2	AI for Precision Crop-fertilisation Using Anaerobic Digestate as an Organic Fertiliser	*Cynthia Okoro Shekwaga - University Academic Fellow*
	3	Detection of Sorghum Aphids with Advanced Machine Vision	*Ivan Grijalva Teran - Kansas State University*
	47	Enhancing Autonomy in Flex-Ro with UNL Farm Scene Dataset for Advanced Object Classification	*Ankita Kalra - University of Nebraska-Lincoln*
	4	Feasibility of PlanetScope Satellite Data and Random Forest Machine Learning Model for Soybean Yield Prediction at Last Three Growth Stages	*Jitender Rathore - Virginia Polytechnic Institute and State University*
	7	Generative Modeling Method Comparison for Class Imbalance Correction	*Benjamin Vail - Kansas State University*
	5	Optimizing Soybean Management with UAV RGB and Multispectral Imagery: a Neural Network Method and Image Processing	*Flavia Luize Pereira de Souza - University of Connecticut*
	35	Predicting Peanut Yield Integrating Topographic Indices and Remote Sensing	*Mailson Freire de Oliveira - University of Nebraska-Lincoln*
	37	Spectral Imaging Deep Learning Mapper for Precision Agriculture	*Antti Lajunen - University of Helsinki*
	36	Unsupervised Techniques for Enhanced Crop Segmentation in Agriculture	*Elias Ennadifi - University of Mons*

MONDAY EVENING POSTER SESSIONS

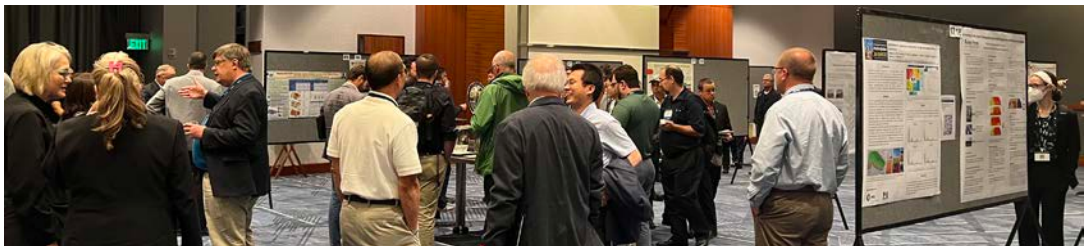
Monday 5:00pm to 6:30pm. See poster locations on page 8.

