

January/February 2018

# RESOURCE

engineering and technology for a sustainable world

## **VisualChallenge7**

**“This is how I see it”**

### **Also Inside:**

AE50 Awards

Ethics Essay Winner



# ASABE at the World Food Prize, Ethical Dilemmas, and the Beauty of our Work



In October, I had the honor of representing ASABE at the Borlaug Dialogue. The highlight was the awarding the 2017 World Food Prize to Dr. Akinwumi Adesina, President of the African Development Bank. Dr. Adesina, who holds a PhD in agricultural economics from Purdue University, was recognized for aiding the small-scale farmers of Africa in general and Nigeria in particular. As Nigeria's Minister of Agriculture,

he introduced the E-Wallet system, which broke the back of corrupt elements that had controlled the fertilizer distribution system for 40 years, demonstrating that access to technology (cell phones and electronic commerce) can address long-standing challenges to food production and poverty.

The 2017 Borlaug Dialogue was themed "The Road out of Poverty." As part of our ongoing Global Engagement Initiative, ASABE organized a side event in partnership with the Council on Agricultural Science and Technology (CAST). We hosted a panel discussion, "Designing the Road out of Poverty," and gathered a distinguished international and multi-disciplinary group to discuss the importance of access to food, water, and energy in enabling people to bring themselves out of poverty. You can view the discussion at [www.youtube.com/watch?v=byG-MVeOxzE](http://www.youtube.com/watch?v=byG-MVeOxzE).

This was the first activity that ASABE has organized at the Borlaug Dialogue, and it had the intended impact of gently raising the visibility of our Society. As I spoke with attendees following the event, there were two common themes: an appreciation for the importance of the topic, and a lack of awareness of ASABE. We need more outreach activities like this to raise awareness of our contributions toward feeding the world.

This issue of *Resource* contains an interesting juxtaposition of content. ASABE's annual recognition of outstanding new products, the AE50 Awards, highlights some of the latest advances in the food and agriculture industries. Many of these products rely on software and electronic systems to improve efficiency and productivity. Also in this issue is the winning essay from the 2017 Ag & Bio Ethics Essay Competition for our pre-professional members. Amélie Sirois-Leclerc of the University of Saskatchewan was the winner with "Fighting the right to repair: The perpetuity of a monopoly." She argues for the right of equipment purchasers to self-repair or use third-party services rather than be required to use dealerships to obtain repairs.

The proliferation of computerized systems has created a significant issue. We used to think of agricultural machinery as "big iron," but today's products are also "big silicon." Maintaining the functionality of these increasingly software-driven products is complex, as manufacturers have legitimate concerns about intellectual property and liability issues while customers desire options for timely repair of their large investments. Dilemmas such as this are exactly what we challenged our pre-professionals to consider in the ethics essay competition. What are your thoughts on this issue? Are we forced to choose one side, or is there a solution that can satisfy both camps?

And then there are the Visual Challenge photos. Now in the seventh year, the entries just get better and better—statements without words, showing the beauty and strength of ag and bio engineering. I hope these images inspire you to enter the next Visual Challenge.

Please send your comments and feedback to [ssearcy@myasabe.org](mailto:ssearcy@myasabe.org). I do want to hear from you.

Steve Searcy, P.E.

## events calendar

**ASABE CONFERENCES AND INTERNATIONAL MEETINGS**  
To receive more information about ASABE conferences and meetings, call ASABE at (800) 371-2723 or e-mail [migs@asabe.org](mailto:migs@asabe.org)

### 2018

Feb. 12-14 **Agricultural Equipment Technology Conference**, Louisville, Ky., USA.

July 29-Aug. 1 **ASABE Annual International Meeting**, Detroit, Mich., USA.

Sept. 25-27 **10th International Livestock Environment Symposium (ILES X)**, Omaha, Neb., USA.

Oct. 3-6 **Global Water Security for Agriculture and Natural Resources: An ASABE Global Initiative Conference**, Hyderabad, India.

### 2019

July 7-10 **ASABE Annual International Meeting**, Boston, Mass., USA.

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## ON THE COVER:

"Dinner's Ready"  
ASABE member John Lumkes captures a culinary moment when students and faculty participating in the Land O'Lakes Global Food Challenge program visited the Ngiresi Cultural Center near Arusha, Tanzania, and learned about traditional indoor cooking methods. "Indoor air quality can be a challenge when open fires are used for cooking," says Lumkes.

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# RESOURCE

engineering and technology for a sustainable world

January/February 2018

## Congratulations AE50 Winners!



### 4 5R Series Utility Tractor

John Deere

#### AgriCapture Cube

Enginuity Worldwide, LLC

### 5 AirRinse Sprayer Rinsing System

John Deere

#### Alpha Evo Self-Propelled Sprayer

HARDI North America Inc.

#### ATMOS 41 Compact Weather Station

METER Group, Inc. USA

#### BalerAssist™

John Deere

### 6 Challenger MT700 Series Track Tractor

AGCO Corporation

#### Challenger® RoGator® C Series Applicator

AGCO Corporation

#### CustomSteer™

New Holland Agriculture

#### CVXDrive™ for Case IH Steiger® and Quadtrac® Tractors

Case IH Agriculture

### 7 Datatronic 5 Tractor Terminal

AGCO Corporation

#### Double Duty Twin Chain

GVM Inc.

#### Dynamic Command™ Transmission

New Holland Agriculture

#### EASY On-Board App

CLAAS of America Inc.

### 8 EWOTEC

Graintec, Inc.

#### ExactApply™ Nozzle Control System

John Deere

#### FieldNET® Advisor™

Lindsay Corporation

#### FieldNET® Pivot Control Lite

Lindsay Corporation

### 9 FieldScout® TDR 350 Soil Moisture Meter

Spectrum Technologies, Inc.

#### GK Lettuce Harvester

GK Machine, Inc.

#### Grain Quality Camera

CLAAS of America Inc.

#### GrainViz

151 Research Inc.

### 10 Guardian SP310F Front Boom Sprayer

New Holland Agriculture

#### Hesston by Massey Ferguson

2370 Ultra High Density Baler

AGCO Corporation

### Hesston by Massey Ferguson

WR9900 Series Self-Propelled

#### Windrower

AGCO Corporation

### In-Cab Split-Row Lift System for

Case IH Early Riser® 2140 Pivot

Transport Planter

Case IH

### 11 Individual Nozzle Boundary Control for PinPoint® II

Capstan Ag Systems

#### IntelliTurn™ the Intelligent

Automatic End-of-Row Turn System

New Holland Agriculture

#### INTERCEPTOR™ 8050 High Speed

Tillage

Kuhn Krause, Inc.

#### JAGUAR 900 Series (Type 498)

Forage Harvester

CLAAS of America Inc.

### 12 John Deere Connected Support™ -

Expert Alerts

John Deere

#### KMC 2100 Double-Fold Field

Cultivator

Kelley Manufacturing Company

#### Merge Maxx® MM 1100 Hay Merger

Kuhn North America, Inc.

#### Mixmate™

Praxidyn

### 13 NL5000 G5 Dry Nutrient Applicator

New Leader

#### Nutri-Placer 930 HSLD Fertilizer

Applicator

Case IH Agriculture

#### Optispread Plus™ Residue

Management

New Holland Agriculture

#### Plus2™ John Deere Round Bale

Accumulator

John Deere

### 14 Precision Cotton Harvesting

Technology for CP690 and CS690

Cotton Harvesters

John Deere

#### ROBOVATOR Mechanical Weeding

Machine

F Poulsen Engineering ApS

#### Rubicon Self-Propelled Sprayer

HARDI North America Inc.

#### S700 Combine

John Deere

### 15 SpotOn® Digital Soil Compaction

Meter

Innoquest, Inc.

#### Straw Claw™ Chopper Blades

Kondex Corporation

#### Sweep Wheel Grain Reclaimer

Sukup Manufacturing Co.

#### TotalGrow Pure Flowering 200 Lamp

Ventis Technologies, LLC

### 16 Trident® 5550 Liquid/Dry

Combination Applicator

Case IH Agriculture

#### Valley® X-Tec™ Center Drive

Valley Irrigation

#### XLamp® XP-G3 Royal Blue LED

Cree, Inc.

#### XUV835 Gas and XUV865 Diesel

Gator Utility Vehicles

Deere and Co.

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Bob Stwalley and

Carol Stwalley



# What's New?

**R**esource is pleased to sponsor the AE50 Awards—celebrating companies for their developments in agricultural, food, and biological systems. This issue is dedicated to the gifted engineers and co-workers who creatively harness and manage company resources and talent to pursue the new. They are honored for their ingenuity in product development—saving producers time, costs, and labor, while improving safety as well.

The products featured represent the diversity of agricultural and biological engineering, as well as the variety of companies—of all sizes and specializations—that continue to bring advanced technology and exciting improvements to the marketplace.



Over 30 years old, AE50 is the only awards program of its kind. From the many entries submitted each year, an expert panel selects up to 50 products for recognition. The award-winning products are those ranked highest in innovation, significant engineering advancement, and impact on the market served. Formal presentation of the AE50 Awards will occur at ASABE's Agricultural Equipment Technology Conference (AETC) on February 13 in Louisville, Kentucky.

To all AE50 Award winners, congratulations from the *Resource* staff!

If you have questions about the AE50 Awards, visit the ASABE website ([www.asabe.org/AE50](http://www.asabe.org/AE50)) or contact Sandy Rutter ([rutter@asabe.org](mailto:rutter@asabe.org) or 269-932-7004).

## 5R SERIES UTILITY TRACTOR

**John Deere**  
Moline, Illinois, USA  
[www.deere.com](http://www.deere.com)

The John Deere 5R Series Utility Tractor features a newly designed chassis, panoramic cab, electro-hydraulic partial power-shift transmission and pressure flow compensated hydraulics. The transmission includes AutoClutch™ functionality, a joystick reverser button for quicker shuttle shifts, and an automatic mode to set speed and allow the tractor to operate at the most efficient point. The innovative chassis design provides best in class turning radius at 3.75 m and the shortest wheelbase in its class at 2250 mm. The panoramic cab increases upward visibility by 80% for improved loader productivity. Additional comfort is provided with a cab suspension system and the John Deere CommandARM™ integrated into the cab. Tractor efficiency provides 7% better fluid consumption than the closest competitor in its class.



## AGRICAPTURE CUBE

**Enginuity Worldwide, LLC**  
Centralia, Missouri, USA  
[www.enginuityww.com](http://www.enginuityww.com)

The AgriCapture™ Cube is a soil remediation product made from animal waste that includes a dose of partially carbonized agricultural waste and/or anaerobic digestate (AD) material and biochar. It improves overall soil health while controlling release rates of minerals and nitrogenous wastes associated with waste products. The AgriCapture™ Cube provides an effective solution to the management and disposal of agricultural/AD wastes. The AgriCapture™ Cube is produced with a rotary compression unit (RCU) that sterilizes and partially carbonizes the waste material. The AgriCapture™ Cube is used as a supplement to increase soil health and efficacy, increase soil carbon sequestration soils, and provide a safe and effective means to stabilize nitrogenous compounds on the field to avoid leaching into surrounding waters.



## AIRRINSE SPRAYER RINSING SYSTEM

**John Deere**  
**Moline, Illinois, USA**  
[www.deere.com](http://www.deere.com)

The John Deere AirRinse Sprayer Rinsing System for field crop sprayers automatically uses water and air to enhance the dilution factor, reduce the chemical cross-contamination risk, and reduce the environmental impact of rinsing sprayers. The AirRinse system applies more of the remaining spray liquid to the field, and it dilutes and recovers the residual liquid better than traditional rinse methods. Dilution is improved by a factor of 16 while using the same volume of rinse water. Two automatic modes allow efficient rinsing in the field or farmyard to ensure that the sprayer is effectively rinsed before the next spray application, reducing the sprayer's environmental impact.



