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Farming of the future

This year's Cereals Live didn't fail to deliver when it came to showcasing some of the very best of innovation. *CPM* highlights some of the key launches from the two-day virtual event.

By Charlotte Cunningham

Though the pandemic has halted all hopes of the social aspect of show season, it hasn't hampered the progress of the latest game-changing innovation, and this year's virtual Cereals Event was brimming with technology and information for growers to digest without even leaving the farm.

For those that couldn't tune in on the day, *CPM* scouted the virtual Innovation and Tech demo ring — as well as the online Sprays and Sprayers arena — to see what's new in the ever-changing world of agricultural innovation.

RootWave

With pressure increasing from regulators and herbicide resistant weeds, RootWave has developed a scalable and sustainable alternative to herbicides.

RootWave Pro works by using a handheld tool that optimises electricides to organically treat all types of weeds, including invasive species.

"Simply touching a weed allows the electricity to flow and its natural resistance turns this energy into heat — boiling it from the inside out, from the root upwards," says the firm. "This quickly kills the weed, after which it naturally decomposes — returning its goodness back to the soil.

"Unlike other technology, generating heat directly from within the weed ensures that no energy is wasted and that the roots are always treated — making Rootwave what we believe to be the most economical and sustainable solution on the market."

In terms of power requirements, RootWave Pro can be connected to either a generator or mains supply and by using solely electricity — and no other fuel sources — keeps running cost low, while the compact design makes it easy to transport, adds the firm.

FarmDroid

Autonomous kit has increased in popularity over recent years, and adding to the commercially available options is FarmDroid — a field robot that's claimed to help growers reduce the costs of sowing and weeding of crops, while also offering an organic and more environmentally-friendly alternative weed control option to growers.

Founded by Jens and Kristian Warming, together with Innovation Environment Syddansk Innovation A/S and robot expert Esben Østergaard, the FarmDroid FD20 bot is a fully autonomous, light-weight robot that optimises GPS technology to ensure accurate weeding and seeding.

According to the firm, key benefits include, minimal soil damage due to its light-weight design, a viable alternative to herbicides and a payback on investment of around two years.

MagGrow

Perhaps one of the most interesting pieces of tech in the demo ring was the MagGrow system ▶

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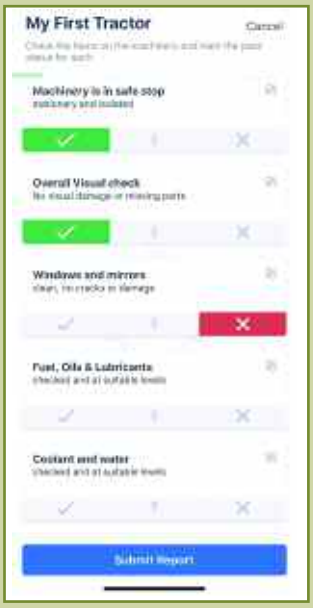
Not at Cereals, but keeping safe

While they weren't virtual exhibitors at this year's Cereals Live, specialist consultancy, Safety Revolution, has just launched a brand new, free app, designed to offer a paperless solution to daily farm safety checks that's worth noting on the new-tech scene.

Available on iOS and Android, Merit Ag Check allows real time recording of machinery defects, but how does it work? "Users have individual logins and are able to complete individual, daily checklists on a per-machine basis," explains Oliver Dale, managing director at Safety Revolution. "A traffic-light colour-coding system is used to flag up defects and at the end of checklist, users have to input an e-signature to officially sign it off as true and accurate."

The app also has the functionality to upload pictures of any specific machinery issues, which are sent with the time-stamped report, to make management easy and straightforward. "As well as this, managers are able to see the time on the app carrying out the checks, to ensure an operator hasn't just quickly flicked through and ticked everything off," he adds. "For a thorough inspection, we estimate the Merit Ag Check to take three to four minutes to complete (per machine)."

Further functionality updates due in August will also mean users have the ability to upload service records and set statutory inspection reminders. "Farm safety — particularly when it comes to machinery — is incredibly important and this new app was developed directly on the back of our customer feedback," explains Oliver. "While farmers and farm managers recognise that daily checks are essential, getting all members of staff to complete them regularly has been a challenge. Merit Ag Check aims to be the solution in these scenarios."



Specialist consultancy, Safety Revolution, has just launched a brand new, free app, designed to offer a paperless solution to daily farm safety checks.

▸ — a retrofitted sprayer attachment that magnetises fluid to improve droplet size.

The firm claims that this ensures better coverage than conventional crop spraying systems and has the potential to reduce spray drift by an impressive 70%.

So how does it work?

"MagGrow's technology uses magnets to transform the spray fluid properties which enables it to adhere to the crop in a more efficient manner," explains Nick Jessop, director of crop science at MagGrow. "This results in a reduction of chemical costs of up to 25%, of water usage by 50% and of spray drift of up to 70%

The claims were put to the test by Professor Michael Coey, school of physics at Trinity College, Dublin, who says the results have been impressive. "It's important that any claim for magnetic effect be made on a respectable scientific basis. We set up a special dummy and magnetic line to test the MagGrow system and measured pressure, turbulence, flow rate and temperature.