TOPIC	#	TITLE	PRESENTER
Big Data, Data Mining and Deep Learning	17	Application of Advanced Soft Computing to Estimate Potato Tuber Yield: a Case Study from Atlantic Canada	*Qamar Zaman - Engineering Department, Faculty of Agriculture, Dalhousie University*
	41	Geographic Database in Precision Agriculture for the Development of AI Research	*Claudio Bazzi - Technological Federal University of Parana, Davi Rocha - Federal University of Technology - Paraná/ UTFPR - Computer Science Department - Santa Helena - Bra*
	18	Machine Learning Algorithms in Detecting Long-term Effect of Climatic Factors for Alfalfa Production in Kansas	*Sourajit Dey - Kansas State University*
	16	Potato Disease Detection Using Laser Speckle Imaging and Deep Learning	*Mohamed Salem - North Dakota State University Ahmed Rabia - North Dakota State University*
	19	Simultaneously Estimating Crop Biomass and Nutrient Parameters Using UAS Remote Sensing and Multitask Learning	*Maitiniyazi Maimaitijiang - South Dakota State University Ubaid Janjua - South Dakota State University*
	20	Trends in Agricultural Technology Advancements: Insights from US Patent Analysis	*Priscila Cano - Kansas State University*
Data Analytics for Production Ag	8	A Digital Interactive Decision Dashboard to Analyze, Store and Share Year-to-year Crop Genotype Yield	*Pedro Henrique Magalhaes Cisdeli - Kansas State University*
	9	A Multi-level Filtering Approach for Yield Data Cleaning and Automated Analysis Using R Programming	*Sreeja Vinod - University of Nebraska-Lincoln*
	10	Analytics Model for Predicting Sucrose Percentage in Sugarcane Using Machine Learning Techniques	*Paula Marcela Valencia Ramirez - Providencia*
	6	Computer Vision by UAVs for Estimate Soybean Population Across Different Physiological Growth Stages and Sowing Speeds	*Flavia Luize Pereira de Souza - University of Connecticut*
	11	Environmental Characterization for Rainfed Maize Production in the US Great Plains Region	*Lucas Lingua - Kansas State University*
	12	Ground-based Imagery Data Collection of Cotton Using a Robotic Platform	*Oscar Fernandez - Texas A&M AgriLife Research*
	13	Private Simple Databases for Digital Records of Contextual Events and Activities	*Dennis Buckmaster - Purdue University*
	14	Semiautomatization in Open Source Software of a Method for Monitoring the Land Cover Change with GEE and Sentinel-2	*Sergio Rubaino Sosa - Purdue University*
	15	Spatio-temporal Assessment of Climate Change Impacts on Food Security in Saudi Arabia: a Case Study on Wheat and Barley Yields	*Ahmed Rabia - North Dakota State University*
Decision Support Systems	21	Detailed Derivation of Spatial Soil Attributes Using Soil Sensor Data, Terrain Analysis and Soil Maps with Supervised Classification	*Kurt Heil - Technical University Munich, Chair of Plant Nutrition*
	22	Dimensionality Reduction and Similarity Metrics for Predicting Crop Yields in Sparse Data Microclimates	*Leif Huender - North Idaho College*
	25	From Scientific Literature to the End User: Democratizing Access to Data Products Through Interactive Applications	*Carlos Hernandez - Kansas State University*
	23	Predicting Within-field Cotton Yield Variability Using DSSAT for Decision Support in Precision Agriculture	*Bishnu Ghimire - Texas Tech University*
	24	Simulation of Cotton Yield Variability Within Field Using Crop Model for Application in Precision Agriculture	*Bishnu Ghimire - Texas Tech University*
	26	Sugarcane Yield Mapping Using an On-board Volumetric Sensor	*Julio Masnello - University of São Paulo, Brazil University of Nebraska*

MONDAY EVENING POSTER SESSIONS

Monday 5:00pm to 6:30pm. See poster locations on page 8.

TOPIC	#	TITLE	PRESENTER
Drainage and Irrigation Optimization	27	Delineating Dynamic Variable Rate Irrigation Management Zones	*Ross Unruh - Kansas State University*
	28	Evaluating the Impact of Irrigation Rate, Timing, and Maturity-based Cotton Cultivars on Yield and Fiber Quality in West Texas	*Emily Wieber - Texas Tech University*
	29	Evaluation of Peanut Response to Soil Water Levels Using the Crop Water Stress Index Generated from Infrared Thermal Sensors and Imagery	*Bram Parbi - Auburn University*
	30	Optimizing Corn Irrigation Strategies: Insights from NDVI Trends, Soil Moisture Dynamics, and Remote Sensing	*John Eric Abon - Kansas State University*
	31	Precision Tools for Monitoring Experimental Irrigation Treatments in California Vineyards	*Brent Sams - GALLO*
	32	Prediction of Field-scale Evapotranspiration Using Process Based Modeling and Geostatistical Time-series Interpolation	*Gaurav Jha - Kansas State University*
	33	Use of Radar SAR Images to Assess Soil Moisture in Cane Crops: Practical Implications in Agricultural Operation	*Julian Fernando Mateus Rodriguez - Cenicaña*
	34	Using Simulation Modeling to Evaluate the Corn Response to Deficit Irrigation Imposed During Reproductive Period	*Sr Jhoan Velasco - Auburn University*
Farm Animals Health and Welfare Monitoring	59	3D Computer Vision with a Spatial-temporal Neural Network for Lameness Detection of Sows	*Yuzhen Lu - Michigan State University*
	60	Bird Welfare and Comfort in Poultry Coops Through Computations and AI	*Ramana Pidaparti - University of Georgia*
	61	Determining Desirable Swine Traits that Correlate to High Carcass Grades for Artificial Intelligence Predictions	*Ariana Spina - The Ohio State University*
	62	Lameness Detection in Dairy Cattle Using GPS and Accelerometers Wearable Sensors	*Nokuthula Mhlongo - Wageningen University and Research*
	63	Utilizing Image-based Artificial Intelligence for Grading Bovine Oocytes	*Grace Koppelman - The Ohio State University*
Wireless Sensor Networks and Farm Connectivity	38	Affordable Telematics System for Recording and Monitoring Operational Data in Crop Farming	*Antti Lajunen - University of Helsinki*
	42	AgDataBox-IoT – Managing IoT Data and Devices on Precision Agriculture	*Claudio Bazzi - Technological Federal University of Parana*
	39	Crop and Water Monitoring Networks with Low-cost, Internet of Things Technology	*Ansley Brown - Colorado State University*
	40	Optimizing the Connectivity of Wireless Underground Sensor Networks	*Mingqiang Han*
	43	Recovery Mechanism for Real-time Precision Agriculture Sensor Networks: a Case Study	*Lacey Hunt - University of Idaho*



