



“ We’ve seen an explosion of innovation in recent years. ”

# The digital revolution

## Innovation Digital Direction

There’s been an exponential growth in the adoption of digital farming tools in recent years — but just how beneficial can they be in achieving a more sustainable outlook for agriculture? *CPM* explores the concept.

By Charlotte Cunningham

With both UK and global agriculture now in the midst of the so-called ‘fourth agricultural revolution’, digitalisation is quickly becoming a key enabler for growers and agronomists. It’s helping them to make more informed, sustainable crop production decisions through realising the value in their farm data — as well as to utilise precision farming techniques, such as variable application of inputs.

Agri-TechE, a membership organisation supporting a network of innovative farmers, producers, scientists, technologists and entrepreneurs, has been championing the importance of innovation in an agricultural environment for seven years during which the uptake and adoption of digital technology has increased exponentially, says Belinda Clarke, director. “We started in March 2014 based on the concept of bringing together those who are developing innovations with those who are implementing them.

“It’s been really interesting over this time to see such an explosion of innovation and the use of data — both in terms of how it’s physically captured and how it’s used.”

But while progress is impressive, Belinda believes the industry has only just started to scratch the surface. “We’re still very much

on a journey with digital technology and to get the maximum value from it, it’s all about extracting the data in the most beneficial way.”

So what does this journey look like — both short and long term?

“From a short-term perspective, the farmers who have really embraced innovation and are now looking deeper at what the data is telling them, are benefiting from unprecedented insights into core aspects of production — like when the best intervention timing is and how they can reduce crop variability.

“This is helping to reinforce attention to detail, which essentially has always been a key differentiator between really good farmers and producers.”

### Data-enabled farms

In the future, this adoption could be a key part in creating the ‘sustainable farm’ — from both a financial and an environmental perspective, explains Belinda. “The data-enabled farm, from a sustainability point of view, has to be a no-brainer when all the pieces of the puzzle are in place. Long-term, this could lead to reduced emissions from crop production by implementing sustainable practices and perhaps even a reduction of labour resources, through technology such as robotics.”

With regards to carbon counting and natural capital, there’s great potential for technology to play a role here too, but it is still a largely complex and unclear area, says Belinda. “This isn’t going to happen overnight, and we need to allow time to get to this position. But in terms of how we get there, it’s all about collecting and analysing as much data as possible to allow growers to make more accurate decisions.”

As the deadline to net zero zooms closer,

many forward-thinking growers are looking to technology and the data they can collate from it to fine-tune operations and bring both the financial and environmental cost of their business down.

Among those is Doncaster grower Pat Thornton. Pat’s farming philosophy is that if you do the same thing every year, you can’t expect different results. So he’s working with BASF’s digital division, xarvio, and machinery manufacturer Amazone to look at how integrating innovation could maximise profitability and minimise his impact on the environment — something he says is integral to a sustainable business model.

“I’m old enough to have seen a lot of prediction model-type software come and go, but having first used xarvio Field Manager 18 months ago — initially just to track crop growth stages — it’s incredibly accurate,” says Pat.

“I’m only farming 150ha so I often walk in the shadow of the big growers, however, this kind of technology can really add value and streamline even the smaller operations.

“For me, anything I can do to reduce costs and be more efficient — both ▶



Agriculture has only just begun to scratch the surface when it comes to using digital technology, says Belinda Clarke of Agri-TechE.

"Our choice in fungicide appears to have paid off."



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Luke Pollard says xarvio's Spray Timer module alerts growers to the most efficient application timing for their crops.

► economically and environmentally — is worth considering."

Using machinery from Amazone — including the Pantera sprayer, the Cayena tine drill, the Cirrus trailed minimum disturbance drill and the ZA-TS fertiliser spreader — alongside xarvio's Spray Timer and Zone Spray functions, Pat has already looked at optimising his application timings, with variable rate seeding and nitrogen in his sights for the coming year after starting to investigate this last season.

But what exactly do these modules do?

