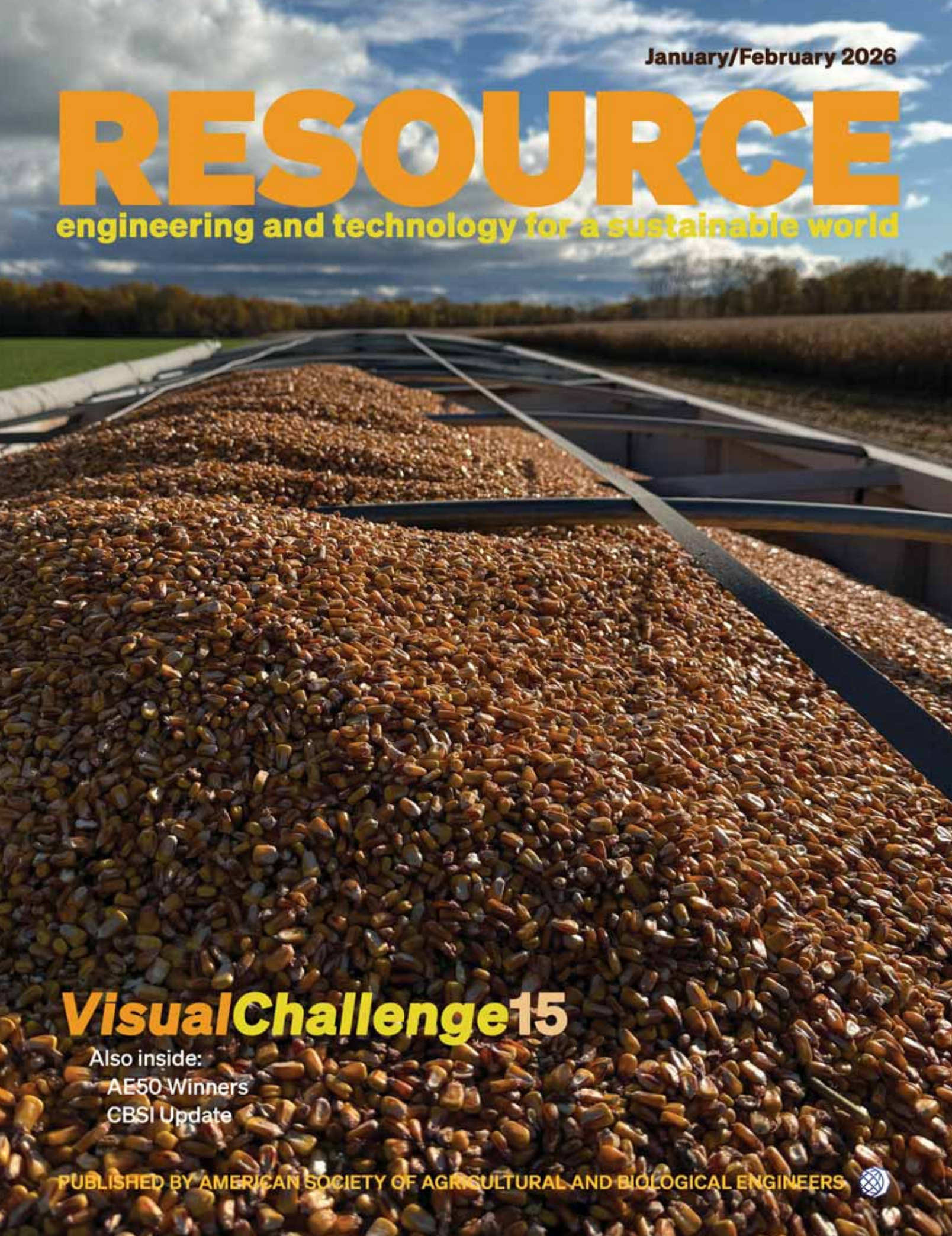
January/February 2026

RESOURCE

engineering and technology for a sustainable world



VisualChallenge15

Also inside:
- AE50 Winners
- CBSI Update

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Engagement and Connection

Last year had its share of challenges for all of us, but three words resonate the most with me: thankful, grateful, and blessed.

In recent weeks, I've paused to reflect on the past, present, and future. As you may recall from my remarks at the 2025 AIM in Toronto, my *engagement and connection* provided the foundation for me to succeed in my profession, and I'm thankful for that.

As I reflect on the past, I recall my mentors **ASABE Fellows Bill Barfield, Tom Haan, Marvin Stone, John Solie, Greg Hanson, Ron Elliott, Glenn Brown, Darrel Temple,** and **ASABE member Kem Kadavy,** and many more, who poured their heart and soul into students like me. They treated us like peers. They set the bar high, and they taught us that no bar is ever too high. It was a "swing for the fences" mentality where no idea was foolish, only the ones that were never shared held back innovation. I'm grateful for their kindness.

Encircle yourself with like-minded people. As an example, my former classmates are some of the most talented engineers I've ever met. They rarely mention their achievements, including a Davidson Prize, multiple AE50 awards, and a World Ag Expo Top 10 New Product award. We formed lifelong friendships, and they became an extension of my family. Unfortunately, that family has become a little smaller in recent months, as two of my friends I mentioned above are no longer with us. I'm blessed to have known them.

In the coming year, my challenge is for you to *engage and connect* as well. Here are some ideas:

Start with this issue of *Resource* by celebrating our recent AE50 winners. These winners will be highlighted at the Agricultural Equipment Technology Conference (AETC) on February 8-11, 2026, in Louisville, Kentucky. Come celebrate in person and hear the keynote address, "Feeding a Hungry World: The Borlaug Mission," by Randy Renze. But act fast—early-bird registration closes on January 31!

Start planning for this year's AIM in Indianapolis, Indiana, which is scheduled for July 12-15, 2026. Abstracts are being accepted through January 12. What better way to engage than by presenting your work and learning from others!

Consider mentoring the next generation of engineers by volunteering at one of the local or state events during Engineers Week, February 22-28, 2026. This is a great opportunity to show students that engineering and technology can expand their creativity and help them make a difference in the world.

Another opportunity to inspire our future students is the National Future City Competition, February 14-16, 2026, in Washington, D.C. The theme of this year's competition is "Farm to Table"—that's a perfect fit for ASABE! If you can't make it to D.C., look for a regional competition in your area.

And speaking of the future, this year the ASABE Foundation will focus on student growth. You can help prepare the next generation to address our pressing challenges—feeding the world, improving climate resilience, and creating innovative energy solutions—by visiting the ASABE Foundation website and volunteering for one of the many student competition committees (https://asabe.org/get-involved/asabe-foundation).

As we soar into the new year, I wish you a happy, safe, and productive 2026, and I look forward to hearing how you have helped inspire our future—remember to *Embrace your Story*. Here's to *engaging and connecting*, and making your ASABE presence known in the coming year!

Sherry Hunt
sherry.hunt@usda.gov

upcoming events

ASABE CONFERENCES AND INTERNATIONAL MEETINGS

To receive more information about ASABE conferences and meetings, call ASABE at 800-371-2723 or email mtgs@asabe.org.

2026

Feb. 8-11	**Agricultural Equipment Technology Conference (AETC).** Louisville, Ky., USA.
July 12-15	**ASABE Annual International Meeting.** Indianapolis, Ind., USA.

2027

Feb. 7-10	**Agricultural Equipment Technology Conference (AETC).** Louisville, Ky., USA.
July 18-21	**ASABE Annual International Meeting.** New Orleans, La., USA

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Magazine staff: Joseph C. Walker, Publisher, walker@asabe.org; Melissa Miller, Editor, miller@asabe.org; Glenn Laing, Technical Editor; Jill Straub, Consultants Listings, GuideToConsultants@asabe.org; Cedric Calhoun, Executive Director, calhoun@asabe.org.

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ON THE COVER:
The Last Harvest. **A truckload of freshly harvested corn waits patiently in Port Austin, Michigan. Submitted by ASABE Past President and Fellow Keith Tinsey.** ***VisualChallenge*****15 begins on page 20.**

ASABE
Engineering a Sustainable Future

American Society of Agricultural and Biological Engineers
2950 Niles Road
St. Joseph, MI 49085-9659, USA
269-429-0300, fax 269-429-3852
hq@asabe.org, www.asabe.org

Celebrate the winners!

The AE50 Award program, which recognizes companies for recent innovations in agricultural, food, and biological systems, is proudly sponsored by *Resource* magazine. From the many entries submitted in 2025, an expert panel selected the products featured on the following pages for distinction. These award-winning technologies ranked highest for innovation, engineering achievement, and measurable impact within their respective markets.

Together, the products reflect the breadth of agricultural and biological engineering, as well as the wide range of companies advancing the industry through cutting-edge technology and practical innovation. This year's AE50 recipients join a distinguished group of honorees recognized for ingenuity in product development—helping producers save time, reduce costs and labor, and enhance safety and usability.

The AE50 Awards trace their origins to June 1984, when ASABE's *Agricultural Engineering* magazine (now *Resource*) published a special issue highlighting 25 notable new techniques, inventions, and innovations. These selections were drawn from product information submitted to the Society and evaluated by a panel of engineers. Building on this effort to identify and promote impactful technology, the AE50 Award program was formally established two years later.

As announced at the program's inception, "Acceptance in the marketplace is the highest accolade any new agricultural product can receive. But for innovative developments in the last 12 months, a singular honor is to be named one of the year's Agricultural Engineering 50 outstanding innovations." Interest was immediate and strong. In 1986, following review by a panel of technical experts, the first AE50 Awards were presented.

