Fieldwise

AGRONOMY NEWS FROM HUTCHINSONS

Crop Production Specialists

APRIL 2022

Practical solutions to cutting carbon

Reducing the greenhouse gas footprint of farming operations benefits the environment and business profitability.

That was the clear message to more than 200 attendees at the Hutchinsons National Carbon Conference.

While farming was often criticised for its GHG emissions, delegates heard how the sector was pivotal to tackling climate change through improved efficiency and carbon sequestration.

It was still early days for carbon markets and financial incentives, but speakers said simple improvements to the carbon footprint made sound business sense and would help meet ambitious GHG targets.

NFU climate change adviser **Dr Ceris Jones** was confident UK agriculture could meet the union's 2040 net zero ambition - 10 years earlier than the government's target - through a concerted effort across different areas.

"There is no silver bullet to tackling GHGs. We need as many farmers as possible to do everything they can to reduce emissions per hectare and per tonne.

"Farmers can't do this alone, so it's great to see Hutchinsons grabbing this issue."

Speakers highlighted the links between reducing emissions, efficiency and cost savings, and that on productive land, maximising yield helped reduce the carbon footprint per tonne.

"Many things we can do to reduce emissions make perfect business sense," conference chairman **Gary Mills-Thomas** said.

But before making changes, he, and others, advised farms to assess their individual carbon situation to identify areas to focus on and provide a baseline to measure changes against. TerraMap Carbon and Omnia Carbon management offered an ideal means of doing this.

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Challenges and opportunities 2022

Matt Ward
(Hutchinsons Services Leader)

I really see spring as the start of a New Year and what a year we have in front of us! Whilst we cannot ignore the undoubted challenge of record high fertiliser and fuel prices, further reductions in BPS and of course the constant doubts about the weather, I am always heartened by the state of the crop, which is a welcome relief for many compared to recent years.

Record high commodity prices mean that careful nutrient management planning will be of greater importance than ever to optimise yield and maximise profits.

There has never been a better time to start discussions around the big questions looking forward.

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How do we design a farming system, where we...

- **Get comparable crop yields?**
- **Recycle nutrients better?**
- **Impact less?**
- **Lower costs and reduce risk?**

Now is the opportunity to review our rotations; are there alternatives that allow us to build more natural fertility and require less inputs? Can a change in rotation affect our soil management strategy, so that we can get more from the soil, improve nutrient efficiency, reduce cultivations? Should we be looking at more fertility building opportunities within our rotations, or continue to invest heavily in parts of fields that constantly under-perform?

Delegates to our Carbon conference heard how we might address some of these questions and we are looking to explore them further at our Helix sites this year, using technology to help us make sense of the information we have on our farms.

Finding solutions to these questions will not only be good for reducing Carbon emissions and improving biodiversity, but also help reduce financial risk and improve profitability

– that is a definite win-win.

Areas to target

Nitrogen fertiliser was highlighted as a major contributor to the carbon footprint on arable farms, as its production and application accounted for around 60% of emissions, The Farm Carbon Toolkit's **Becky Willson** said.

Fuel use and field operations accounted for 20%, while other fertilisers, lime, seed and crop protection made up the remainder.

"Although crop input emissions are the predominant factor, we still have to produce food, otherwise we risk exporting the problem."

Improving nitrogen use efficiency was a great starting point for reducing emissions, that offered significant financial benefits given high fertiliser prices. Advice included more accurate application timing matched to crop requirement and greater consideration of fertiliser type used.

Dr Nigel Davies of Maltdoctor Ltd said **"abated"** nitrogen fertiliser offered significant carbon savings. As former director of sustainability for Muntons he embedded abated fertiliser use in supplier contracts, reducing the carbon footprint of the firm's primary raw material by 32%, at no extra cost to growers. Coupled with reduced emissions in malting, Muntons had decarbonised by around 60% since 2010.

Soil health focus

While nitrogen often grabbed carbon headlines, the focus should be on soil, speakers said.

Hutchinsons head of soils **Ian Robertson** said well-managed healthy soil fulfilled four functions:

1. **Plant production**
2. **Carbon sequestration**
3. **Filter and buffer water**
4. **Biological habitat and diversity.**

Healthy, well-structured soil meant better crop rooting and improved nutrient use efficiency, potentially creating opportunities to reduce fertiliser applications whilst maximising yield. Healthy soils were also more resilient and could facilitate management changes that reduced carbon emissions, such as zero tillage, he said.

Helix Yorkshire host farmer **Nick Wilson** said soil health underpinned any successful farm business. He explained how the farm's move away from a plough/power-harrow based system to strip tillage had dramatically improved soil health, resilience and carbon footprint.

