PURDUE UNIVERSITY
Institute for Digital and Advanced Agricultural Systems

IDAAS Newsletter
November 2025

Directors' Opening

What is your title? Does it cover all that you do? Do you plan events (event planner)? Do you teach (instructor)? Do you write (author)? Do you manage people, processes, projects, or facilities (manager)? Do you present (speaker)? Do you help yourself and others work through sticky situations (Problem solver)? Do you post/share information (influencer)? I have shared in multiple situations that when data science became a real thing, I didn't consider myself a data scientist. Then after learning more, I realized I actually was one. I also used to say "I don't really do AI"; then I learned how other people were using it and joined the club. We all have complex positions that cover a wide range of skills we have or are developing. Don't forget that you are unique in the blend you bring.

Now back to data science for a quick minute ... I don't think it is just me, but I keep noticing that data management surfaces as a challenge across many disciplines. Do you and your lab do well on this front? Could you say your data is "tidy"? Did you avoid clipboards and slips of paper and go digital from the start? Is it secure and backed up? Can you find it? Is it accessible to you and others who legitimately should have access? Is it interoperable in a way that someone could use it analytics software or to feed a dashboard of some type? Is it fully contextualized with metadata so that it could have lasting value to a future you or someone else? I guess if any of this makes you squirm or flinch even a little, some strategizing for a better path forward seems fitting. That's the set-up for this month's limerick:

A researcher with notes that would scatter,
Migrated to digital matter.
With columns and rows,
Order constantly shows,
Now yield and insight come much faster.

Wishing you the best,

Dennis R. Buckmaster Ignacio Ciampitti

Seminars * Webinars * Events

SyDAg 2025: A Landmark Celebration of Digital Agriculture Innovation

The first annual Symposium of Digital Agriculture (SyDAg 2025), hosted by the Institute for Digital and Advanced Agricultural Systems (IDAAS) at Purdue University, was a phenomenal success — a vibrant celebration of innovation, collaboration, and the future of ag-tech.

With more than 140 attendees, this student-led event brought together world-class researchers, industry leaders, and emerging innovators, all united by a shared vision: to make digital agriculture impactful, intuitive, and accessible for growers and stakeholders everywhere.

IDAAS had the distinct pleasure of welcoming Purdue President Dr. Mung Chiang and Dean of Agriculture Dr. Bernie Engel, whose opening remarks set an inspiring tone for the day. Their words underscored Purdue's commitment to leading the global digital agriculture revolution and empowering the next generation of innovators.

From Dr. Xin (Rex) Sun, Endowed Chair and Director of the Peltier Institute for Advancement in Agricultural Technology at North Dakota State University, to speakers Dr. Elizabeth Hawkins (Ohio State University), Dr. Eric Schultz (Corteva Agriscience), and Dr. Kaiyu Guan (University of Illinois Urbana-Champaign), each presentation highlighted the powerful intersection of AI, data, and agriculture shaping the future of food systems.

The SyDAg Hackathon, powered by the Rosen Center for Advanced Computing (RCAC) and Bayer Crop Science, challenged students to harness Purdue's Anvil supercomputer to create real-world ag-tech solutions. Over $5,000 in student awards were presented, recognizing outstanding research, posters, and innovation.

SyDAg's reach extended well beyond campus, with livestreamed sessions and international watch parties at EARTH University and UTEC University connecting participants across the Americas. More than 35 research posters are now published in Purdue e-Pubs, expanding access to cutting-edge digital agriculture research.

A heartfelt thank you goes to our generous sponsors — Corteva Agriscience, John Deere, Bayer Crop Science, Beck's Hybrids, Indiana Corn Marketing Council, Indiana Soybean Alliance, CNH, aerialPLOT, and RCAC — as well as Purdue's College of Agriculture departments that supported the poster awards.

Finally, sincere appreciation to the 2025 SyDAg Organizing Committee for their dedication and creativity, guided by mentors Dr. Ignacio Ciampitti, Dr. Ankita Raturi, and Melinda Smith.

Planning is already underway for SyDAg 2026, returning next October. Stay tuned as IDAAS continues to lead the charge in building a future where technology, data, and agriculture grow together.

Get ready for our coming event, October 2025!
DATA-DRIVEN
DECISION-MAKING
PURDUE

SyDAg Crew

Advancing Collaboration in One Health and Digital Technologies

On November 4th, faculty, researchers, and affiliates from across Purdue University gathered in Pfendler Hall for the One Health and Digital Technologies Event, co-hosted by the Institute for Digital and Advanced Agricultural Systems (IDAAS) and Purdue Veterinary Medicine.