## ALPHA EVO SELF-PROPELLED SPRAYER

**HARDI North America Inc.**  
**Davenport, Iowa, USA**  
[www.hardi-us.com](http://www.hardi-us.com)

The Alpha Evo self-propelled sprayer by HARDI North America features a three-post Class 4 cab and the a superior application system in the TWIN spray boom system at up to 120 ft. The cab's pressurization and filtering system protects the driver from dust, aerosols, and vapors in a climate-controlled environment, while the three-post structure provides an unobstructed 320° field of view. The TWIN spraying system has been enhanced to reach 120 ft of crop coverage per pass while precisely placing chemical applications to minimize or eliminate drift. The folding frame and the use of aluminum in the wings provide greater durability and lower weight. Potential compaction is reduced by a pneumatic ride coupled with the strong engineering design for strength where needed while reducing dead weight to less than 18 lb per square inch.



## ATMOS 41 COMPACT WEATHER STATION

**METER Group, Inc. USA**  
**Pullman, Washington, USA**  
[www.metergroup.com](http://www.metergroup.com)

The ATMOS 41 Compact Weather Station is designed for continuous monitoring of environmental variables, including all standard weather measurements. All sensors are integrated into a single unit, requiring minimal installation effort. Ultra-low power consumption and a robust, no-moving-parts design that prevents errors due to wear or fouling make the ATMOS 41 ideal for long-term remote installations. Twelve weather sensors for atmospheric conditions are packaged into a single, compact device. The data is transmitted over a single wire, so only one port on a data logger is needed. The ATMOS 41 measures air temperature, relative humidity, vapor pressure, barometric pressure, wind speed, wind gust, wind direction, solar radiation, precipitation, lightning strike and distance, and compass direction and tilt.



## BALERASSIST™

**John Deere**  
**Moline, Illinois, USA**  
[www.deere.com](http://www.deere.com)

BalerAssist™ is an industry-exclusive available on the new John Deere 1 Series large square baler that gives the operator the ability to control the drivetrain hydraulically. This new drivetrain system can operate at two different reduced speeds in both forward and reverse directions, and it can hold the drivetrain in a braked position. This option

reduces the time needed to remove plugs that can occur in the pickup or rotor by operating BalerAssist™ from the user display. Operators benefit by spending more time baling and less time dealing with plugs. BalerAssist™ can also be controlled with a wireless remote, which makes performing maintenance and adjustments, including knottter troubleshooting, a one-person job.



## CHALLENGER MT700 SERIES TRACK TRACTOR

AGCO Corporation  
Duluth, Georgia, USA  
[www.agcocorp.com](http://www.agcocorp.com)

The all-new MT700 Series track tractor from Challenger is designed for maximum productivity and operator comfort. The entirely new AccuDrive™ Powertrain delivers high torque at low engine speed. With a maximum speed of 1790 rpm and working range of 1200-1600 rpm, all tractor functions, including the CVT, PTO, cooling system, and hydraulics, are geared to run at optimum levels at this low engine speed. This delivers lower fuel consumption, reduced engine and component wear, and quiet operation. The three-stage Maxx Ride™ Integrated Comfort System (ICS) delivers a quality ride. The system is comprised of a redesigned oscillating midwheel system, all new primary hardbar suspension, and advanced cab suspension.



## CHALLENGER® RoGATOR® C SERIES APPLICATOR

AGCO Corporation  
Duluth, Georgia, USA  
[www.agcocorp.com](http://www.agcocorp.com)

The Challenger® RoGator® C Series Applicator with the LiquidLogic™ application system combines automation, recirculation, and streamlined flow to ensure accuracy and safety in applying nutrients and crop protection products while preventing residue accumulation. Booms can be charged without dispensing product, saving product and preventing under- or over-application when beginning an application. Product cleanout processes evacuate over 90% of residual volume while on-screen prompts guide the operator. Operator interface improvements and automation reduce the workload in agitation, load management, and repetitive tasks by using machine-memorized headland sequences. The drive system, hydraulics, and engine are controlled automatically to deliver peak performance at lower rpm with fuel savings of 11% to 15%. The AWD SmartDrive™ system continuously monitors each wheel for torque and speed to maintain traction and deliver timely treatments in less-than-ideal field conditions.



## CUSTOMSTEER™

New Holland Agriculture  
New Holland, Pennsylvania, USA  
[www.newholland.com](http://www.newholland.com)

The CustomSteer™ system is a variable-ratio steering feature that allows operators to choose their own steering ratio, which is the number of steering wheel rotations to turn fully from left to right. With CustomSteer™ this can be reduced to just a single rotation, which significantly reduces operator input when performing repetitive maneuvers. A different ratio can be set independently for forward and reverse directions, and switching ratios can be programmed into the automated end-of-row system, Headland Turn Sequencer II. Precise steering control is maintained and safety is ensured because the custom ratio gradually returns to the standard ratio as travel speed increases. CustomSteer™ is available in New Holland's T6 and T7 tractor ranges.



## CVXDRIVE™ FOR CASE IH STEIGER® AND QUADTRAC® TRACTORS

Case IH Agriculture  
Racine, Wisconsin, USA  
[www.caseih.com](http://www.caseih.com)

The CVXDrive™ in the Case IH Steiger®, Rowtrac™, and Quadtrac® Series tractor is the industry's first continuously variable transmission for an articulated tractor. Coupled with 605 peak hp, the intuitive CVXDrive™ delivers constant speed and uninterrupted power to the ground from 3 ft/min to 25 mph. Four mechanical speed ranges ensure peak mechanical efficiency, especially at the lower operating speeds where power and torque are required for a 4WD tractor. This means easy operation with optimal fuel efficiency. Once the desired operating target (working speed or engine rpm) is set, the CVXDrive™ automatically selects the most efficient transmission range, allowing the operator to focus on other tasks.



## DATATRONIC 5 TRACTOR TERMINAL

**AGCO Corporation**  
**Duluth, Georgia, USA**  
[www.agcocorp.com](http://www.agcocorp.com)

The Massey Ferguson Datatronic 5 Tractor Terminal system puts complete tractor and precision farming control at the operator's fingertips. The system and in-cab terminal combine all the functions needed by the operators of modern tractors, such as implement control, guidance, and precision data, into an ISOBUS-compatible user interface that is straightforward and efficient to use. Today's tractor operators have become well adapted to using consumer-grade tablets, which are intuitive as well as fast and responsive. The goal of the Datatronic 5 terminal was to achieve those same characteristics. Customer feedback during development was in line with these expectations, and the Datatronic 5 terminal will boost efficiency, productivity, and profitability as a result.

## DOUBLE DUTY TWIN CHAIN

**GVM Inc.**  
**East Berlin, Pennsylvania, USA**  
[www.gvminc.com](http://www.gvminc.com)

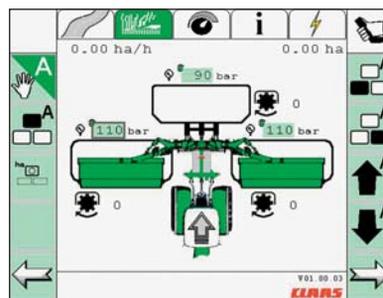
GVM's Double Duty Twin Chain spreader offers up to four-section swath width control with simplicity and precision. The Double Duty Twin Chain features two bar chains with individual shut-off and air-actuated funnel control to precisely direct product placement. After the product is placed onto the spinner discs, the patented five-blade spinner discs reverse-rotate to spread the product farther and flatter than a traditional spreader. With its unmatched spread pattern, the Double Duty Twin Chain offers on-the-go adjustability, perfect for waterways, point rows, and boundary spreading. The design minimizes moving parts to simplify operation and reduce maintenance. The Double Duty Twin Chain rides on the four-wheel-steer, all-wheel-drive Prowler chassis for optimum flotation.



## DYNAMIC COMMAND™ TRANSMISSION

**New Holland Agriculture**  
**New Holland, Pennsylvania, USA**  
[www.newholland.com](http://www.newholland.com)

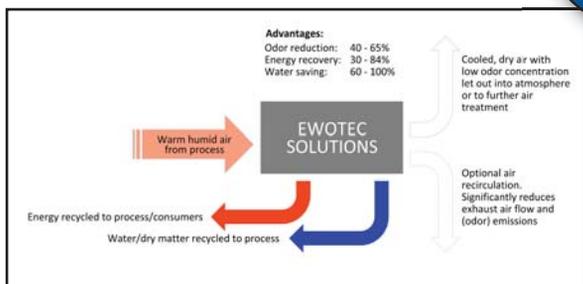
The New Holland Dynamic Command™ transmission is a new 3 range, 8-step, semi-power shift design that uses a dual-clutch concept similar to that used in the automotive industry and provides the driver with seamless gear shifting, increasing efficiency and overall productivity. The 4 odd-numbered gears and one clutch are located on one shaft, the 4 even gears and one clutch on a second shaft. Power is then simply modulated between the two clutches. As an odd gear is disengaged with one clutch, the second clutch is engaging the even gear ratio. Dedicated clutches for forward and reverse ensure a controlled power shuttle, while the range shifting is all robotized.



## EASY ON-BOARD APP

**CLAAS of America Inc.**  
**Omaha, Nebraska, USA**  
[www.claas.com](http://www.claas.com)

The CLAAS EASY on-board app enables farmers to use an Apple iPad as an ISOBUS terminal. A wireless interface connects to the ISOBUS plug in the tractor's cab, creating a Wi-Fi network. The iPad connects to the Wi-Fi network, establishing a save link with the wireless interface. With a save link, other devices cannot connect to the same implement at the same time. The EASY on-board app is available through the Apple iTunes Store. As soon as the app starts, it loads ISOBUS information from the implement. The implement can be controlled from inside or outside the cab. The EASY on-board app includes a task management menu that can record jobs. These tasks can be sent out as an ISOXML file via email.



## XEWOTEC

**Graintec, Inc**  
 Kansas City, Missouri, USA  
[www.graintec.com](http://www.graintec.com)

EWOTEC is a processing system for the exhaust air from feed dryers that reduces odor emissions while recycling energy, saving water, and maintaining product quality. EWOTEC first separates water from the dryer exhaust air. Many of the odorous components in the exhaust are water-soluble and follow the separated water, improving the air quality. Fine dust particles also follow the separated water and improve the air quality. In addition, much of the latent heat from the separation process is recovered, which reduces the energy consumption. Finally, all or part of the separated water can be reused, reducing water consumption. This eco-friendly and sustainable technology increases energy efficiency while safeguarding fresh water resources in the feed processing industry.

## EXACTAPPLY™ NOZZLE CONTROL SYSTEM

**John Deere**  
 Moline, Illinois, USA  
[www.deere.com](http://www.deere.com)

The ExactApply™ Nozzle Control System improves the ability to manage droplet size and spray coverage, thus enhancing the efficacy of the applied product. This system also helps producers manage their input costs by reducing the overapplication and underapplication that can occur in varying field conditions. ExactApply™ enhances the performance of drift-reducing nozzles by controlling the flow rate and pressure through the tip throughout a larger speed range. It also adjusts the spray rate by individual nozzle across the length of the boom during turns and curves for more accurate application. Along with more flexible control from the cab, the system includes LED lights in each nozzle body and smart diagnostics.



## FIELDNET® ADVISOR™

**Lindsay Corporation**  
 Omaha, Nebraska, USA  
[www.lindsay.com](http://www.lindsay.com)

FieldNET® Advisor™ is an irrigation management support solution designed to provide growers with science-based recommendations to enable faster and better-informed irrigation management decisions that help maximize yield while reducing unnecessary input costs and waste. FieldNET® Advisor™ combines more than 40 years of crop and irrigation research into FieldNET's technology platform, leveraging volumes of big data, cloud computing and remote sensing capabilities, and machine learning to deliver field- and crop-specific recommendations relating to when, where, and how much to irrigate. FieldNET® Advisor™ simplifies irrigation management by dynamically tracking crop development, seamlessly retrieving application data, and performing complex soil water depletion calculations, all within the FieldNET platform.



