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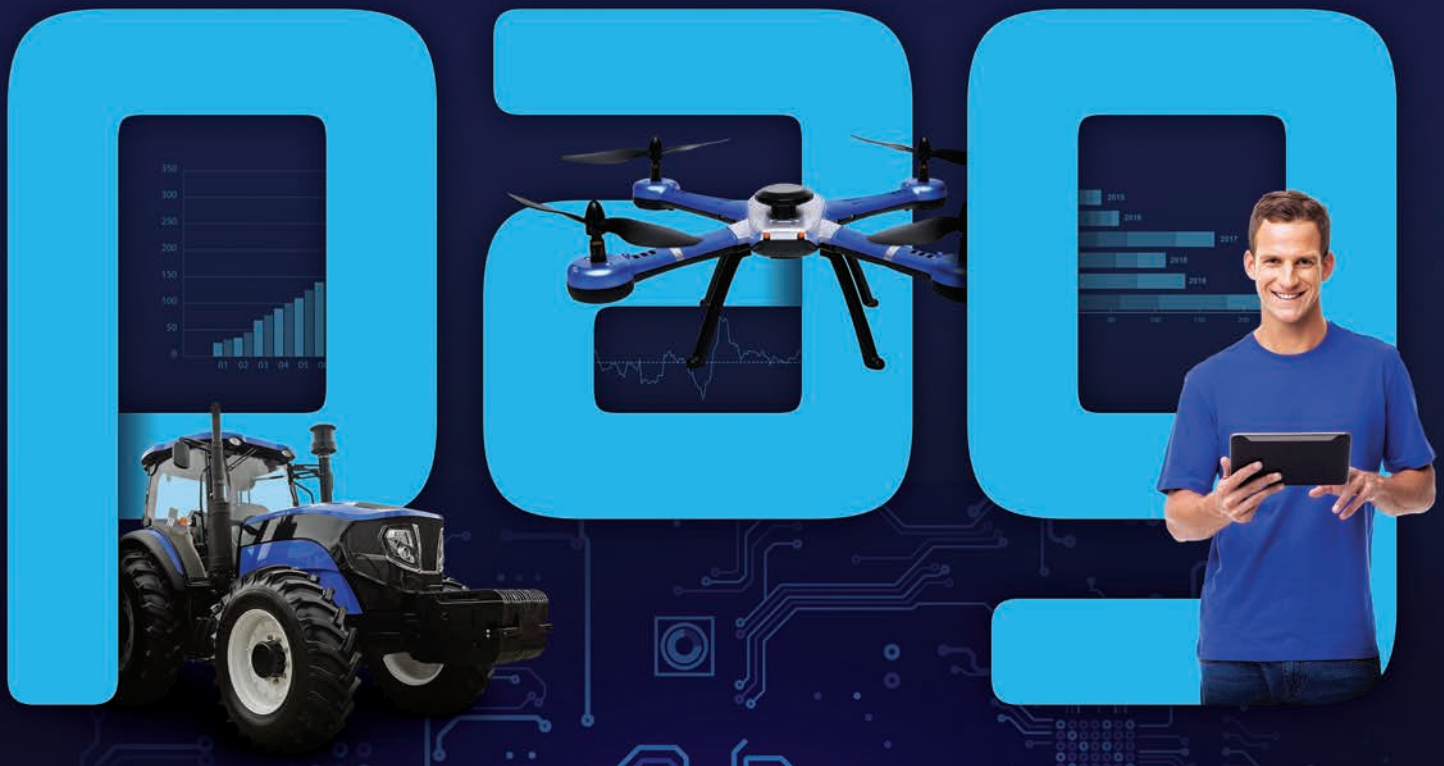

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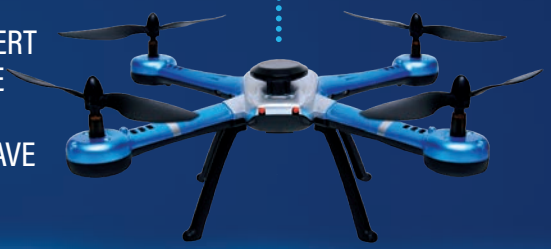

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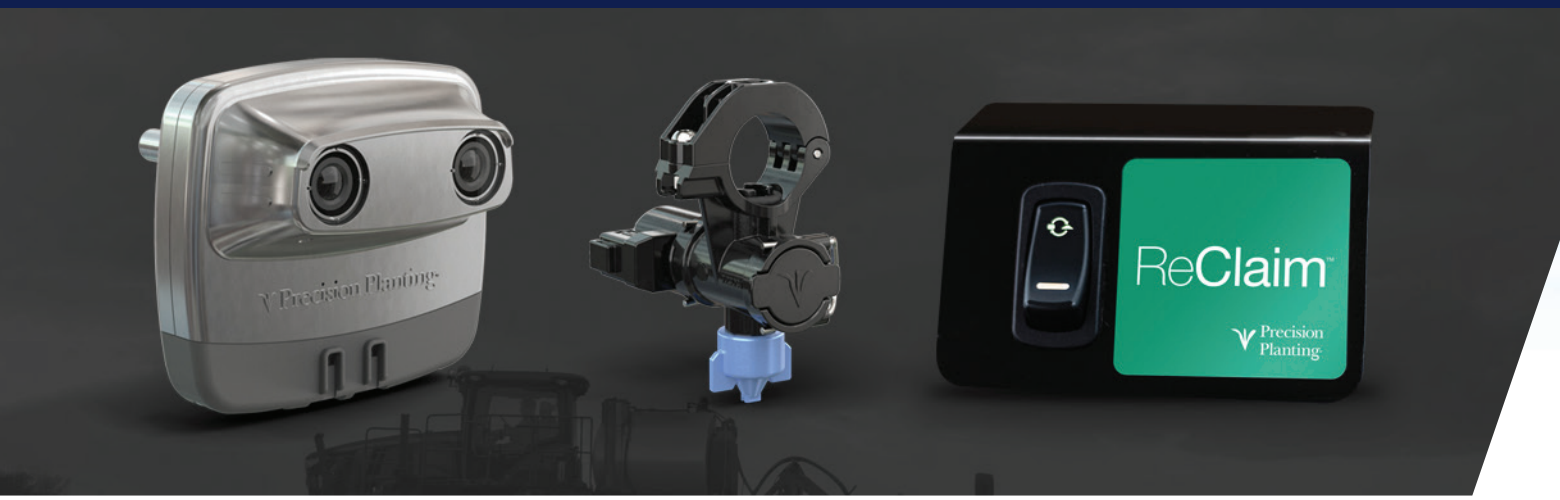
PRECISION PLANTING JOINS THE SPRAYER MARKET



Precision Planting, LLC, headquartered in Tremont, Illinois, has joined the sprayer market, setting its sights on projects that will focus on improving the operation and data collection of sprayers.

As a dominant player in planting technologies, this announcement at its Winter meeting marks the company's first move into sprayer technology.

"Precision Planting is for farmers who Believe In Better, and nowhere is that more apparent than at the annual Winter Conference," said **Bryce Baker**, marketing manager for Precision Planting. With today's sprayer announcements, Precision Planting expands our focus of challenging the status quo into crop sprayers, along with existing lines for planters, combines, seeders, and sidedress bars."

Precision Planting®

While traditional sprayers require farmers or operators to spray product to the ground to prime the width of the boom fully with more than 50 gallons of product is sprayed, it can cause a "hot spot" of chemicals.

Precision Planting counters with its new **ReClaim** product that is added to sprayers, to mix the chemicals in the tank to be circulated through the booms and back to the tank, never having to spray a drop of chemical to the ground.

"ReClaim uses a single rocker switch in the cab to engage recirculation, and once recirculation is completed, farmers are ready to spray with the correctly mixed chemical across the entire boom," explain Justin McMenamy, director of product, Precision Planting. "ReClaim is designed to be retrofit onto a farmer's existing sprayer with electric or standard nozzles."

For sprayer nozzle technology, Precision Planting also has a solution—**Symphony**.

Many sprayer nozzles have a change in pressure when the sprayer operating speed or rate are changed, causing a difference in droplet sizes that increases the risk of drift or reducing leaf coverage of the spray, resulting in reduced efficacy.

PHOTO: precisionplanting.com

Company to provide multiple solutions, including machine learning, AI, and data science projects for new sprayer products

ANDREW JOSEPH
FARMS.COM

But, the Symphony nozzle control system allows the sprayer to maintain constant pressure even when changing rates or speed.