While technology continues to evolve, the industry's commitment to innovation remains constant. Over the years, many AE50-recognized products have been patented, trademarked, and further refined—some earning repeat recognition as advancements progressed. What endures each year is a shared dedication to excellence. We are proud to honor that commitment through the AE50 Awards, the highest recognition in an awards program of its kind.

Let us celebrate this year's winners.

3100FT Planter Series

Deere and Company
Horizontina, Rio Grande do Sul, Brazil
www.deere.com

The 3100FT Planter is a narrow-transport seed and dry fertilizer planter with 19 to 31 rows. Easy Fold reduces the transport width to 4.3 m in about 2 minutes, without removing parts or affecting row performance. A 3.2-m configuration allows legal truck transport, improving uptime. A three-section chassis with 30° of movement and row units with 0.5-m amplitude improve ground following and planting precision.

AB230CD Chassis-Mounted Air Boom

Salford Group
Salford, Ontario, Canada
https://salfordgroup.com

The AB230CD air boom applicator, designed for the Case IH Trident 5550 chassis, uses its hydraulic capacity to achieve fast speeds, high product rates, and wide coverage with reduced compaction. An 80 ft boom and a 225 ft^3 triple bin hopper allow three products to be applied at independent rates. Integration with the terminal, improved boom ride, and optional drop tubes support consistent, efficient application.

ADAPT Standard and ADAPT Standard Plugin

AgGateway
Arlington, Virginia, USA
https://aggateway.org

The AgGateway ADAPT Standard is a data model with standardized data type definitions and measurement unit abbreviations that is designed for business-to-business transfer of agricultural production data. It succeeds the ADAPT Framework released in 2015, an open-source application that reads and writes field operations data files, including ISOXML and proprietary OEM formats. Unlike the original framework, the ADAPT Standard is not limited to Microsoft development technologies. AgGateway has also released an ADAPT Standard Plugin that enables the use of the new standard within existing ADAPT Framework-based solutions.

Advanced Dryer Control Systems for Belt Dryers

Forest Concepts, LLC
Auburn, Washington, USA
www.forestconcepts.com

With support from the USDA-NIFA and DOE SBIR programs, Forest Concepts has developed an advanced control system for biomass belt dryers. The system improves product uniformity, reduces the need for operator experience, and increases thermal efficiency. These efficiencies reduce residence time, energy consumption, and potentially the physical size and capital cost of the dryer The model-based control self-adjusts to changing incoming moisture content and ambient air conditions to provide consistent outbound product moisture without operator intervention.

AiCPlus 3S

Agrifac Machinery
Seward, Nebraska, USA
www.agrifac.com

Agrifac's AiCPlus 3S is an OEM-integrated camera and AI spot-spraying system that delivers plant-level selectivity at commercial field speeds. Triple-layer precision with confidence-gated detections and physics-aware nozzle control reduces chemical use while protecting yield. Boom-mounted cameras, real-time inference, and predictive nozzle timing eliminate the need for pre-mapping. Per plant application maps and ISOBUS workflows make the sprayer a field intelligence hub.

Air Command™ Section Control for Pro-Force® Dry Fertilizer Spreaders

Unverferth Manufacturing Co., Inc.
Kalida, Ohio, USA
www.umequip.com

Air Command™ section control uses pneumatics to redirect fertilizer on the Pro-Force dry spreader spinners for precise four-section control. It prevents over-application, reduces input cost, and offers a simple yet reliable design for applying fertilizer only where it's needed. A blower pressurizes an air manifold, and valves redirect fertilizer while the conveyor slows to prevent excess application. Each section can shut off independently, and the ISOBUS system follows coverage maps for accurate placement.

All-N™ Advisor

Sentinel Ag
Ithaca, Nebraska, USA
www.sentinelag.tech

Sentinel's All-N™ Advisor uses a model and sensor fusion strategy that integrates crop and soil nitrogen dynamics models with image-based sensing for nitrogen management. The models project how a crop is likely to grow and estimate nutrient needs under different conditions, while images capture what is happening in the field in real time, including plant health and variability. Combining these perspectives enables the platform to generate recommendations that are forward-looking yet grounded in current conditions, giving producers a practical and reliable guide for N management. This is the first use of these approaches in parallel to inform nitrogen decisions and provides a more adaptive, data-driven tool for producers and agronomists.

AutoFill

Oxbo
Lynden, Washington, USA
www.oxbo.com

AutoFill automates lug handling for Oxbo 7440 and 7450 berry harvesters, reducing harvester labor by up to 75%. It de-stacks, fills, and moves lugs automatically using EvenFill scale technology for accurate weights. This automation increases harvest efficiency and improves downstream processing at packing facilities. AutoFill showed impressive field runs during the 2025 blueberry harvest in Washington, harvesting 1.1 million pounds on one of their demo Oxbo 7450 berry harvesters.

AWN CropAI

Washington State University AgWeatherNet
Pullman, Washington, USA
https://weather.wsu.edu

AWN CropAI is an AI-powered smartphone application that helps tree fruit growers manage summer heat stress and improve crop quality. It combines radiometric thermal imaging, localized weather data, and 7-day forecast-driven AI models to deliver real-time and predictive assessments of fruit surface temperature and sunburn risk. Developed through five years of research in WSU's PrecisionAg Lab, the app works with compatible thermal RGB imagers to also assess apple and grape canopy stress and fruit color progression, with additional crops coming soon. Growers can also crowdsource timestamped thermal-RGB imagery, helping refine cultivar-specific forecasts and enabling a shift from reactive to proactive crop management.

BD7410 and BD7510 Narrow-Transport Box Drills

Great Plains Manufacturing
Salina, Kansas, USA
www.greatplainsmfg.com

The BD7410 includes a patent-pending transport system to ensure ideal weight distribution during transport. Three row spacings, including 5 in., support specialty crops, and up to three seeds can be metered into the furrow simultaneously. It is the only minimum-till drill that rotates from a 20 ft working width to under 10-ft transport width. The BD7510 uses a patent-pending hydraulic system that sequentially operates five cylinders to move from transport to field position without leaving the cab. It folds from under 10-ft to up to 20-ft working width and can meter three products, including a native grass meter for fluffy seeds.

Bourgault Intelligent Control–BiC™

Bourgault Industries Ltd.
St. Brieux, Saskatchewan, Canada
www.bourgault.com

Bourgault Intelligent Control-BiC™ is a product-centric seeding system designed for simplicity, flexibility, and integration. Its intuitive interface allows operators to learn the system quickly, and a wireless monitor and control system eliminates the complexity of wired installations for faster setup and easier replacement. Operators select the product and rate, and the system optimizes tank configurations to maximize efficiency. It has the option to integrate seamlessly with the John Deere and CNH task controllers which leverages the ability to use variable rate control, sectional control, and machine to machine communication as well as integration with John Deere Operations Center and CNH Field Ops to give managers real-time visibility. This approach improves confidence and efficiency for broad-acre seeding operations.

CLAAS JAGUAR 1000 Series Forage Harvester

CLAAS of America Inc.
Omaha, Nebraska, USA
www.claas.com

The CLAAS JAGUAR 1000 Series is a ground-up redesign featuring up to 1110 hp and an efficient driveline to support harvest rates up to 500 tons per hour. Four hydraulic pre-compression cylinders improve chop consistency. The 12.2-in. corn cracker is now the largest in the industry, and a new accelerator accommodates greater crop flow. The redesigned cab is quieter, more comfortable, and provides better visibility, with features such as joystick steering and 225° spout rotation.

CLAAS ORBIS 10500 Header

CLAAS of America Inc.
Omaha, Nebraska, USA
www.claas.com

The CLAAS ORBIS 10500 has a 35-ft working width and is built for the capacity of the JAGUAR 1000 Series. Press-hardened components, removable guide fingers, high-frequency cutting discs, Hardox steel transport discs, upgraded intake drums, and a hydraulic header drive improve cutting quality, feeding, and durability. A new contouring system enhances ground following.

Cropwise AI

Syngenta Crop Protection LLC
Greensboro, North Carolina, USA
www.syngenta.com

Cropwise AI is Syngenta's global artificial intelligence platform that changes how agricultural professionals access information and make decisions. It provides instant, intuitive access to agronomic knowledge, product insights, and field-specific recommendations to improve crop planning, resource use, and productivity. Built on a scalable AI infrastructure, Cropwise AI combines natural language processing, agronomic modeling, and agent-based AI reasoning in a secure, governed environment. Capabilities developed in one region can be deployed quickly worldwide, accelerating innovation and maintaining consistent quality. By uniting advanced technology with user-centered design, Cropwise AI helps producers and agronomists do more with less, supporting efficiency, sustainability, and profitability across global agriculture.

Double Barrel Power Sweep

Sudenga Industries, Inc.
George, Iowa, USA
www.sudenga.com

The Double Barrel Power Sweep is a high-capacity grain bin unloading system designed for installation in economical 13-in. grain dryer floors, reducing the need for expensive foundations or tunnels. Its flexible conveyor can stop at the bin center or extend across the entire diameter to match different site layouts. A zero-entry sweep remains permanently mounted inside the bin and is driven externally by heavy-duty gearboxes to improve safety and reduce labor. With a capacity of 6,500 bushels per hour and low power requirements, the system delivers high performance with minimal maintenance for large commercial bins.