Starting with Spray Timer, this is a feature within xarvio Field Manager which provides field-specific alerts for the most efficient timing for nitrogen and fungicide applications, explains Luke Pollard, xarvio implementation lead. "This is based on agronomic crop modelling, which analyses data such as experienced and predicted weather for that location, when the crop was drilled, the variety nuances of the crop, and previous applications."

Spray Timer also provides an overview of disease and insect risk in cereals and oilseeds as well as crop growth development tracking and forecasting, he adds.

## Optimal inputs

Also within Field Manager, the Zone Spray module helps growers to apply the optimal amount of input to their crop for each part of the field by utilising variable rate application (VRA) technology, explains Luke. "Field Manager utilises satellite imagery to show the biomass heterogeneity of a field, so where in the field has the crop grown more successfully, and where less successfully.

"The grower can then decide if, and how to adjust the amount of input they use across the areas of differing biomass, instead of using a flat rate. For example, applying a higher rate of fertiliser to a thinner area of wheat in early spring, or even facilitating the application of PGR Caryx to areas of OSR which require it. Growers can create a variable application map in Field Manager, which they can then transfer and use with their terminal in their farm machinery (sprayer/drill)."

From a machinery perspective Amazone's Simon Brown says the combination of physical kit and digital innovation marks a huge step forward in the capabilities of both technologies. "Machinery is a key part of crop establishment and that's never going to change. But what does have to change is how efficient, cost-effective, and environmentally sustainable that kit is, and using real-time decision making with



Anything he can do to reduce costs and be more efficient is worth considering, believes Doncaster grower Pat Thornton.

platforms like xarvio enables just that."

Pat adds that he believes environmental — and subsequently, economic — efficiency is going to be a marketable factor for farm businesses. "With subsidies going and changes to policy ahead, we should be looking at ways to add value to our operations and products.

"What's more, using technology to drive efficiency is a massive leg up towards net zero — something most farmers are now becoming increasingly aware of.

"Platforms like xarvio help to clarify what kind of decision making is right for your individual farm as it's based on your data — it's a much safer, less risky way of planning than just going on what you've done previously or what your neighbour has done.

"I don't think growers and agronomists should see technology as a threat or a hassle — it's a very useful tool which provides a simple way of tapping into your own data, and that's inevitably what's going to drive sustainable businesses going forward." ■

## Future-focused collaboration

In June 2021, BASF and Bosch got the go-ahead for a joint venture to bring technology like Smart Spraying solutions to market. But looking to the future, what could this partnership mean for growers?

According to Janis Faltmann, global product manager Smart Spraying, the ethos behind it is to bring technology to market with a 'perfect farmer-fit'. "However, with sophisticated technology like the smart sprayer, it needs both reliable, experienced hardware and strong agronomic support. This is what we believe we've achieved by bringing Bosch and BASF together and in turn will be able to deliver the most optimum solutions for growers.

"Bosch is well-known for high-quality, reliable hardware manufacturing, but BASF and xarvio know how to build a product that farmers like. We also bring agronomic expertise in the form of algorithms which trigger the decision to apply — what, when and how."

The Smart Spraying solutions concept is based upon elevating what's already available to farmers, adds Janis. "Spot spraying is a concept that is already on the market, but we are taking the existing capabilities of this — which is based on green-on-brown application — and elevating it to the next level. This enables its use in post-em row crops to detect weeds within the row, known as green-on-green."

This configuration supports a more efficient use of herbicide, with trials showing herbicide volume savings of 70% are achievable, he adds.

"We're also combining this with agronomic intelligence from xarvio, where we are capable of measuring what species and number of weeds can also remain in the field without harming the quality of weed management or the yield.

"Eventually we believe this will help us move away from not only blanket application but also spraying every single weed. Instead, we hope to be in a place where growers are only spraying the



It's absolutely essential to work more sustainably, says Janis Faltmann.

weeds when it is absolutely necessary from a production perspective.

"Digitalisation is something that's been happening at scale over the past few years and especially in agriculture. I think we can use all the positive aspects of it to support farmers.

"In my view, it's absolutely essential to work more sustainably and this can be achieved by using novel technology and innovation."



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