TUESDAY EVENING POSTER SESSIONS

Tuesday 4:45pm to 6:30pm. See poster locations on page 8.

TOPIC	#	TITLE	PRESENTER
In-Season Nitrogen Management	1	Assess the Feasibility of Remote Sensing Vegetation Index for In-season N Status Evaluation with Nitrogen Measurement from Commercial Field	*Anh Nguyen - Auburn University*
	2	Assessing the Nutritional Status of Field Crops by Remote Sensing During the Growing Season	*Beáta Šusliková - Mendel University*
	3	Developing a Decision Support Model for Informing N Fertilization in Corn	*Leonardo Lemes Bosche - Kansas State University*
	4	Estimating Crop N Requirements Using Crop Models and Remote Sensing in Site-specific Management Zones	*Raghav Joshi - Kansas State University*
	5	Evaluation of Fall and Spring Nitrogen Rates Effect on Cereal Rye Forage Crude Protein and Tillering Using NDVI and Canopeo to Make Infield Nitrogen Rate Decisions	*Kendra Stahl - The Ohio State University*
	6	Improving Winter Wheat Nitrogen Status Monitoring Using Proximal Canopy Sensing and Agrometeorological Information with Machine Learning	*Xiaokai Chen - Northwest A&F University*
	7	In-Season Nitrogen Management for Wheat in Tunisia Using Proximal and Remote Sensing	*Omran Alshihabi - Swedish University of Agricultural Sciences*
	8	In-Season Nitrogen Management: Leveraging Data Visualization for Precision Agriculture	*Chathurika Narayana - University of Nebraska-Lincoln*
	9	Potential Benefits of Variable Rate Nitrogen Topdressing Strategy Coupled with Zoning Technique: a Case Study in a Town-scale Rice Production System	*Xiaojun Liu - Nanjing Agricultural University*
	10	Proximal, Drone, and Satellite Sensors for In-season Variable Nitrogen Rate Application in Corn: a Comparative Study of Fixed-rate and Sensor-based Approaches	*Amrinder Jakhar - University of Georgia*
	11	Using Dynamic Crop Growth Data to Assess Early Season N Status in Maize	*Alex Yore - Cornell University*
Land Improvement and Conservation Practices	45	Biochar Synthesis, Its Impact on Different Soils and Canola Growth	*Masooma Hassan - Macquarie University*
	46	Delineating Management Zones for Optimizing Soil Phosphorus Recommendations Under a No Till Field in Eastern Canada	*Athyna Cambouris - Agriculture and Agri-Food Canada*
	47	Effects of Fallow Management Practices on Soil Water, Crop Yield and Water Use Efficiency in Winter Wheat Monoculture System: a Meta-analysis	*Muhammad Adil - Henan University*
	48	Estimating Spatial and Temporal Variability in Soil Respiration Using UAV-based Multispectral and Thermal Images in an Irrigated Pistachio (*Pistachia Vera L.*) Orchard	*Anish Sapkota - UC Davis*
	49	Fertigation Management Strategies Effect on Residual Nitrates in the Soil Profile and Ground Water	*Katie Bathke - University of Nebraska-Lincoln*
	50	Plant-protecting Potential of Biostimulants Against Septoria Tritici in Winter Wheat Under Different N Supply	*Klara Bradacova - University Hohenheim*
	51	Soil Microbial Biomass and Bacterial Diversity Enhanced Through Winter Cover Cropping in Paddy Fields	*Shumei Cai - Cornell University*
	38	Spatial and Temporal Variability of Soil Biological and Chemical Parameters Following the Introduction of Cover Crops into a Conventional Corn-cotton Rotational System	*Joby Czarnecki - Mississippi State University*
On Farm Experimentation with Site-Specific Technologies	12	Driving Growth Through Precision Agriculture: the Evolution of the Nebraska On-farm Research Network	*Bruno Tobaldo - University of Nebraska*
	13	On-farm Experimentation Case Study in Brazil: Evaluation of Soybean Seeding Rate Using Resources Available at the Farm	*Israel Molina Cyrineu - Oklahoma State University*