Draft Tube Free Toolbar System for Case IH Early Riser® 2160 24-row 22-inch Large Front-Fold Trailing Planter

Case IH
Racine, Wisconsin, USA
www.caseih.com

The draft tube free toolbar system for the Case IH Early Riser® 2160 24-row, 22-in. large front-fold trailing planter delivers an industry first: a large front-fold trailing planter design without draft tubes or a telescoping hitch. This innovation reduces toolbar weight, shortens transport length, and improves routing and accessibility. The design allows Pro-Box placement underneath both bulk fill seed tanks to easily empty remaining seed, while also enabling seed tender access alongside both bulk fill seeds tanks for greater tendering flexibility in both transport and planting position. Unique toolbar hitch weldments, wing weldments and wing fold cylinders are designed for 10-mph high-speed planting and 650-lb hydraulic downforce draft loads. This lighter footprint helps minimize soil compaction while increasing yield and profit potential.

ED3 On-Board Charger

Danfoss Power Solutions
Ames, Iowa, USA
www.danfoss.com

ED3 is a high-power bi-directional onboard charger and electric PTO for off-highway battery electric machines. It provides a 44-kW AC charge rate that supports large batteries while using simpler, lower-cost AC infrastructure. The three-phase 400 or 480 VAC ePTO can power compressors, pumps, motors, or microgrid connections while the DC ePTO supplies regulated power to implements. Galvanic isolation ensures a safe external interface.

FD2 PLUS FlexDraper®

MacDon Industries Ltd.
Winnipeg, Manitoba, Canada
www.macdon.com

The FD2 PLUS FlexDraper® builds on MacDon's FlexDraper platform with more than 2 in. of extra flex at the cutterbar so it hugs the ground more tightly, reaches deeper into low spots, and picks up more crop. Unlike other flex headers, the FD2 PLUS flexes while maintaining MacDon's close reel-to-cutterbar relationship for smooth, consistent feeding. An ultra-light instant float response keeps the header moving with the land, cutting closer, capturing more crop, and helping producers get more from every harvest.

Fendt® 800 Vario® Gen5 Tractor

Fendt
Duluth, Georgia, USA
www.fendt.com

The Fendt® 800 Vario® Gen5 tractor features a high-torque, low-engine-speed design AGCO Power™ CORE80 8.0 L for its three models ranging from 283 to 343 maximum horsepower. The VarioDrive™ CVT, VarioGrip tire inflation, and a maneuverable frame support productivity and soil protection. A dual-pump hydraulic system delivers more than 101 gallons per minute, and operator comfort includes the FendtONE™ station, CAN-controlled seating, and UltraVision™ lighting.

Fendt® 1000 Vario® Gen4 Tractor

Fendt
Duluth, Georgia, USA
www.fendt.com

The Fendt®1000 Vario® Gen4 tractor builds on the Fendt 1000 Series with more power, versatility, and comfort. The 12.4 L engine powers four models from 426 to 550 hp. The VarioDrive™ CVT delivers smooth power, while VarioGrip™ reduces compaction. A redesigned cab offers ergonomic upgrades, including CAN-controlled heated and ventilated massaging seats and 360° UltraVision™ LED lighting. Autonomy options range from implementing automation with TeachIN™ to full grain cart and tillage autonomy capability.

FiberCut™ 414 Harvester

Bish Enterprises
Giltner, Nebraska, USA
https://bishenterprise.com

The FiberCut 414 is a tractor powered, pull-behind harvesting system that rethinks how tall fiber crops move from field to factory. A hydraulically controlled lifting and tilting cylinder pairs with modular, height adjustable arms to cut multiple stalk zones in one pass, matching different processor or baler requirements. Its 14-ft cutting knife delivers up to 17 acres per hour (at 10 mph ground speed), turning large acreages in tight windows. By combining high speed cutting with controlled crop laydown, the FiberCut 414 lowers capital and labor barriers, simplifies downstream logistics, and improves fiber uniformity for hemp, kenaf, and other tall biomass crops. This creates a scalable, adaptable platform for modern regenerative supply chains.

FlowGrade Vision Module and Grain Grading System

RealmFive, Inc.
Lincoln, Nebraska, USA
https://realmfive.com

The FlowGrade Grain Grading System is the first integrated, continuous-flow solution that measures major grain quality attributes in real time, using a modular architecture that includes moisture, test weight, odor sensing, and the FlowGrade Vision Module for high-frequency machine vision classification. The Vision Module analyzes every kernel in the stream to identify foreign material, broken kernels, heat damage, and visible mold with consistent accuracy, removing the variability and delays of manual inspection. Each module can operate independently or as part of the complete FlowGrade platform, which connects directly into RealmFive's award-winning SMARTSITES software to deliver automated, defensible grading data that feeds inventory decisions, pricing workflows, reporting, and multi-location visibility. This combination increases consistency, reduces labor dependence, improves operational transparency, and accelerates quality-related decision-making across grain centers.

FurrowVision™

Deere and Company
Moline, Illinois, USA
www.deere.com

FurrowVision™ is an in-furrow imaging and sensing system that improves planter performance by giving operators a live, high-resolution view of seed delivery and furrow conditions during planting. It provides immediate feedback for adjustments and combines machine vision with agronomic analytics to monitor seed depth, residue level, and furrow health in real time. By revealing furrow dynamics that were previously invisible, FurrowVision™ improves depth accuracy, reduces variability, and enables more informed decisions that support better emergence and yield potential.

Grain Weevil®

Grain Weevil Corporation
La Vista, Nebraska, USA
www.grainweevil.com

The Grain Weevil® is a grain bin safety and management robot that performs work that traditionally puts people at risk. It reduces long-term exposure to dust and prevents entanglements, entrapments, and falls. In addition to improving safety, the robot enhances productivity by controlling risk, reducing costs, and optimizing stored grain. Grain flow intelligence is a new approach to post-harvest management that automates grain movement, conditioning, and control across bins and storage facilities. Grain Weevil® is the first platform to deliver this capability, replacing manual clean out and reactive practices with precision movement, protocol-driven management, and zero-entry operation.

Gripp Rendezvoo

Gripp, Inc.
Kewaskum, Wisconsin, USA
www.gripp.ag

Gripp Rendezvoo is the world's first Equipment Relationship Management (ERM) platform connecting OEMs, dealers and service providers to equipment owners and each other in real time. Rendezvoo provides always-on customer service, delivers the right equipment information when it is needed with Product Information Management (PIM) capabilities, centralizes communication and support across equipment, teams, and organizational boundaries. Centralize warranty information, parts, videos, manuals, recalls, bulletins and equipment history for you, your channel and your owners for each specific machine. The fastest growing app in Ag for managing customer and channel strategies from factory to field. In a world with shifting brand loyalty, build trust and stay top of mind with seamless service and relationship management for your products. Cut support costs and grow loyalty with Gripp.

High-Capacity Double Square Baler

Great Plains Manufacturing, Inc.
Assaria, Kansas, USA
www.greatplainsmfg.com

This baler divides the crop flow into two chambers and forms two bales simultaneously, using separate plungers timed 180° apart to reduce gearbox load and improve smooth operation. Independent tying systems ensure consistent bale length even in uneven windrows. Finished bales merge into a single line for easier handling or bundling.

Intell-Attach™

Great Plains Manufacturing, Inc.
Salina, Kansas, USA
www.landpride.com

The Intell-Attach™ system allows Kubota compact track loaders to recognize Land Pride attachments equipped with an Intell-Attach™ tag and automatically match hydraulic flow to the attachment. In the My Kubota app, operators program the tag by scanning or entering the serial number, and the app stores the model and flow rate. When the loader approaches the attachment, the receiver and tag communicate using Bluetooth® to transmit the stored data and the loader adjusts its settings accordingly. The Intell-Attach™ system is accurate even with multiple units nearby, preventing cross-interference and simplifying operation.

John Deere Autonomy

Deere and Company
Moline, Illinois, USA
www.deere.com

John Deere® Autonomy™ for 8R™ and 9R™ Series tractors with TruSet™-enabled tillage equipment takes control of the tillage task and performs it for the operator. A perception system with 16 cab-mounted cameras provides a full 360° view to protect the machine and bystanders from hazards. The system builds on proven technologies, including AutoPath™, AutoTrac™ Turn Automation, and the John Deere Operations Center™ Mobile, all essential tools for maximizing in-field productivity. An upgraded braking system provides redundant braking for safety. With John Deere Autonomy, producers can direct the tractor and tillage tool to continue working overnight or while they focus on other high-value tasks, thereby saving time and increasing efficiency.

John Deere ExactInject System

Deere and Company
Moline, Illinois, USA
www.deere.com

The John Deere ExactInject system offers a wider operating range, longer seal life, precise rate control, and a simpler interface. A 10% wider application range supports faster speeds and wider booms. Seal life is tripled, reducing drips and maintenance. Fully integrated with the John Deere Tech Stack, this system supports advanced prescriptions, multiple mapping options, and future machine integration.

KMC 7600 Litter Pulverizer

Kelley Manufacturing Co.
Tifton, Georgia, USA
www.kelleymfg.com

The KMC 7600 Litter Pulverizer uses a dual-stage rotor system combining a high-torque front rotor with a counter-rotating flail rotor to break dense cake into dry, aerated material in one pass. It reduces processing time by up to 60%, eliminates extra equipment, lowers fuel use, and improves litter uniformity. This litter pulverizer reflects engineering improvements guided by rotor dynamics analysis and grower feedback.

