Fieldwise
AGRONOMY NEWS FROM HUTCHINSONS
Crop Production Specialists
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Helix

Farm trials target efficiency to increase bottom line

With higher input costs and diminishing direct support driving the need for greater farm efficiency, ***Hutchinsons is trialling some potential solutions at its Helix farms.***

Large hikes in fuel and fertiliser prices present a significant cost uplift for 2022/23, and although stronger commodity markets are mitigating some of the impact, the stakes are raised considerably.

The financial impact of underperforming crops on farm profitability will be magnified at higher prices, so growers must improve efficiency, reduce risk and build more resilient, farming systems.

Developing practical solutions to these challenges lies at the heart of Hutchinsons Helix project, which uses a network of farms to test, develop and validate technologies and techniques to help improve decision making and add value to growers.

Two Helix farms are in Oxfordshire and Suffolk; areas that are separated geographically, but share common challenges.

Start with the soil

Healthy soil underpins productive, efficient farming systems, so start by assessing physical, chemical and biological properties, says Technical Manager Dick Neale.

At Helix Oxfordshire, TerraMap soil scanning has been combined with Hutchinsons Gold soil test to build a comprehensive picture of soil properties and highlight in-field variations.

The site, hosted by George and Jerry Stephenson, is relatively new to digital mapping, but George recognises the benefits. Like other Helix farms, he is using Omnia as a central "hub" to record, analyse and evaluate information, including crop observations, satellite imagery, input plans, TerraMap analysis and yield data.

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Tom Jewers, Host of Helix East Anglia

George Stephenson, Host of Helix Oxfordshire

"One of the biggest things TerraMap showed us was that although our soils are not in bad condition, we had been over-cultivating, which was reducing organic matter."

Tillage intensity has been reduced, and he keeps the cultivation strategy flexible, adapting to conditions, using either a JD 750A for direct drilling, a low disturbance subsoiler, or an occasional extra pass with a Horsch Joker.

Improving nutrient efficiency

Various Helix trials are finding ways to improve nitrogen and phosphate use efficiency to deliver savings at high fertiliser prices.

At Helix East Anglia, Suffolk farmer Tom Jewers is hosting trials examining whether foliar nitrogen can more efficiently supply nitrogen to plants, particularly in dry springs. Trials include slow-release products, and a foliar treatment that uses nitrogen-fixing bacteria to fix atmospheric nitrogen into a plant-available form, bypassing root uptake.

"On average, only 50-60% of ammonium nitrate gets into the crop, so increasing NUE offers significant financial and carbon savings," says Commercial Fertiliser Specialist Rob Jewers.

"Applying 6-7 kg N/ha in foliar form could replace up to 40 kg N/ha of bagged nitrogen, while the nitrogen-fixing product claims it can supply up to 30 kg N/ha. Early signs are encouraging, but work is ongoing."

Yara's N-Tester and digital biomass imagery is also used to more accurately tailor nitrogen use to crop requirements.

Better understanding the nitrogen response for a given soil type in a farm situation is also being examined at Helix East Anglia, where a randomised plot trial is comparing rates from 0 to 340 kg N/ha in LG Astronomer winter wheat.

Last year's trial showed the baseline yield from no applied nitrogen was around 4 t/ha, which increased to 10 t/ha with the first 160 kg N/ha, notes Tom Jewers (see back page).

"But beyond that, the response starts to decline, with the next 1 t/ha of yield needing an extra 90 kg/ha of nitrogen. Ultimately, our aim is to use some of the technologies we're testing within Helix to cut nitrogen applications on our winter wheat from the current farm standard of 220 kg N/ha. We could be much more efficient with nitrogen by using it differently."

Phosphate focus

Phosphate is another nutrient under the spotlight. Neither the Oxfordshire or Suffolk site is deficient in soil phosphate, however lockup can occur on higher pH soils.

Rob Jewers says just 4-12% of applied triple superphosphate granular fertiliser typically gets into plants, with most reverting to rock form in soil. Hutchinsons is therefore trying small, targeted applications of microgranular fertiliser - such as Primary-P or Crystal Green - with seed at drilling to kick-start stronger root development.