TUESDAY EVENING POSTER SESSIONS

Tuesday 4:45pm to 6:30pm. See poster locations on page 8.

TOPIC	#	TITLE	PRESENTER
Precision Crop Protection	52	Application Accuracy of Two Different Sprayer Flow Control Systems During Site-specific Pesticide Applications	*Ravi Meena - University of Georgia*
	53	Assessing Spray Coverage Variability of an Under-canopy Robotic Sprayer System in Sorghum Crop	*Prashanta Pokharel - University of Kentucky*
	36	Development of a High-throughput UAV System for Precision Weed Detection and Control Using Laser Speckle Imaging and UV-C Irradiation	*Mohamed Salem - North Dakota State University* *Ahmed Rabia - North Dakota State University*
	54	Effect of Application Rate and Height on Spray Deposition and Efficacy of Fungicides Applied with a Spray Drone in Corn	*Coleman Byers - University of Georgia*
	55	Evaluation of the Effect of Different Herbicide Treatments by Using UAV in Maise (*Zea mays L.*) Cultivation – First Experiences in a Long-term Experiment at Széchenyi István University, Hungary	*Istvan Kulmany - Széchenyi István University*
	56	Fungicide Application Methods and Corn Variety Effect on Corn Silage Deoxynivalenol Levels	*Jason Hartschuh - The Ohio State University*
	57	Integration of Post Emergence Herbicide (PoE) with Nano-urea for Optimized Management of Weed in Indian Black Mustard (*Brassica Juncea L.*)	*Udit Debangshi - Kansas State University*
	58	System Development for Application and Testing of Spray-on Biodegradable Mulch	*Nirajan Piya - Kansas State University*
Proximal and Remote Sensing of Soils and Crops (including Phenotyping)	24	Airborne Spectral Detection of Leaf Chlorophyll Concentration in Wild Blueberries	*Kallol Barai - University of Maine*
	25	Comparative Analysis of Different On-the-go Soil Sensor Systems	*Haitam Moulay - Oklahoma State University*
	26	Eco-friendly LiDAR Drone Surveying for Sugarcane Land Leveling in the Cauca River Valley, Colombia	*Julian Fernando Mateus Rodriguez - Cenicaña*
	27	Field Mapping for Aflatoxin Assessment in Peanut Crops Using Thermal Imagery	*Sandesh Shrestha - University of Georgia*
	28	Growth Analysis on Cotton Using Unoccupied Aerial Systems (UAS) Based Multi-temporal Canopy Features	*Sindhu Palla - Kansas State University*
	29	Hyperspectral Analysis of Mycotoxins to Identify Sensitive Wavelengths for Identifying Contaminated and Clean Corn	*Ruth Kerry - Brigham Young University*
	37	Predicting Soil Cation Exchange Capacity from Satellite Imagery Using Random Forest Models	*Ivo Muller - Mississippi State University* *Joby Czarnecki - Mississippi State University*
	30	Relationship Between Water Use Efficiency, Daily Stomatal Conductance Trend and Evaporation of Maize and Soybean Crops	*Junxiao Zhang - University of Nebraska-Lincoln*
	31	UAV Multispectral Data As a Suitable Tool for Predicting Sweetness, Size, and Yield of Vidalia Onions	*Marcelo Barbosa - University of Georgia* *Luan Oliveira - University of Georgia*
	32	Using Drone Remote Sensing for Phenotyping Hessian Fly Resistance in Wheat	*Trevor Witt - Kansas State University*
	33	Using Remote Sensing to Evaluate Cover Crop Performance and Plan Variable Rate Management	*Sergio Rubaino Sosa - Purdue University*
	39	Using Remote Sensing to Quantify Biomass in Alfalfa	*Matias Lucero - Kansas State University*
	35	Utilizing Thermal and RGB Imaging for Nutrient Deficiency and Chlorophyll Status Evaluation in Plants	*Ahmed Rabia - North Dakota State University*