"When spraying to kill weeds or diseases, it is important to get consistent spray patterns across the field, even when changing speeds or rates," said Luke Stuber, Symphony product manager, Precision Planting. "Symphony maintains consistent pressure across the boom, along with swath control and turn compensation for consistent spray coverage across every acre of the field."

Controlled by the Precision Planting **Gen3 20|20** system, Symphony will be field tested again in the spring of 2022, along with its upcoming vision-based technologies that it is developing for cameras on a sprayer:

- **Vision-Based Guidance**: Post spraying crops is a high-fatigue job on the farm, often with the operator hand-driving the sprayer to keep from running over crops. Vision guidance steers the sprayer in the crop rows, allowing the operator to focus on sprayer operations and not on steering, all while preventing crops from being run over and damaged, while providing a reduction in operator fatigue.
- **Vision Scouting:** One of the best times to check for even crop emergence and stand counts is when most farmers make a post-emergence spray pass. Vision-based scouting will provide farmers with a snapshot of their stand count in the field and information about how evenly the crops emerged, letting them know if there are areas of the field to which they should pay more attention.
- **Vision-based Weed ID:** Uses machine learning and artificial intelligence to see and categorize each plant seen in the field as a either a crop, a broadleaf weed, or a grass weed. With this information secured, a map of weed pressure can be created that allows farmers to understand the type of weeds and the variability in pressure across the field.
- **Targeted spraying technology:** Precision Planting's Symphony Nozzle control system is being designed to pair with the Precision Planting vision module for targeted spraying.

"THE COMBINATION OF VISION AND SYMPHONY WILL ALLOW SPRAY RATES TO BE VARIED WITHIN THE LABEL RATE TO BE EFFECTIVE AGAINST THE WEED PRESSURE IN A SPECIFIC AREA."

"The combination of vision and Symphony will allow spray rates to be varied within the label rate to be effective against the weed pressure in a specific area," said Jason Stoller, Vision product manager, Precision Planting. "We know that a high percentage of sprayer passes use a residual herbicide, so targeting only growing weeds does not allow for the value of the residual herbicide to be present in the field. We are actively researching the best way to spot spray growing weeds while at the same time laying down a blanket residual herbicide in order to control emerging weeds, all using the 20|20, Symphony and Vision technologies." | pag

WATCH THE VIDEO

NEW SMART SOIL TECHNOLOGY FROM KUHN KRAUSE

The technology brings control of the machine into the cab

DIEGO FLAMMINI
FARMS.COM

A new piece of technology from **KUHN Krause** gives operators control of a vertical tillage tool from the tractor cab.

Available on the Excelerator XT 8010 is the Smart Soil Technology system, which received an AE50 award in January.

Smart Soil Technology "brings electronic control of all the main features of the machine into the cab through an ISOBUS display," said **Peter Goodge**, senior product manager at KUHN Krause. "With Smart Soil Technology, we can control the front and rear gang angle, the working depth, the wing down pressure, the star wheel down pressure and the level of the machine."

"WITH SMART SOIL TECHNOLOGY, WE CAN CONTROL THE FRONT AND REAR GANG ANGLE, THE WORKING DEPTH, THE WING DOWN PRESSURE, THE STAR WHEEL DOWN PRESSURE AND THE LEVEL OF THE MACHINE."

Operators can adjust the settings individually or store favorite settings into eight presets.

One unique Smart Soil Technology feature compared to competitors is a preset only mode.

"There's always a learning curve with these machines and not every operator is going to be able to make use of individually all of those features," Goodge said. "Preset mode allows the customer to set a few of those presets, activate preset only mode and then the operator can only have access to those presets."

This could work well for the main body of the field or the end rows, he added.

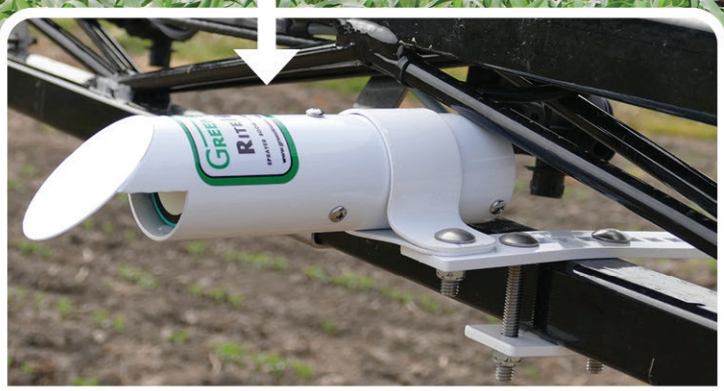
Farms.com connected with Goodge at the 2022 National Farm Machinery Show to talk about KUHN's Smart Soil Technology. Click the button below to watch the video. | pag

PHOTO: en.kuhn-canada.com

WATCH THE VIDEO

AUTOMATIC BOOM HEIGHT CONTROL

Durable, Compact Stainless Steel Housing; Sealed Weatherproof Sensor



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GETTING HEIGHT RIGHT WITH RITEHEIGHT

Precision tech for sprayer booms keeps things at a consistent height even when the terrain gets wonky

MATHEW MACDONALD
FARMS.COM

As far as small-town family-owned ag tech business **Greentronics Ltd.** goes, it has a precision ag tool to make the global market blush with envy.

Although the company's auto tilt controller, conveyor scale and yield monitor products continue to be key contributors to the company's continued growth, its **RiteHeight** product has become Greentronics' single-most important and popular product in North America and around the world.

The beauty of the RiteHeight is that it keeps a sprayer's booms automatically at a consistent height. This reduces the need for manual height adjustments in hilly terrain and minimizes the risk of boom contact with the ground.

"From the start," explained **Bill Menkveld**, Sales & Admin. for Greentronics, "our goal for this product was to have a system that most sprayer owners would feel comfortable installing themselves."

"This meant designing a system without a requirement for additional hydraulics, but one that could be installed by connecting directly with the sprayers' own factory-installed hydraulic boom valves," he continued. "By going in this direction, we ensured that the system would only require a few components and be quick and straightforward to install."

"Most importantly," added Menkveld, "we could set a price point that made the system attractive even for sprayers with a relatively low value due to age or type."

"MOST IMPORTANTLY, WE COULD SET A PRICE POINT THAT MADE THE SYSTEM ATTRACTIVE EVEN FOR SPRAYERS WITH A RELATIVELY LOW VALUE DUE TO AGE OR TYPE."

Greentronics was conceived in 1994 when agricultural equipment distributor **Jake Kloosterman Equipment Ltd.** asked brothers Bill and Bert Menkveld to design an automatic tilt controller for potato harvesters. These harvesters must maintain a level position in hilly fields to provide better dirt separation with less product damage.

New partnership in hand, Bert Menkveld began to work on developing an automatic boom height controller for sprayers in 1995.

Designed around sonar sensors he had created previously, prototypes of the **RH100** system were installed on various sprayers in local fields for testing. However, owing to another commitment with Kloosterman Equipment, the Menkvelds had to put the boom height controller on hold. Instead, they used the time to develop a yield monitor for root crop harvesting equipment. This work led to a new product release in 1997.

Menkveld remembers being busy with production and sales during '98 and '99. Yield mapping and data analysis, however, required fast computers, special software, and experienced professionals. All three

were not always available at that time. As a result, early enthusiasm was followed by some years of much slower growth.

To keep the technology and further development alive, Greentronics offered a simplified version without GPS connectivity that worked very well as a conveyor, or in-line scale. It quickly became popular with users who wanted a better handle on filling loads, field totals and tracking inventory.

"In 2005, some potato growers from Manitoba asked Greentronics to develop an automatic boom height controller for their harvesters. That's when we finally got back to working with sonar sensors," said Menkveld. "The purpose of this device was to give operators an automated tool for maintaining proper drop height from the harvester boom into trucks and trailers. This accomplished two goals: first to reduce the potential for bruising; and second, to take away some of the operator's workload."

Menkveld said that by this time the technology for sonar sensors had advanced a great deal. There were many more options with much more attractive pricing.

Prototype development and field testing continued through 2006 with what he deemed "good success."

Although sales to potato growers were initially slow, Menkveld said that with this development work now complete, "Greentronics was able to turn its attention back to finish the last stages in development of its auto sprayer boom height control technology."

Thanks to good field performance of prototypes during 2007-08, Greentronics was able to launch its 2-sensor **RH200** RiteHeight product in 2009. The **RH300** version soon followed in 2010 and allowed up to five sensors per system.

