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Innovation Research Briefing

Mind the gap...

Hutchinsons’ Helix project has positioned itself as a ‘one-stop shop’ for identifying and then proofing all of the latest technology in profitable crop production. CPM attended one of its recent open days to get an update of the latest research under the project.

By Charlotte Cunningham

It has been two years since Hutchinsons has been able to hold a ‘real-life’ open day, but that doesn’t seem to have stemmed the drive for progression and innovation within the Helix project — and its network of Helix farms — which have all been working away in the background to trial and validate the value of the latest innovation on the market.

Digital and precision technology has been gaining traction for some time, but with so many options, gadgets, and gizmos available, Hutchinsons aims to sort the wheat from the chaff — so to speak — by proofing technology and strategies on its network of Helix farms, to ensure growers can attain reliable advice on progression.

The Helix project’s ethos is all about adding value to the bottom line through technology and most recently, this has

focused on bridging the gap between progression and the barriers of some of UK farming’s biggest challenges. “What we want is growers to see Helix as a standard for proofing and validating technology,” says Stuart Hill, head of technology and innovation. “It’s not just about the technology itself, but also what information that technology can produce and how agronomists and growers can interact and make use of this to make beneficial decisions on farm.

Network of farms

“We’re trying all sorts of technologies on our network of farms, some of them fail and some of them get through, but ultimately in our eyes, they have to provide a benefit — whether that’s financial or environmental — otherwise we don’t believe they are of use to farmers or their farm business.”

But what is the point in it all? “We firmly believe that technologies can help us make better decisions — there’s a lot of really useful innovation coming along and without information and data, how can we measure things?” asks Stuart. “Really, it’s all about using the technology to extract the data to make better decisions.”

And these decisions can be anything from the strategic side of farm planning — perhaps using yield maps on the combine in a bid to dig down into productivity and around the farm and rethinking the usage of lower productive areas, for example, or there is the potential to use technology to monitor and measure as we change and improve soils — looking deeper into how soil biology and nutrition work, he adds

Then there are also aspects such as crop genetics, with Stuart noting a huge improvement in new genetics coming through. “An example of that is that over the past five years we’ve seen an average of 1.5 points increase in strength of conventional wheat varieties with septoria.

“We also have next generation hybrid wheat on the horizon — which we see as a new technology — as well as all sorts of new traits coming through, so it’s all about looking at how we can use them and maximise their impact on farm.”

Another important aspect is then thinking about how this all can fit in with the ideology of integrated pest management, adds Stuart. “From a political viewpoint, we must have more transparency and be able justify the decision making we’re going through. So I believe that we’re really going to have to ▶



Stuart Hill says Helix is all about using the technology to extract data in order to make better decisions.



Though it's often presumed that precision farming costs a fortune, variable rate drilling technology can be retrofitted to existing drills via Hutchinsons new E-Seed for under £5000, says Nick Strelczuk.

► cement IPM practices as a standard part of our approach.

"I'm sure many growers are already doing this, but don't necessarily document it, but through the use of technology, we can bring all of this information together — in systems like Omnia — to deliver a report to end users."

New technology is tested as a prototype at the national Helix site in Northampton. "Here we're looking at what does it do, what information it provides, how the agronomist and growers can interact with it, and what decisions can be made from it."

After this, the tech moves out to the regional farms, to test it on different systems, soil types and climates.

Hutchinsons' recent demo days have been based on the theme 'bridging the gap' but what exactly does that mean in the field? "With Helix, it's obviously about technology but bridging the gap is two-fold for us," explains Stuart.

"The biggest challenges we're facing are a 50% reduction in BPS by 2024, and arguably most importantly is climate change.

"We've seen such extreme weather patterns over the past five years, ranging from really wet autumns where nothing could get planted, to really dry springs which have delayed field operations. So really, it's about asking how we build, with technology, a resilient farming system."

One of the most recent farms added to Helix's strategic network is Helix Central, near Banbury, hosted by Gerry and George Stephenson.

And while the farm is fairly new to the project, one of the first trial areas has been within precision drilling.