TUESDAY EVENING POSTER SESSIONS

Tuesday 4:45pm to 6:30pm. See poster locations on page 8.

TOPIC	#	TITLE	PRESENTER
Scouting and Field Data collection with Unmanned Aerial Systems	40	Comparison of NDVI Values at Different Phenological Stages of Winter Wheat (*Triticum Aestivum L.*)	*Sándor Zsebő - Széchenyi István University*
	41	Monitoring and Mapping of Weed Canopy Cover Using Drone Data	*Judith Oppong - Tennessee State University*
	34	Spectral Response of Six Treatments of Soil Fertilization in Potato (*Solanum tuberosum L.*) Var. Diacol Capiro with UAS	*Sergio Rubaino Sosa - Purdue University*
	42	Vegetation Coverage Specific Flower Density Estimation in Blackberry Using Unmanned Aerial Vehicle (UAV) Remote Sensing	*Akwasi Tagoe - University of Arkansas*
Site-Specific Nutrient, Lime and Seed Management	14	Assessing Crop Yield and Profitability with Site-specific Seed Rate Management in Corn and Soybean Cropping Systems	*Asbin B K - University of Missouri-Columbia*
	15	Comparing Proximal and Remote Sensors for Variable Rate Nitrogen Management in Cotton	*Anish Bhattarai - University of Georgia*
	16	Enhancing Phosphorus Nutrient Management in Corn Through Tissue Analysis and Diagnostic Tools	*Gustavo Roa Acosta - Kansas State University*
	17	Improving Site-specific Nutrient Management in the Southeastern US: Variable-rate Fertilization Based on Yield Goal by Management Zone	*Dalton Beasley - University of Georgia*
	18	Influence of Potassium Variability on Soybean Yield	*Jolee Derrick - Oklahoma State University*
	19	Optimizing Chloride (Cl) Application for Enhanced Agricultural Yield	*Flavia Luize Pereira de Souza - University of Connecticut*
	20	Optimizing Soil Nutrient Management: Agricultural Policy/environmental Extender (APEX) Model Simulation for Field Scale Phosphorous Loss Reduction in Virginia	*Sheetal Kumari - Virginia Tech*
	21	Response of Canola and Wheat to Application of Enhanced Efficiency Nitrogen Fertilizers on Contrasting Management Zones	*Haben Asgedom - Agriculture and Agri-Food Canada*
	22	Site Specific Evaluation of Dynamic Nitrogen Recommendation Tools	*Seth Norquest - University of Nebraska*
	23	The Evaluation of Spatial Response to Potassium in Soybeans	*Samuel Akin - Oklahoma State University*
Small Holders and Precision Agriculture	59	Differential Response of Pro-vitamin A Cassava Cultivars to Nitrogen Fertilization in Nigeria	*Vincent Aduramigba-Modupe - Institute of Agricultural Research and Training*
	60	Exploring Crop Suitability in Senegal Across Global Warming Scenarios: an In-silico Approach	*Ana Julia P Carcedo - Kansas State University*
	61	Potential for Improving African Smallholder Cereal Farming Using Sentinel-2A Spectral Reflectance	*Aicha Biaou - Oklahoma State University*

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