## FIELDNET® PIVOT CONTROL LITE

**Lindsay Corporation**  
 Omaha, Nebraska, USA  
[www.lindsay.com](http://www.lindsay.com)

Pivot Control Lite from FieldNET® by Lindsay® is an easy-to-install, economical remote monitor and control product that works with any brand of electric center-pivot irrigation system. Many farmers face the challenge of operating multiple brands of pivots, particularly on leased land. Ideal for farmers who don't own all the pivots they operate, but they want to reap the benefits of remote management. The patent-pending design allows farmers to use all the features of their existing controller. Pivot Control Lite gives farmers a tool to place irrigation water in the right spot to avoid over-watering and reduce labor cost and time. Pivot Control Lite includes an integrated cellular modem and on-board GPS. Pivot Control Lite will also monitor the electrical cable, detect tampering, and send alerts.



## FIELDSCOUT® TDR 350 SOIL MOISTURE METER

Spectrum Technologies, Inc.  
Aurora, Illinois, USA  
[www.specmeters.com](http://www.specmeters.com)

The FieldScout® TDR 350 Soil Moisture Meter provides growers, researchers, and turf managers with a portable tool for measuring moisture, salinity, and temperature in the soil. The TDR 350 adds electrical conductivity and temperature sensors to improve water content accuracy in a wider range of soil conditions and at grower-selectable depths through its use of multi-length replaceable rods. An optional infrared temperature sensor provides instantaneous surface temperature readings. The integral GPS receiver records the location of every measurement. All values are displayed on a crisp graphical LCD display, plus the integral Bluetooth Low Energy radio enables communication to a companion smartphone app. The TDR 350 will help growers better manage irrigation, fertilization, near-surface salt accumulation, and disease pressure.



## GK LETTUCE HARVESTER

GK Machine, Inc.  
Donald, Oregon, USA  
[www.gkmachine.com](http://www.gkmachine.com)

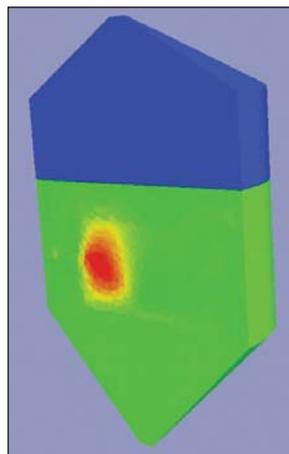
The GK Lettuce Harvester is a double-sided, shaded harvest platform designed with a unique track undercarriage and alternator/inverter system with extensions on both sides that fold up for transport. The unique feature of the platform is its ability to be driven in either direction, with one side for boxed lettuce and the other for heat-sealed bag products. Picking and processing tables fold down on either side specific to the process type. Steering controls can be aligned with the direction of travel. The platform rotates for steering and to maintain alignment with the field, allowing 360° of travel independent of the platform orientation. The entire platform is constructed of stainless steel to allow daily cleaning.



## GRAIN QUALITY CAMERA

CLAAS of America Inc.  
Omaha, Nebraska USA  
[www.claas.com](http://www.claas.com)

The Grain Quality Camera is a high-definition color camera that monitors the quality of grain in the clean grain elevator. High-quality pictures of the grain flow are taken every second and then processed to calculate the real-time amount of foreign matter and broken kernels traveling into the grain tank. The feedback from the camera is then displayed to the operator in a picture and/or bar graph so the operator can monitor the quality of grain entering the grain tank and can modify the combine settings according to the camera's feedback. Picture refresh rates can be adjusted for optimal viewing. Active audible and visual alerts inform the operator when the amount of foreign matter and/or broken kernels exceeds the threshold.



## GRAINVIZ

151 Research Inc.  
Winnipeg, Manitoba,  
Canada  
[www.151research.com](http://www.151research.com)

GrainViz is a way of monitoring stored grain through 3D electromagnetic imaging. Using a series of antennas on the outer wall of the bin, GrainViz creates a highly detailed 3D image of the moisture content of the entire bin contents, allowing producers to closely monitor and condition the grain. Producers can view the data

through a website on any web-connected device. Unlike cable-based monitoring, GrainViz sees the bin in its entirety, ensuring that no hotspots are present at any point during conditioning or storage. Because GrainViz generates an image profile of the moisture content, it can also detect pre-conditions for hotspots. GrainViz allows fine-grained control of the grain conditioning process, allowing producers to maximize the quality and price of their crop.



### **GUARDIAN SP310F FRONT BOOM SPRAYER**

**New Holland Agriculture**  
**St. Nazianz, Wisconsin, USA**  
[www.newholland.com](http://www.newholland.com)

The New Holland Guardian SP310F™ Front Boom Sprayer covers ground faster, maximizes acres sprayed per hour, and allows applications later in the growing season. The Guardian SP310F™ features active suspension that provides variable height adjustment for 72 to 78 in. of crop clearance. The machine has 20 in. of wheel travel, and the suspension adjusts to apply equal loads to all four wheels in demanding terrain, reducing soil compaction and maintaining traction. Enhancements include a cab designed specifically for a front boom sprayer. The redesigned center section and lift arms greatly increase visibility during application and transport. The chassis and legs were designed with 100,000 psi strength steel to enhance durability while reducing the overall weight.



### **HESSTON BY MASSEY FERGUSON 2370 ULTRA HIGH DENSITY BALER**

**AGCO Corporation**  
**Duluth, Georgia, USA**  
[www.agcocorp.com](http://www.agcocorp.com)

The Hesston by Massey Ferguson 2370 Ultra High Density (UHD) baler redefines the capacity and performance of high-density large square balers. Newly designed pickup, faster running packer crank, and a plunger that runs at 50 strokes per minute maximize capacity. A more powerful plunger with an exclusive split torque design gearbox, redesigned driveline, extended-length bale chamber with larger tension cylinders, heavy-duty chassis, and ultra heavy-duty knotters allow the baler to achieve 20% greater bale density than the 2270 XD baler. The 2370 UHD baler was designed specifically for producing dense bales in grass hay and hard-to-bale crop residues that can be lightweight, dry, and slick. Fewer, denser bales require less expense to handle, transport, and store, reducing operating costs.



### **HESSTON BY MASSEY FERGUSON WR9900 SERIES SELF-PROPELLED WINDROWER**

**AGCO Corporation**  
**Duluth, Georgia, USA**  
[www.agcocorp.com](http://www.agcocorp.com)

The Hesston by Massey Ferguson WR9900 Series Self-Propelled Windrower has been re-designed to provide increased capacity and operator comfort. At 265 hp, the WR9980 provides more power with less parasitic loss, lower field compaction, and no reduction in maneuverability without increasing the overall dimensions, wheelbase, or weight. The improved hydraulic system delivers a 20% increase in available header power on 16 ft disc headers for higher throughput in the most difficult crops and conditions. All models in the series can run disc, auger, or draper headers, making the WR9900 Series extremely versatile. The new VisionCab™ provides better visibility, has a 50% increase in A/C cooling capacity, and includes a new user interface for more intuitive monitoring and control.



### **IN-CAB SPLIT-ROW LIFT SYSTEM FOR CASE IH EARLY RISER® 2140 PIVOT TRANSPORT PLANTER**

**Case IH**  
**Racine, Wisconsin, USA**  
[www.caseih.com](http://www.caseih.com)

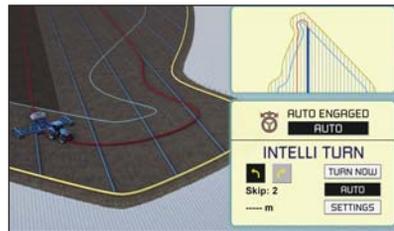
The In-Cab Split-Row Lift System for the Case IH Early Riser® 2140 Pivot Transport Planter eliminates the special tools and physical exertion traditionally required to manually raise or lower the soybean row units when changing between 30 in. (corn) and 15 in. (soybean) row spacing. The operator can perform these functions from the comfort of the cab using the planter's touchscreen display and a single tractor electro-hydraulic remote. Operators can use the In-Cab Split-Row Lift System in the following Case IH Early Riser® 2140 Pivot Transport Planter configurations: 12/23 row 30"/15", 12/24 row 30"/15", 16/31 row 30"/15", and 16/32 row 30"/15".



## INDIVIDUAL NOZZLE BOUNDARY CONTROL FOR PINPOINT® II

Capstan Ag Systems  
Topeka, Kansas, USA  
[www.capstanag.com](http://www.capstanag.com)

Using sub-meter precision algorithms coupled with location information from the applicator's GPS and satellite mapping, the Individual Nozzle Boundary Control software for the PinPoint® II precision spraying system provides exact spray applications to any field boundary in real time. Individual Nozzle Boundary Control is designed to allow applicators to save time, money, and reduce environmental risks. Applicators no longer need to address waterways, field edges, trees, or other obstacles prior to spraying the rest of the field. Overlap and overspray into protected areas are also reduced. The pulse width modulation spray system consisting of Individual Nozzle Boundary Control, coupled with the Individual Nozzle Overlap of the PinPoint® II, will accomplish the highest resolution spray application available while increasing the application productivity.



## INTELLITURN™ INTELLIGENT AUTOMATIC END-OF-ROW TURN SYSTEM

New Holland Agriculture  
New Holland, Pennsylvania, USA  
[www.newholland.com](http://www.newholland.com)

Using knowledge gained from the NHDrive Autonomous Concept Tractor Project, the IntelliTurn™ system allows the operator to improve machine efficiency by automatically plotting and executing the most efficient turn path at the headland, minimizing "out of work" time. The IntelliTurn™ system ensures that the implement re-enters the in-field work area in line with the desired path without the need for intervention, reducing operator fatigue and increasing work rates. The system dynamically modifies its path planning based on vehicle speed when approaching the turn and recommends speed reductions when necessary, providing an optimized vehicle turn. The IntelliTurn™ system is available on New Holland T6, T7, T8, and T9 tractors that have IntelliSteer™ Auto Guidance.



## INTERCEPTOR™ 8050 HIGH SPEED TILLAGE

Kuhn Krause, Inc.  
Hutchinson, Kansas, USA  
[www.KuhnNorthAmerica.com](http://www.KuhnNorthAmerica.com)

The Kuhn Krause INTERCEPTOR™ is a high-speed tillage system that uses rotary soil-engaging components combined with a single row of heavy-duty, adjustable, 30-in. tines to maintain full contact with the soil surface, forcing airborne soil and residue from the front row of blades downward for further sizing and leveling. Two parallel rows of 32-flute Excalibur® CT shallow concavity blades, configured in a tandem design, are mounted onto individual, compound-angle bearing arms, providing a clean cut and creating a uniform seed bed floor. Two active hydraulic down-pressure circuits maintain uniform operational depth across the machine and consistent contact of the Star Wheel™ rotary treaders. Clod sizing and soil consolidation are accomplished by 24/7° conditioning reels.



## JAGUAR 900 SERIES (TYPE 498) FORAGE HARVESTER

CLAAS of America Inc.  
Omaha, Nebraska, USA  
[www.claas.com](http://www.claas.com)

The CLAAS JAGUAR 900 Series has many added features to the Type 498 forage harvester. The feeder house is redesigned for better feeding and offers an innovative optional hydraulic header drive that allows the operator to adjust header speed from the cab. A heavy-duty axle with optional Differential Lock improves traction. The drivetrain is redesigned for improved efficiency, less fuel consumption, and up to 13.6 mph in first gear. Duals, available from the factory, lend greater stability on hilly or soft ground. The CLAAS AUTO FILL system continues to evolve with the Rear AUTO FILL system that automatically fills a truck positioned directly behind the chopper. The automatic adjustment of the shear bar adjusts the lower drum concave for improved cut quality and performance.