During 2014 and 2015, Greentronics worked hard to develop its own ISOBUS client implementation. This was first tested with the **RH400** systems, and became a standard option with the introduction of the **RH430** system in 2016, said Menkveld.

In 2016, new sonar sensors were implemented by Greentronics featuring longer range capacity and better durability. "These sensors could be mounted in much smaller housings," said Menkveld. "More importantly, the new sensors allowed for more advanced software programming. It became possible for operators to select from three modes: Bare Ground, Full Canopy, and Partial Canopy. These were all major improvements from the end-users' point of view."

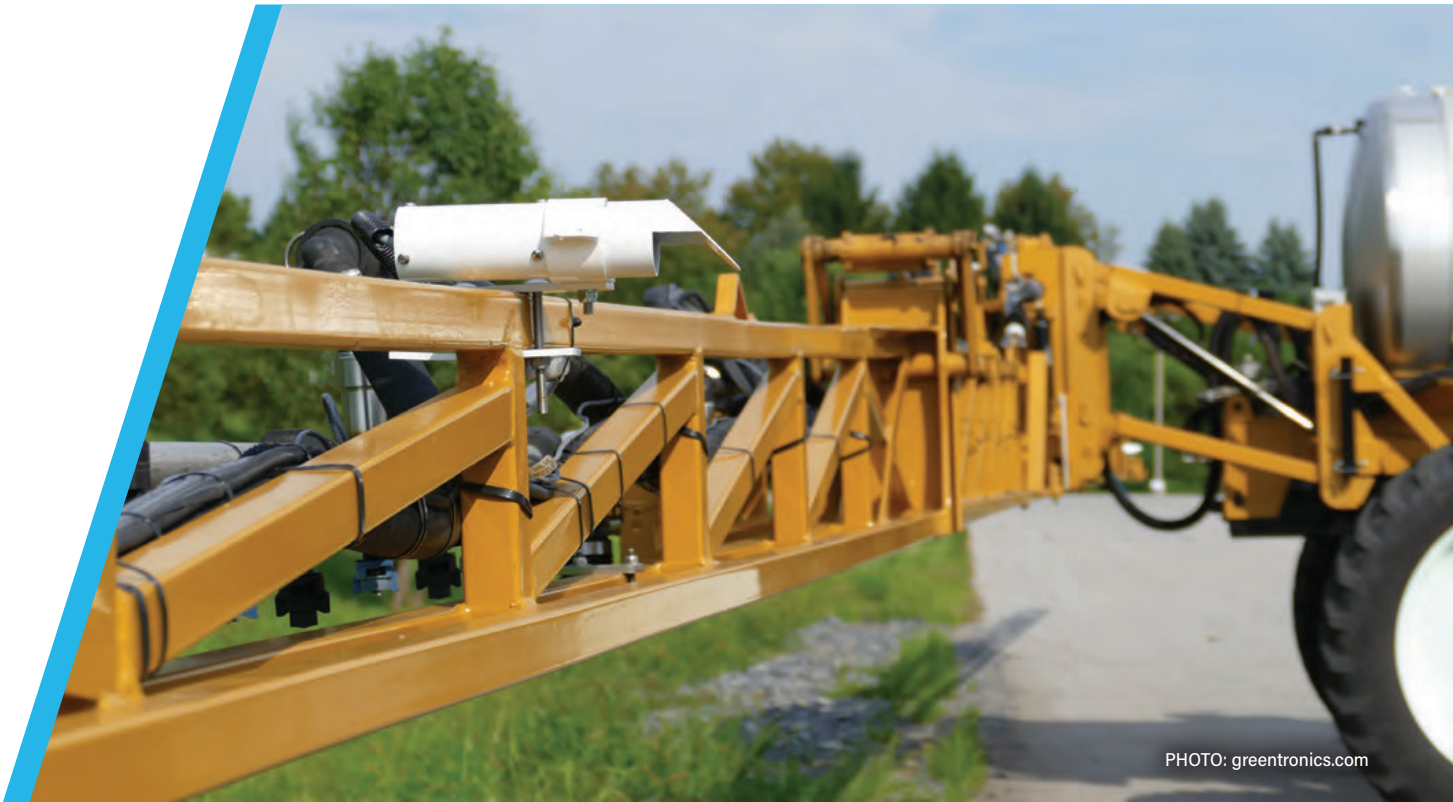


PHOTO: greentronics.com

"Back in 1996, it was clear that many sprayers in use by farmers would benefit from an auto boom height controller. Twenty-five years later, we still see many sprayers without auto boom height," related Menkveld. Auto boom height control increases the percentage of time that the spray nozzles are at the correct target height. This means reduced off target drifting, reduced waste, and better weed and pest control.

"While there are obvious financial advantages to reducing drift and waste, it's even easier to think about dollars and cents when you consider that auto boom height control reduces the chance of the boom impacting with the ground or the crop. Even minor issues such as having to replace damaged nozzle tips and nozzle bodies after a small impact can easily run into hundreds of dollars of repair costs, downtime, and missed opportunities to get spray products applied at the correct moment," explained Menkveld. "A solid impact can result in structural damage to the boom frame with very high repair costs.

While technical advancements sometimes get complicated, the folks at Greentronics are proud that its own precision ag products are easy to install and use. The auto boom system for example features just four main components:

1. Console with display and small keypad;
2. Junction Box;
3. Sensors complete with housings and mounting hardware, and;
4. Cable Harnesses for the sensors, communication, and power.

"An important aspect of RiteHeight, is that it is safe to use," noted Menkveld. "It constantly monitors operator input and instantly suspends automatic mode when the operator manually moves a boom. When sensors are unable to measure distance accurately, the system stops moving booms until the operator intervenes manually. It will not operate blindly."

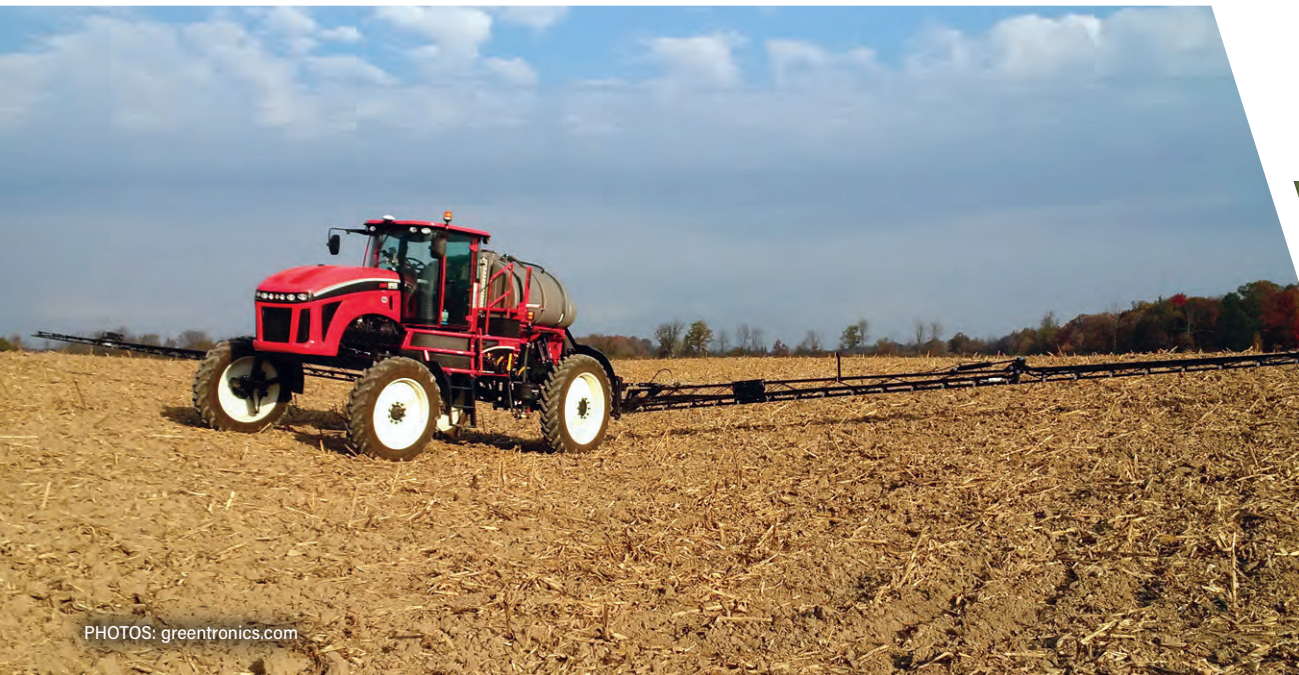
Other products developed by Greentronics include:

- Data management software that allows real-time yield data integration with displays from **Trimble** and **John Deere**;
- A field-to-storage geo-tracking system for potato growers.