The day-long event explored how digital tools and data-driven innovation can strengthen One Health initiatives—bridging the connections between animal, human, and environmental health. Through presentations, breakout sessions, and collaborative discussions, participants examined how technologies such as precision agriculture, disease modeling, AI analytics, and digital diagnostics can power interdisciplinary solutions for global challenges.

The program opened with remarks from Dr. Dennis Buckmaster, Director of IDAAS, followed by an overview of Purdue's One Health Structure and Strategy from Kaethe Beck, Assistant Vice President for Strategic Impact in Life and Health Sciences. Aaron Schacht, CEO of BiomEDIT, shared valuable insights into the challenges and opportunities shaping One Health innovation today.

Interactive breakout sessions invited participants to dive deeper into specific focus areas:

- Grown with Precision, Designed for Health
- Disease Modeling, Analytics & Surveillance
- Novel Diagnostics, Therapeutics & Devices

Facilitated by Dr. Tim Lescun, Dr. Luiz Brito, and Dr. Ilya Slizovskiy, these sessions fostered cross-disciplinary dialogue and sparked ideas for future research collaborations.

The event concluded with closing remarks from Dr. Ignacio Ciampitti, Co-Director of IDAAS, who emphasized the importance of continued partnership and the creation of white papers and joint research projects emerging from these conversations.

Special thanks to all who contributed to this productive and inspiring day, especially Dennis Buckmaster, Kaethe Beck, Aaron Schacht, Luiz Brito, Tim Lescun, Ilya Slizovskiy, and Ignacio Ciampitti for sharing their expertise and leadership.

We look forward to seeing the collaborations, proposals, and innovations that will grow from this event.

Stay connected with IDAAS and Purdue Veterinary Medicine for upcoming opportunities to advance One Health through digital innovation.

Research – Potential Areas of Excellence
Grown with Precision; Designed for Health
Disease Modeling, Analytics, and Surveillance
Translational Health and Delivery of Care
Novel Diagnostics, Therapeutics, and Devices
Precision Agriculture
Nutrient and Nutrition-Centered Health
Applied Microbiome
Sustainable Agriculture
Food for Health
PURDUE UNIVERSITY

Kaethe Beck, Assistant Vice President for Strategic Impact in Life and Health Sciences for the Institutes and Centers in Discovery Park, jump-starts the One Health and Digital Technologies event

2025 Industry Experts Lead the Conversation in the IDAAS Fall Seminar Series

The IDAAS Data-Driven Seminar Series is in full swing this fall, featuring an impressive lineup of industry experts who are leading innovation across digital agriculture. This semester, IDAAS is highlighting voices from industry to showcase how data, AI, and advanced technologies are transforming real-world agricultural systems.

Fall 2025 Speakers:

- **October 23:** Mike Van Koevering, Senior Director – Elanco & Eric Schilling, Global Learning & Development Director – Elanco
- **November 6:** Ryan Bartlett, Chief Technology Officer – Pairwise
- **November 20:** Sanjeewa Narayana, IT Technician – University of Guelph (Virtual)
- **December 4:** Aaron Shew, Vice President of Product & Data – ACRES

If you missed a session, recordings are available on the IDAAS Seminar Series webpage. Watch for the Spring 2026 line-up coming soon.

Research Spotlight

Advancing AI-Based Operational Surveillance for Plant Disease Monitoring in Corn

Emerging diseases such as corn tar spot threaten crop biosecurity and agricultural sustainability in the U.S. Midwest and beyond. To address this challenge, a Purdue University team is developing AI-driven surveillance systems for real-time detection and management of plant disease epidemics.

Central to this effort is an AI model for tar spot quantification, created through collaboration between the Cruz Lab (College of Agriculture) and the SmartInformatix Lab led by Dr. Mohammad Jahanshahi (College of Engineering). Their combined expertise in plant epidemiology and computer vision enables accurate disease quantification under complex field conditions. The model is being refined to include predictive simulations that support dynamic decision-making.

Recognizing that corn tar spot is an international challenge, Cruz also collaborates with experts across the Americas, including Dr. Steve Goodwin (USDA-ARS), Dr. Carlos Góngora (Tecnológico Nacional de Mexico), Dr. Joaquín Ramirez (National University of Colombia), and Dr. César Falconí (University of the Ecuadorian Armed Forces). These partnerships strengthen epidemiological frameworks, support cross-regional data collection, and create opportunities for students and staff to engage in collaborative research.