## JOHN DEERE CONNECTED SUPPORT™ - EXPERT ALERTS

**John Deere**  
Moline, Illinois, USA  
[www.deere.com](http://www.deere.com)

John Deere Connected Support™ - Expert Alerts utilizes JDLink™ machine connectivity and data analytics to predict service needs, reduce diagnostic time, and minimize downtime. This results in higher levels of machine availability, improved machine performance, and lower cost of operation. Unexpected machine downtime during critical busy times is a risk for producers and service providers, especially as farm sizes continue to increase and seasonal operating windows become tighter. Expert Alerts allows customers and dealers to reduce service costs and improve operational efficiencies to get the work done on time with fewer interruptions. Expert Alerts provides remote monitoring and notification to John Deere dealers, which enables them to contact customers about impending or potential issues, and often gives dealers solutions to resolve the issue.



## KMC 2100 DOUBLE-FOLD FIELD CULTIVATOR

**Kelley Manufacturing Company**  
Tifton, Georgia, USA  
[www.kelleymfg.com](http://www.kelleymfg.com)

With a 47% increase in operating width over the previous model, the KMC 2100 Double-Fold Field Cultivator is an economical three-point-lift implement that creates a smooth seedbed. It has up to 41 ft of working width, improved transport dimensions, and better center of gravity. The shorter overall length is a result of repositioning the gauge wheels, tines, and toolbar. The wings flex to keep a consistent operating depth (2 to 6 in.) on uneven ground. Transport safety is improved by reducing the width (17 ft 10 in.) and height (13 ft) while maintaining excellent rear visibility from the tractor cab. The spring-loaded rear finishing section can be equipped with various options depending on soil type and desired condition of the seedbed.



## MERGE MAXX® MM 1100 HAY MERGER

**Kuhn North America, Inc.**  
Brodhead, Wisconsin, USA  
[www.KuhnNorthAmerica.com](http://www.KuhnNorthAmerica.com)

Providing 36 ft of continuous merging capability in a single pass, the Merge Maxx® MM 1100 hay merger with ISOBUS compatibility provides improved operator ergonomics and reduced fatigue. The MM 1100 incorporates six tine bar cam pickups with tine arm wear guards and anti-wrapping rings, providing maximum productivity. The floating windguard ensures smooth and even windrows to make the forage harvester more efficient. The crop netting improves leaf retention into the windrow for optimum feed quality. Simple and durable mechanical flotation on each head eliminates the need to engage float via the tractor's hydraulics. Folding the machine is done in a single operation to make it faster and more efficient when transporting from field to field.



## MIXMATE™

**Praxidyn**  
Oakland, Iowa, USA  
[www.praxidyn.com](http://www.praxidyn.com)

Mixmate™ is a fully automated chemical blending and recordkeeping system with modular options for portable or stationary installations and measurement by weight and volume. The patent-pending process drains, weighs, rinses, records, and reconciles the data from a 2.5 gal container in about 12 seconds. Simultaneous measuring of multiple products results in fast mixing speeds, typically filling a large sprayer in 4 to 8 minutes. The Android app controls the system, captures the data automatically, and synchronizes with their Intersect® cloud service to backup the data and provide remote access. Intersect® uses CSV and API data access for easy data transfer with other recordkeeping systems. Intersect® and Mixmate™ can automate data processing to save time and reduce errors.



## NL5000 G5 DRY NUTRIENT APPLICATOR

**New Leader**  
Cedar Rapids, Iowa, USA  
[www.new-leader.com](http://www.new-leader.com)

The NL5000 G5 is a high-output, variable-rate, dry nutrient applicator with 16-section swath width control. The technology dynamically adjusts the spinner assembly left/right and fore/aft to give the operator a responsive and reliable method to apply the right amount of nutrients in the right place. The G5 section control gives increased accuracy for point rows and irregularly shaped areas and provides last-pass control to significantly reduce overlap when finishing a field with a partial swath. The hydraulic system supports the spinner control, conveyor control, and an automatic chain tensioner. The intuitive New Leader interface is ISOBUS-compatible and incorporates diagnostic feedback, stored profiles, automated service notifications, low bin countdown, and an automatic chain oiler.

## NUTRI-PLACER 930 HSLD FERTILIZER APPLICATOR

**Case IH Agriculture**  
Racine, Wisconsin, USA  
[www.caseih.com](http://www.caseih.com)

The Case IH Nutri-Placer 930 HSLD Fertilizer Applicator increases productivity for anhydrous ammonia fertilizer applicators while minimizing soil erosion. Achieving speeds up to 11 mph, the Nutri-Placer 930 fertilizer applicator with new High-Speed Low Disturbance (HSLD) coulters helps growers cover acres fast and efficiently, achieving up to 57% greater productivity than traditional shank-style fertilizer applicators. This increased productivity is matched with superior agronomic performance. The HSLD coulters provide better residue cover and a more level surface finish than other coulters-style applicators available, properly sealing nutrients to lock in each crop's profit potential. The heavy-duty Nutri-Placer 930 frame provides the strength and



stability needed for high-speed operation, while the stubble-resistant radial tires prevent costly downtime due to tire failures and reduce soil compaction.



## OPTISPREAD PLUS™ RESIDUE MANAGEMENT

**New Holland Agriculture**  
Zedelgem, West Flanders, Belgium  
[www.newholland.com](http://www.newholland.com)

The Optispread Plus™ residue management system for New Holland CR combines gives combine operators an improved residue spreading system that delivers excellent chopping performance and equal spreading of the chopped material across the full width of current and future headers. The patented system relies on three principles: an airflow-based MOG spreader, an active spreader with V-shaped paddles, and mixed MOG/straw spreader flow with air draft support. The Optispread Plus™ underwent computational fluid dynamics (CFD) testing and extensive validation on machines in the field. The complete system uses 3% less power, resulting in lower fuel consumption, lower CO<sub>2</sub> emissions, and increased throughput with the same available engine power.



## PLUS2™ JOHN DEERE ROUND BALE ACCUMULATOR

**John Deere**  
Moline, Illinois, USA  
[www.deere.com](http://www.deere.com)

The new John Deere Plus2™ Round Bale Accumulator is the industry's first integrated round bale accumulator that attaches to John Deere 7, 8, 9, and 0 Series 6-ft diameter round balers. To maximize efficiency in the field, the Plus2™ accumulator allows operators to place one or two bales from the cart in predetermined, strategic locations without stopping the tractor and baling process. All three bales can be dumped at one time, but the tractor must be stopped. The bale is transferred to the carrier during the gate open cycle, and a slide moves the bale to the side before the gate closes. This complete bale movement is completed with a single hydraulic outlet. The integrated design provides superior maneuverability and handling. Whether in small fields, rolling hills, or open plains, the Plus2™ Round Bale accumulator strategically places bales, reducing bale retrieval time by 50%, and preserves yield for future cuttings by limiting regrowth damage.



## PRECISION COTTON HARVESTING TECHNOLOGY FOR CP690 AND CS690 COTTON HARVESTERS

**John Deere**  
Moline, Illinois, USA  
[www.deere.com](http://www.deere.com)

The John Deere CP690 and CS690 Cotton Harvesters offer integrated Precision Cotton Harvesting Technology. Onboard moisture sensing and round module weighing technologies are factory integrated to provide real-time data that corresponds to cotton quality. Round module moisture sensing uses capacitance technology to provide accurate moisture readings. Round module weighing allows a producer to calibrate the yield monitor in the field based on seed variety. Moisture and round module weight can be tracked and managed by Harvest Identification, Cotton Pro, and John Deere Operations Center Field Analyzer to optimize the cotton production system. These technologies provide a precision ag package that enables producers and farm managers to preserve cotton lint and seed quality and to optimize the overall production system.



## ROBOVATOR MECHANICAL WEEDING MACHINE

**F Poulsen Engineering**  
Hvalso, Denmark  
[www.visionweeding.com](http://www.visionweeding.com)

On the ROBOVATOR mechanical weeding machine, a camera above each row controls an hydraulically operated tool that moves in and out of the row at the correct time with respect to the passing plants. The cameras record and detect the positions of individual plants. Software calculates the correct timing from plant to plant, allowing the implement to operate at the specified distance from the plants. If a plant is found at an offset position, the movement of the tool is adjusted accordingly. The automatic side control compensates for steering variations of the tractor. The software and the side shift mechanism lock the position of the machine onto the row.



## RUBICON SELF-PROPELLED SPRAYER

**HARDI North America Inc.**  
Davenport, Iowa, USA  
[www.hardi-us.com](http://www.hardi-us.com)

A new class in self-propelled sprayers, the HARDI Rubicon self-propelled sprayer covers more ground in less time and minimizes labor, fuel, and depreciation while maximizing the days available to apply chemicals. The large cab conforms to the newly certified Class 4 clean environment standard and provides visibility of the entire boom with uninterrupted forward vision. The HARDI Rubicon includes a 2200 gal product tank for maximum capacity spraying, an Aluforce boom up to 160 ft long, an all-new boom suspension system with increased stability, a 380 hp Cummins FT4 engine, and pneumatic ride. With these features, the HARDI Rubicon self-propelled sprayer maintains a light footprint of just over 21 lb per square inch.

## S700 COMBINE

**John Deere**  
Moline, Illinois, USA  
[www.deere.com](http://www.deere.com)

The John Deere S700 Combine brings innovative technology to machine optimization, precision harvest information, and automated control. Combine Advisor™ is a suite of seven technologies to set, optimize, and automate the combine. The system uses ActiveVision™ cameras to analyze grain quality and tailings, along with grain loss monitors, to maintain optimal combine performance. Rotor and fan speeds, concave, chaffer, and sieve clearances are automatically adjusted when conditions change. ActiveYield™ improves harvest information as it calibrates the yield monitor each time the grain tank fills, maximizing yield data accuracy. The S700 cab includes the intuitive Gen 4 CommandCenter™ display, customizable CommandArm™, a redesigned ergonomic multi-function control lever with customizable buttons, and a swivel seat for operator comfort.





## SPOTON® DIGITAL SOIL COMPACTION METER

Innoquest, Inc.  
Woodstock, Illinois, USA  
[www.innoquestinc.com](http://www.innoquestinc.com)

The SpotOn® Digital Soil Compaction Meter is a handheld meter for quickly and accurately quantifying areas or layers of compacted soil in production agriculture and turf markets. This affordable electronic meter features high sensitivity and automatic peak compaction capture. A large digital display includes a color-coded bar graph for easy interpretation of compaction readings by farmers and growers. The meter's electronic load cell design allows all types of soil to be accurately measured without the need for changing tip sizes while still meeting the ASABE S313.3 Soil Compaction Standard. Soil compaction affects root growth, drainage, and tillage power requirements. The result of poorly managed soil compaction can affect a grower's bottom line through reduced yields and increased fuel costs.



## STRAW CLAW™ CHOPPER BLADES

Kondex Corporation  
Lomira, Wisconsin, USA  
[www.kondex.com](http://www.kondex.com)

Kondex Corporation's Straw Claw™ chopper blades feature a patented design that uses Tungstrong™ laser cladding on a through-hardened blade to control wear and maintain sharpness. The pattern of the laser cladding controls the wear in a self-serrating manner that improves the cutting edge as the blade is used. By controlling the wear pattern, Straw Claw™ blades also have a reduction in

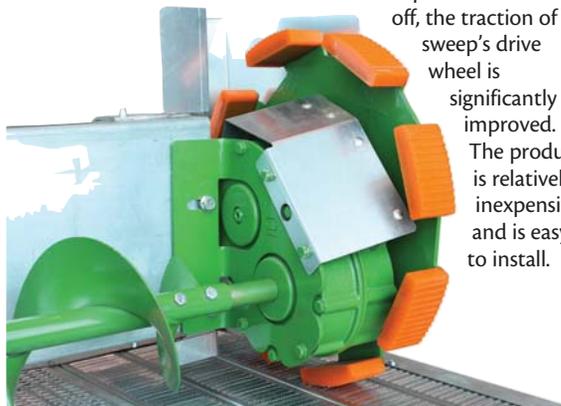


chipping and blade damage, which maintains rotor balance and minimizes maintenance. The double-bevel cutting edge and stay-sharp design create a more efficient cut while delivering smaller, more consistent particles than traditional blades. Smaller particles produce a thinner, more evenly distributed crop mat that maximizes ground contact for the fastest microbial breakdown.

