

Working smarter



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Smart technology

Smart farming seems to be taking over. Technology might be integrated in some farming systems and still a concept in others, but it's here to stay. *CPM* explores how farmers can adopt it and some of the latest innovations.

Melanie Jenkins

Technology is advancing at an increasingly rapid pace, with such a wealth of new innovation and data available that it can be hard to keep up. And although these may be costly to invest in, they're helping to shape agriculture so it can meet the challenges of the future.

If the pandemic achieved anything in agriculture, it was the increased use of digital tools by farmers. Since COVID-19, more than 40% of farmers have tried new technologies as a direct result according to Map of Ag's farm research unit poll of 2,218 farmers across the UK and the Republic of Ireland.

But despite this, according to research by Inmarsat — a world leader in global, mobile satellite communications — around 90% of agricultural organisations still aren't using the Internet of Things data as effectively as they could be.

It seems that although farmers are adopting new technologies, there's still a lot more it has to offer to help improve

efficiencies and zero in on costs, believes James Webster at Andersons.

“Smart technology offers a lot of opportunities to farmers both now and in the future — from field and yield mapping technology right through to the cutting edge.”

But its adoption can often be restricted by one major factor, he says. “The main barrier to the adoption of technology will undoubtedly be cost, particularly for the newest technologies. Early adopters will benefit from the advances in technology but not from the economies of scale that widescale adoption brings.

“And those who are later to the party inevitably pay less for the technology as it reaches the mass market,” he says.

“That said, history tells us that technology constantly evolves, and there will always be people there to adopt it.”

Using scaled up adoption could be a way of adopting technology at a relatively lower cost, such as taking advantage of platforms which use ‘big data’ right through to robotics, says James.

If cost is such a major factor, how can those looking to move with technology adopt it affordably?

“Everything that farmers or growers do should be done with their bottom line in mind,” advises James. “Farmers should think about how technology enhances productivity and efficiency, and whether the returns from doing so justify the cost.

“This is particularly true when we're seeing the periodic declines in BPS payments which have supported businesses for a long time.”

A further challenge when thinking about

making investments is rising interest rates, he says. “The cost of borrowing is still comparatively cheap, but while inflation rises so too does the likelihood of interest rate rises.”

Though investing directly in developing technologies may be difficult for most growers, the role of investing in and advancing technology is one that is being taken up by the four ag-tech centres; CHAP, CIEL, Agri-EPI and Agrimetrics, says James. “Each has a remit backed by Innovate UK (UK Research and Innovation) to advance technology within agriculture. Their role is to bring together scientists, advisors, and businesses to advance ag-tech.”

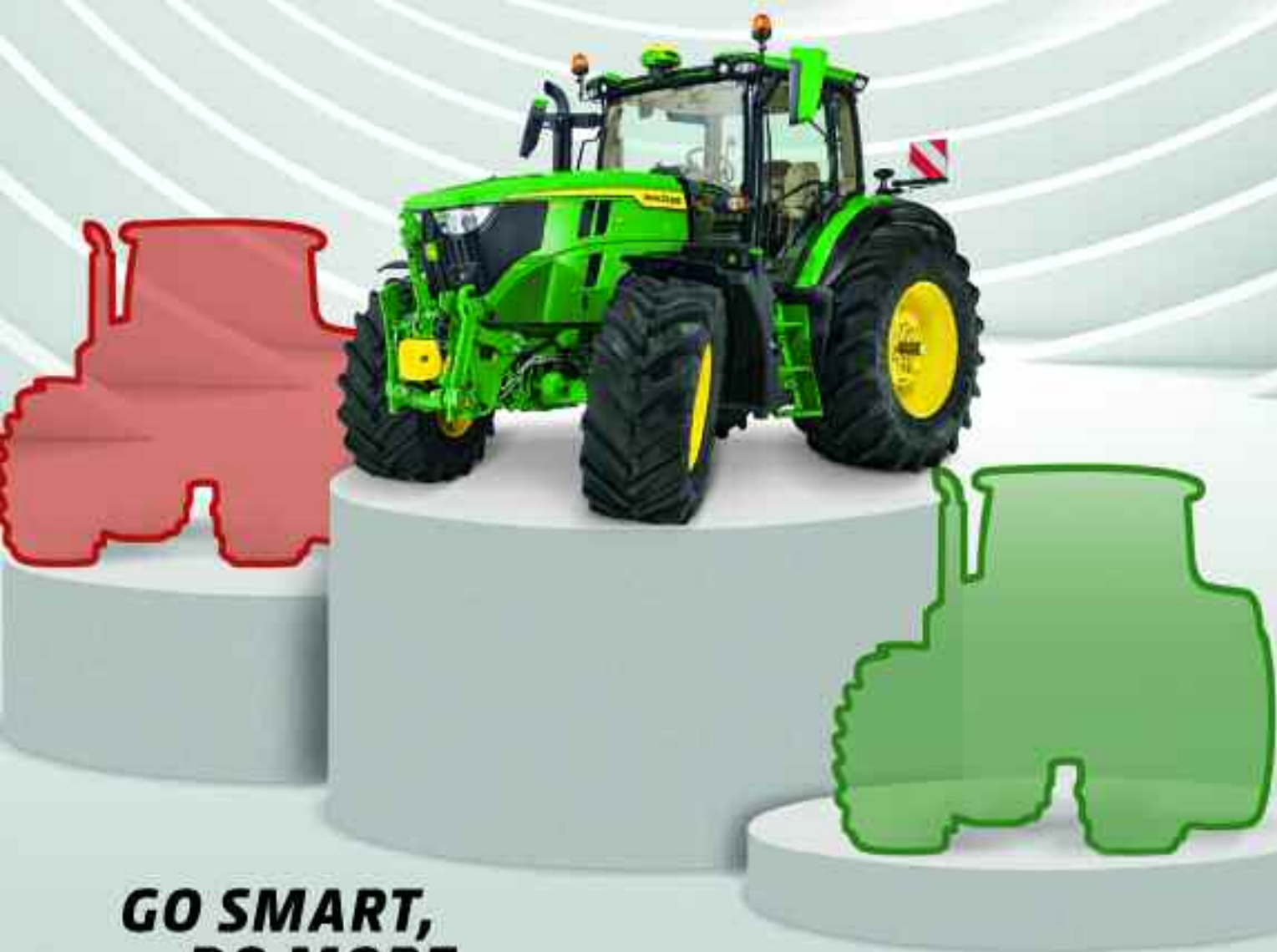
For those looking to get trials and demos on farm, there could be opportunities to ▶