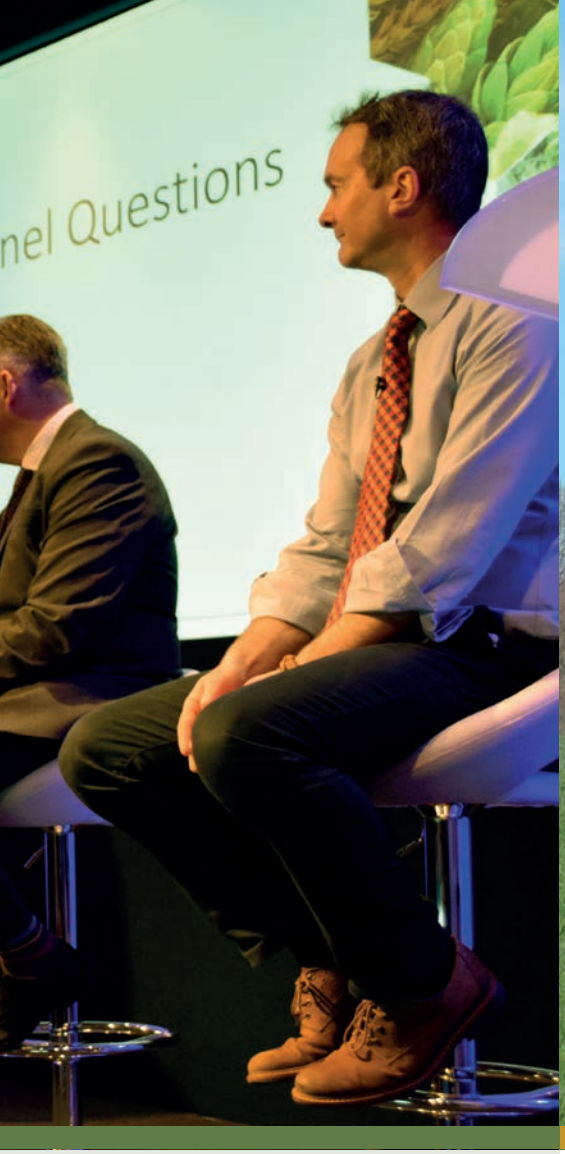
Particular focus was on managing organic matter through applying manures and introducing mixed species cover crops.

Kent farmer **Tom Sewell** also moved to no-till with a concerted focus on protecting and enhancing soils across 600 ha managed for 15 landowners.

"Soil health underpins everything we do."

Cover and catch crops, plus regular organic matter additions had been vital for feeding soil biology, retaining moisture, and improving structure and workability, he said.

Finances had benefitted too. Over three years, fertiliser use had been cut 10% annually from 300 kg N/ha,



Tailor T1 solutions to risk

With the spring fungicide campaign underway, Hutchinsons **Dr David Ellerton** and **David Howard** explain how to optimise upcoming wheat and barley treatments.

David Howard
(Hutchinsons Head of ICM)

Dr David Ellerton
(Hutchinsons Technical Director)

while maintaining yields, and fuel used for crop establishment had fallen to 8-10 litres/ha. He planned further reductions, potentially to 4 litres/ha, by purchasing a high capacity Horsch drill.

Soil carbon storage

Rothamsted's **Steve McGrath** said soil was important for sequestering carbon, but soil type and land use affected its storage 'capacity'.

Different soils had their own **"saturation point"** for soil organic carbon (SOC) and levels would gradually decrease if organic carbon inputs fell as material was degraded, he noted.

Soils with high clay or fine silt content were good at protecting SOC, as it became bound to mineral particles.

To view recordings of the Carbon conference presentations, please register via our website: www.hlhltd.co.uk/resources

(use QR code above)

Last season proved challenging for some T1 wheat fungicides. Although early disease levels were generally low due to cold, dry conditions in April, slow crop growth meant some T1s were applied too early where the focus was more on calendar date rather than crop development.

In such cases, coverage of leaf 3 was compromised and the spray interval to the flag leaf application was stretched, just as disease pressure surged following rain later in May.

Of course, no two seasons are the same and spring 2022, at the time of writing at least, was milder and wetter than last year, with crops advancing strongly. Indeed, some September-sown KWS Extase had reached GS 31 by mid-March, highlighting the need to monitor crops carefully and treat fields on their own merits.

This is especially true given the mild, damp conditions last winter, which combined with a large area of early sowing, created a higher base disease level, with mid-March forecasts from Omnia's disease risk forecasting model predicting generally high Septoria and rust pressure.

Below are four ways to optimise T1 wheat fungicide applications and maximise yield response:

Assess risk

Understanding which crops are at greatest disease risk is vital to prioritise applications and spray programmes. Varietal rating, drilling date, and weather drive risk, and are all incorporated into Omnia's disease forecasting model, which is updated fortnightly and provides a useful risk indicator across the farm, from which individual treatments can be tailored.

Generally, prioritise susceptible crops rated 5 or less, but remember even robust varieties can come under pressure in bad seasons, especially when sown early.