## SWEEP WHEEL GRAIN RECLAIMER

Sukup Manufacturing Co.  
Sheffield, Iowa, USA  
[www.sukup.com](http://www.sukup.com)

The Sweep Wheel Grain Reclaimer reduces the amount of grain left behind the drive wheel of a bin sweep. It consists of a slanted plate that fits over the drive wheel gearbox, directing grain inward toward the sweep auger, and a reclaim shield that fits behind the drive wheel. After capturing grain, the sweep wheel lifts it onto the slanted plate, where it flows by gravity into the path of the sweep auger. This patent-pending assembly reduces the amount of grain left behind by more than 80%. In addition to reducing the labor needed to remove grain after the sweep has been turned off, the traction of the sweep's drive wheel is significantly improved. The product is relatively inexpensive and is easy to install.



## TOTALGROW PURE FLOWERING 200 LAMP

Ventis Technologies, LLC  
Holland, Michigan, USA  
[www.ventistechologies.com](http://www.ventistechologies.com)

The TotalGrow Pure Flowering 200 Lamp provides efficient, reliable, and effective photoperiodic lighting for greenhouse growers to control the timing of flowering in long-day plants. This light produces a targeted light spectrum to trigger long-day perception with minimal power consumption, installation effort, and investment cost. Traditionally, growers have relied on incandescent lights for this lighting due to the effective emphasis of the 600-800 nm wavelengths produced.

Horticultural research has now revealed the ideal peak wavelengths and ratios of the red and far red light needed for photoperiodic lighting. This new generation of photoperiodic light eliminates all unnecessary wavelengths and bulb components while using the latest LED advances in unique configurations to control flowering with reliability and cost-effectiveness.





## TRIDENT™ 5550 LIQUID/DRY COMBINATION APPLICATOR

Case IH Agriculture  
Racine, Wisconsin, USA  
[www.caseih.com](http://www.caseih.com)

The Case IH Trident™ 5550 liquid/dry combination applicator is a 390-hp applicator that can be changed from a 1400-gal liquid application system to a 10-ton dry applicator throughout three seasons of use with a changeover time of as little as 42 minutes, using the Case IH Aerial Lift Device along with an appropriate lifting machine. It features optional factory-available duals in row crop tire sizes to make wet fields more accessible and reduce soil compaction. The machine sits on a trailing link and air strut suspension system that automatically maintains a consistent ride height and a comfortable ride under all loads.



## VALLEY® X-TEC™ CENTER DRIVE

Valley Irrigation  
Valley, Nebraska, USA  
[www.valleyirrigation.com](http://www.valleyirrigation.com)

The Valley® X-Tec™ advanced DC drive motor delivers top speed for quick irrigation cycles and dynamic power for the toughest terrain. It operates at up to twice the speed of a standard, high-speed AC drive motor. The advanced DC drive can move at speeds as low as 1 rpm, just 1% of maximum motor speed, or ramp up to 136 rpm while moving at full torque at any speed. The patented alignment technology and robust DC motor keep the pivot moving at a smooth and consistent pace. FastPass™ Technology operates up to twice the speed of a standard, high-speed AC drive motor. Constant torque at any speed provides growers with unmatched control and additional options to maximize crop yields.



## XLAMP® XP-G3 ROYAL BLUE LED

Cree, Inc.  
Durham, North Carolina, USA  
[www.cree.com](http://www.cree.com)

Optimized for horticulture lighting applications, the Cree® XLamp® XP-G3 is a high-performing Royal Blue LED that doubles the maximum light output of similar-sized LEDs and delivers wall-plug efficiency of up to 81%, enabling horticulture lighting manufacturers to deliver higher-performance products, reduce luminaire size, and lower system cost. At its 2 A maximum current and 85°C junction temperature, the Cree® XLamp® XP-G3 Royal Blue LED delivers up to 3402 mW of radiant flux, which corresponds to 13  $\mu\text{mol s}^{-1}$  of photosynthetic photon flux in the 450 nm peak wavelength that falls within the peak absorption spectrum of chlorophyll b.

## XUV835 GAS AND XUV865 DIESEL GATOR UTILITY VEHICLES

John Deere  
Moline, Illinois, USA  
[www.deere.com](http://www.deere.com)

The XUV835 Gas and XUV865 Diesel Gator utility vehicles offer power, comfort, and convenience. Models are available in E, M, and R trim levels, similar to John Deere tractors. The factory-installed cab on the M and R trim levels have heating and air conditioning, room for three passengers, dash-mounted controls, tilt steering and a fully adjustable operator's seat. It is also the quietest cab in the Gator utility vehicle lineup—quiet enough for conversations at a comfortable volume. Factory-installed wiring on the M and R trim levels allows customizing with more attachments and accessories. Plenty of enclosed storage keeps small items protected from the elements and ready to use when needed.



# ASABE Foundation Work in Focus

Your ideas are needed! Help your Society best use the Foundation's support!

Dave Murray

**R**ecently, the Foundation Board of Trustees has looked for a more defined process for receiving direction from the ASABE Board of Trustees concerning Foundation fundraising priorities. Knowing which priorities best support the needs of the Society allows the Foundation to approach potential donors more confidently.

The ASABE Foundation has worked hard over the last few years to ensure that the Foundation is in the best possible position to support ASABE activities and programs. Foundation assets continue to grow, thanks to your generous support and the Foundation's watchful money management. Foundation policies and procedures ensure that donor designations are respected. The Foundation is ready and able to continue to help ASABE advance engineering in food, water, energy, and the environment in a meaningful way that remains well aligned with Society needs and objectives.

The ASABE Foundation continually asks how it can best support ASABE goals, activities, and programs in the future. While the Foundation exists to raise money in support of the Society, most of its current funds are designated by donors for specific programs. Making decisions about what additional funds are needed in the future is the job of the Society and its leadership. Providing focus on which goals the Foundation will concentrate its fundraising is critical. The E-06 Foundation Liaison Committee was established by the ASABE Board of Trustees to provide a means to collect fundraising foci that are important to groups within the Society and champion them to the ASABE and Foundation Boards.

The overarching purpose of E-06 is to oversee, develop, and review activities related to interactions of the Society with the Foundation. More specifically, the E-06 committee generates ideas for Society initiatives and activities through outreach to ASABE communities and then communicates

these ideas to the ASABE Board of Trustees, communicates fundraising needs to the Foundation, provides feedback to the Foundation on fundraising opportunities, and stimulates member engagement in fundraising activities in conjunction with the Foundation. E-06 also appoints ad hoc committees as needed to manage the expenditure of funds or conduct other liaison activities.

E-06 is pleased to announce that it now has a process in place to collect fundraising foci from the membership. A webpage has been developed ([www.asabe.org/about-us/governance/e-06-foundation-liaison-committee.aspx](http://www.asabe.org/about-us/governance/e-06-foundation-liaison-committee.aspx)) that fully explains E-06 and the process for submitting a Fundraising Focus Proposal Form, a necessary step for bringing your fundraising idea to light. The webpage also explains the difference between this process and the Initiative Fund. The key to avoiding confusion is to remember that E-06 accepts and funnels ideas for fundraising foci, while the Initiative Fund is an existing, Board-approved endowment to which groups within ASABE may apply. In other words, E-06 collects, reviews, and recommends foci for fundraising efforts to the Foundation Board, but E-06 does not provide funding.

We need your ideas for ASABE initiatives and activities to focus our fundraising efforts! To learn more, and to submit a Fundraising Focus Proposal Form, visit the E-06 webpage. If you have further questions, e-mail us at [e-06committee@asabe.org](mailto:e-06committee@asabe.org). We look forward to hearing from you.

**ASABE member Dave Murray**, ASABE Trustee and E-06 Chair; Director, Product Safety & Standards, AGCO Corporation, Wichita, Kan., USA, [dave.murray@agcocorp.com](mailto:dave.murray@agcocorp.com).

*This is one in a series of articles from the Foundation Development Committee.*

**ASABE Fellow Sylvia Schonauer, P.E.**, Foundation Trustee and Development Committee Chair, Principal Engineer (retired), W.K. Kellogg Institute, Bellaire, Mich., USA, [sylvias@valkyrie.net](mailto:sylvias@valkyrie.net).

# Fighting the Right to Repair: The Perpetuity of a Monopoly

Amélie Sirois-Leclerc

**Editor's Note:** Three Ethics Essay Competition finalists presented their essays at ASABE's 2017 Annual International Meeting (AIM) in Spokane, Washington. Third place went to Tyler Smith of Auburn University for "A Call to Ethics," and second place was awarded to Sonja Loy of Texas A&M University for "Adopting a Systems-Thinking Ethic in Engineering Practice." The first place essay is presented here. The Ethics Essay Competition is open to undergraduate and graduate student members of ASABE and/or the Institute for Biological Engineering (IBE). Entrants submit an original essay of up to 1500 words on a topic that affects the practice of professions related to agricultural and biological engineering, systems, or technology. Up to three finalists are selected to present their essays at the AIM. The top three entrants receive cash awards and complimentary AIM registration. To learn more, visit [www.asabe.org/awards-landmarks/student-awards,-competitions-scholarships/ethics-essay.aspx](http://www.asabe.org/awards-landmarks/student-awards,-competitions-scholarships/ethics-essay.aspx). Views expressed are solely those of the author and do not necessarily represent the views of ASABE.

**Author's note:** The objective of this essay is not to undermine agricultural equipment manufacturers, but rather to discuss the reasons why we, as engineers, should be concerned with the right-to-repair issue that is under debate in some states. The reality is that engineers working in our industry are constantly striving to improve customers' productivity by pushing the boundaries of equipment capabilities. However, decision-makers in this case are implementing measures that don't necessarily align with engineers' and end-users' objectives.

The agricultural equipment industry has seen an increase in the use of electronic systems as key parts of its products for a number of years. As these systems have been getting increasingly complex, agricultural equipment manufacturers have steered toward limiting their customers' ability to repair their own equipment. As of 2017, several states are considering "Right to Repair" legislation that would give access to diagnostic and service tools for electronic products to the public. While proponents on

both sides of this issue have legitimate reasons to be advocating their position, this essay dives into the ethical implications of limiting the right to repair and the reasons why farmers should be given the liberty to undertake repairs on agricultural equipment.

## Time is money

The first factor to consider when discussing the right to repair is the time-sensitive nature of agricultural activities. In fact, preventing farmers from executing repairs on their own equipment is particularly detrimental to the agricultural industry because of the aspect of timeliness involved. Due to the nature of handling biological materials, product quality or yield are affected if activities involved in the growing process are not performed in a timely manner. With this in mind, it can be assumed that most farmers are using their equipment more extensively during the same periods at which timely repairs are more likely to be needed than during other periods within the year. In this situation, agricultural equipment dealerships most often do not have the capacity to repair equipment within the timeline required by their customers. Therefore, activities necessary to agricultural production are severely impaired when equipment needs to be repaired. Given these points, it can be said that the time-sensitive nature of activities involved in agriculture production means farmers are particularly vulnerable when their equipment's electronics need repairs.