Namely, this has involved testing the capabilities of Hutchinsons' new E-Seed, the first stand-alone variable rate drill conversion



Omnia E-Seed enables a standard land-metered drill to be converted simply and efficiently into a variable rate drill.

Eastern focus on sustainable practices

Wood Hall Farm near Rattlesden in Suffolk became the Eastern demonstration site in 2019 and host farm, Tom Jewers, believes the Helix project will provide valuable information to help shape future practices across the 385ha farmed area.

"We're always trying to do the right thing and find better, more efficient ways of working, but with the Basic Payment going in a few years' time, we feel it's important to try new things now, while we've still got a bit of a fallback with the BPS."

Hutchinsons is conducting a range of work at Wood Hall Farm this season, covering many different areas, but sharing common aims of improving efficiency, building resilience, and developing more sustainable farming systems.

The Omnia precision farming system provides a central "hub" to record, analyse and evaluate much of the information, from crop observations, satellite imagery and input plans, to Terramap soil analysis and yield data.

At present, trials are exploring ways of improving nitrogen and phosphate fertiliser use efficiency.

"Fertiliser accounts for around 30% of farm input costs, so if we can use it more efficiently while maintaining productivity then we can save cost and improve our carbon footprint," says Hutchinsons trials and technical manager, Bob Bulmer.

The Nitrogen Use Efficiency (NUE) trial is examining different rates, from 0-240 kg/ha, granular and liquid fertilisers, and the impact of nitrogen inhibitors on NUE. Alongside thorough

crop and yield assessments throughout the season, work is also examining whether inhibitors affect soil microbiology, such as by inhibiting the activity of bacteria involved in the nitrogen cycle.

A baseline assessment of chemical, physical and biological soil properties was taken at the start of the season and further tests are being done to identify any impact on soil health.

Another trial is looking at different nitrogen timings, as Tom has concerns that in very dry springs, crops are not taking up granular fertiliser efficiently. The traditional granular approach is being trialled against foliar-applied N later in the season and through dry spring weather.

Improving phosphate use efficiency is another key area, especially as national Hutchinsons testing of 167 grain samples last season revealed 46% were low in phosphate. "Phosphate is easily locked up by calcium, magnesium and aluminium in the soil, which means crops cannot access it," notes Hutchinsons' Rob Jewers. "Additionally, triple super phosphate (TSP) has just 10% use efficiency, compared with nitrogen's 60%."

Interactions between soil biology and phosphate availability are being examined in a field of Planet spring barley, which was drilled on 2 April this year. Four treatments are being evaluated, including different starter fertilisers (Crystal Green, Biolite, and Primary-P), and a root-colonising bacteria (*Bacillus amyloliquefaciens*) which is claimed to help plants extract phosphate.

A separate tramline trial is also testing whether a novel endophyte seed treatment could help



Wood Hall Farm near Rattlesden in Suffolk became the Eastern demonstration site last year, hosted by farmer Tom Jewers.

crops fix nitrogen, sequester phosphate, potassium, and zinc, and improve drought tolerance.

Similarly to the Helix Central demo site, another focus area is a field-scale trial investigating whether sowing a blend of different wheat varieties including RGT Saki, KWS Extase, KWS Siskin and Graham can improve crop resilience to pests and diseases.

"Increasing genetic diversity helps us reduce the risk of a disease like rust sweeping across a whole field. The blend should be more resilient, and there may be scope to reduce our input spend," says Tom.

The wheat blend has been sown next to a two tramline trial of Hyking hybrid wheat, sown at half the seed rate (200 seeds/m²) of the blend to see how it compares, and particularly if there is any benefit from the hybrid vigour in more challenging growing conditions."



Data is showing that a blend of wheats has 49% less selection pressure on septoria mutations than a single variety, explains Dick Neale.

kit that fits to any standard drill and does exactly what it says on the box — enables a standard land-metered drill to be converted simply and efficiently into a variable rate drill, explains Nick Strelczuk, precision technology specialist. “Shortly after our first visit to the farm, George purchased a new John Deere 750A drill, but we quickly realised it didn’t have the capabilities to do variable rate drilling.