The geo-tracking system, said Menkveld, allows automatic generation of traceability information, allowing users to quickly check product in storage with field locations where the crop originated.

"We all know that there are a host of factors, including weather and soil conditions, that have an impact on crop quality in storage," he explained. "By collecting detailed data, the system is able to turn traceability data into valuable agronomic data, complete with inventory and farm management reports."

"BY COLLECTING DETAILED DATA, THE SYSTEM IS ABLE TO TURN TRACEABILITY DATA INTO VALUABLE AGRONOMIC DATA, COMPLETE WITH INVENTORY AND FARM MANAGEMENT REPORTS."



PHOTOS: greentronics.com

Known as RiteTrace, Greentronics first tested it at **P&K Vander Zaag Farms** in 2016. "P&K's support, encouragement and feedback was absolutely key to further development steps", noted Menkveld. Further work was completed during 2017, and by 2018, RiteTrace was being sold.

"There is growing interest in this product," noted Menkveld, "especially with the on-going concerns about soil-borne and transmissible infestations. Also, if foreign materials such as glass or steel objects are discovered in stored potatoes, RiteTrace makes it much easier to trace this back to field origins."

Meanwhile, the number of dealers for Greentronics products continues to grow, both in North America and in offshore markets.

The company has been very happy with how it has been perceived in the ag community.

Said Menkveld: "Despite Greentronics being very much unknown at the beginning, we have received a great response to advertisements and internet presence. We have always offered and still offer a money-back guarantee. During the early days this helped to build trust and confidence. As customers and dealers got used to seeing us at tradeshows, in advertisements, mentions on forums, and by word-of-mouth, our dealer network and our sales grew steadily. For RiteHeight, our biggest markets continue to be the US mid-west and the western provinces of Canada. We are seeing growing interest and sales in some EU countries, in UK and Australia, a success due to Greentronics having solid products that fit the market well."

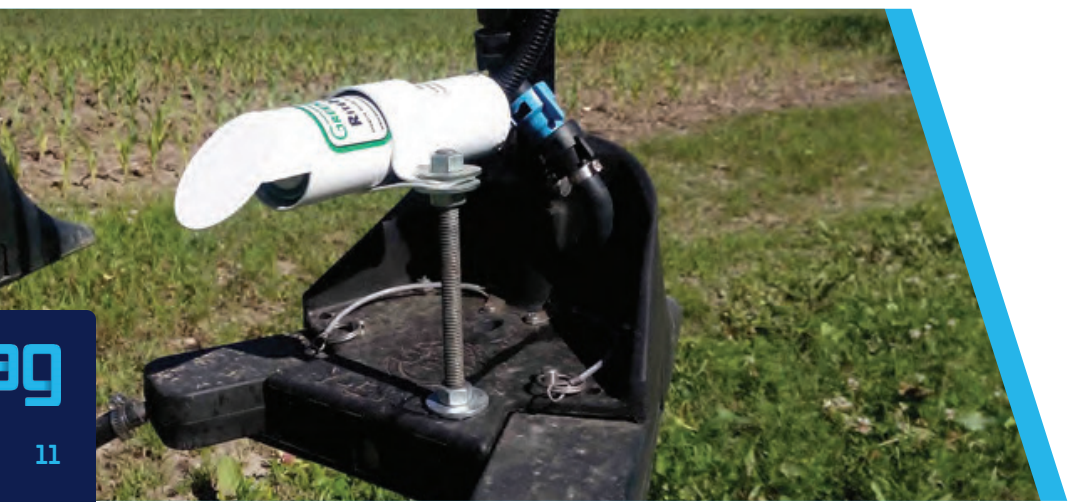
"Success is also directly connected with having experienced live tech support available to all our customers."

"SUCCESS IS ALSO DIRECTLY CONNECTED WITH HAVING EXPERIENCED LIVE TECH SUPPORT AVAILABLE TO ALL OUR CUSTOMERS."

Explaining what's next for Greentronics, Menkveld said that the company has recently completed development of a system capable of using up to eight sonar sensors, introducing it in 2021. "Sprayer booms are becoming wider every year and there is a need for such systems," he mentioned.

He noted that many sprayer operators—both self-propelled and pull type—seem to prefer using one touchscreen display to manage their sprayer functions. As a result, more and more RiteHeight sales include ISOBUS compatibility.

"In the near future, Greentronics will introduce a RiteHeight system without its own console," summed up Menkveld. "The standard system will automatically rely on an ISOBUS connection to a native display. Where needed, we'll provide an optional display. We believe that this direction will further simplify installation, reduce cab clutter, and enhance the user experience." | pag



BITS & BYTES

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7 companies added to John Deere's Startup Collaborator

The program enables companies to test its innovative technologies with customers and dealers alike. It also helps John Deere deepen its interaction with start-up companies whose technology could add future value.

MORE

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Raising the bar for harvesting productivity

MacDon Industries and Case IH have aligned to manufacture co-branded draper headers designed for Case IH Axial-Flow® combines.

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The Future of Ag Robotics

The global market for agricultural robots is forecast to reach $7.88 billion by 2032. How will robotics and technology developments change the business of agriculture?

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04

Precision Disk™ air drill coming from Case IH in 2023

Equipped with greater tank capacity, a superior parallel-link row unit and new productivity-enhancing features, the Case IH Precision Disk™ 550 air drill is designed to boost yield potential in a variety of crops and tillage practices.

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Farmer's benefit when Augmenta and Arva Intelligence join forces

Arva Intelligence and Augmenta have partnered to offer clients convenient infield analytics, automation, and environmental opportunities.

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Earth Observation Tech

Dr. Alyssa Whitcraft (NASA Harvest Deputy Director) speaks to the importance of Earth observation technology in service of the public good, improved agricultural monitoring for food security applications, and farming resilience.

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New biological breaks down residue, releases more nutrients

As fertilizer prices hit record highs, one company is helping farmers claw back nutrients they already bought with a new patent-pending, fast-acting biological that breaks down residue and releases more nutrients for next season's crop.

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08

High-clearance robotics irrigation system in the works

The project in Iowa aligns nutrient application timing to a crop's nutrient needs to improve efficiency and reduce nutrient loss.

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09

First multi-action autonomous farm robot for specialty crops

To meet farmers' demands for more sustainable and profitable growing practices, Verdant Robotics announced the expansion of its robot-as-a-service (RaaS) model to ensure access for more specialty crop farmers.

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Introducing Verdova

The founding team at Verdova is comprised of farmers, entrepreneurs, and technologists with a combined goal to maximize the value and availability of precision agricultural data. The company connects, combines, cleans, and aggregates growers' data, transforming the data from its crude state into a valuable asset.

MORE

PHOTO: FluxFactory/E+ via Getty Images

MAKING THE CASE FOR CASE IH

Case IH wins three awards for its windrower, sprayer and planter equipment

ANDREW JOSEPH
FARMS.COM

The **American Society of Agricultural and Biological Engineers (ASABE)** has announced that **Case IH** has garnered three awards for outstanding agricultural innovation helping farmers gain productivity.

The award-winning innovations are:

- **Patriot 50** series sprayers (pictured below);
- **WD5** series self-propelled windrowers;
- **Fast Riser 6100** series 3-section front-fold planters.

The Patriot 50 series sprayers provide exceptional operator environment, complete vehicle control, enhanced connectivity, and integrated technology to provide consistent, accurate applications every season. These sprayers are agronomically designed to help operators get into fields sooner with less compaction. A range of connected solutions provides the next steps toward remote management and optimization of machines, data, diagnostics, agronomic inputs, and precious resources.

The WD5 series of windrowers allow operators to get to the field faster and muscle through the tough spots, all without sacrificing harvest quality or comfort. Transport speeds up to 30 mph (48.3 kph) and cutting speeds up to 20 mph (32.2 kph), together with simplified operations and innovations, such as Field Cruise and the Triple Windrower Attachment, bring peak operational efficiency. These windrowers also feature integrated Advanced Farming Systems (AFS) technology, including the AFS Pro 700 display, to manage autoguidance, to control key machine functions and to monitor windrower performance.