For generations, farmers have fixed everything on their farms, solely relying on equipment manuals and their own expertise to do so. Therefore, limiting farmers' ability to repair their own equipment is not only unheard of, but also rather counter-intuitive. As stewards of their enterprises, farmers are accustomed to tackling any and every task they encounter. Thus, relying on someone else to repair their equipment does not sit well with the centuries-old culture of the farming community. Additionally, requiring a technician to undertake repairs hinders productivity for two reasons. First, valuable time is lost when waiting for an available technician to come and repair equipment, and compounding this

is the fact that dealerships are sometimes few and far between. Secondly, as will be discussed, some individuals would argue that dealership repair rates are unreasonably high. Considering this from an engineering standpoint, it is worrisome to think that this negative impact on productivity is being allowed while engineers are being encouraged to constantly strive to increase efficiency. Finally, opponents of the right to repair could try to make the case that farmers may not have the actual skills and knowledge to undertake repairs on their equipment's electronic systems. While this constitutes a valid argument, it is important to note that the new generation of farmers is very technologically inclined. Additionally, farmers have not only adapted to the increased use of technology in the last decades, they have also been the instigators for the incorporation of electronics in some cases. Taking these issues into consideration, restricting the farmers' right to repair their own equipment is counter-intuitive in two aspects: first, because they have historically always repaired their own equipment, and secondly, because it decreases efficiency in food production.

Another issue that arises from restricting the right to repair is the fact that only a select number of parties have the necessary tools to repair agricultural equipment; this allows a situation where parties capable of performing such repairs retain a monopoly on repair services. Since manufacturers are lobbying intensively to oppose "Right to Repair" legislation, it can be assumed that this monopoly is benefiting these select parties, otherwise known as the agricultural equipment dealerships. By definition, a firm that retains a monopoly in an industry has inflated profits due to the fact that its products' sale price exceeds what it would be in a market where there are competing firms. With this said, one recurring opinion amongst farmers is that the dealership repair rates are overpriced, which impairs the farmers' bottom line. The fact is that any business model that relies on a monopoly is not sustainable and does not encourage free enterprise.

### **Intellectual property and liability questions**

As a counter-argument, manufacturers state that giving customers or third parties access to the necessary tools would put the manufacturers' intellectual property in jeopardy. However, since some farmers are already using hacked software as a way to bypass their inability to diagnose and repair, the fact that manufacturers' intellectual property could be exposed is no longer relevant. Another issue to consider is liability; manufacturers suggest that equipment may not function as it is meant to after a farmer uses third-party services or parts. The loss of intellectual property and the risk of liability are both valid concerns. However, manufacturers could alleviate these issues by exploring the possibility of providing to farmers and third parties some select tools targeting commonly occurring problems in equipment electronics. By doing so, farmers would have legal access to tools they most

often need, while manufacturers and dealerships would still retain control over parts of the product. Additionally, manufacturers would minimize the risk of farmers deciding to obtain hacked software that could not only alter the equipment's functions but also minimize the distribution of options for which farmers usually pay, such as yield mapping and sectional control. To summarize, the manufacturers' current monopoly on repairs is not only affecting a farmer's bottom line, its effectiveness at protecting intellectual property is questionable. Therefore, manufacturers would do better to give access to select tools to mitigate the risk of liability and the loss of revenue resulting from the distribution of options.

After considering these ideas, it is important to take note that the right-to-repair issue is not one that is exclusive to the agricultural equipment industry. However, customers subject to right-to-repair restrictions in the agricultural industry operate under vastly different conditions than do their counterparts in other industries. In fact, according to data from New York University's Stern School of Business, the operating profit margin for the agricultural industry in 2017 was below half of the average operating profit margin for industries in the United States. This indicates that, in some regards, the agricultural industry is considerably less profitable than the average of American industries.

As a result, any opportunity to improve agricultural firms' operating efficiency should be fostered, which is precisely where the right to repair comes into play. As discussed, a farmer's final product depends on many inputs over which he or she has little control. By giving farmers the tools needed to repair their equipment, at least the challenge of timeliness could be alleviated. Furthermore, prohibiting farmers from repairing their equipment's electronic systems not only hinders their productivity, but it ultimately impacts food security in a negative way. Additionally, the monopoly from which manufacturers are benefiting at the moment is not an example of healthy competition in the industry and could be mitigated by giving access to the tools necessary to diagnose and repair select commonly occurring issues in agricultural equipment electronics. All things considered, the issues discussed herein have the overall effect of inhibiting farmers' ability to operate as cost-effectively as possible. Seeing that food security has been and will continue to be a challenge for the world, one should question whether the topics of liability and intellectual property are reason enough to accept that the agricultural equipment manufacturers' monopoly on repairs, and the flawed business model that stems from it, should simply be another challenge with which farmers must contend.

**ASABE member Amélie Sirois-Leclerc**, B.Eng. 2015 McGill University; MBA 2017 University of Saskatchewan, Stewardship Specialist for Regulatory Affairs, Bayer CropScience Canada, Ottawa, Ontario, [asiroisleclerc@gmail.com](mailto:asiroisleclerc@gmail.com).

# YPC News & Notes

## Growing the YPC from the top down

**T**he YPC strives to identify opportunities to enrich ASABE membership for young professionals. While the YPC has always been very active during the Annual International Meeting—as highlighted in previous News and Notes columns, it has expanded its reach outside of the AIM over the past few years. The AIM attracts a large concentration of our Society's young professional members and makes it very easy to engage them in various activities, but the AIM alone does not give young professionals full exposure to all of our community. Almost 20% of the Society's membership is young professionals, but only 20% of those members attend the AIM.

With that in mind, we've worked with local sections to help them attract young professionals to attend and network at their own yearly meetings. Encouraging an active membership at the local level is a promising path toward a more rewarding experience at the national and international levels.

Two events, previously highlighted on the YPC blog ([www.asabe.org/membership/membership-communities-cooperating-organizations/blogypc.aspx](http://www.asabe.org/membership/membership-communities-cooperating-organizations/blogypc.aspx)), took place at the Texas and Iowa sections. During their fall meetings, these sections collaborated with the YPC to host social gatherings. The Iowa Section hosted a tailgate prior to the Iowa State vs. San Jose State football game. Attendees agreed that the tailgate was a relaxing time to chat with new students, talk with old friends, and connect with young members. The Texas Section hosted a social event during their annual meeting to welcome graduating students to the section and encourage networking with other ASABE members. These events are great examples of how the YPC can collaborate with sections to further engage young professional members outside of the AIM.

Is your section looking to involve younger members? We'd love to help you and expand our presence within the Society. Contact the YPC ([ypc@asabe.org](mailto:ypc@asabe.org)) to find out more.

**ASABE member and YPC chair Shane Williams**, Kuhn North America, Brodhead, Wisc., USA, [shane.williams14@gmail.com](mailto:shane.williams14@gmail.com).

**ASABE member and YPC member at large Amélie Sirois-Leclerc**, Bayer CropScience Canada, Ottawa, Ontario, [asiroisleclerc@gmail.com](mailto:asiroisleclerc@gmail.com).

**E**lection to Fellow is one of the highest distinctions an ASABE member can achieve. Recognition by peers is a superlative honor. Thirteen new ASABE Fellows were announced at the 2017 Annual International Meeting in Spokane, Washington. In this issue and in the next three issues of *Resource*, we shine the spotlight on these honorees.

The ASABE Constitution establishes that “a Fellow shall be a member of unusual professional distinction, with outstanding and extraordinary qualifications and experience in, or related to, the field of agricultural, food, or biological engineering. A Fellow shall have had 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 shall have honorary status, to which members of distinction may be elected, but for which they may not apply. Admission shall be only after a minimum of 20 years as an active Member-Engineer or Member of ASABE.” Congratulations to these new ASABE Fellows!



**Sreekala G. Bajwa**, Professor and Chair, Department of Agricultural and Biosystems Engineering, North Dakota State University, Fargo, was honored for her outstanding research in precision agriculture and biocomposites, stakeholder engagement, academic leadership, and service to agricultural and biological engineering.

Bajwa's research has two main goals: creating value-added products derived from agricultural waste streams, and using aerial remote sensing in agriculture. Bajwa built a research program in biocomposites to remove products from agricultural waste streams, which has led to new commercial products in various industrial materials. Bajwa's work in precision agriculture and the application of remote sensing to predict crop yield, monitor crop condition, and monitor soil characteristics are major technical contributions.

*Pictured here: Sreekala Bajwa at an NDSU Field Day.*

# Honoring the Newly Elected



**Edward M. Barnes**, Senior Director, Agricultural and Environmental Research Division, Cotton Incorporated, Cary, N.C., was honored for advancing the cotton industry and for his contributions to agricultural and biological engineering.

At Cotton Incorporated, Barnes removed barriers to adopting precision technologies for cotton producers and helped farmers adopt better water management tools. He has led efforts in the modernization of cotton harvest systems and facilitated the use of radio-frequency identification technologies for tracking cotton modules from the field to the gin. Barnes has focused on simplifying precision management for site-specific agricultural producers, leading to improved sustainability while minimizing costs to producers and minimizing environmental impacts.

Barnes developed a national interdisciplinary precision cotton working group that coordinates research and facilitates information sharing. This group has developed protocols for the use of precision agriculture technologies for on-farm testing and helped facilitate the use of sensors in cotton breeding.

*Pictured here: Barnes in a high cotton (Australian type) field.*



**Christopher L. Butts, P.E.**, Research Agricultural Engineer, USDA Agricultural Research Service, Dawson, Ga., was honored for his expertise in postharvest peanut processing, reducing costs while preserving quality throughout the value chain.

Butts has had a diverse career, encompassing the areas of on-farm storage and grain drying, solar energy, feedstocks for biodiesel, irrigation scheduling, decision support systems, and processing peanuts from the farm gate to the manufacturer's loading dock.

Butts is regarded as a world leader in peanut harvesting, curing, storage, and handling. He was part of a team that successfully introduced the use of semi-trailers converted into peanut drying trailers and adapted drying techniques for large batches in the humid American Southeast. He has also improved peanut drying through the creation of Peanut Curing Management software and developed algorithms for setting optimum drying temperatures. These techniques have reduced post-harvest losses as well as the energy required to dry, store, and handle peanuts.

*Pictured here: Butts, center, "talking peanuts" on the Georgia Peanut Tour.*



**Mark Casada, P.E.**, Research Agricultural Engineer, USDA Agricultural Research Service, Manhattan, Kan., was honored for his contributions to science and education related to grain aeration, modeling, and storage.

Casada is a pioneering researcher in grain-based food and feed supply chains, resulting in innovative commercialized technologies. His work in improved storage and transport methods for a variety of crops has led to reductions in post-harvest and shipping-related losses.

Casada has developed novel recommendations that prevent moisture and fungal issues during shipment of bulk peanuts and potatoes and has led research on grain aeration management practices, monitoring methods, and system requirements to account for the effects of humid air on the aeration of wheat, which has determined the engineering design and management requirements for effective use of aeration. He has also created management practices for insect control in empty grain bins using propane heat treatment.

*Pictured here: Casada with his wife Sheryl at their daughter's wedding.*

## Visual Challenge 7

# THIS IS HOW I SEE IT

## IMAGES OF AGRICULTURAL AND BIOLOGICAL ENGINEERING

Once again, the beauty, accomplishments, and variety of work in ag and bio engineering come to life in the images entered in *Resource's* annual **Visual Challenge**. These photos are only a glimpse of the many activities in the ABE profession.

Now in its seventh year, the Visual Challenge brought in more entries than ever before and proved once again that the selected images provide statements without words and often explain: "This is how I see it."