Building on foundational Purdue AI Fusion, AgEng, and AgSeed support, the team is advancing core components of a next-generation AI-powered syndromic surveillance and decision support system. This effort aims to establish the essential framework for implementing real-time surveillance, predictive forecasting, and decision support at scale. It benefits from close collaboration with academic partners and industry innovators such as Solinftec, ensuring that research outcomes align with practical needs and can be scaled effectively. The team's vision is shaped by local, national, and international collaborations, as well as by global conversations, including a recent contribution to the international dialogue on plant disease surveillance and epidemiological modeling: https://apsjournals.apsnet.org/doi/10.1094/PHYTO-11-24-0359-FI

In cooperation with Dr. Ignacio Ciampitti, Co-Director of the Purdue Institute for Digital and Advanced Agricultural Systems (IDAAS), the team is developing strategies to align with quality management systems and industry best practices. Drawing on consulting expertise with industry experience, the researchers emphasize that institutional readiness is a critical factor. These foundational steps will enable the future deployment of robust decision-support platforms a scale.

To learn more about Purdue's interdisciplinary and international approach to digital agriculture and plant disease monitoring, visit:

- https://ag.purdue.edu/news/2024/08/purdue-researchers-adopt-interdisciplinary-approach-to-assessing-emerging-tar-spot-disease-in-corn.html
- https://purdueag.exposure.co/revealing-tar-spot-microbiology

Extension Spotlight

IDAAS Extension in Action

October was a busy and productive month for the IDAAS Extension team, filled with outreach, education, research, and collaboration across Indiana. From UAV demonstrations to cover crop applications and student engagement, the team continues to bring digital agriculture to life through hands-on learning and real-world impact.

Field & Demonstration Highlights: This month featured several successful UAV (drone) flights and cover crop applications at ACRE, including work supporting ongoing agronomy and soil health research. The team also presented UAV demonstrations to diverse audiences—sparking curiosity and excitement about technology in agriculture.

- **October 4:** UAV Talk and Demonstration at the Academy of Science (37 attendees including 32 fifth graders)
- **October 20:** Panelist at the Symposium of Digital Agriculture (SyDAg 2025)
- **October 29:** Drone Demonstrations at Fair Oaks Farms, reaching nearly 400 FFA students and advisors

Consultations & Outreach: Throughout the month, the team provided personalized consultations to strengthen digital ag education and on-farm implementation, including:

- 5 teachers
- 2 farmers
- 4 Extension educators

These efforts reflect IDAAS's commitment to connecting technology and data-driven tools directly with those who benefit most—producers, educators, and students.

Professional Development & Collaborations: Team members participated in numerous professional development meetings and initiatives, including Field Crops, ANR Updates, Digital Ag in Extension, and RCPP Project discussions. Additional October accomplishments included:

- Seeding cover crops at ACRE using the T50 Drone
- Completing the Cover Crop Winter Kill and Injury commodity grant report
- Submitting a SARE grant proposal to train the trainers
- Participating in Tri-State PoTF training wrap-up
- Planning the upcoming LSLA event with FNR faculty
- Preparing for the Spring UAV Agronomy Course with Dr. Lee Schweitzer

From empowering the next generation of agricultural leaders to advancing applied research, October showcased the depth of collaboration and innovation happening within IDAAS Extension.

Free and Forever: Smarter Farm Data Capture

A recent Farm Progress feature highlights how structured data collection is reshaping farm management—showing that even simple, consistent recordkeeping can unlock powerful insights, no complex systems required.

When farmers log data in an organized way, they open the door to smarter decisions around budgeting, scheduling, nutrient management, and equipment efficiency. It's a reminder that meaningful innovation often starts small—with a clear, consistent data story.

At IDAAS, we're committed to helping farmers turn field notes into digital insights—

bridging the gap between everyday recordkeeping and AI-driven decision tools that advance productivity and sustainability across agriculture.

🔗 Read the full article by Adam Shanks and Dennis Buckmaster here.

MACS Academy Visits OATS and IDAAS

Several agricultural consultants visited the Purdue Open Ag Technology and Systems Center on November 1. Sami Basir, Harsh Pathak, Fabio Castiblanco, and Dennis Buckmaster provided presentations and demonstrations on enhanced data management, AI applications in agriculture, modeling for improved nitrogen decision-making, and Internet of Things (IoT) technologies developed in Purdue laboratories. Aaron Ault followed with a demonstration showcasing real-world computations used in blockchain technologies.