Only available in Brazil at this time, the Fast Riser 6100 series 3-section front-fold planters provide a very high level of productive and agronomic three-section front-fold planter for growers and contractors who transport frequently on public roads. One operator can convert from 13-meter planting width to 3.2-meter regulatory road transport width from the tractor cab in one minute versus multiple operators taking numerous hours for competitive 3-section planters. The area of principal use is row crop planting of crops, such as soybeans, corn and/or cotton, in no-till to conventional tillage systems with 45-, 50-, 76- and/or 90-centimeter row spacing.

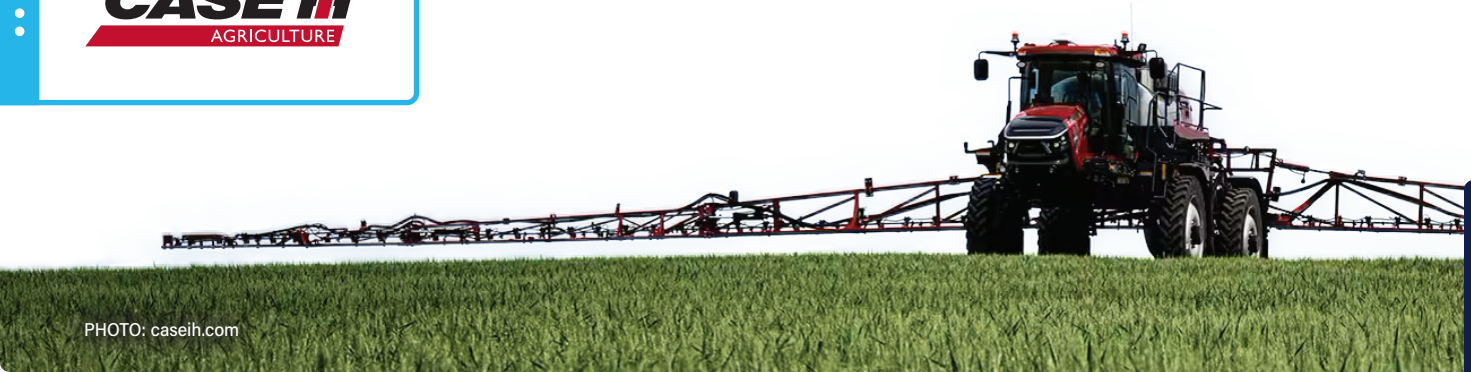


PHOTO: caseih.com

Scott Harris, global President with Case IH said: "We pride ourselves on manufacturing high-quality equipment and solutions that help producers increase profitability. Case IH equipment is designed, built, and tested by farmers. This recognition from the American Society of Agricultural and Biological Engineers reflects our commitment to providing innovative solutions that meet today's farmers' needs."

The innovation awards ag products that save producers time and reduce costs and labour, all while improving user safety.

"WE PRIDE OURSELVES ON MANUFACTURING HIGH-QUALITY EQUIPMENT AND SOLUTIONS THAT HELP PRODUCERS INCREASE PROFITABILITY."

The awards will be presented at the **ASABE Agricultural Equipment Technology Conference (AETC)** in February 2022. | pag

LAUNCH PAD TO THE VERGE AND BEYOND

Software company helps farmers manage operations and provide carbon footprint savings before setting foot in the field

MATHEW MACDONALD
FARMS.COM

Farming always has numerous "x-factors" attached to it that make the outcome difficult to predict. One group of farmer entrepreneurs built a company on their desire to help farmers and save the planet. Here's their story.

Verge Agriculture—produces one product only, **Launch Pad**, which it calls a "the only interactive planning experience ever made."

The privately held company currently employs 23 people (and growing), and has established itself as a SaaS (software as a service) company that lacks a brick-and-mortar-office, instead having its workers located across North America, as it establishes partnerships in numerous countries around the world.

Lyndsay Barch, Marketing Manager of Verge explained: "Launch Pad came about with the realization that farmers were lacking a solution which helps them manage the dependencies between their land and equipment."

"We saw that farmers needed planning software with an intuitive interface to realize cost savings as it relates to increasing efficiencies, reducing the use of inputs, and managing equipment and labour," she said. To resolve it, a team was formed, including farmers, entrepreneurs, and yes, rocket scientists. Plural. Barch said that the team set about to develop the world's first interactive software to help farmers plan their field operations.

Launch Pad was introduced to the market in 2020 as a software solution that "enabled farmers to plan, simulate, and validate the movement of equipment in the field and execute field operations efficiently," Barch noted. "The combination of climate crisis and an already-declining net farm income is a perfect storm that threatens farmers' livelihoods and our food supply. We wanted to develop a solution that led with an economic driver (increase efficiencies and reduce costs) but also solved the climate crisis (reduce GHG emissions, increase soil value, and long-term sustainability)."

As Barch pointed out, Launch Pad is the first product of its kind, and Verge is, as far as it knows, the only company focused on exposing the relationship between land, equipment, and best practices. It has doubled its customer base from 2020 to 2021 and is continuing to grow.

"The only input our product requires is a field boundary. This can either be created on Launch Pad or uploaded in the appropriate format by the user. With just that, farmers can plan, analyze, compare and manage the routes their equipment take across all of their operations," said Barch.

PHOTO: Wavebreakmedia Ltd/Wavebreak Media/Getty Images Plus

Once the paths are completed for each stage of the production cycle, it is exported directly to the monitors in the machines. From there, operators follow the lines displayed in their monitors. By ensuring that all equipment is working off a consistent path plan for all fields, operators can focus more on execution of field operations and not just driving equipment.

> **"THE PRODUCT WAS BUILT BY FARMERS FOR FARMERS."**

"The product was built by farmers for farmers," Barch stated. "We saw value in the product as farm sizes continued to expand and multi-fleet operations were becoming more common."

"We knew there needed to be a way for the equipment to move more efficiently—not just driving into the field and going for it."

Barch said that Launch Pad takes into consideration field obstacles, such as tree rows, artificial and natural markers, and related hurdles when outputting path plans.

"Our target customer is primarily progressive cereal, grain or row crop farmers who have already adopted automation technology like auto-steer and guidance receivers in their equipment."

Verge markets Launch Pad as a simple-to-use web application that within a mere three clicks allows a farmer to be off and running with field equipment management.

Interested users can visit Verge's (**vergeag.com**) website and click on "start trial" to create an account in less than a minute and indulge in an interactive planning experience. Here, users will see an aerial view of their fields and a dashboard that provides various information about their fields in terms of shape complexity and other data associated with the movement of equipment. They can select a field or multiple fields and start creating path plans for a specific field operation.

Launch Pad helps users visualize path plans and decide what is optimal for their specific goal. For some it may be reducing the number of passes in the field, for others it could be saving time, and in certain parts of the world users would want the least erosive field coverage plan.

Once these decisions are saved, users can easily export the path plans. Launch Pad supports all major OEM formats like **John Deere** (Gen 2-4), **Case**, **New Holland**, **Raven**, **Trimble**, and **ISOXML**. Users can export just AB lines or all tracks including inner and headlands as adaptive curves.

All created path plans remain stored within Launch Pad, allowing users to make year-to-year comparisons so that adjustments for each stage of the production cycle can be analyzed, and cost savings to be monitored.

"ADDITIONAL BENEFITS INCLUDE THE ANALYTICAL TOOLS INSIDE THE APP."

"Additional benefits include the analytical tools inside the app," said Barch. "Farmers can compare equipment types to understand what the best fit for their farm would be. We also allow farmers to compare various scenarios and associate cost savings of using each unique path plan."

For ROI, Barch is even more enthusiastic: "Path planning reduces in-field decision making. This helps farmers and operators save time to complete operations, focus on increasing machine utilization rate, reduce fuel use —different for each farm based on what kind of equipment they are running—and how complex their fields are in terms of shape and terrain. We can calculate ROI for single- or multi-fleet operations—we have a subscription-based model, and results would be seen instantly on the first plan they run. This is compounded across all fields for the entire farming season.

"OUR PRICE IS AFFORDABLE FOR ANY FARMER OF ANY FARM SIZE."

"Our price is affordable for any farmer of any farm size." See **vergeag.com/product-pricing**.

For future endeavors, Barch said that as ag equipment becomes autonomous—such as the new John Deere tractor introduced in January of 2022–Launch Pad will be used as a complementary tool to path plan for autonomous farm equipment.