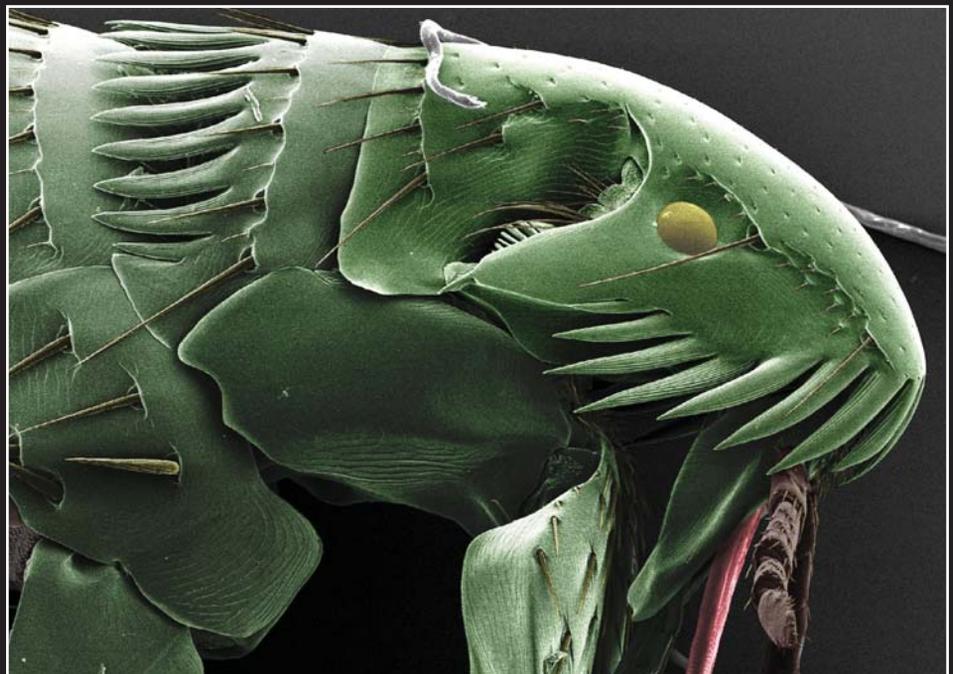
The photos show scenes from work life at close-to-home locations as well as travels abroad, proving that understanding of other cultures and perspectives is fundamental to ABE. Ag and bio engineers are educated citizens of a changing world—adaptive, innovative, and globally engaged—and with an eye for color and composition.

To all those who submitted entries, thank you for sharing your journey. And congratulations to those whose work is featured on these pages. We eagerly invite all readers to contribute to next year's **Visual Challenge**.

Staff Member  
**Melody Melzer**, Graduate  
Student **Nick Vanstone**,  
and ASABE member  
**Suresh Neethirajan**,  
University of Guelph,  
Ontario, Canada.

### FLEA

"Magnified image detailing the front half of a flea taken from a veterinary sample. Artificially colored scanning electron microscope image taken with a Hitachi S-4500 SEM."



Staff Member **Andrew Moore**,  
Graduate Student **Nick Vanstone**, and  
ASABE member **Suresh Neethirajan**,  
University of Guelph, Ontario, Canada.

### FUNGUS

"Magnified image of the fungus *Cytospora* sp. growing on the bark of an apple tree. Dissecting microscope image taken with a Nikon SMZ1500."



**ASABE member A.J. Both**, *Professor and Extension Specialist, Department of Environmental Sciences, Rutgers University, New Brunswick, N.J.*

## AUTOMATION MOVES HUNDREDS OF ORCHID PLANTS AT FLORICULTURA PACIFIC SALINAS, CALIFORNIA

*"Watch the video showing how the orchids are moved in this greenhouse operation at <https://www.youtube.com/watch?v=t1eFr3160wE>."*



**ASABE member Alan VanNahmen**, *Farm Buddy Co., Columbus, Ind.*

## USING AG TECHNOLOGY TO CREATE CROP IMAGES

*"I grew up in southwest Kansas, where we created crop circles in wheat fields back in the 1960s. As a private pilot, I've had opportunities to view fieldwork across the Midwest. I started consulting in 1990 to help farmers move their product ideas into production. My sons and I created the Farm Buddy logo near the 1992 Farm Progress Show in Columbus, Indiana. As the market for 'advertising in a big way' continued to grow, I started Land Logo LLC in 2002 and have continued to use advanced precision farming practices and tools—including GPS guidance, variable-rate planting, Google Earth, Smart Guidance, UAVs, and intercropping—to create other images over the past two decades."*

*"The methods for creating and maintaining these images are changing, with more use of drones, real-time Google Earth images, and multi-hybrid planters. Crop images can be an additional revenue stream for small farming operations, as well as an additional way to use their GPS systems and precision planters."*



**ASABE member Brian McLaughlin**, *Safety Psychographics, LLC, Notre Dame, Ind.*

## OIL PUMP IN A CORNFIELD

*"This was one of two 'grasshopper' pumps seen along Kentucky Route 141, Union County, in the Morganfield South oil field, an area known for Mississippian horizontal drilling activity. These pump jacks are colloquially known as grasshoppers, oil horses, nodding donkeys, thirsty birds, and dinosaurs, among other things. With renewable sources of energy ascendant, this photo represents the past and the future."*



**Pruthvi Raj Pola**, College of Agriculture, Engineering, and Technology, Arkansas State University, Jonesboro, Ark.

## FIELD DATA COLLECTION

*“ASABE member Chin Nee Vong, an Arkansas State University graduate student, collects water-sensitive paper in a spray coverage experiment with a precision boom sprayer at the ASU Farm Complex.”*



**ASABE Fellow Darrin Drollinger**, Executive Director, ASABE, St. Joseph, Mich.

## FARMER’S WIFE

*“While touring a progressive farming village in India, I met a group of women who, with the help of a local company—Asian Paints—are marketing dried distillers grains for use as dairy feed. Repurposing this previously wasted material provides a family with about \$185 per month of extra income. A concrete check dam, also sponsored by Asian Paints, holds stormwater long enough to recharge the water table. Because of the extra water, the local farmers can grow a second crop in the same year. Now they are collectively affluent enough to own a tractor, on which a farmer’s wife poses proudly. Small changes like these are making a real difference in people’s lives.”*



**ASABE member John H. Lumkes Jr., P.E.**, Professor, Department of Agricultural and Biological Engineering, Purdue University, West Lafayette, Ind.

## ETHIOPIAN TRANSPORT

*“Ethiopia, with an estimated eight vehicles per 1000 people, relies on animal transport in many rural areas. Compare this with the (arguably excessive) 800 vehicles per 1,000 people in the United States. This picture was taken near Sagure, Ethiopia, during a Mandela Washington Fellows reciprocal exchange visit.”*



**Alexander Bohlen**, *photographer, Cal Poly Magazine, San Luis Obispo, Calif. Submitted by ASABE member Peter Livingston, P.E., Professor and Head, Department of BioResource and Agricultural Engineering, California Polytechnic University, San Luis Obispo, Calif.*

### TAKE YOUR ALPACA TO WORK DAY

*"His name is Tommy, and he is a six-month-old alpaca, one of several born on our property. He took a ride in my SUV when he came to campus to spend the day with me. Note that he wears a reflective vest while surveying, and he wears safety glasses in the machine shop. Even an alpaca can survey using our department's new robotic survey equipment."*



**ASABE member Dave Lanning**, *Mechanical Engineer, Forest Concepts, LLC, Auburn, Wash.*

### BIOMASS FLASK

*"Woody biomass sample from Forest Concepts' and Washington State University's investigation of the effects of comminution method, comparing a rotary shear and a hammer mill, on enzymatic hydrolysis loadings."*



**ASABE member Shane Williams**, *Design Engineer, Kuhn North America, Brodhead, Wis.*

### RUST LINES

*"Engineers spend hours designing ways to prevent or delay rust. Give Mother Nature some air, water, iron, and time, and she'll oxidize that effort into a work of art with a story behind it."*

**ASABE member Paul Funk,**  
*Agricultural Engineer, USDA-ARS  
Southwestern Cotton Ginning Research  
Laboratory, Mesilla Park, N. Mex.*

## THE SOUTHWESTERN COTTON GINNING RESEARCH LABORATORY

*"Since 1949, agricultural engineers at the USDA Southwestern Cotton Ginning Research Laboratory have solved practical problems related to post-harvest processing of cotton, helping the industry maintain fiber value, reduce operating costs, and comply with environmental regulations. Our lab specializes in irrigated long-staple cotton, roller ginning, as well as companion crop issues like nut harvest emissions and chili pepper harvest mechanization."*



**ASABE member Jason Schuster,**  
*Engineer, John Deere Product  
Engineering Center, Waterloo, Iowa.*

## SUSTAINABLE AGRICULTURE

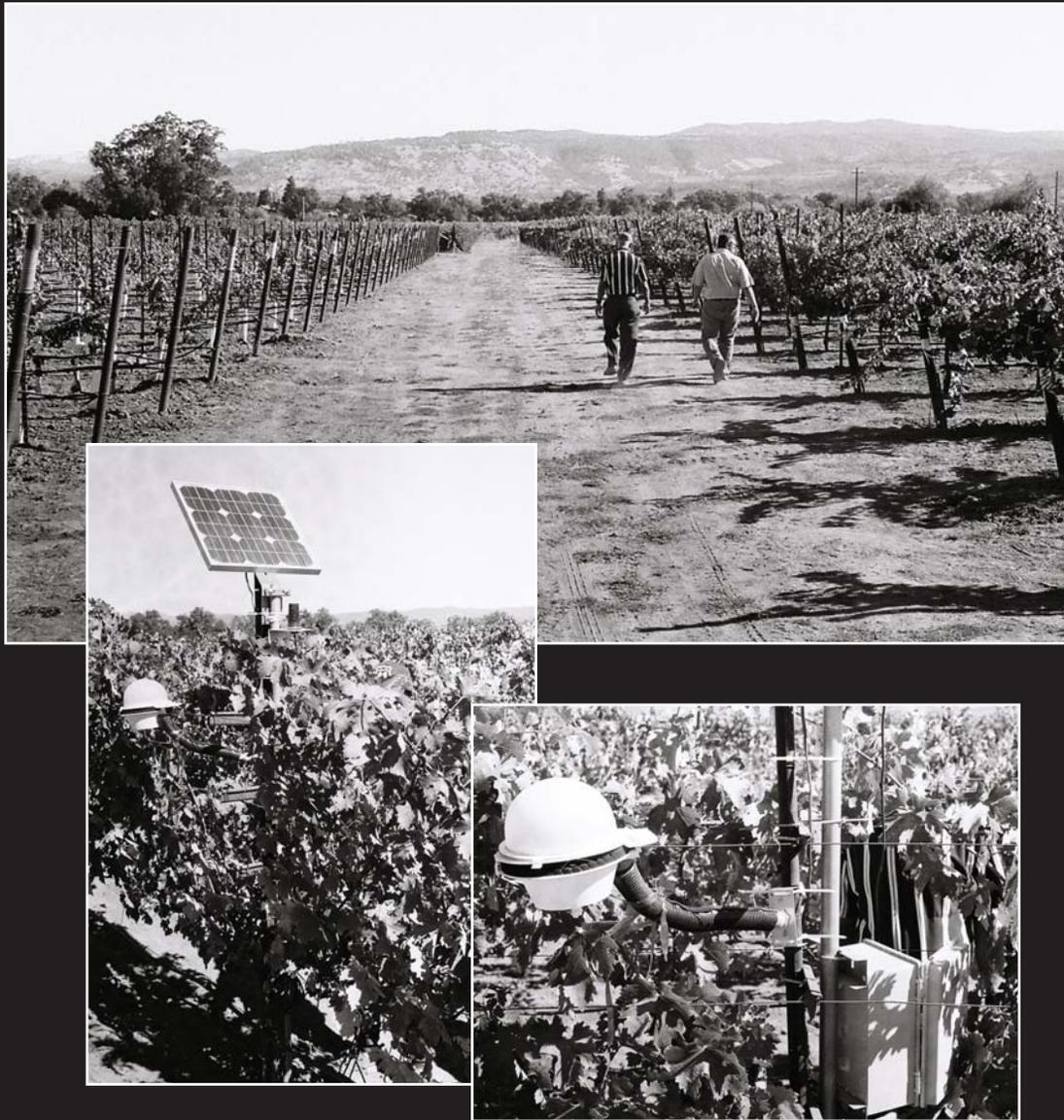
*"Agricultural and biological engineers are working with producers to install buffer strips and other edge-of-field technologies. These practices reduce nutrient losses to Iowa waters and the Gulf of Mexico and align with the goals of the Iowa Nutrient Reduction Strategy. This will help ensure a sustainable future for agriculture."*