Mainero 1045 Row-Independent Sunflower Header

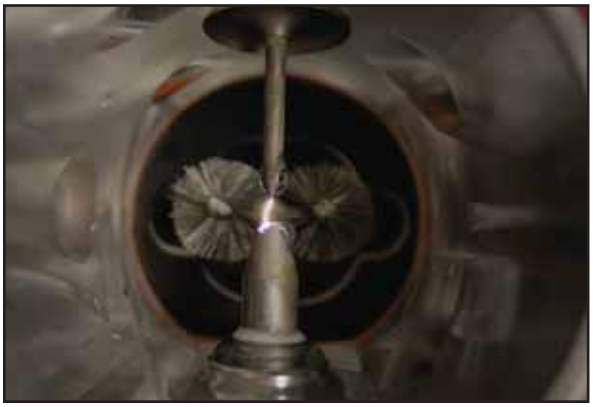
Carlos Mainero y Cia SAICFI
Bell Villa, Cordoba, Argentina
www.mainero.com

The Mainero 1045 increases working width while preserving the performance of earlier models and adds a row-independent capability. Folding pans allow the header to meet transport width without tilting on the trailer. The improved pan design provides unrestricted stalk flow and reduces jamming. Operators can now adjust the shield height relative to the pans and reel to reduce intake of material other than grain. The reel fingers are tangent to the pipe rather than perpendicular, preventing heads from being pushed forward. Central drives for both the sickle bar and auger narrow the outer fenders and reduce harvest losses. A modular manufacturing system simplifies assembly at the destination.

Massey Ferguson® SB.1436DB Baler

Massey Ferguson
Duluth, Georgia, USA
www.masseyferguson.com

The Hesston by Massey Ferguson® SB.1436DB baler is the first OEM double small square baler, doubling output by forming two bales simultaneously. A single chamber is divided by a splitting knife, creating two 14- × 18-in. bales sharing density control, while independent knotter trips maintain uniform lengths. The SimplEbale™ system automates key processes, improving reliability, consistency, and handling efficiency.



MicroGlow™

Radicle Agronomics® by Precision Planting®
Tremont, Illinois, USA
www.radicle.ag

Radicle's MicroGlow™ is a nutrient analysis system within the Radicle Lab™, a fully automated soil testing laboratory that provides same-day results. MicroGlow™ uses a plasma-based method to excite atoms in soil samples and quantify potassium, calcium, and magnesium. It automates sample preparation and analysis, reducing the human error common in traditional workflows. Automated calibration and diagnostics deliver high-speed, high-accuracy soil analysis to support timely, data-driven fertility decisions.

MiraSense™

Precision Planting®
Tremont, Illinois, USA
www.precisionplanting.com

Precision Planting's MiraSense™ is an optical seed sensor with optimized LEDs and firmware that accurately senses a wide range of seed sizes. This eliminates the need to change sensors when switching between crops. A dust-rejection algorithm distinguishes seeds from dust, improving accuracy and giving producers confidence in seeding data across all crop types.

Orion PC™

Orbia Netafim
North America
Fresno, California, USA
www.netafimusa.com

Orion PC™ is a thin-wall pressure-compensated dripline designed to bring high-uniformity irrigation to growers who have traditionally used non-compensated systems. Its compact, patent-protected dripper uses a self-cleaning multi-slot design that maintains consistent flow across slopes and variable water quality while resisting clogging. Orion PC™ is a ground-up innovation that supports longer lateral runs, lowers installation and operating costs, and improves yields. It is designed for short-cycle crops such as tomatoes, melons, and cotton and provides durability, flexibility, and affordability in a recyclable tubing that extends modern pressure compensation technology to a wider range of growers.

OutRun™ | Tillage

PTx Trimble
Tremont, Illinois, USA
www.ptxtrimble.com

OutRun™ | Tillage is a retrofit autonomy kit that enables fully driverless tillage with existing tractors. Operators use a smartphone app to plan, start, control, and monitor autonomous tillage missions, allowing work to be done at the optimal time regardless of labor availability. The system extends the OutRun autonomy platform beyond grain cart applications with a new tillage workflow and a kit that monitors the tillage tool to maintain performance.

Predictive Ground Speed Automation with Weed Detection

John Deere
East Moline, Illinois, USA
www.deere.com

John Deere S7 and X9 combines now feature further advanced automation, including terrain and weed biomass detection, to proactively adjust the ground speed. Building upon the previous model year control algorithm, the system now integrates terrain maps via John Deere Operations Center and Work Planner to anticipate field variability while also sensing weed biomass in field via the onboard cameras. These enhancements deliver smarter automation, enabling more precise ground speed adjustments across a wider range of unique field conditions- mimicking the decisions of an experienced operator and maintaining the combine's full productivity potential

See & Spray Select™

Deere and Company
Moline, Illinois, USA
www.deere.com

The John Deere R900i Trailed Sprayer with See & Spray Select™ introduces targeted spraying technology to the European and Australian markets, providing precise weed targeting in row crops and fallow ground. The crop-agnostic vision system reduces herbicide use, lowers input costs, and minimizes environmental impact. The system is compatible with third-party tractors, supports low-light and night spraying, and integrates fully with the John Deere digital ecosystem. It represents a significant advancement in precision agriculture for European and Australian producers.

See & Spray™ Select Variable Rate

Deere and Company
Moline, Illinois, USA
www.deere.com

See & Spray™ Select Variable Rate uses real-time biomass imaging to vary the application rate at individual nozzles. It enhances the original system by enabling precise application of fungicides, desiccants, and pre-harvest treatments without prescriptions. The system supports targeted and broadcast spraying, reduces inputs, and improves yield potential through efficient, sustainable application.

Seedbed Sense Speed Control

Case IH
Racine, Wisconsin, USA
www.caseih.com

Seedbed Sense Speed Control is a new advancement for the Case IH Tiger-Mate™ 255 field cultivator that monitors seedbed conditions in real time and adjusts tractor speed to maintain a consistent seedbed floor. Shank-mounted sensors measure levelness and use Class 3 ISO control to automatically manage speed, giving operators immediate feedback on uniformity and allowing them to set speed targets up to 10 mph based on field conditions. Operators can customize shank sensitivity and feedback thresholds to match soil variability. By turning passive tillage into an intelligent, responsive process, Seedbed Sense Seed Control helps deliver a more uniform seedbed for improved planting consistency and emergence.

SenseApply™

Case IH
Racine, Wisconsin, USA
www.caseih.com

Case IH SenseApply™ technology uses real-time sensing and advanced rate control to detect crop health and weeds, automatically adjusting application rates based on what the camera sees. The single cab-mounted multispectral camera reduces chemical use while maintaining agronomic effectiveness. The solution supports up to five Live Variable Rate Application modes across liquid and granular applications and integrates seamlessly with existing precision farming tools. Its dual-mode Selective Spray capability pairs Green-on-Brown spot spraying with a Base plus Boost mode to apply product only where needed. SenseApply operates without continuous calibration and delivers precise application at speeds up to 25 mph, helping operators optimize input use, reduce waste and improve efficiency.

SymphonyVision™ | Spot and SymphonyVision™ | Rate

Precision Planting®
Tremont, Illinois, USA
www.precisionplanting.com

SymphonyVision™ | Rate adds camera-based variable-rate control to the SymphonyNozzle platform. Nozzles remain on but intelligently adjust the herbicide rate based on weed size and density, allowing operators to set rates according to label guidance and weed pressure. SymphonyVision™ | Spot builds on the SymphonyNozzle platform by adding cameras that distinguish crops from weeds and adjusting the herbicide rate based on weed severity, including turning nozzles off when weeds are absent to reduce chemical use. Reporting in the 20|20 and Panorama systems includes maps of weed severity, weed type, and crop stand metrics, along with field photos for scouting. After application, maps support future passes, and field photos help verify weed control. Together, these two systems deliver variable-rate intelligence to the sprayer.

Synk™ Bin Controls

Synk™
Ames, Iowa, USA
www.synk.com

Synk™ Bin Controls use advanced sensors and automation software to monitor stored grain and operate aeration fans as needed to maintain optimal grain condition. The system uses temperature and moisture sensors suspended from the bin roof, along with sensors at the top and bottom of the bin sidewall that measure CO_2, static pressure, temperature and humidity. Together, these sensors provide data for drying or cooling decisions. Fans can be controlled using a touchscreen, with automatic and remote control planned through a Synk™ app. Designed to simplify and improve one of the most important tasks in grain farming, this system provides modular automation, adaptive product handling, strong data integration, and faster decision-making to make grain storage safer, smarter, and more efficient.

T9096 Tractor-Powered Table Bagger

RCI Engineering
Mayville, Wisconsin, USA
www.rci.ag

The T9096 uses a producer's existing tractor for power while providing the capacity and efficiency of a rear-unloading table bagger. Rated at 350 hp with a 12-ft feed table and multiple tunnel options, it suits expanding forage operations. It modernizes an earlier concept by adding features such as an anchor system, independent wheel braking, a hydraulic bag boom, a tunnel cleanout, and a wider feed table.