Results have been encouraging thus far, he says. "The Primary-P treated plot at the Suffolk trial in KWS Extase looked darker green earlier in the season, so it's encouraging to see it appears to be working."

Building disease resilience

With increasing interest in variety blends to mitigate disease risk, both Helix farms are trialling different mixes.

The Suffolk trials include a three-way Nelson, KWS Extase and Graham blend, plus a four-way mix containing Graham, KWS Extase, Costello and Gleam. This is being compared against LG Skyscraper treated with a standard single purpose dressing, or an endophyte seed treatment, said to help crops fix nitrogen and sequester phosphorus and other nutrients.

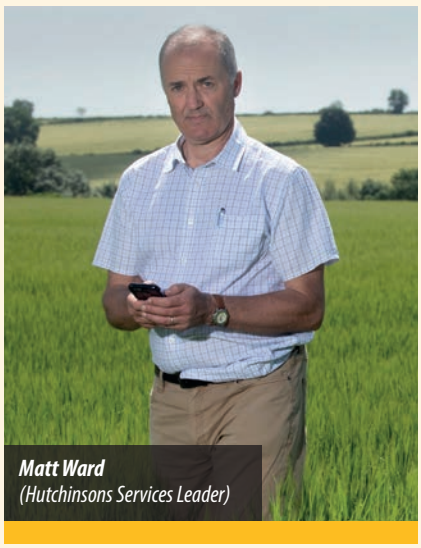
"There wasn't much visible difference in disease incidence, with some Septoria present on older leaves through winter, but we did notice real differences in how quickly varieties developed earlier in the season," notes Tom Jewers.

Crops have been assessed in-season, and yield and grain analysis will be done after harvest.

Keep up to date with all the Helix project activity by visiting our dedicated website: https://helixfarm.co.uk

What's the one thing I **should do** in response to current market conditions?

***Matt Ward** (Hutchinsons Services Leader) talks through how to approach the coming season with regards to managing market and price volatility.*



Matt Ward
(Hutchinsons Services Leader)

During our recent Helix demonstration events, the question above has frequently been posed.

Grain and oilseed markets are at high levels, but so are fuel, fertiliser and labour costs, so it's no surprise that so many people are looking for answers to this unprecedented volatility.

In a recent survey, almost the same number of growers said they were planning to increase their wheat area in 2023 in response to high prices; as there were growers that said that they were going to reduce their wheat area, due to high input costs.

It is possible of course, that both groups are correct and they have all based these decisions upon well thought through budgets, that reflect the likely productivity from their individual farms. I fear that for many, however, it's not based on data, budgets or planning tools, but personal perspective on the risk or reward from high prices for either inputs or outputs.

Business tools from Omnia

Last year we launched the Carbon management tools in Omnia and at the time stressed that good carbon management achieved by reducing fuel and fertiliser use to optimise yield, made good financial sense and as an important aside, would also help reduce growers' carbon footprint. Little did we realise what was coming around the corner!
As part of these developments, we set out a plan to launch an additional set of business tools in 2022.

Our **Business Performance Planning tool** will be launched later this summer and has been specifically developed to allow growers to compare and contrast a number of different management options. This can be done either by comparing cultivation techniques e.g. ploughing v. direct drilling, or comparing one rotational choice against another e.g. 50% wheat with 50% break crops, compared to 67% wheat with 33% break crops.

Omnia allows comparisons of net margins, as well as the relative carbon emissions across the whole rotation. It also allows the user to interrogate costs so that even where margins may be higher for one option compared to another, the relative cost might make it too risky for the grower to adopt.

What is key is that changes are adopted in a planned manner to make success more likely. For example, simply adopting a no-till approach without careful planning may reduce fuel costs, but if yield is compromised as a result, cost per tonne may increase and profits fall.

At our Helix National site, soil investigations have identified some shallow compaction areas, despite several years of direct drilling and cover crop use. In these situations, we have seen yields and profits have increased dramatically from light cultivations, even though overall costs and carbon emissions for these fields increased.