Aspia Space has developed technology to provide satellite imagery of fields, even when there's 100% cloud cover.

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²Case Puma 220 MC: 35.0 g/kWh Fuel + 16 g/kWh DEF. Fuel Test Results: 001/01/01 at 40 km/h test conditions.
³Fendt 724 Vario: 37.8 g/kWh Fuel + 17 g/kWh DEF. Fuel Test Results: 001/01/01 at 40 km/h test conditions.
⁴John Deere 6R 250: 34.0 g/kWh Fuel + 16 g/kWh DEF. Fuel Test Results: 001/01/01 at 40 km/h test conditions.



Will Dunn created Ag-drive after seeing his father struggle with streamlining paperwork.

► work with one of these centres on research projects or alternatively by going directly to the companies developing products. But when it comes to investing in commercially available technology, there may be funding to help, he says.

"The Government has a raft of funding available for enhancing technology adoption on farms. The main one of these is the Farming Transformation Fund. Government provide 40% funding in arrears, meaning you have to pay for the project to completion before receiving grant funding (minimum of £35,000 from government, minimum capital cost of tech is £87,500)."

However, applications for this grant will be closed by the time *CPM* goes to print. But this won't be the only and last opportunity to apply for such grants, says James.

"There will be more rounds of the Farming Equipment and Technology Fund, which is more accessible to most farmers and covers smaller capital items, such as yield monitoring, variable rate controller technology and fruit ripeness spectrometers."

So should farmers be looking to invest?

"There certainly seems to be a push for adoption of smart technologies at all levels; government are incentivizing this, businesses are actively developing technology and farmers are engaging with it," says James.

"I'm not sure there's one single driving force. As legislation gets more complex and we have an increased focus on the environment, any technology that helps deal with new requirements in the shortest time possible will likely see uptake by farmers.

"The main consideration worth highlighting is the declining income from BPS and the potential for further interest rate rises, which will make investing in ag tech more challenging for many."

So where can technology take us next?

Aspia Space

Field mapping using satellite imagery isn't new to farmers, but Aspia Space has just launched technology that will see this almost staple resource advance to the next level. The new system can see through clouds by combining artificial intelligence and cloud-penetrating Synthetic Aperture Radar (SAR).

Aspia Space's new cloud-free satellite imaging data unlocks earth observation imaging data and intelligence that would have otherwise been lost, says Aspia Space co-founder, Jim Geach.

"By bringing together advances in satellite imaging and machine learning, as well as a deep knowledge of how to analyse and interpret data, we can offer businesses and organisations unprecedented cloud-free earth observation imaging."

The technology will provide understanding of the conditions and trends on the ground, across multiple sites, anywhere in the world, he says. "This hands businesses the opportunity to solve problems faster,



There's a push for adoption of smart tech at all levels and farmers are engaging with it, says James Webster.

discover new opportunities and manage resources more effectively."

The Cornish start-up has partnered with UK ag-tech company Origin Digital, to bring its 'ClearSky' service to the UK agricultural sector.

Due to launch imminently, the company says farmer users will be guaranteed to receive a satellite image every six days, showing them how their crop is developing, whatever the weather. This is opposed to traditional, weather dependent imagery that could have gaps of several



Ag-drive is a cost-effective cloud-based app that allows farmers and agricultural contractors to manage their business.

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ClearSky can supply farmers with a satellite image every six days, showing them how their crop is developing, whatever the weather.

weeks between cloud-free views.