Thorx® CLM 12 T Cam Lobe Motor

Danfoss Power Solutions
Ames, Iowa, USA
www.danfoss.com

The CLM 12 T is a hydraulic motor that uses cam lobe technology to provide an efficient drive for rubber track systems, such as those found on compact track loaders. Its symmetrical design improves space utilization and extends life. Positioning the rotating flange at the motor center keeps the motor within the track width, unlike traditional designs that extend inward, requiring frame cutouts and reinforcement. Two tapered roller bearings located near the central rotating flange reduce bending loads and improve durability. A rotary group with more pistons than competing motors reduces contact stress on the cam and increases service life.

Vision Zero

Agricultural Industry Electronics Foundation (AEF)
Frankfurt am Main, Germany
www.aef-online.org

Vision Zero aims to prevent road fatalities. Agricultural machinery is being integrated into cooperative intelligent transport systems (C-ITS). The usage of standardized V2X communication shares vehicle position, driving intentions and hazard information with other road users in the environment.

The AEF develops, a common, cross-manufacturer software-component which ensures compatibility between tractors or combine harvesters with cars, trucks, motorcycles, cyclists and infrastructure. It reduces the complexity of integration and ensures consistent safety behavior across all manufacturers.

This new software component improves the perception of slow or oversized vehicles, entrances and exits, convoys and roadside operations, helping all drivers to react faster.

By extending C-ITS to the agricultural sector, the industry is making an important contribution to Vision Zero – preventing accidents and saving lives on all roads.

Weave Automation

Deere and Company
Ottumwa, Iowa, USA
www.deere.com

Weave Automation introduces a weaving hitch system for balers that improves bale shape, density, consistency, and overall feed quality while reducing operator fatigue. The system keeps the tractor centered over the windrow and allows the baler to move side to side with full automation, using integrated sensors and hydraulics from both the tractor and baler to place the crop precisely in the chamber. This produces uniform, square-shouldered bales with less operator input. Weave Automation can operate in two modes: with the baler in the tractor wheel track, or in weaving mode, in which the baler follows the tractor while weaving.

Are you introducing a new product in 2026?

If you have a new product, we might be celebrating you here next year! If your company will bring a new product to market for 2026, consider nominating it for an AE50 award. ASABE is proud to sponsor AE50, the only awards program of its kind, celebrating product innovations in the areas of agricultural, food, and biological systems. Our online nomination process begins in August, check our website (www.asabe.org/AE50).

What's next?

The Best of the Best

The Davidson Prize Announcement

ASABE has once again partnered with the Association of Equipment Manufacturers (AEM) to present an award recognizing exceptional innovation and impact in agricultural, food, and biological systems. The honored products reflect the breadth of modern engineering and technology, as well as the diverse range of companies advancing meaningful, market-ready solutions.

The Davidson Prize is awarded annually to a select group of AE50 winners, representing the most outstanding newly introduced products of the year. Up to three Davidson Prizes are presented, chosen from the ten highest-scoring AE50 honorees. These winning technologies are expected to make a significant contribution to agricultural productivity, operational efficiency, or safety.

The 2026 Davidson Prize winners will be announced at AEM's Commodity Classic in February. Take note of your favorite AE50 selections and see if you can predict the winners. *Resource* will feature the Davidson Prize recipients in an upcoming issue.

Index of AE50 Winners by Company

AgGateway
ADAPT Standard and ADAPT Standard Plugin

Agricultural Industry Electronics Foundation (AEF)
Vision Zero

Agrifac Machinery
AiCPlus 3S

Bish Enterprises
FiberCut™ 414 Harvester

Bourgault Industries Ltd.
Bourgault Intelligent Control–BiC™

Carlos Mainero y Cia SAICFI
Mainero 1045 Row-Independent Sunflower Header

Case IH
Draft Tube Free Toolbar System for Case IH Early Riser® 2160 24-row 22-inch Large Front-Fold Trailing Planter
Seedbed Sense Speed Control
SenseApply™

CLAAS of America Inc.
CLAAS JAGUAR 1000 Series Forage Harvester
CLAAS ORBIS 10500 Header

Danfoss Power Solutions
ED3 On-Board Charger
Thorx® CLM 12 T Cam Lobe Motor

Deere and Company
3100FT Planter Series
FurrowVision™
John Deere Autonomy
John Deere ExactInject System
See & Spray Select™
See & Spray™ Select Variable Rate
Weave Automation

Fendt
Fendt® 800 Vario® Gen5 Tractor
Fendt® 1000 Vario® Gen4 Tractor

Forest Concepts, LLC
Advanced Dryer Control Systems for Belt Dryers

Grain Weevil Corporation
Grain Weevil®

Great Plains Manufacturing
BD7410 and BD7510 Narrow-Transport Box Drills
High-Capacity Double Square Baler
Intell-Attach™

Gripp, Inc.
Gripp Rendezvoo

John Deere
Predictive Ground Speed Automation with Weed Detection

Kelley Manufacturing Co.
KMC 7600 Litter Pulverizer

MacDon Industries Ltd.
FD2 PLUS FlexDraper®

Massey Ferguson
Massey Ferguson® SB.1436DB Baler

Orbia Netafim
Orion PC™

Oxbo
AutoFill

PTx Trimble
OutRun™ | Tillage

Precision Planting®
MiraSense™
SymphonyVision™ | Spot and SymphonyVision™ | Rate

Radicle Agronomics® by Precision Planting®
MicroGlow™

RCI Engineering
T9096 Tractor-Powered Table Bagger

RealmFive, Inc.
FlowGrade Vision Module and Grain Grading System

Salford Group
AB230CD Chassis-Mounted Air Boom

Sentinel Ag
All-N™ Advisor

Sudenga Industries, Inc.
Double Barrel Power Sweep

Syngenta Crop Protection LLC
Cropwise AI

Synk™
Synk™ Bin Controls

Unverferth Manufacturing Co., Inc.
Air Command™ Section Control for Pro-Force® Dry Fertilizer Spreaders

Washington State University AgWeatherNet
AWN CropAI

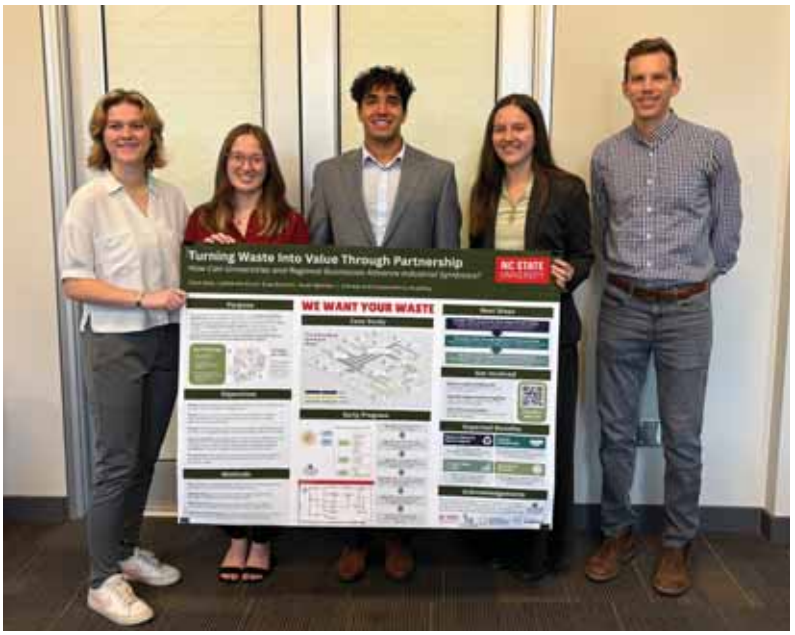
Update on the Circular Bioeconomy Systems Institute

Advancing Circularity through Industrial Symbiosis

Joe Sagues

Across the Raleigh-Durham region, North Carolina State University is spearheading an effort to rethink how materials, energy, water, and industrial byproducts, including biomass residues, move through the regional economy. Led by NC State's Climate and Sustainability Academy, the initiative aims to establish the Research Triangle's first coordinated industrial symbiosis network—serving the Raleigh, Durham, and Chapel Hill metropolitan area, and anchored by NC State University, Duke University, and the University of North Carolina at Chapel Hill—in which neighboring organizations exchange resources to reduce waste and support regional resilience. Biomass and other organic byproducts play an important role in this work, as they are among the region's most abundant and underutilized material streams.

Industrial symbiosis, illustrated by the world-leading Kalundborg Symbiosis in Denmark, connects industries so that one facility's waste becomes another's resource. With its mix of biotechnology, advanced manufacturing, agriculture, energy systems, and major research universities, the Research Triangle is well-positioned for such an approach. NC State is now working to adapt that model to North Carolina.



North Carolina State University student interns working on the industrial symbiosis project (*left to right*): Elise Boorom, Catherine Kirch, Noah Mathew, Clara Stec, and faculty advisor Joe Sagues.

Campus as catalyst

The current phase of work uses NC State's Campus as a Classroom program. Four student interns are assessing the university's major waste and resource flows, including organic and biomass-derived streams. Their work includes mapping materials and byproducts, identifying opportunities for reduction and reuse, and developing early quantitative models of potential symbiotic exchanges. These analyses help demonstrate how a large campus can serve as a living laboratory for circular strategies.

Scaling to the Research Triangle

Building from the campus case study, the team is examining how similar exchanges may emerge across the region. This includes opportunities in water reuse, heat integration, nutrient recovery, and the productive use of biomass-rich residues from agriculture, food processing, landscaping, and biomanufacturing.