What is becoming increasingly obvious as we look at more and more clients' data is that the variation in performance across fields is just as great as it is from one field to the next. Therefore, once an ideal rotation is 'chosen' further investigation can demonstrate just how close to break-even, or loss-making some fields and some parts of fields are. The next step is to decide whether these areas or fields are worth taking a gamble on, particularly with more risky crops. Or should a lower risk option be taken with these fields i.e., adopt new crops and techniques on these fields last, or reduce inputs to closer match yield potential.

Digital farming capabilities take these options to a new level of detail, but the principles are the same whether it applies to a part of the field or the whole field itself.

- **Strategic planning – Cropping, Cultivations and Cash**
- **Cost of Production**
- **Yield**
- **Variable costs – fertiliser**
- **Direct costs – Fuel – Labour**
- **Rotational planning essential**

For more information on business planning tools within Omnia, please email the team: info@omniadigital.co.uk

Autumn **cereal establishment**

Dick Neale (Hutchinsons Technical Manager) **gives advice on soil assessment post-harvest and drilling to seed number and not weight.**

Dick Neale *(Hutchinsons Technical Manager)*

So, what's new, we have established cereals in the autumn for decades - what's to learn?

What's fundamentally new is the level of risk associated with growing all crops, but particularly cereals.

Cereals for most are a high input crop, with fertiliser levels, fungicide, PGR and herbicide inputs all at the upper end of the cost slope.

However, we are in unprecedented times, and it's not just one element of the crop's input that is seeing rapid inflation …it's everything, from diesel, seed and fertiliser to general inflationary pressures on all other inputs.

This focusses the mind on optimising every hectare of crop we establish; we cannot afford to apply expensive inputs to a substandard crop.

Establishment

Summer 2022 has offered up one of those ideal transition years from deeper tillage to a system of focussed need and outcome.

Soils now are reaping the benefits of the previous warm, dry and open autumn that allowed for excellent establishment of crops in good seedbeds with low Thousand Seed Weight (TSW) seed samples and minimal winter losses. As many continue to drill by weight, the lower TSW samples produced last autumn meant increased numbers of seeds/m^2 were drilled.

Continued overwinter growth has filled the soil with roots to greater depths and with minimal soil structure damage from harvest 2022 activities, many soils will be in a good, stable structural condition.

There is little point in trying to assess soil structure post-harvest when the soil is at its driest and is structurally hard. When in this condition I always advocate adding water …at least 20 litres of water to roughly 0.5m^2 and allow that to soak for around 2 hours …then do a structural dig, the difference is dramatic and always raised the question …why would you cultivate this?

Adding water does not mask any compacted zones or poor structure, they are equally highlighted, but it does stop the 'dry soil = compacted soil' mistake being made.

As dry as soils have been, with the expense of diesel and wearing metal, it really is worth thoroughly assessing soil with the water soak inspection. Just waiting for rain could be a very real option for many this year, the very best seedbed structure exists on the top of the soil, only heavy harvest traffic can spoil it when the soil is trafficked wet.

At the very least, if reduced tillage is the intention, delay when cultivations start. Working gently from the top down means a good structure of seedbed is made rapidly …it does not require the 10 weeks of weathering time we always gave deep tilled operations. If delaying drilling for improved grass weed control, then only give shallow till seedbeds 4 weeks of weathering.

Drilling by TSW

The importance of drilling to number and not weight must be increasingly recognised. Seed cost follows commodity cost and therefore seed cost will be significantly higher this season.

Low Thousand Seed Weight (TSW) samples in 2021 (40-42g TSW) meant that for any given weight drilled, more seeds/kg were sown, resulting in thicker plant stands.

In 2022 the opposite could be the case, or we are at least back to normal TSW figures of 55-58g, in which case seeds sown/kg will be less.

- @40g TSW 180kg seed/ha = 450 seeds/m^2 sown
- @58g TSW 180kg seed/ha = 310 seeds/m^2 sown

In terms of good agronomy, we have three scenarios here: -

- You get lucky and the 180kg sown delivers exactly the seeds/m^2 you require
- The TSW is low and too much seed is sown at increased cost
- The TSW is high and too little seed is sown resulting in a compromised crop on day one.