Analysis by Origin Digital found that while the European Space Agency's widely used 'Sentinel 2' satellites captured an average of just 13 clear images per farm in the UK during 2021, ClearSky produced more than 60.

According to Madhumita Mund Rao, of Origin Digital: "ClearSky is a hugely exciting development because it guarantees the ingredient of dependable regularity that precision farming systems need to deliver optimal results, but which has been missing from traditional imagery services. This reliability will give UK farmers a substantial new advantage in sustainably optimising their yield and input use."

Ag-drive

From seeing through clouds to storing things on them, Ag-drive has produced a cost-effective cloud-based app that allows farmers and agricultural contractors to manage their business, from job planning through to completion, including the ability to invoice.

Apps are providing farmers with in-hand tools that can help save time and streamline work, with Ag-drive looking to be a part of this. Work can be scheduled, recorded, and invoiced through Ag-drive, allowing for better communication

and team management, while providing traceability of work completed and a more professional service to customers, believes the company.

Ag-drive provides a paperless system and can help farm business provide traceability for what they do.

Founded by Will Dunn in July 2020, Ag-drive was the product of struggles his father, Simon Dunn, had with keeping track of employees and sending invoices for his own contracting business.

Launching in July 2021, this app is already being used in the UK, Ireland, Australia and New Zealand. ►



The HorshConnect Telematics Portal aims to make data exchange between machine, farmer, dealer and the manufacturer as efficient as possible.

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HorschConnect is available across the full Horsch seed drill and sprayer ranges and will be compatible with other external systems in the future.

► AgriLedger

According to AgriLedger, most farmers are operating at just 40% of their potential capacity to access information. It aims to aid farmers to achieve better access to financing and storing transactional data.

Though its app is still in production, it's one of many companies looking to utilise blockchain in agriculture. Blockchain is a digital ledger of transactions that should be almost impossible to hack or cheat.

Though information in the blockchain can be copied and shared within the network on that specific blockchain, once a block of the chain has been filled it gets a timestamp, is added to previous blocks in the chain, and is inherently linked to those.

John Deere

Another concept that continues to develop at pace is the autonomous tractor and John Deere has joined the fray. Its autonomous tractor concept is designed to be compact with electric drive.

The tractor has a total output of 500kW and can be equipped with either wheels or tracks. Flexible ballasting from 5-15t is possible, depending on the application, to help reduce soil compaction. Thanks to the electric drive, there are no

operating emissions and noise levels are extremely low.

Due to restrictions due to legislation, the autonomous tractor is unlikely to be launched in Europe in the near future.

Robotriks

Robotriks, funded by Agri-tech Cornwall, is a robotics focused research and development company based in the county. Founded in 2018, it aims to apply state of the art technology to various applications affordably.

Its most recent innovation is Robotriks Traction Unit (known as the RTU), which has been designed from the ground up to be a low-cost, modular platform to facilitate autonomous robotics in a farm environment.

With its range of sensors and high-power motors, it's able to compute all the data it collects on-board without a need for a network connection. From automating soil sampling, to localised pesticide delivery or even crop monitoring and harvesting, the RTU is the platform that aims to make this an affordable possibility.

Horsch

Horsch has also moved into the realms of intelligent farming, with its new HorschConnect. Using apps like MobileControl and the HorschConnect Telematics Portal, the aim is to make data exchange between machine, farmer, dealer and manufacturer as efficient as possible. This could be locating the live position of a machine in the field, to controlling the seed drill.

Using HorschConnect, a farmer can see machine information, such as operational speed or the application rate, in a user-friendly format. Instructions can be sent to the machine to optimise working processes and increase efficiency. Remote diagnostics of machine information and

error messages allow for a proactive and targeted service.

A machine can be calibrated quickly and intuitively via the app and all the product information is available to hand.

Using an integrated WLAN and GPS modem, the SmartCan hardware solution connects the machine to the internet or a smartphone. An integrated memory card guarantees an additional data back-up if there's no mobile network coverage.

HorschConnect is available across the full Horsch seed drill and sprayer ranges and will be compatible with other external systems in the future. Horsch is not creating an isolated solution but will focus on compatibility and connectivity to other control systems and telemetry.

Trimble

In early February Trimble announced the launch of its Virtual Farm, an interactive online tool that farmers can use to identify common challenges they encounter on a day-to-day basis.

From there, farmers are directed to Trimble's easy-to-use, connected solutions for each challenge and put in touch with a Trimble Ag representative to identify the best solution for their farm.

"At Trimble, we work with farmers every day. This helps us understand their biggest pain points and how to best help them resolve these issues," says Jim Chambers, vice president of Trimble Agriculture. "We know farming is hard. However, Trimble Agriculture solutions can help make it easier, and this new tool will help farmers specify their issues and quickly align to a solution."

The Virtual Farm presents common issues and their solutions, including ensuring the work gets done, start-to-finish data management, input management for cost savings, resource and time management, water management and getting started in precision farming. ■

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