“Though it’s often presumed that precision farming costs a fortune, we were able to look at the technological solutions available and were able to retrofit the E-Seed for under £5000 – a minor investment in comparison to the value that variable rate drilling and data would provide for the farm.”

This data can then all be brought together within the Omnia Platform to facilitate further decision making, explains Nick.

And it’s not just all about digital technology at Helix — Dick Neale has been looking into the value of growing blends in a bid to achieve more sustainable, robust crop production, with trial plots at the Helix Central farm. “Sometimes, it’s really important to look at the unusual rather than what we’ve been doing for a really long time, and this is one of the key principles of the Helix projects,” says Dick.

“Soil underpins everything and measuring what the soil is telling us can help us make better decisions about cropping. For me, it’s about pulling together all of that information to guide what we do.

“So, while I’m not saying that growing blends of wheat is a better strategy — in terms of yield — than growing the highest yielding variety on the list, it’s about considering the wider benefits.”

Dick adds that a core principle of good soil health is adding diversity to it. “That means diversity in the way we cultivate it, what crops we plant, whether we put in a mix of crops or a mix of the same crops — it’s all adding diversity to the soil.”

Increasing research

On the back of this, there’s an increasing amount of research highlighting the impact and benefits of cover crops and disease profiles within situations such as blends, he adds. “Research on the potential of growing blends is coming out of Denmark at the moment and it’s all being driven by necessity. In Denmark, they have had huge restrictions on fungicides and have had to look at what they can do other than using sprays to protect crops from disease.

“What the data is now telling us is that a blend of wheat has 49% less selection pressure on septoria mutations than a single variety.

“While we’ve got some really good fungicides which will be with us for the next 10 years, and a couple of new launches in the pipeline, it’s so important to keep them working. We already have SDHI mutations which, if they decide to spread through our population of wheat, that will stop SDHIs working very quickly .

“Thankfully, at this point, it hasn’t happened — but we could easily and

unknowingly pick one variety which accelerates that process.

“By adopting practices such as growing blends, we will put a stop to that. The data is also telling us that the optimum blend will consist of four or more varieties — two is not enough, just like cover crops — it’s all about maximising the diversity.

The blends trial plot at Helix Central comprises 25% Siskin, 25% Graham, 25% Extase and 25% Saki. “They were picked because in general they are good varieties with sound disease profiles, however, another aspect that is coming out of the research is that we shouldn’t formulate blends which consist solely of ‘middle-of-the-road’ varieties — it’s important to have very clean ones in there and one ‘mucky’ one.

“This is something we’re going to be looking into more and more, current research doesn’t indicate any significant yield increase but there is potential in disease management and this has to be thoroughly tested and proofed. For now there is no support from breeders or suppliers so growers thinking of blends need to consider carefully what they do. We need to do more work.” ■



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Current Helix projects

As Hutchinsons and the Helix initiative continues to delve into validity of new technology, here’s a summary of some of the project areas the firm is working on at present:

- Data and sustainability: how data can deliver better strategic decision making
- Soils and Nutrition: how technology can monitor, measure and bring improvements in soil and plant nutrition
- Genetics: can new genetics bring benefits to your farm
- Integrated crop management: technology to deliver justified and transparent decision support

Research Briefing

To help growers get the best out of technology used in the field, manufacturers continue to invest in R&D at every level, from the lab to extensive field trials. *CPM* Research Briefings provide not only the findings of recent research, but also an insight into the technology, to ensure a full understanding of how to optimise its use.

CPM would like to thank Hutchinsons for sponsoring this Research Briefing and for providing privileged access to staff and material used to help bring it together.

With turnover in excess of £220 million, the business has grown to become one of the leading national agricultural and horticultural

input advice and supply companies. Hutchinsons takes a dynamic, forward thinking approach to supporting grower clients in the production of quality crops and food in a sustainable and responsible manner.

Hutchinsons recognises that the people working within the business are the most important ingredient in maintaining and enhancing the quality of services offered to their customers.