Drilling by TSW is a very simple adjustment for all and it has such a profound effect on crop performance and cost.

Questions on this article? Please contact us: information@hlhltd.co.uk

Questions about the Sustainable Farming Incentive

The Sustainable Farming Incentive opened on the 30th June for applications in England. The scheme is the first of three new environmental schemes being introduced during the phase out of basic payment subsidies. It is avaliable to all farmers who currently receive basic payment scheme (BPS) payments.

In 2022 there are three standards avaliable, each with an introductory and intermediate level to claim for and each with different payments.

- **Arable and horticultural soils**
- **Improved grassland**
- **Moorland**

How long will the scheme last?

An SFI agreement will last for three years. More standards and levels in each will be introduced within that time that can be added to an existing agreement, as well as adding additional land.

How will payments work?

Payments will be made on a quarterly basis, the first payment made three months after your agreement commences.

Is there a deadline for applications?

No. Unlike Countryside Stewardship where the deadline for applications is the 29th July, the SFI has no deadline so farmers can apply at any time to suit them.

How do I apply for the SFI?

The SFI is applied for online through the Rural Payments Agency service. An agreement should then be sent out within two months of applying.

I am currently in an agri-environment agreement, can I still apply?

Yes. If you have an existing agri-environment scheme and want to apply you can either email the RPA at **ruralpayments@defra.gov.uk** (use 'Apply early for SFI' as the email subject heading and include your SBI) or call the RPA on 03000 200 301.

The RPA expect that by the end of August all BPS eligible farmers should be able to apply directly online in their Rural Payments service.

For more information, please contact our environmental specialists: enviro@hlhltd.co.uk

Trialling a route to better maize

The Hutchinsons maize trials in Cumbria are shedding new light on how to maximise the productivity of crops in more marginal maize-growing areas.

This is the objective of the Carlisle maize trials site at Smalmstown Farm, Longtown, courtesy of Mr & Mrs R Fisher, where a range of varieties and growing techniques are being put to the test to identify what does and does not work; vital lessons that can better inform farm practices.

Speaking ahead of the annual open day on 13th September at the Carlisle site, Hutchinsons agronomist Jim Clark says: "The old adage that no two seasons are ever the same has been very evident in recent years, creating markedly different challenges."

"Managing these seasonal variations is tricky for any crop, especially one like maize grown in north-western parts of the UK, where the climate can be less conducive to warm-season crops.

"While many maize crops are established under film to mitigate some of the early season risks from cooler temperatures in spring, the technique creates its own challenges and requires considerable investment, so maximising crop output is vital to secure the future of maize growing in such areas."

Exploring the best ways to manage many of these maize growing issues, visitors to the event can expect to hear the latest findings on:

- Maize Varieties: Up to 15 different varieties, all grown under film, with some also sown in the open.
- A range of grass mixes suitable for undersowing with a focus on weed control

Jim Clark
(Hutchinsons Agronomist)

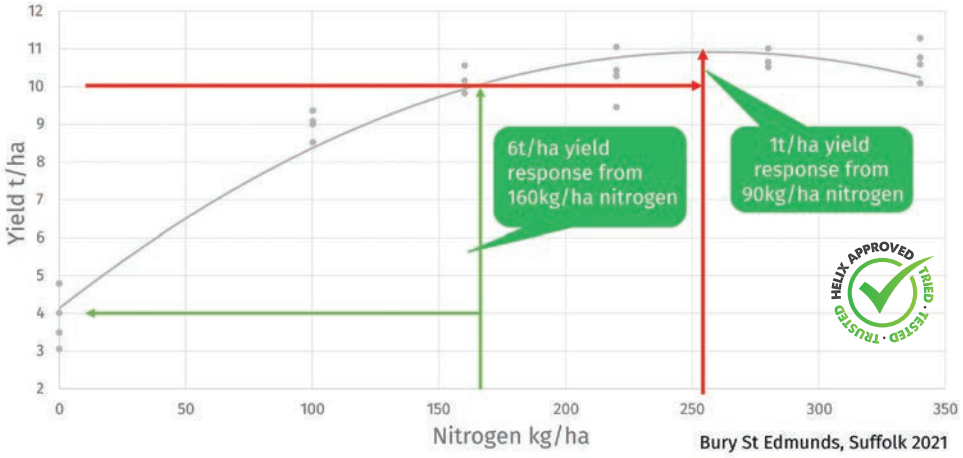
- Starter fertiliser benefits – latest results
- Narrow film trials results