"We have one version of Launch Pad, but are working to develop more and more features," summed up Barch. "With new features will come self-service pricing bundles based on each individual farmer's needs. Each user has a custom experience as the fields they see in Launch Pad are their own. We are fully integrated with John Deere Operations Centre but, as mentioned, also work with all machine types/brands."

Case studies employed by Verge have shown that customers are happy with Launch Pad, seeing tremendous results after a single farming season. "You can find testimonials on our website," said Barch. "Customers working off Launch Pad path plans are expressing how easy it is to navigate and are very satisfied.

"They also enjoy how easy the product is for planning and implementing," she continued. "We offer an on-farm service as part of our Professional Services package (customer consultation and seasonal service), or for those farmers who are eager and understand tech, they can easily figure it out on their own."

Verge offers Launch Pad worldwide, selling to farmers and dealers via partnerships in key ag regions.

"WE ARE A UNIQUE PRODUCT SOLVING A REAL-WORLD PROBLEM IN AGRICULTURE—REDUCING THE CARBON FOOTPRINT."

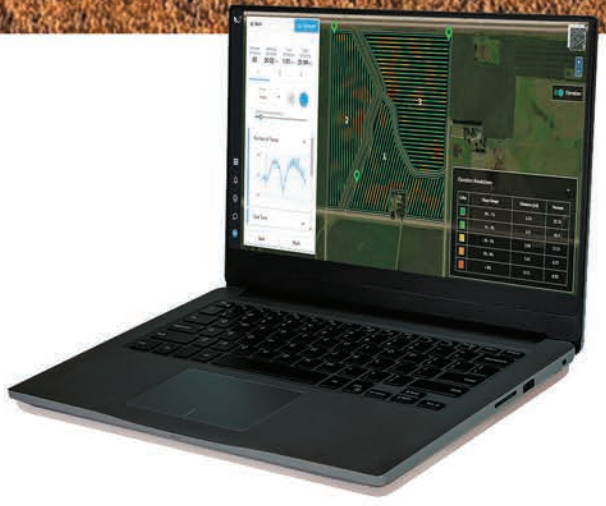
"We are a unique product solving a real-world problem in agriculture—reducing the carbon footprint," said Barch. "Customers are seeing value in Launch Pad no matter where they are located." | pag

PHOTO: zhaojiankang/iStock/Getty Images Plus

A NEW ERA IN FARM TECHNOLOGY

For Farmers, By Farmers.

Launch Pad is the world's first interactive software that uses machine data to help farmers plan for seeding, spraying and harvest. Create custom path plans and limit soil erosion and compaction. Reduce drive time and fuel consumption. Boost farm profitability. Any equipment type. Any farm size. No additional hardware required.



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LAUNCH PAD
by verge

01

Enhanced Seed-Trench Closing with 360 WAVE — LIVE DEMO!

Surrounding corn seeds with moist soil ensures uniform emergence. And uniform emergence leads to better yields. 360 Yield's WAVE gently surrounds seeds with moist soil by peeling a band of moist soil from the lower half of the seed trench and rolling it over the seed.

WATCH ▶

02

ReClaim Retrofit Sprayer Recirculation System — Available in 2022

Traditional sprayers require farmers to spray product to the ground to prime the width of the boom fully. This can cause a "hot spot" of chemicals. Precision Planting counters with its new retrofit sprayer recirculation system, ReClaim, which can be added to ANY sprayer.

WATCH ▶

03

NEW Precision Disk™ 550 Series Air Drill — Available in Spring 2023

Complete with greater tank capacity, a superior parallel-link row unit and new productivity-enhancing features, Case IH's Precision Disk™ 550 air drill is designed to boost yield potential in a variety of crops and tillage practices.

WATCH ▶

04

The LARGEST Combine in North America — Fendt's IDEAL 10T

Tyler Hillman with AGCO Corporation provides an overview of the Fendt IDEAL 10T combine — the largest combine in North America.

WATCH ▶

pag TECH CLIPS

05

Trimble Agriculture — Overview of Trimble Virtual Farm, WeedSeeker 2, and Trimble Select

Trimble Agriculture provides an overview of its Virtual Farm — a one-stop shop for farmers to see industry-leading solutions at work; as well as WeedSeeker 2 — Trimble's next-generation spot spray system, and Trimble Select; the company's first precision ag marketplace.

WATCH ▶

06

Manage Your Fleet from the Comfort of Your Home Office

New Holland's PLM Connect enables you to monitor key operating parameters on your fleet to maximize efficient farming. You can also receive fault code alerts so that any service issues that arise can be quickly resolved.

WATCH

08

Seed or Plant in a Single Pass!

Synopsis of the Bourgault FMS Series with Airplanter™ option.

WATCH

INSIGHTS FROM THE 2022 NATIONAL FARM MACHINERY SHOW

MISSED THE SHOW? HERE'S THE PRECISION AG RUNDOWN

07

KUHN Excelerator with NEW Smart Soil Technology

Highlights of the KUHN Krause Excelerator XT 8010 vertical tillage tool equipped with the NEW Smart Soil Technology system.

WATCH

09

John Deere's ExactApply — LIVE DEMO! Are You Ready to Upgrade?

ExactApply features precise droplet sizing and consistent application management. With 3x the pulsing frequency of competitive systems — and advanced A+B nozzle design — ExactApply maintains a target rate and pressure over a wider range of speeds.

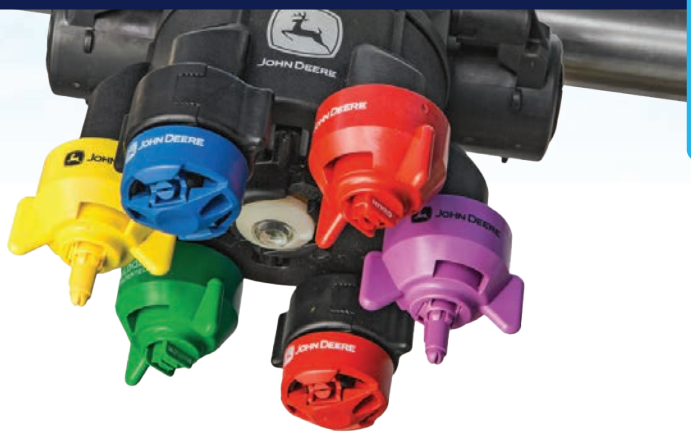
WATCH

PHOTOS: DS70/E+ via Getty Images, stefann11/iStock/Getty Images Plus, hudiemm/iStock/Getty Images Plus

JOHN DEERE'S EXACTAPPLY TECHNOLOGY

This sprayer upgrade features precise droplet sizing and consistent application management

DIEGO FLAMMINI
FARMS.COM



JOHN DEERE

Farmers looking to increase precision during spraying can do so with a product from **John Deere**.

The ExactApply nozzle control system is available as a factory option or aftermarket upgrade on R Series sprayers and can bring multiple benefits to producers.

Its pulse with modulation (PWM) technology allows for flow rate alteration across the width of a spray boom.

"We get a more uniform and even dose across the width of the boom, so we don't get those herbicide carryover issues (and) we don't have the over- and under-applying issues in the corners of our fields," said **Nick Fleitz**, a John Deere representative.

Another function included with ExactApply is the nozzle switching function.

This allows operators to choose between two pre-positioned nozzles from the cab for smaller or larger droplets.

In addition, ExactApply allows operators to have individual nozzle control.

Operators can use this feature to adjust which nozzles are applying product at the appropriate times.

"Instead of having (up to) 10 nozzles working in concert, we're putting our individual sections in 15- or 20-inch spacings," Fleitz said. "Our resolution is better in the field and that can provide time and money savings."

Another benefit of ExactApply is application uniformity.

A sprayer without this system uses a pressure and flow-based rate control.

"If we double our ground speed, we have to quadruple our pressure to maintain that consistent output," Fleitz said, adding this could lead to over- and under-applying.

ExactApply makes those changes almost instantaneously.

"It's much more responsive and helps us maintain a constant pressure so our droplet size remains much more consistent," he said. | pag

WATCH THE VIDEO

PHOTO: deere.ca

HELPING FARMERS MAKE DECISIONS

For every farmer involved in the precision ag technology field, there are some trying to figure out which product might work best for them, and even more wondering just what all the fuss is about.

Like it or not, autonomous farming technology can be confusing to decipher at the onset. And because it is a major capital expenditure for any farm, many farmers opt to avoid the hassle altogether.