The effort aligns with the Business Sustainability Roundtable, a partnership between the Greater Raleigh Chamber of Commerce and NC State. With guidance from leaders of the Kalundborg Symbiosis, the team is adapting global best practices to the Research Triangle's diverse industrial and agricultural landscape.

Leadership and regional partnership

The initiative is co-led by Mark Schmidt, Associate Vice Chancellor for Partnerships at NC State; Christopher Galik, Professor in NC State's School of Public and International Affairs; and Joe Sagues, Assistant Professor of Biological & Agricultural Engineering at NC State. Through Sagues's role as Vice Chair of ASABE's Circular Bioeconomy Systems Institute (CBSI), the project benefits from complementary expertise in circular systems and biomass-focused innovation, with CBSI serving in an advisory capacity.

The leadership team is convening biotechnology companies, agricultural stakeholders, utilities, economic development organizations, municipalities, and university partners to develop a regional vision for industrial symbiosis. Four student interns were sponsored for the semester by Novo Nordisk, a global biopharmaceutical company, which operates four manufacturing facilities in the Research Triangle and is actively working to reduce waste in North Carolina while seeking to replicate the industrial symbiosis successes achieved in its home country of Denmark.

Impact for ASABE and BAE students

This work supports ASABE's mission to advance engineering solutions that integrate biological systems and sustainability. Through faculty leadership in NC State's Department of Biological and Agricultural Engineering, BAE students are engaged in waste stream mapping, circular systems modeling, and stakeholder engagement. Students gain hands-on experience working with real data and real partners, including exposure to biomass utilization pathways that span agriculture, biotechnology, and the emerging circular bioeconomy.

Toward a circular North Carolina

The long-term goal is a fully integrated industrial symbiosis network across the Research Triangle that reduces waste, strengthens regional competitiveness, and accelerates circular innovation. By grounding the effort in detailed campus analysis and expanding through coordinated regional partnerships, NC State is helping to build the foundation for a more resource-efficient and sustainable North Carolina.

What began as a campus-centered investigation is becoming a blueprint for a more resilient regional economy, one in which the value of materials, including biomass, is captured and reused to benefit industries and communities alike.

ASABE member Joe Sagues, Vice Chair of ASABE's Circular Bioeconomy Systems Institute, Chair of ASABE's Bioprocess Startup Student Competition, and Assistant Professor, North Carolina State University, USA, wjsagues@ncsu.edu.

VisualChallenge15

FOCUSED IN

Images of Agricultural and Biological Engineering

For the past 15 years, *Resource* has asked ASABE members and their colleagues to communicate with images–statements without words–to celebrate the visual aspects of agricultural and biological engineering. After the call went out this year for VisualChallenge15, we were excited to see the submissions. On the following pages, you will see some of our favorites.

We thank our many contributors who focused on the profession, finding beauty and meaning. Their work comes to life in these images, showing those outside the field: "This is what we do."

We hope these photos provide a glimpse into the variety of activities, workplaces, and surprises that an ABE career can offer. In 2026, remember to pull out your camera or phone and take a shot for next year's Visual Challenge!

ASABE member Nick Tipper, P.E., Feldpausch Precision Services, Fowler, Michigan, USA.

Harvest, Uninterrupted

A drone photo of the soybean harvest around my house—taken during the Golden Hour—with combines in the field and a grain cart unloading on the road. If you look closely, you can see me controlling the drone!

ASABE member Brian McLaughlin, Safety Psychographics LLC, Notre Dame, Indiana, USA.

Last Standing

Starting in 1926, Indiana Farm Bureau Co-op became a statewide system, growing from 27 local operations until nearly every county had a Farm Bureau Co-op grain elevator and feed store. After a $2 billion year in 1992, its fortunes fell, and a scandal unraveled the system in the late 1990s. All elements of the system were sold except for this lone CountryMark oil co-op, once part of a vertically integrated, well-to-refinery system of service stations. This facility is in Logansport's AgriBusiness Park, with a large ADM grain facility visible in the background. Coincidentally, ADM was one of the buyers of Indiana Farm Bureau Co-op's core businesses.

Gilbert Tinsey, T&H Farms, Port Austin, Michigan, USA.

Depth Matters

Winter wheat seeding depth and singulation performance check in extremely dry and hard clay soil conditions in Port Austin, Michigan.

Seedling development is enhanced by consistent seeding depth into moist soil.

ASABE Member
Paula Steiner, P.E.,
Engineer, USDA-NRCS, Lansing, Michigan, USA

Harvest Time!

Soybeans ready for harvest, and the weather is cooperating. I took this photo during a farm tour in Clinton County, Michigan, that was hosted by the Michigan Section of ASABE.

ASABE Past President and Fellow Keith Tinsey. P.E.,
Sr. Agricultural Engineer, Maurer-Stutz, Inc., Grand Ledge, Michigan, USA.

Laying the Groundwork

ASABE member and Agricultural Engineer in Training Andrew Pursifull, along with Jack McIntire, EIT of Maurer-Stutz, Inc., prepare a digital GPS topographic survey of a Michigan dairy farm in support of a planned facility expansion.

ASABE member AJ Both,
Professor and Extension Specialist, Rutgers University, North Brunswick, New Jersey, USA.

Take the Winding Path

This is Duke Farms' LEED Platinum-certified Orchid Range, in Hillsborough, New Jersey. A plant enthusiast sees a carefully maintained ecosystem. An agricultural engineer sees the structure and equipment necessary to provide an optimum growing environment. Either way, it's beautiful.

ASABE member
Quenton Schneider, P.E., CGA,
Marshalltown, Iowa, USA

Reflection on the Pond

This drone photo was taken while scouting out farm buildings in northeast Iowa in early August. The stocked farm pond catches field runoff and is home to bluegill, largemouth bass, and yet-to-be-caught catfish. The pond was constructed in the 1980s.

ASABE member Ajit K. Mahapatra,
Professor, Food and Bioprocess Engineering, Food Engineering Laboratory, Agricultural Research Station Fort Valley State University, Fort Valley, Georgia, USA.

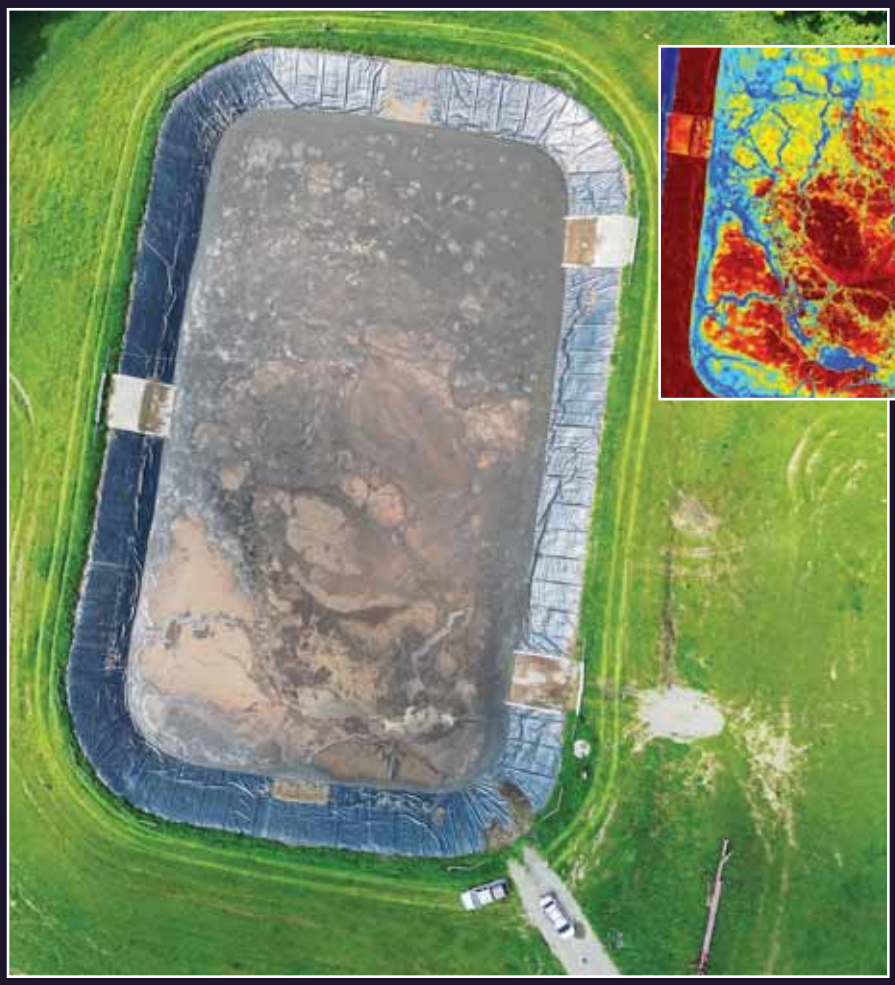
Friendly Ghost Overhead

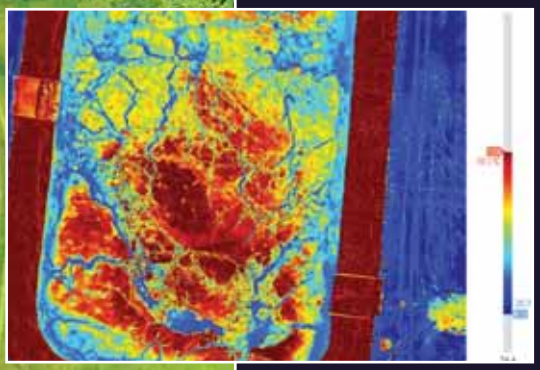
A photo of the sky above the experimental peanut plots at Fort Valley State University's new farm. These plots are part of a joint research project by our team and Purdue University to develop an integrated sensing system for environmental parameters that will help improve peanut production.