Fabio Castiblanco explains the IoT pipeline developments out of OATS and IoT4Ag to a group of agricultural consultants

Purdue and Google Host 2nd Annual AI Summit; Showcasing Statewide Collaboration and IDAAS Leadership

Purdue University, in partnership with Google, successfully hosted the second annual AI Summit on November 13 at the Hyatt Regency Indianapolis. The event brought together leaders from industry, academia, and government for a full day of discussions on the advancement and responsible adoption of artificial intelligence across key sectors.

A central theme of the summit was the power of collaboration, and the Institute for Digital and Advanced Agricultural Systems (IDAAS) played a visible role in representing Purdue's leadership in digital agriculture. IDAAS highlighted ongoing efforts to integrate AI into agricultural research, field-based technologies, and data-driven decision-making to support farmers, industry partners, and communities across Indiana.

Throughout the summit, several sessions emphasized how AI is transforming agriculture, sustainability, and food systems—areas closely aligned with the mission and expertise of IDAAS. Attendees had opportunities to learn about the institute's applied work in UAV technologies, predictive analytics, and digital tools that enhance on-farm productivity and resilience. IDAAS team members also engaged with cross-sector partners to explore new collaborations and opportunities for innovation.

The summit reinforced the need for coordinated, forward-looking strategies that connect technology development, research, and real-world implementation. IDAAS's presence underscored Purdue's commitment to ensuring that agricultural innovation remains central to statewide AI conversations.

With valuable insights, strengthened partnerships, and a growing network of collaborators, the AI Summit once again proved to be a key event in advancing Indiana's leadership in artificial intelligence. The involvement of IDAAS further highlighted the critical role that digital agriculture plays in shaping the future of AI-driven solutions.

AI FOR AGRICULTURE & FOOD SYSTEMS

Ignacio Ciampitti, Co-Director of IDAAS and Professor in Agronomy, serves on the panel at the AI Summit, along with other Purdue powerhouses

Education Spotlight

AgBridge 2025: Bringing Digital Agriculture to Middle and High School Classrooms

This fall, Purdue launched the AgBridge 2025 initiative aimed at equipping middle and high school students—especially those in rural and underserved communities—with hands-on experience using digital agriculture technologies.

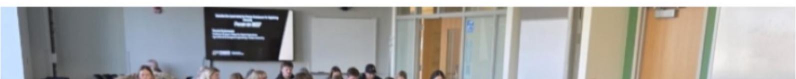
The program, led in part by Yaguang Zhang (Clinical Assistant Professor, Online Education & Agricultural Engineering), addresses the "rural digital gap" by providing schools with equipment and curriculum support so that students can engage with data-driven farming, IoT sensors, and precision-ag practices.

By linking agricultural STEM content with real-world farm-tech challenges, AgBridge 2025 hopes to inspire the next generation of ag-tech innovators—and to embed digital competence in regions that often lack the resources to adopt emerging tools.

Read the full article here.

Airtable in HORT 31800 and ANSC 44100

By request of Dr. Ron Lemenager and Dr. Petrus Langenhoven, Dennis Buckmaster visited their Beef Management and Field Production of Horticultural Crops courses to demonstrate the private databases approach to digital records. These students got a quick introduction to tidy data, data types, importance of data validation, and value of records for decision making. Within a single lab period, students learned about multiple applications of the same approach and were able to customize a database for their operation (whether real or hypothetical). With proper guidance, the road from novice to effective user is short!



Introduction (and more) to Private Databases for Digitizing Records
Focus on BEEF
Dennis Buckmaster
Professor & Dean's Fellow for Digital Agriculture
Agricultural & Biological Engineering, Purdue University

Purdue Animal Science students are customizing a beef herd records database

Digital Ag in the News

AI on the Farm: Insights From Dr. Dennis Buckmaster

Dr. Dennis Buckmaster of Purdue University recently shared how AI is transforming agriculture in an interview with CNH Industrial. From image-processing to generative AI dashboards, smart farm equipment helps farmers reduce waste, stress, and errors while improving efficiency.

Dr. Buckmaster emphasizes treating AI as a trusted adviser—not perfect, but invaluable when paired with high-quality data. Advances in IoT, edge computing, and connectivity are making real-time monitoring and automation possible even in rural areas. Looking ahead, generative AI may serve as an "always-available adviser," turning decades of farm data into actionable insights.

Read the full interview here.

