

Right mindset needed to make technology work

Precision farming technology is playing an increasingly important role at Mentmore Park Farms in Buckinghamshire, but the past 10 years haven't all been plain sailing, as **Louise Impey** discovers

A willingness to adopt new technology, together with the determination to make it succeed, have been essential requirements in helping Robin Gaymer overcome the teething problems associated with precision farming.

First introduced by his father in 2001 with variable rate P and K applications, the 1,500ha arable farm is now using variable seed rates alongside other developments including GPS auto-steer, yield and soil mapping, to help drive yield increases and efficiency gains.

"There's no doubt it is the way to go," says Mr Gaymer. "But we've learnt a great deal along the way. Precision farming doesn't work

GPS auto-steer resulted in the biggest savings, says Robin Gaymer.



on its own; the right mindset and attitude is very important."

He is also clear about what he wants it to achieve. "Just getting the yields even across the fields and managing for an average figure isn't enough. I want to see every identified area producing its most, by using precision agronomy."

With help from his Masstock agronomist and the company's specialist precision farming division, he is well on the way to doing this. Having applied the principles successfully to winter wheat, this autumn saw a similar approach being adopted with oilseed rape.

Ten years ago, the starting point came when tissue tests taken from growing wheat crops showed nutrient deficiencies, despite the soil tests being fine. "Clearly, there were pockets of problems. So we had five fields sampled and zoned, then applied P and K according to the results."

That approach worked well and is now applied across the entire farm, which grows winter wheat, oilseed rape and beans, most of which is on heavy clay soils.

The next step, however, was less successful. In 2002, variable seed rates were attempted, in an effort to reduce areas of poor establishment. "Unfortunately the technology let us down and it wasn't possible to do," recalls Mr Gaymer.

Undeterred, the business continued on its precision farming quest in 2003, when GPS auto-steer was fitted to both of the farm's crawlers, giving accuracy within 50cm. "That was a good step forward for cultivations work and we increased that accuracy to within 10cm the following year."

The ability to cover more ground, work longer hours and



JONATHAN PAGE

Growers should get good advice before buying kit, as there can be problems with compatibility.

reduce errors have resulted in efficiency improvements, he points out. "We've seen savings in fuel and our workforce is much happier. Everyone has benefited."

In 2006, the purchase of a new combine bought yield mapping and telematics to the business. The information proved very useful, explaining some of the variation experienced over the years, and persuaded Mr Gaymer to consider variable rate nitrogen applications.

EXPENSIVE

"Having seen how variable rates of P and K had worked, we wondered if we could do the same for nitrogen. Nitrogen is a considerable expense on a farming business of this size and nutrient use efficiency needs to improve, for both financial and environmental reasons."

But it wasn't until the purchase of a new 32m sprayer in 2009, complete with GPS auto-steer and boom levelling, that variable liquid applications became a reality. Even so, the cost of purchasing two sets of the technology to measure canopy reflectance and fine-tune nitrogen applications has proved prohibitive to date, although fur-

ther progress is anticipated soon. "One of the issues is that it is still a developing technology. But hopefully it could be used to vary plant growth regulator rates, as well as fertiliser."

The next year, 2010, is described by Mr Gaymer as a big one. Another change of combine, this time to include GPS auto-steer, coincided with Masstock establishing a precision agronomy division, SoilQuest Precision Agronomy. This gave him access to Stuart Alexander, who together with Mr Gaymer's agronomist Andrew Richards, were able to drive further improvements.

"We were keen to try variable seed rates, for a number of reasons. These included bad black-grass, some drainage issues, slugs and compaction on the headlands. Masstock helped us to make use of all the information and the machinery, in order to do this."

Two different approaches were taken with seed rates. On the home farm, he decided the cost of scanning was too great. "Instead, we made use of my father's knowledge and experience, and Mr Alexander's expertise, to produce maps of management zones."

"These have enabled us to alter seed rates by as much as 25% where required, either up or down,



from crops and allowing him to make the best use of inputs. "It's more efficient. All our knowledge has been brought together to make management easier, but there's greater attention to detail."

However, he admits there has been a considerable time commitment and that technology failures are common. "It can be very frustrating. The backup and support from some of the manufacturers just isn't good enough."

For this reason, he urges other farmers to get good advice before they buy any kit. "Despite what you are told at the time, there are no guarantees when it comes to compatibility. Some of the boxes simply don't talk to each other, even though they should."

Another recommendation is to have one central place for all the data. "In our case, that's Farmade's Gatekeeper. It allows us to transfer data from the machines to the

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Robin Gaymer

to compensate for limiting factors or take advantage of favourable conditions."

However, on some contracted land, he opted for SoilQuest scanning. "We had a few years of yield maps, but not much other information. It is a very different, much lighter soil, and there was one 44ha field that had always underperformed."

A seed rate plan was developed with Mr Alexander, based on soil variance. "We were very intent on improving crop establishment. In fact, we saw the average yield rise from 8t/ha to 10t/ha on that particular field."

Importantly, the same amount of seed was used overall, he adds. "It didn't add to our seed costs."

Looking ahead, he would like to be able to make use of zones to apply variable herbicide strategies. "Putting the herbicide where it's needed is the right way to go, both financially and environmentally. We could really target our pre-emergence treatments, using stacks where necessary, with this approach."

For this to happen, the ideal scenario would be direct injection on the move, he says.

Mr Gaymer is confident that precision farming and its application is helping him get the best

STUART ALEXANDER'S 10 TOP TIPS

- 1 Investing in time and effort is essential – consider buying in professional advice and guidance
- 2 Understand your soil – nearly all variation comes from the soil
- 3 Combine existing knowledge and precision farming data. Don't forget that your agronomist's knowledge can add another dimension
- 4 Set out clearly what you want to achieve
- 5 Identify areas on your farm that may benefit from targeted inputs
- 6 Remember that every farm is different
- 7 Involve operators – ensure they have adequate training and that they understand what you are trying to achieve
- 8 Question what you see – data collection and method of interpretation can affect results
- 9 Make sure any new technology has all the functionality you require
- 10 ISO – the new industry standard for controllers does not always guarantee compatibility with existing kit



Some contract-farmed fields were scanned and sampled to provide soil mapping information.

office and back out again. But you do need a basic understanding of computing and technology."

While the biggest expense has been the installation of GPS auto-steer, it has also resulted in the biggest savings. "Our fuel bill is 5-10% less, as is our use of agrochemicals, thanks to automatic shut-off."

The soil scanning and nutrient maps service costs about £25/ha, he reports. "The scanning can be used as a management tool to target many other inputs and there's no need to have the whole farm done at the same time. It can be introduced gradually."

Andrew Richards, of Masstock, who has been the agronomist at Mentmore Park Farms for some time, emphasises the need for growers to understand what they are taking on before embarking on precision farming.

"There will be challenges along the way. Make sure that your staff, and your agronomist, are involved. Variable rate recommendations have to be carried out correctly to get the benefit."

He also highlights the extra management that can be involved. "Having 50 fields with five different soil zones is equivalent to having 250 fields. So there is additional commitment required."

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