But what most autonomous technology neophytes are unaware of, however, is that regardless of the size of one's farm or what or where they farm, there is a practical solution that will work within their budget while providing better results over the more "traditional" farming methods.

That solution—knowledge—is what **Haggerty AgRobotics Company, Ltd.** has been offering customers since the business was founded in 2021. Privately owned by **Chuck Baresich**, the company is under the auspices of his parent company **Haggerty Creek Ltd**.

"Basically, Haggerty AgRobotics is the consolidation of the activities of Haggerty Creek and myself into a more streamlined organized structure," explained Baresich. Covering Ontario and the northeast United States, the company currently has three employees but is expanding to seven by the summer.

"We are an autonomous solutions provider for agriculture, focusing on field crops," he added, "to address chemical resistance, provide alternative methods to weed control, reduce labor challenges, and improve productivity."

"...ADDRESS CHEMICAL RESISTANCE, PROVIDE ALTERNATIVE METHODS TO WEED CONTROL, REDUCE LABOR CHALLENGES, AND IMPROVE PRODUCTIVITY."

According to Baresich, farmers may choose to lease an autonomous solution from Haggerty AgRobotics or purchase a robotic solution directly.

The company also provides parts, service and training on autonomous equipment, and a wide range of precision agriculture equipment.

But not just a leaser/seller of precision ag technologies, Haggerty AgRobotics is directly involved in field-testing OEM (original equipment manufacturer) machines to see how it stacks up in real-world situations—and not just rely on what the brochure says.

Because, said Baresich, there is always a lot of pressure on farmers regarding labor issue and weed control issues, the utilization of autonomous robotics and other precision ag technologies have become a key concern in agriculture.

It's been Baresich's experience that, for the most part, farmers have been quite excited to hear about the autonomous technologies, and—rightly so—others are quite skeptical of it and want to see machines running to ensure it is both reliable and makes sense for their operation.

"For 2022, our primary focus is on Autonomous Weeding," related Baresich. "We'll be field-testing four different robotic technologies on farms to examine practicality and to provide feedback to the OEM."

Haggerty AgRobotics helps farmers transfer into the world of autonomous farming technology armed with knowledge and confidence

MATHEW MACDONALD
FARMS.COM

1. The **Nexus GOAT**, built in Montreal, weeds carrots, lettuce, onions and other crops using camera AI and mechanical fingers that physically pull the weeds out of the field, leaving the crop intact. Baresich said that two of these will be deployed;
2. The **FarmDroid FD20**, built in Denmark, one has been outfitted to seed and weed onions, sugar beets and other crops;
3. The **Naio Dino**, built in France, will be used for autonomous weeding of carrot fields and other crops.
4. The **Naio Oz**, also built in France, is used for small market garden operations for weeding and other tasks.

Outside of autonomous weeding trials, Baresich said they also have a pair of **Raven OmniPower** units (formerly **DOT**) outfitted with high accuracy fertilizer spreaders, which will be used for spreading fertilizers and lime.

Baresich explained how these field tests work.

"The farmer is always in control of the equipment," he stated. "Haggerty AgRobotics will be assigning field technicians for all the machines to assist the farmer in the startup phase to make sure things go smoothly. We expect that there will be some bumps in the road with the technologies, but we are comfortable that we can provide the means to overcome them."

Haggerty AgRobotics expects that the successful planning of 2022 will continue and enable it to double its offerings in 2023—in anticipation, it has already begun to increase its staffing efforts with plans to get even more robots into field trials.

"We want to help farmers help themselves," explained Baresich. "We know that precision ag technologies can help farmers improve the way they go about their day-to-day operations in the field, both in time saved and yield gains which will improve overall financials.

"Along with providing great ROI and fuel savings, as well as speed of job completion and fewer labour requirements, these technologies also allow farmers the time to concentrate on other duties that may need attention," he summed up.

"We believe that autonomous robotics have a key part to play in the ag sector, and we want to ensure farmers see the all the benefits it can bring to them."

To learn more about the Nexus GOAT, Naio Dino, and Naio Oz, click the button below to watch Baresich's presentation at the 2021 Virtual Precision Agriculture Conference & Ag Technology Showcase. | pag

PHOTO: haggertyagrobotics.com

WATCH THE VIDEO

THE PATH TO QUALITY SOIL SAMPLING

To **Felix Weber**, making agronomic decisions is always rooted in having confidence in the data collected.

When soil sampling, Weber is particular about the quality and consistency of collected soil cores. "If careful attention is not paid to where, when, and how those cores are collected, how can you have confidence in the test results or fertilizer recommendations?"

This may sound rather simplistic, given the level of technology we now have at our disposal, but Weber is the Chief Executive Officer of **Ag Business & Crop Inc.**, who farms, operated a crop consulting business, and is the distributor for **Wintex Soil** samplers, and offers these tips for getting the most value out of your soil sampling.

- Sample fields at the same time of year so analyses are comparable over time;
- Avoid fields where fertilizer, manure, or bio-solids were recently applied;
- Soil sample minimum every four years for a given field, and at the same point in the rotation;
- Clean equipment between fields to avoid moving soil-borne pests like SCN, clubroot;
- Use plastic or stainless steel containers for collecting samples. Galvanized metal containers can affect test results for some micronutrients;
- Sample to a depth of six to eight inches, the depth of most topsoil and where soil mixing occurs, and where plants extract most nutrients, except for nitrogen. Fertilizer recommendations are based on this depth; every inch makes a difference, so consistency in depth is important;
- Long-term no-till fields and pastures may need an additional sample to two to three inches to note changes in pH, where nitrogen is being surface applied;
- Collect a minimum of 15-20 soil cores per sample. More cores have the greatest impact on the accuracy of results. Label samples consistently to easily refer and compare results in the future;

PHOTO: agbusiness.ca

Drive greater value from your soil sampling

MATHEW MACDONALD
FARMS.COM

- Take two or more analyzed samples from different locations to compare the low/high;
- GPS reference every sample to accurately map fertility and allow repeat sampling of the same locations in the future. Sampling the same points in the future allows for reliably looking at trends in soil nutrients;
- Preferably submit the entire sample to the lab; the lab is much better equipped to thoroughly mix and sub-sample for analysis.

Above all else, Weber also emphasizes the point that it's important to have a sampling plan based on other data layers, but most of all based on the conversation with the farmer's experience and knowledge of the field.

This last point can often be missed from sampling plans. Field sizes have grown as fence rows have been removed, fields combined, drained—the farmer's knowledge of this is critical.

After years of sampling his fields and those of clients by hand, Weber searched for a professional automatic sampler that would make sampling faster, but still offer the consistency and accuracy of a manual soil probe.

That's why he adopted the Wintex Agro automatic sampler from Denmark that Weber now distributes across Canada.

"I saw right away that this automated technology was a great way to save time in the field while also providing a consistent six-inch deep soil sample every single time," Weber noted, adding that accurate data and trend analysis helps agronomists and farmers make improved decisions.

"I'M ALL FOR MORE DATA, BUT IT'S IMPORTANT THAT IT'S DATA COLLECTED WITH A PURPOSE, REPEATABLE, ACCURATE, AND PROVIDES A REAL RETURN ON INVESTMENT."

"I'm all for more data, but it's important that it's data collected with a purpose, repeatable, accurate, and provides a real return on investment."

With today's high fertilizer prices, soil testing is a high payback investment, and for those that have a good history of test results it gives them the confidence to adjust fertilizer plans.

Weber said that with today's higher yields, growers and agronomists are looking to understand soil health and increasingly map their fields for nutrients and other measures. This has driven more interest in the Wintex Agro sampler by those desiring professional soil samples such as independent consultants, crop input dealers, university and agricultural government agencies, as well as the commercial market.

"We have larger clients that do their sampling, and others who have added sampling as a service to farmers," he said.

Because of the automated nature of the technology, Weber noted that many clients have mounted the Wintex Agro on an ATV/Side by Side; a pickup truck; or a tractor 3-point hitch.

Although the most-used delivery method is, according to Weber, via an ATV and Side by Side, there are different frames available, including a special pickup frame built by Ag Business & Crop for mounting the sampler on the rear of a truck and it folds for transport.

As a farmer and consultant, Weber highlights the importance of timely support, parts, and service: "We know the industry and understand the client's needs. We listen to their needs and work with them to answer questions and remove barriers."

"THE TECHNOLOGY WORKS SO WELL THAT WE HAVE SOME CLIENTS WITH OVER 10 WINTEX SOIL SAMPLERS."