ASABE member AJ Both, Professor and Extension Specialist, Rutgers University, North Brunswick, New Jersey, USA.

A Cut Above

Using a flail mower to cut forage along a vertical bifacial photovoltaic array at one of the award-winning (2025 North American Agrivoltaics Awards - Solar Farm of the Year) agrivoltaic installations at Rutgers University.

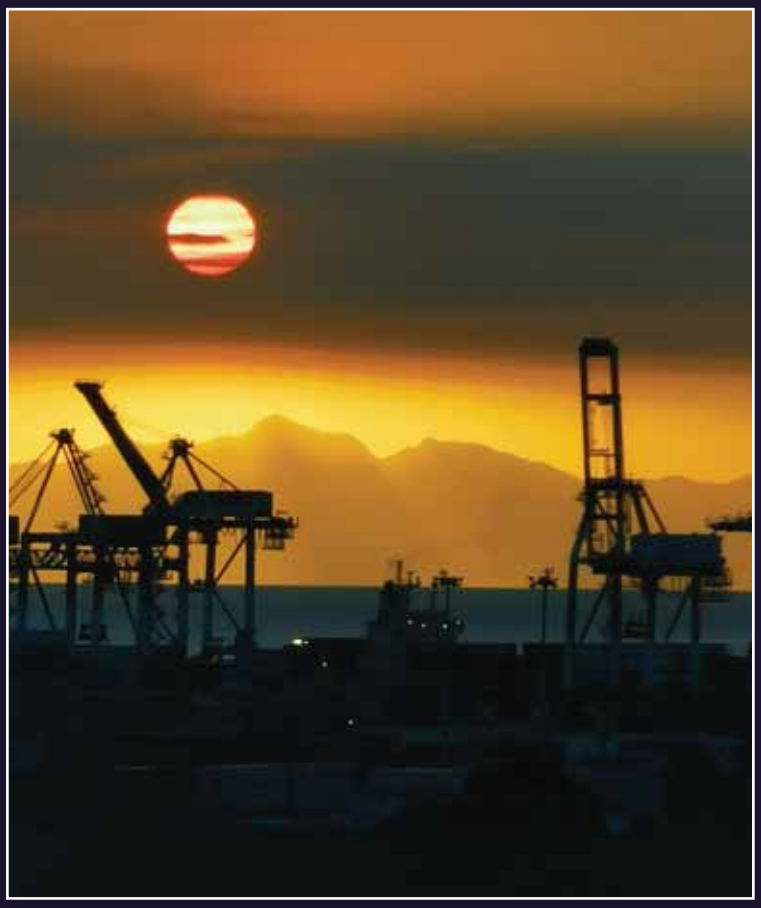




Gabriella Hubchen and **Sierra Dages,** Students, Dept. of Applied Physics, Ithaca College, Ithaca, New York, USA.

Quantifying Methane Admission

A New York State dairy farm stores its liquid manure in a pond to minimize runoff, and methane emissions are a concern. The large photo is a drone's view of the pond from a height of 350 m, and the inset photo is a thermal image, showing minute temperature differences. The thermal image shows higher temperatures near the lower end of the pond, where the inlet pump is located. However, we found a higher density of methane at the cooler end of the pond. Some people may find this gross, but we find it wildly intriguing, and only a bit smelly.



ASABE member Ekramul Haque Ehite, Principal Scientist - Early Engagement and Deviceability, GSK, Collegeville, Pennsylvania, USA.

Golden Hour Symphony

At the old port of Thessaloniki in Greece, industrial cranes are silhouetted in the warm glow of the setting sun, against a backdrop of distant mountains—a captivating fusion of human ingenuity and natural splendor.

ASABE member Brian McLaughlin, Safety Psychographics LLC, Notre Dame, Indiana, USA.

Grain to Gallery

The former Oakwood Farms trackside grain facility has been retired and now serves as a towering beacon of art in the little town of Edwardsburg, Michigan. Various scenes adorn the silos, along with silhouettes of the people who painted the giant mural.

Decisions, Decisions, Decisions: How to Not Get Bogged Down

For as long as I can remember, I've had trouble making decisions in my work. I'm not talking about the difference between good and bad, but rather between what's good and what's "good enough" for the project. I can spend an inordinate amount of time choosing material specifications, piping routes, and sometimes even the words to put on a page.

In many cases, those choices have no significant ramifications for the project, but they still weigh me down. In my mind, an overwhelming amount of information needs to be collected and analyzed to determine the pros and cons of each alternative.

Many factors can tilt the scales for or against a particular choice, such as cost, durability, convenience, or some other criteria. Often, in addition to the many known factors, my mind looks for unknown factors. How can I even determine which unknown factors need to be considered?

As a result of these mental gymnastics, the decision-making process has always been tedious for me. However, I've learned a few strategies to manage the uncertainty:

Choices have longevity. Determining the implications of a decision is a strategy that I use to gauge how much time I need to spend on that decision. Knowing that the impact of a choice will last minutes, days, years, or decades helps narrow the options, and it reduces the time I spend dwelling on inconsequential details.

Time is money. If the time that I spend considering the possible outcomes of a decision exceeds the cost of the proposed solution, the time required to implement the solution, or the lifespan of the solution, then I'm spending too much time deciding.

Trust in my ability. Second-guessing and overthinking can hinder my ability to make an informed choice. I'm learning to trust myself to make the best decision possible. As ag and bio engineers, we have real expertise, and we can use that expertise to make informed decisions through science, observation, experience, and research.

Know when to seek help. Recognizing when I need more information to make a decision is another strategy I'm learning to develop. As young professionals, our decision-making processes may be less informed than those of later-career professionals, so we need to find a balance between demonstrating our abilities and knowing when to seek help.

The difference between a good decision and a "good enough" decision often lies in the knowledge that someone else can provide, and that knowledge is available if you are willing to ask. Taking that step does not indicate a lack of knowledge but rather a professional curiosity that often leads to learning much more than you expected.

Experienced end users, contractors, senior engineers, and colleagues in the workplace and in ASABE can all be valuable sources of information. Talk to everybody. Communication informs your decisions, makes your job easier, creates new opportunities, increases trust between people, and helps pass on institutional knowledge that would otherwise be lost.

When facing a decision, consider the value of the time you spend reflecting on outcomes and conducting research, trust yourself to make the best choice with the available information, and don't be afraid to ask others for their opinions.

If you find decision-making as tedious as I do, then getting outside of your own head can really help the process. Be open to ideas that can only be gained by talking to others. Communication and curiosity can help us make better decisions, and they can help us become better engineers and better people.

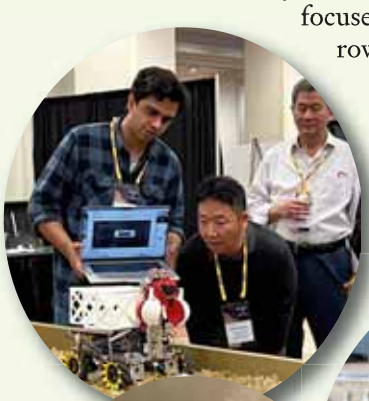
ASABE member and YPC Chair Quenton Schneider, P.E., CGA, Marshalltown, Iowa, USA, qschneid@gmail.com.

Behind the AE50 Awards: An Investment in Engineering

Each year, ASABE's AE50 Awards spotlight the most innovative products and systems advancing agricultural, food, and biological engineering. These technologies reflect the ingenuity, rigor, and problem-solving excellence that define the profession. But behind every breakthrough recognized through AE50 is something less visible—and just as critical: a strong pipeline of talent, leadership, and professional community.

That pipeline did not happen by accident. It has been built intentionally over decades through education, experiential learning, mentorship, and sustained investment in people. This is where the ASABE Foundation plays a vital role.

The Foundation exists to strengthen the profession by supporting engineers at every stage of their journey—from students discovering engineering through hands-on competitions, to early-career professionals developing leadership skills, to seasoned members giving back through mentorship and service. While AE50 celebrates today's innovations, the Foundation focuses on ensuring that tomorrow's innovations are possible.



Student competitions such as Quarter-Scale Tractor, Robotics, Fountain Wars, and Bioprocess offer far more than technical challenges. They immerse students in teamwork, project management, systems thinking, and real-world problem solving—skills that translate directly into industry and research success. Many engineers working on AE50-recognized products trace their professional confidence and career direction back to experiences like these.

Beyond competitions, the Foundation supports scholarships and leadership development programs, including the Society and Regional Leadership and New Professionals (SRLNP) program. These initiatives prepare engineers not only to excel technically but to lead teams, guide organizations, and shape the future of the profession. Innovation depends as much on leadership and collaboration as it does on design and analysis.

Industry partners and individual donors make this ecosystem possible. Corporate support—often from companies whose products earn AE50 recognition—helps ensure that students have access to high-quality experiential learning and that young professionals are equipped to step into leadership roles. Individual members contribute their time, expertise, and resources to sustain the profession they care deeply about.

The connection between AE50 and the ASABE Foundation is ultimately a long view of engineering excellence. Today's award-winning innovations are built by engineers who were once students, competitors, scholars, and volunteers. Tomorrow's AE50 honorees are sitting in classrooms, labs, and competition arenas right now.