For details of the Carlisle Maize Trials open day on Tuesday 13th September, and to secure your place, please visit the events section at www.hlhltd.co.uk

Looking at the value of **Nitrogen in a different way**

Tim Kerr (Hutchinsons Nutrition Manager) **says the benefit of Nitrogen fertilisers is a classic example of the law of diminishing returns.**

Tim Kerr (Hutchinsons Nutrition Manager)

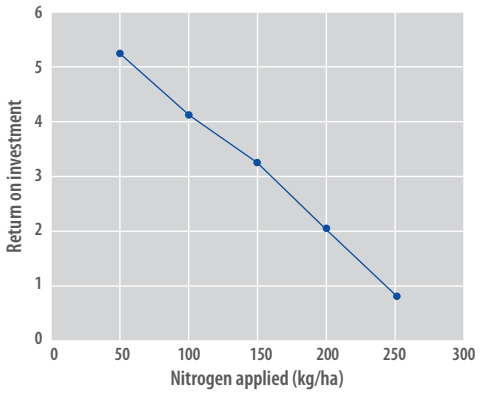


We are more likely to be familiar with the Nitrogen response curve shown above than the chart below that shows the return on investment – and this clearly shows the diminishing returns.

The ROI is what you get back in terms of crop value versus the cost of the Nitrogen applied.

The more N applied – the lower the ROI.

Nitrogen Return On Investment (ROI)



The N response curve does show that Nitrogen fertiliser increases yield by 7 tonnes per hectare over the zero N plots, but it should be noted that 6 tonnes of that yield response is produced by the first 160 kg of Nitrogen. The last tonne of yield improvement came from 90 kg of N.

When we consider the return on investment – there is a relatively simple formula we can see from this example.

N applied	Return on investment
0-50 kg	5:1
50-100 kg	4:1
100-150 kg	3:1
150-200 kg	2:1

This is based on a Nitrogen price of £2 per kg and a wheat price of £250 per tonne.

Compared with a year ago, the ROI is better at today's figures, even though the numbers are significantly higher.

Despite the frankly alarming price of Nitrogen, it is difficult to argue that it does not offer good value for money. However, it is more important than ever to consider what the optimum rate should be. Looking at it from the ROI hopefully allows us to have a clearer picture of when the benefit becomes too marginal to be justifiable.

Optimising NUE is a top priority, and it is crucial to remember that Nitrogen requires a combination of nutrients to be used efficiently.

Most of the elements that are essential for crop nutrition support Nitrogen use efficiency. If we are to get the most from Nitrogen, then an adequate supply of the other elements is essential.

Crops require a cocktail of 13 nutrients to grow effectively. The growing medium can supply some or all the requirements, the rest need to come from other sources – manures, fertilisers and foliar feeds being the main sources.

Assuming the growing medium is soil – it cannot be overstated how important it is to know what your soil can supply – the cost of all fertilisers has escalated beyond any recognition, therefore the value of your soil nutrient bank has also increased.

Testing the soil, managing the soil as best we can and monitoring the nutrient levels in the crop will all contribute to getting the balance right – thankfully the cost of soil and tissue analysis has not tripled – so it is better value than ever.

Straw:

Where straw is removed, so are nutrients – by reflecting the increase in phosphate and potash prices, the value of P and K in wheat straw has jumped in the last year from £26 per ha to £65 per ha. Whichever way you look at it, whether this is a withdrawal from the "soil bank" – or an extra fertiliser requirement – it is a very real cost that needs accounting for.

Decisions on the use of fertilisers are bigger than ever – and consulting with a FACTS qualified advisor will provide reassurance in those decisions.

If you have any questions on crop nutrition that you would like to discuss – speak to your local Hutchinsons agronomist or email me – tim.kerr@hlhltd.co.uk