"From this, we took images of the spray and found there was real difference when the system was used."

Following a soft launch in 2019, the MagGrow system is preparing for its full commercial launch this year, adds Gary. "It doesn't matter what you're spraying with or what your boom width is, we have a technology that fits all."

Autonomous kit has increased in popularity over recent years and adding to the commercially available options is FarmDroid.

Field Scanalyzer

Rothamsted Research used the event to showcase its Field Scanalyzer system — which is claimed to be the world's first field crop analytics facility.

Supported by Rothamsted and the Biotechnology and Biological Sciences Research Council (BBSRC), the Field Scanalyzer comprises of a gantry that supports a motorised measuring platform with multiple sensors.

Crops within a 15m x 120m area can be monitored throughout the season with a high degree of resolution and reproducibility, according to Rothamsted.

The facility is fully automated and can operate 24hrs a day throughout the year.

On board illumination facilitates the data collection and sensors for simultaneous and non-destructive analyses of plant growth,

morphology, and physiology. Together, the data obtained from the panel of sensors can provide a complex picture of plant growth and vigour from single field experiments.

Perhaps one of the most interesting pieces of tech in the demo ring was the MagGrow system — a retrofitted sprayer attachment that magnetises fluid to improve droplet size.

According to the research centre, the Field Scanalyzer is robust enough to cope with harsh environmental conditions with high sampling frequency and greenhouse accuracy, which provides information concerning the varietal responses to the external environment and their effect on yield.

It's equipped with a high-resolution sensor array that can be accurately positioned in 3D and mounted on fixed rails.

"Employed sensors comprise of high-resolution visible, chlorophyll fluorescence and thermal infrared cameras, two hyperspectral imagers and dual 3D laser scanners," says a spokesperson for the research centre. "The sensor array facilitates specific growth measurements and identification of key growth stages with dense temporal and spectral resolution.

"Together, this platform produces a detailed description of canopy development and health across the crops entire lifecycle, with a high degree of accuracy and reproducibility." ■

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New innovation at an old Cereals favourite

The Sprays and Sprayers Arena is often a highlight for many visitors to Cereals every year, offering the chance to see the latest innovation and application technology in the flesh. While this wasn't physically possible this year, the online arena hosted an array of walk-around videos, allowing growers to get an insight into what's new.

Among these was Agrifac's Condor V. Launched in January, key features include the StabiloPlus chassis for optimum stability and GreenFlowPlus to ensure continuous pressure using the specially designed pump, to ensure no difference in spraying at any point during operation, and no residual liquid left in the tank.

From the Hardi side of the brand, Agrifac also introduced the Aeon Centura line — a new high-end trailed sprayer which is preparing for its debut, planned for LAMMA 2021.

The new Aeon boasts a 36m boom, and comes equipped with Hardi's AutoNozzleControl, AutoTerrain boom management and the ComfortTrack wheel steer system which allows a turning radius of only 6.3m, measured in the middle of the track.

Sponsors of the arena, Syngenta, also used the event to debut its new Spray Assist app — following a soft launch at LAMMA earlier this year. Now available on iOS and Android, Spray Assist has been developed to guide operators to the most appropriate application techniques for a wide range of crops.

But in a world where every daily job seems to have a supporting app, how exactly does Spray Assist work and what can growers get out of it?

Utilising a database of sprayer trials results and expertise knowledge, the app computes weather conditions and the specific application target, to recommend the optimum nozzle and operation, explains Harry Fordham, new farming technology lead at Syngenta.

"Spray Assist allows three main things: spray planning, spray alerts and spray optimisation. Spray planning highlights the best time to spray within a five-day forecast window — with hourly resolution — while the spray alerts send timely reminders if a change in the weather forecast could impact spray performance. Spray optimisation uses a combination of nozzle, pressure, volume and speed data to fine tune application.

"Localised weather forecasting enables operators to prioritise upcoming treatments, to achieve the best overall timing and results, and the app also suggests techniques to enable sprayer operators to mitigate risks or alter practices.

According to Syngenta's application specialist, Scott Cockburn, there's huge potential for digital technology to provide up-to-date decision support solutions.

"Syngenta application trials research has shown the potential for even small tweaks in sprayer set-up and operation to make significant differences in results achieved, including grass weed control and fungicide treatments.

"Sprayer operators also play a huge role in managing the potential risk of spray drift — to ensure sprays hit the intended target and give the best performance.

"Spray Assist will further help them make better informed decisions and tailor their application techniques to optimise results."

Users can enter plans for cropping, locations, and product use and application timings. Further personalisation of the data with the farm's application equipment enables advanced algorithms to provide guidance on the most appropriate available sprayer setup in any selected situation, for the forecasted weather conditions.

Operators can also customise weather condition risks to prioritise factors, such as humidity, temperature, rain or wind. Selecting a proposed spray time up to four days in advance, the app will indicate if conditions are likely to be best to spray; if spraying could be undertaken — possibly with suggested mitigating measures — or if the application is not advisable.

With planned spraying operations for specific crops and treatment targets, the app will suggest the most appropriate nozzle selections and sprayer operation, for speed and water volume, for example, to deliver the best possible results, adds Syngenta.

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