Felix noted one trend he is seeing is that "After purchasing their first Wintex, the customer's question switches from price to model. The technology works so well that we have some clients with over 10 Wintex soil samplers."

For some clients, their first model is the Wintex 1000 which samples to a depth of 10-12 inches. They will often add a model with a hydraulic hammer that allows for sampling in hard soils, and to extend sampling season to sampling through frost.

Ag Business & Crop Inc.

Wintex Agro distributes samplers worldwide and its latest upgrade is to the internationally standard CAN Bus controller electrical hub that simplifies and centralizes control of the Wintex from a single monitor.

Said Weber, "It has helped improve the electrical system and has simplified things for the operator."

He summed up the Wintex technology's ability to provide the operator with time savings and consistent and comparable soil samples: "It's the confidence of the data knowing that the soil samples are the same depth every time."

"Plus, there's less fatigue on the person doing the soil sampling as the hydraulic Wintex allows the operator to perform the job from a driver's seat." | pag

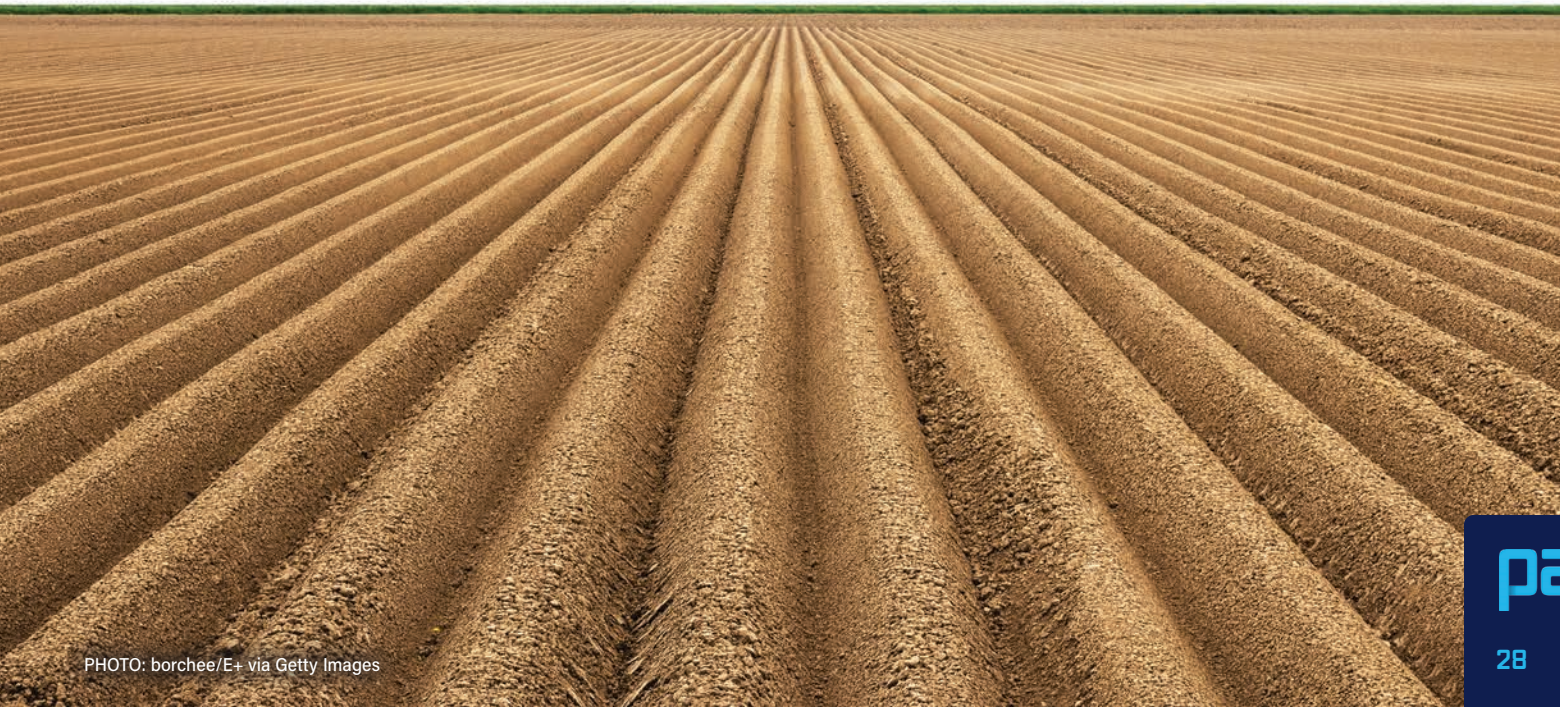


PHOTO: borchee/E+ via Getty Images

JOHN DEERE PROVIDING TECH TO CONVERT YOUR TRACTOR INTO A DRIVERLESS ONE

Adding new technology to a standard tractor, John Deere can convert it to perform driverless field tilling

ANDREW JOSEPH
FARMS.COM

Nothing runs like a **Deere**, but robotic tractors now do.

John Deere said on January 4, 2022, that commercial delivery will begin of driverless tractor technology—not tractors—that can convert your tractor to till a field without a driver.

Initially, the company will deliver some 12 to 20 tractor tech packages before ramping up production. It is in the process of determining the best way to proceed: selling; offering a lease, or providing a subscription package to farmers to allows for future hardware and software upgrades.

According to John Deere, the addition of cameras and computers for automated tilling will be installed on a farmer's existing tractor in just one day.

Stereo cameras are placed in the front and back of the tractor enabling a farm operator to see what the tractor sees by their own smartphone app.

After taking the tractor to the requisite field, a simple swipe on the smartphone screen will send the tractor on its pre-programmed path, as its vision system monitors the tiller.

The tiller will have added mirrors on the shanks that churns the field. According to John Deere, if a shank hits a rock and is tipped up, the operator will be able to see it as there will be a change in the mirror's reflection visible on the smartphone.

The company has been testing its driverless technology for about four years, with spraying technology one of its next projects. | pag

JOHN DEERE

WATCH THE VIDEO

PHOTO: deere.com

360 YIELD CENTER INTRODUCES 360 WAVE

DIEGO FLAMMINI
FARMS.COM

This product offers enhanced seed trench closing with rapid starter uptake

The latest planter attachment from **360 Yield Center** has two functions.

"We want to improve the process of closing and we're also using the blade on 360 WAVE to apply starter near the seed as we're running along next to that trench," said **Tim Sauder**, director of product development with 360 Yield Center.

360 WAVE is an angled blade that slices through the seed trench sidewall and delivers starter to the side and below the seed.

It gently surrounds seeds with moist soil by peeling a band of moist soil from the lower half of the seed trench and rolling it over the seed.

360 WAVE mounts to the rear of the planter-row unit shank, simplifying installation and ensuring alignment with double-disk openers.

The blade swivels to follow the seed trench on curves and includes a stop to limit travel so the blade never places starter in the seed trench.

That reduces the risk of slotting and air pockets in dry, wet and ideal seedbed conditions.

In-house trials have showed positive results.

"IN OUR PLOTS WE'RE SEEING ANYWHERE FROM 1,000 TO 2,000 MORE PLANTS PER ACRE."

"In our plots we're seeing anywhere from 1,000 to 2,000 more plants per acre," Sauder said. "Just by adding this attachment ahead of the closing system you already own."

And some trials have shown anywhere from a two to 14-bushel boost in corn yields compared to traditional closing systems.

Click the button below to watch a demo of the 360 WAVE. | pag

PHOTOS: 360yieldcenter.com

WATCH THE VIDEO

Farms.com™

PRECISION AGRICULTURE

SCHOLARSHIP CONTEST

Students you could win a **$2,000 Scholarship!**

DEADLINE JUNE 30, 2022

Submit a video that describes your research/thesis or idea regarding precision agriculture that meets ESG (Environmental, Social, & Corporate Governance) goals.

Your idea needs to be practical and appealing to farmers – who will be voting on the concepts they believe are the most worthy and PRACTICAL!

One winner will be selected from Canada, the United States, and the United Kingdom.

Scholarship entry submission videos should be less than 2-minutes in length and include the hashtag **#PAG22scholarship**.

Tag the following social media accounts:

@OntAg, **@FarmsPrairies**, **@FarmsNews** (U.S. scholarship)

@Farmscom

FOR MORE INFORMATION, VISIT:

Farms.com/PAGscholarship

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