IDAAS and Animal Science Research Recognized Among Top 100 Most Cited Papers in Journal of Dairy Science

We are thrilled to share that a recent paper from the Purdue Animal Science Data Ecosystem (PASDE) project has been recognized as one of the 100 most cited papers in the Journal of Dairy Science since 2022. This work, led by Dr. Luiz Brito of the Institute for Digital and Advanced Agricultural Systems (IDAAS) and the Department of Animal Science, reflects years of dedication and significant support from Purdue's College of Agriculture.

The paper, "Genomic-based genetic parameters for resilience across lactations in North American Holstein cattle based on variability in daily milk yield records" (Chen et al., 2023, J Dairy Sci. 106:4133–4146), investigates genetic factors influencing resilience in dairy cows, leveraging daily milk yield data to enhance understanding of long-term productivity and animal welfare. You can read the full publication here.

Recognition from the Journal of Dairy Science and JDS Communications highlights the impact of this research on the dairy industry and underscores the importance of data-driven approaches in advancing livestock science.

Congratulations to Dr. Brito, his co-authors, and the PASDE team for this outstanding achievement!

Conference Info

Dr. Ignacio Ciampitti - Named 2025 CSSA Fellow

We are pleased to announce that Dr. Ignacio Ciampitti, Professor of Agronomy and Co-Director of the Institute for Digital and Advanced Agricultural Systems (IDAAS), has been selected as a 2025 Crop Science Society of America (CSSA) Fellow — the highest honor awarded by the society.

This prestigious recognition highlights Dr. Ciampitti's exceptional leadership and innovative contributions to the fields of agronomy and digital agriculture. His work continues to advance data-driven decision-making, improve crop management strategies, and strengthen the technological foundations needed for a more sustainable and resilient agricultural future.

Dr. Ciampitti's dedication to integrating advanced analytics, AI, and field-based research has made a significant impact not only at Purdue University but across the global agricultural community.

Please join us in congratulating Dr. Ciampitti on this well-deserved achievement!

Dr. Ignacio Ciampitti at CSSA

2026 AI in Agriculture Conference - Raleigh, NC

The 2026 AI in Agriculture Conference will take place March 31 – April 2, 2026, at the StateView Hotel & Conference Center, adjacent to NC State University. This national forum will gather researchers, students, industry professionals, and extension specialists to explore how AI, data science, and robotics are transforming agriculture. (Conference Details)

Ignacio Ciampitti is serving on the organizing committee and has developed a panel featuring several Digital Agriculture directors, which he will moderate. He will also present his role as a co-lead of the NASA Acres FIAT project (see details here: https://www.nasaacres.org/fiat). This will be an excellent opportunity to highlight IDAAS's leadership, contributions, and impact within the AI and digital agriculture community.

Conference Highlights Include:

- Plants & Crops: precision agriculture, phenotyping, pest/disease detection
- Animals & Livestock: sensing, automation, and health monitoring

- Soils, Water, Air & Environment: AI for soil health, nutrient/water management, climate adaptation
- Food & Supply Chains: traceability, post-harvest analytics, and logistics
- AI Systems & Integrative Approaches: robotics, digital twins, and decision support
- Cross-cutting: extension, workforce development, and adoption of AI technologies

Abstract submission is open until January 12th, 2026!

All abstracts must be written in English and submitted through the conference portal. Abstracts will be peer-reviewed by the program committee. Notification of acceptance is provided on a rolling basis, and at least one author must be registered for the conference to present.

This conference is a must-attend for anyone interested in the future of agriculture, AI applications, and digital innovation.

Learn more and register here.

Connect with IDAAS as an Affiliate

The Institute for Digital and Advanced Agricultural Systems (IDAAS) invites Purdue faculty and staff to become affiliates and join our growing network of researchers and innovators. Affiliates are engaged in areas such as digital agriculture, AI, advanced sensing, data analytics, automation, and related technologies that are shaping the future of agriculture and food systems.

The challenges in these fields are complex and rapidly evolving. Tackling them requires a collaborative, transdisciplinary approach—one that aligns closely with Purdue’s Land Grant Mission of building human capital, advancing solutions to pressing global challenges, and partnering deeply with industry and community stakeholders.

To be included in the IDAAS directory of faculty and staff affiliates, please complete the short survey below:

- New affiliates: fill out the form to be added.
- Current affiliates: use the same form to update your information.

Affiliate Form – IDAAS Directory

Digital Identity

What is Digital Agriculture? It's the use of digital devices to gather, process and analyze spatial and/or temporal data. This data can then guide targeted actions to improve agricultural efficiency, productivity and sustainability.

Contributions to this newsletter are welcomed. Please send your ideas, ideally about one paragraph with links and a photo, to digitalag@purdue.edu.