**Paige Francis,** *photographer and purchasing agent, USDA. Submitted by ASABE member Kelly Thorp, P.E.,  
Research Agricultural Engineer, USDA-ARS U.S. Arid-Land Agricultural Research Center, Maricopa, Ariz.*

## IRRIGATION MACHINERY AT SUNSET

*"The lateral-move overhead irrigation system at the Maricopa Agricultural Center is used to conduct field research in precision cotton irrigation management and breeding of heat- and drought-tolerant cotton varieties. The magnificent sunset over the Estrella mountain range is a common mid-summer spectacle in Maricopa."*



**ASABE member Channing Ko-Madden**, *Graduate Student, Department of Biological and Agricultural Engineering, University of California, Davis, Calif.*

## MAINTENANCE WORK TRIPTYCH

*“UCD Professor and ASABE member Shrinii Upadhyaya and UCD Cooperative Extension Specialist Kaan Kurtural walk the rows of UCD’s Napa Valley research vineyard. Kaan is the vineyard’s overseer, and Shrinii has developed a sensor for managing precision irrigation. Together, they monitor the results and conduct system maintenance. The second and third photos of the triptych show the sensor and accompanying equipment. With these photos, I wanted to express three ideas:*

- 1. Cooperation among researchers, specialists, and industry is essential for developing effective technology for agriculture.*
- 2. Agricultural engineers do a lot of hard, hands-on work, not just in the lab but also out in the field.*
- 3. Agriculture and technology are deeply intertwined—to a much greater extent, I think, than most people realize.”*



# 2018

ANNUAL INTERNATIONAL MEETING  
JULY 29 - AUGUST 1, 2018  
COBO CENTER | DETROIT, MICHIGAN

## FAST FACTS

From its earliest days to now, The D has made an impact not only on the nation but also the world. Although it's probably best known for putting the world on wheels, it can also boast a large number of other notable — and global — contributions, from being home to the first urban highway to having been the first city to have assigned personal phone numbers.



### WHY DETROIT IS THE MOTOR CITY

- Headquarters for Fiat Chrysler Automobiles, Ford and General Motors and hundreds of tier-one and -two suppliers.
- Home of the North American International Auto Show, with more than 500 vehicles on display representing more than 50 worldwide companies.
- Henry Ford built his first car in Detroit in 1896.
- The world's first concrete road was built in Detroit in 1901.
- Henry Ford introduced an improved assembly line in 1913, revolutionizing the automotive industry and the manufacturing process in general.
- Home to the Ford Piquette Avenue Plant — birthplace of the Model T — the only example of an early Detroit auto factory still open to visitors.
- Home to the historic dwellings of auto barons, including Henry and Clara Ford (Fair Lane Estate), Lawrence Fisher (Fisher Mansion), Edsel and Eleanor Ford (Edsel & Eleanor Ford House) and Matilda Dodge Wilson (Meadow Brook Hall).
- Home of the world's largest tire — 12 tons and 80 feet tall — originally built as a Ferris wheel for the 1964 New York World's Fair.

### WHY DETROIT INSPIRES

- Known for one of the richest collections of late 19th-century, ethnic-based churches in the country.
- Belle Isle, the nation's largest island park within a city, was designed by Frederick Law Olmsted, landscape architect of New York's Central Park.
- The Rev. Martin Luther King Jr. debuted his 1963 *I Have a Dream* speech at Cobo Center in Detroit two months before its famous delivery in Washington, D.C.
- The Charles H. Wright Museum of African American History is the largest museum in the world dedicated to the African-American experience.
- The Arab American National Museum is the first and only museum in the world dedicated to Arab-American history and culture.
- The Detroit Institute of Arts' collection is among the top six in the United States.

### WHY DETROIT ROCKS

- Home to the Motown sound founded by Berry Gordy Jr. in 1957.
- Birthplace of techno music and Movement Electronic Music Festival.
- Host of the Detroit Jazz Festival, the largest free jazz festival in the world.
- Has one of the largest theater districts in the country — more than 13,000 theater seats — and attracts major Broadway productions, headline entertainers, opera, dance, symphony and other performing artists.
- Hometown of more than 50 major entertainment, literary and sport figures — from boxer Joe Louis and actor Tim Allen to singer Aretha Franklin and pilot Charles Lindbergh.
- Birthplace of such rock, hip-hop and pop stars/icons as Diana Ross, Madonna, Eminem, Kid Rock, Alice Cooper, Ted Nugent, Bob Seger, and Jack and Meg White of The White Stripes.
- Sports stadiums double as concert halls — Comerica Park alone has attracted major artists from Paul McCartney and The Rolling Stones to Bruce Springsteen, Taylor Swift and Rihanna.

## ANNUAL MEETING BASICS

### DATE

July 29 – August 1, 2018

### DESTINATION

Detroit, Michigan

### MEETING VENUE

Cobo Center

### HOST HOTEL

Detroit Marriott Renaissance Center

### MORE INFO

[asabemeetings.org](http://asabemeetings.org)

# Engineers Week: Be a Champion

**E**ngineers Week 2018 is February 18-24. It's your opportunity to publicly champion the important work of engineers and to raise awareness of engineering careers.

Founded by NSPE in 1951, Engineers Week—E-Week—aims to promote a diverse and well-educated future engineering workforce by increasing understanding of and interest in engineering and technology careers. Across the U.S., individual members and local chapters of engineering societies, including ASABE, host and promote activities that celebrate the profession. Key events that ASABE supports include:

**February 18:** Discover Engineering Family Day, Washington, D.C.

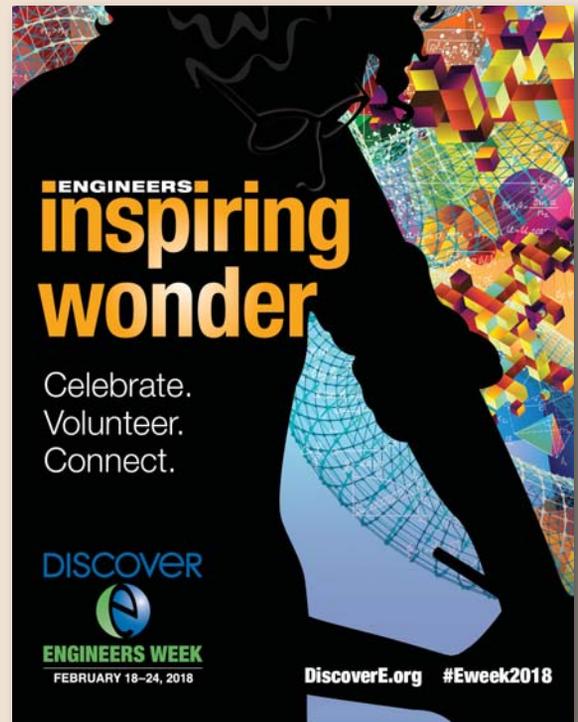
**February 18-21:** Future City Competition Regional Finals, Washington, D.C.

**February 22:** Introduce a Girl to Engineering Day.

Not all events occur during E-Week: The Global Marathon For, By, and About Women in Engineering will take place on March 7-8.

If you share the E-Week vision and would enjoy raising awareness of agricultural and biological engineering and technology, you'll find a variety of options for engagement:

- Volunteer to be a judge at one of the 37 Future City regional competitions. Winners move on to the national finals.
- Inquire about sponsoring a special award for food or renewable energy systems, as ASABE does at the national finals each year.
- Reach out to a local school or youth group and volunteer to speak to students about engineering careers.



- Check in with a local children's or science museum to see whether any events are already planned at which engineer volunteers are needed.
- Is there an iMAX theater near you? "Dream Big" demonstrates the impact engineers have on communities around the world. Take a young person to see it!
- Organize an onsite "Meet an Engineer" event and give students a unique glimpse of your day-to-day life and what is going on in cutting-edge research today.

Find more information about all of these activities, plus outreach resources, at [www.discovere.org](http://www.discovere.org).

**Dolores Landeck**, ASABE Director of Public Affairs, St. Joseph, Mich., USA, [landeck@asabe.org](mailto:landeck@asabe.org).

E-Week is a program of DiscoverE, a formal coalition of more than 70 engineering, education, and cultural societies, and more than 50 corporations and government agencies. ASABE has long supported E-Week, as DiscoverE programs raise public awareness of engineers' positive contributions to quality of life.



The ASABE Chicago Section host a variety of activities at the DuPage STEM Fair, held annually during Engineers Week. One of last year's demonstrations showed the effect of light on the color spectrum of a green leaf.



During E-Week 2017, Chicago Section volunteers delighted DuPage STEM Fair visitors with a discussion of drones. The presentation included an outdoor flight demonstration.



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# Purdue Rising Scholars:

## A New Way to Predict College Success

Bob Stwalley and Carol Stwalley

**T**he culture of American higher education, particularly admissions and counseling, can be problematic for many families, especially for those who are sending their first generation to college. For students who enter STEM fields, these problems are exacerbated by the rigor of the curriculum. Simply allowing students to sink or swim in this highly competitive environment does a tremendous disservice to these students and to our professions by denying society the potential talents of these promising individuals. Allowing this culture to persist threatens the American promise of equality of opportunity. Equity in education demands that we examine the factors that contribute to success in college and that we cultivate these factors for students who do not have the background or understanding to navigate unassisted through the arcane world of higher education.

Nearly everyone who successfully completes the college experience understands that they didn't do it alone. They all had support. That support came from their families, friends, faculty members, lab managers, university staff members, and others who encouraged them and gave them advice along the way. This idea is so basic that it tends to be overlooked by most professional educators and counselors. When this idea is mentioned in academic circles, the response is nearly always along the line of "Well, that goes without saying." However, it doesn't go without saying. The quality of a student's support group is essential to the student's achievement.

Derek Peterson, founder of the Institute for Community and Adolescent Resiliency - Unifying Solutions (<http://icar-us.com>) and formerly with the Alaska Department of Education, began researching the connection between support networks and academic success during the 1990s. Working with Peterson, a team from Purdue University's ABE, Engineering Education, and Minority Engineering programs designed an NSF S-STEM project to select non-typical students from lower socio-economic backgrounds who had the desire and sufficiently active support networks for potential success in engineering at Purdue.

The students for the first cadre were selected through an extensive screening and interview process during the spring of 2017. They attended Minority Engineering Academic Boot Camp during the summer and formally entered the university

in the fall through Exploratory Studies, where they took the standard courses required for freshman engineering. These Rising Scholar students will enroll in special seminars to teach them how to cultivate support group members to enhance their network with professional contacts, and they will participate in research and internship activities to provide additional opportunities to meet professionals in their chosen fields. Almost all of these activities already exist within the university framework and have proven track records for benefiting students. In general, the Rising Scholar students will be provided with a well-structured path through college that increases their contact with individuals who can mentor them in their studies and help them in their careers.

In exchange for their participation in this project, the Rising Scholar students are provided with a \$6,500 annually renewable scholarship to help defray the costs of their education. A second cadre of students will be recruited in the spring of 2018. The performance of these students will be compared with that of the general student population that has been admitted into engineering programs. The research team will stay engaged with these students throughout their college years, and we hope to track their professional careers.

Overall, we hope to demonstrate that selection of qualified students with adequate support networks is a better determiner of college success than high-stakes testing. A pre-determined college path that's designed to enhance support networks will provide a route to professional success for students whose original networks did not include college experience. This project is significant because of the high dropout rate within STEM majors and the shortage of STEM graduates in our society. The success of this project could trigger a significant re-examination of how we admit high school seniors into college and how we counsel students through the college experience. For further information about this project, please contact us. We'd love to hear from you.

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