As ASABE celebrates innovation through AE50, the Foundation remains focused on what comes next—investing in people, leadership, and opportunity so the profession continues to thrive for generations to come.

Liz Metts, Director of Development, ASABE, St. Joseph, Michigan, USA, metts@asabe.org.

ASABE Journals

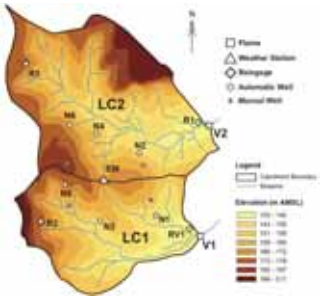
Recent research from our publications

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

JOURNAL OF THE ASABE

Hydrologic Impacts of Afforestation in Uruguay, A 20-Year Paired Watershed Study

George M. Chescheir, R. Wayne Skaggs, Devendra M. Amatya, François Birgand



Highlights

- A 20-year paired watershed study clearly showed that afforestation of a grassland watershed reduced water yield.
- Cumulative water yield over the 17-year tree growth period was reduced by 35%.
- Reductions of water yield were not evident until the fourth year after planting.
- Flow rates were reduced by 40% to 50% for high flows (less than 20% of the time) and by 50% to 70% for the remaining low flows.

Vol. 68(6): 1053-1071
doi.org/10.13031/ja.16474

AI Tools and Text Embedding for Session Organization at ASABE's Annual International Meeting

Joe Dvorak

Highlights

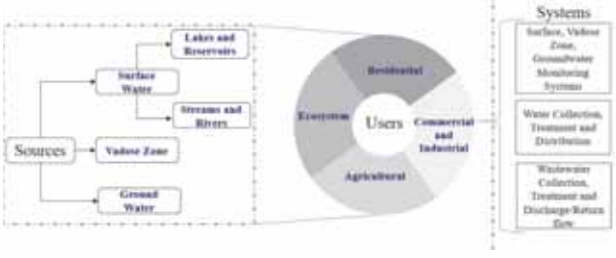
- Text embedding models enable automated determination of the similarity between presentations and sessions.
- Procedures to use metrics based on similarity scores to identify focused and unfocused sessions and outlier presentations are provided.
- Model clustering ability is more critical for this application than the maximum length of input text.

Vol. 68(6): 1115-1127
doi.org/10.13031/ja.16328

JOURNAL OF NATURAL RESOURCES AND AGRICULTURAL ECOSYSTEMS

Digital Water: Computing Tools, Technologies, and Trends

Debabrata Sahoo, Sushant Mehan, Sherry L. Hunt



Highlights

- "Digital Water" is an emerging field, driven by advances in sensors, digital tools, AI, and ML models.
- The field leverages large datasets to understand water in natural, human, and agricultural-dominated ecosystems.
- The Journal of ASABE developed a special collection on "Digital Water" to highlight the emerging works in this field.
- This collection features various applications of sensors, digital tools, and models to address water issues.

Vol. 3(4): 201-206
doi.org/10.13031/jnrae.16475

APPLIED ENGINEERING IN AGRICULTURE

Phosphine Distribution Patterns During the Fumigation of Binned Wheat

Lester O. Pordesimo, Mark E. Casada, Marvin C. Petingco, Kaliramesh Siliveru

Highlights

- Phosphine concentration and, indirectly, movement of phosphine throughout bulk grain presented uneven phosphine distribution patterns, especially when fumigating with conventional techniques.
- Distribution of phosphine gas was much more uniform throughout the bins when using CLF.
- With conventional fumigation, effective doses were only reached for the top levels of the binned grain close to where the phosphine tablets were probed.
- Effects of leakage from the temporarily sealed grain bins were observed with both conventional fumigation and CLF techniques.

Vol. 41(6): 707-718
doi.org/10.13031/aea.16200

ASABE S658 Planter Test Standard: 1. Row Unit Test

Michael F. Kocher, John A. Smith, Greg Arnett, Jason L. Werning, Mark C. Siemens, H. Mark Hanna

Highlights

- US Standard for testing and reporting performance of row-crop planter units.
- Started with and extends beyond ISO 7256/1-1984 (E) (International Organization for Standardization, 1984).
- Accompaniment to ASABE S658 test standard for planter monitoring systems.
- Excel spreadsheets available at https://www.asabe.org/S658 that analyze data and report test results.

Vol. 41(6): 719-731
doi.org/10.13031/aea.16375

JOURNAL OF AGRICULTURAL SAFETY AND HEALTH

Designing a Farm Emergency Plan Utilizing Artificial Intelligence

Noah J. Berning, Shawn G. Ehlers, William E. Field

Highlights

- Three AI systems were used and analyzed on their ability to create farm emergency plans.
- AI were presented with three farm emergency scenarios to access their completeness and accuracy of response.
- AI was not able to present complete farm emergency plans, as human intervention was needed for a complete FEP.
- AI responded well for individual emergency scenarios presented, containing key safety points.

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Modeling the Role of Weather Patterns and Grain Quality in On-Farm Engulfments and Entrapments

Gretchen A. Mosher, Elzerie Derry, Mateus Pizarro, **Yan Jiang,** Cheryl Beseler

Highlights

- Maximum high temperature and maximum relative humidity were found to be important in predicting corn moisture.
- Year, state, and maximum relative humidity were found to be important in predicting engulfment and entrapment.
- Findings warrant further investigation to examine exactly what is changing and impacting corn moisture and engulfment and entrapment incidents.

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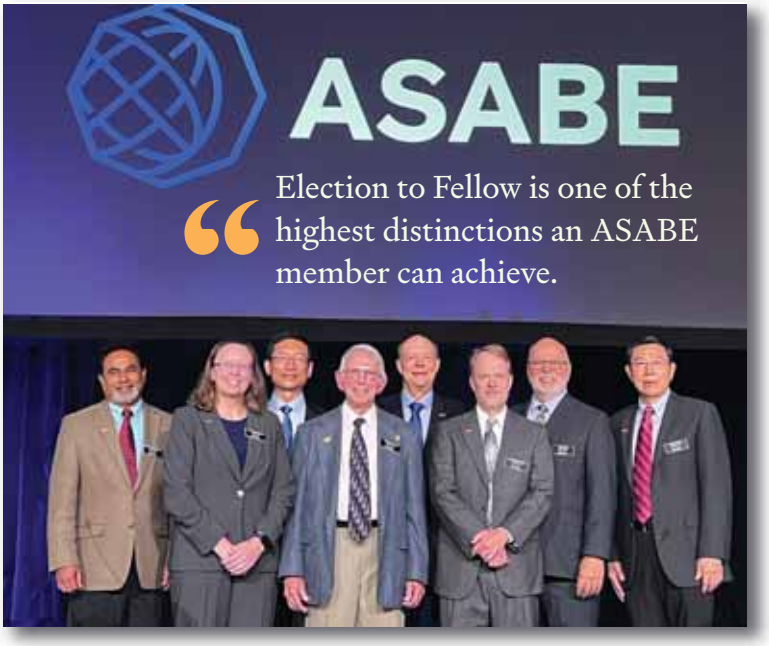
Meet the ASABE Fellows

Honoring the newly elected

ASABE recognized ten new Fellows at the 2025 Annual International Meeting in Toronto, Canada. In this issue of *Resource,* we highlight Charlie Li from the class of 2025.

Fellows must have a minimum of 20 years of active practice in, or related to, the profession of engineering, the teaching of engineering, or the teaching of an engineering-related curriculum. The designation Fellow has honorary status, to which members may be elected but may not apply.

As the ASABE Constitution states, Fellows are "of unusual professional distinction, with outstanding and extraordinary qualifications and experience in, or related to, the field of agricultural, food, or biological engineering." Election to Fellow is one of the highest distinctions an ASABE member can achieve.



The 2025 class of ASABE Fellows.

Changying "Charlie" Li, professor in the Department of Agricultural and Biological Engineering at the University of Florida, is honored for his outstanding contributions in developing innovative sensing and automation technologies to advance plant phenomics, specialty crop harvest, and postharvest technologies. Li also holds an administrative appointment to lead the Artificial Intelligence Working Group within the Institute of Food and Agricultural Sciences, overseeing the collaborative efforts of over 40 faculty members.

Li's research focuses on advancing digital agriculture through innovations in sensing, robotics, and machine learning to address challenges such as labor shortages and the growing need for increased agricultural productivity and resilience. His contributions have significantly advanced specialty crop harvesting, postharvest handling, and high-throughput phenotyping for accelerated crop breeding. He led a multidisciplinary team of specialty crop researchers that developed an affordable and efficient mechanical harvest aid system for fresh-market blueberries, reducing labor costs and minimizing fruit damage. He is a co-inventor of the berry impact recording device, which simulates the impact of berry fruit to measure mechanical impacts during harvesting and packing, leading to improved equipment design and reduced fruit bruising. His group developed the modular agricultural robotic system, an autonomous, multi-purpose, and cost-effective platform for in-field automated phenotyping and precision farming. He has pioneered image-based machine learning methods for yield prediction, high-resolution single-plant phenotyping, and crop stress detection in major crops, including cotton, blueberries, and peanuts. Li also played a leadership role in creating the Phenomics and Plant Robotics Center at the University of Georgia. He teaches both undergraduate and graduate courses on instrumentation, field robotics, computer vision, and machine learning.

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