Genetic Septoria resistance has historically been regarded as very stable, but last year's emergence of races with virulence to Cougar resulted in some notable revisions to Septoria ratings for varieties with Cougar parentage, such as RGT Saki and KWS Firefly. These races are unlikely to disappear, so consider

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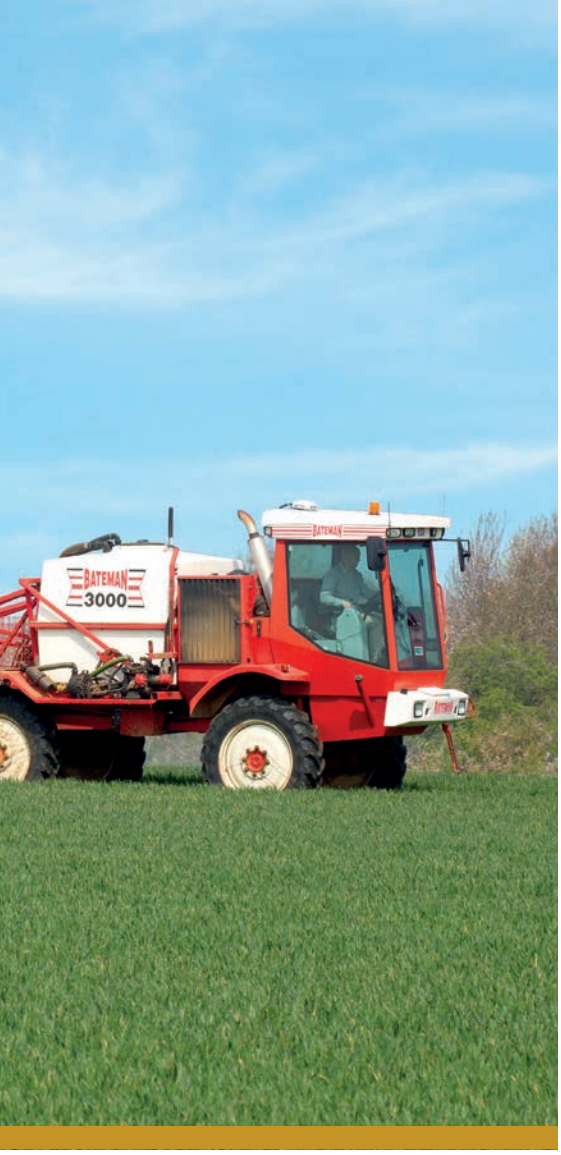


basing risk assessments on the one-year Recommended List rating rather than the three year average.

The changes to yellow rust ratings as new races emerge further illustrates the importance of using RL ratings as a guide only.

Optimise timing

Last spring highlighted the importance of accurate timing and basing spray decisions on leaf emergence rather than calendar date.

T1s are generally applied around GS 32, however the growth stage of leaf 3 emergence can vary, so dissect representative plants to confirm exactly which leaf is emerging and identify the optimum spray timing. Treat crops once most of leaf 3 is emerged to maximise coverage and protection through to T2.

The weather, disease risk and sprayer capacity should all be considered though, as waiting too long risks leaving leaf 3 exposed to infection, while spraying too early before most of the leaf has emerged could compromise coverage.

Select appropriate products

In high-risk situations, such as early-sown susceptible varieties, or where T1 is delayed, stronger Septoria chemistry such as fluxapyroxad + mefentrifluconazole is recommended. Other SDHI combinations based on fluxapyroxad offer relatively strong Septoria activity, as do some dual SDHI products such as bixafen + fluopyram.

Including the multisite folpet is a sensible anti-resistance strategy that brings extra persistence, but resist cutting the dose of mix partners to cover the cost, as this compromises control.

In lower disease situations, older SDHI + prothioconazole-based chemistry can be effective.

T0s should have controlled yellow rust, but in high-risk situations, build programmes around benzovindiflupyr + prothioconazole. Adding tebuconazole to Septoria-focused T1s brings quick rust control, while strobilurins such as azoxystrobin or pyraclostrobin give lasting yellow and brown rust protection.

T1 is the main time for eyespot and take-all protection, notably in early-sown second wheats. Boscalid or prothioconazole are the main eyespot options, while azoxystrobin or fluoxastrobin help reduce take-all.

Consider additional benefits

Early season strobilurin application can bring useful physiological benefits to rooting that potentially improve water and nutrient use efficiency. That may be particularly beneficial for growers looking to apply less nitrogen, given high prices.

Many SDHIs, and to a lesser extent, triazoles, also offer some physiological benefits.

Your Hutchinsons agronomist will be happy recommend a suitable programme for you, or contact us: information@hlhltd.co.uk

Barley T1 & T2 advice

The two main fungicide treatments are central to protecting developing tillers and maximising yield potential in barley, which is less able than wheat to compensate for early tiller damage and ear number drives final yield.

Disease control usually begins from late tillering up to the beginning of stem extension, to ensure maximum tiller survival, with the T1 typically accounting for 40% of the final yield response to fungicides.

Alongside weather, varietal susceptibility drives disease risk, with Rhynchosporium and Net blotch being primary concerns at T1, although brown rust and mildew will threaten susceptible varieties if conditions are conducive. Ramularia is usually more of a focus at T2.

Prothioconazole generally offers the most effective all-round disease control, forming the basis for many T1s, with partner actives added where necessary. Tebuconazole boosts rust control, as do strobilurins such as azoxystrobin or pyraclostrobin, which may also bring physiological benefits.

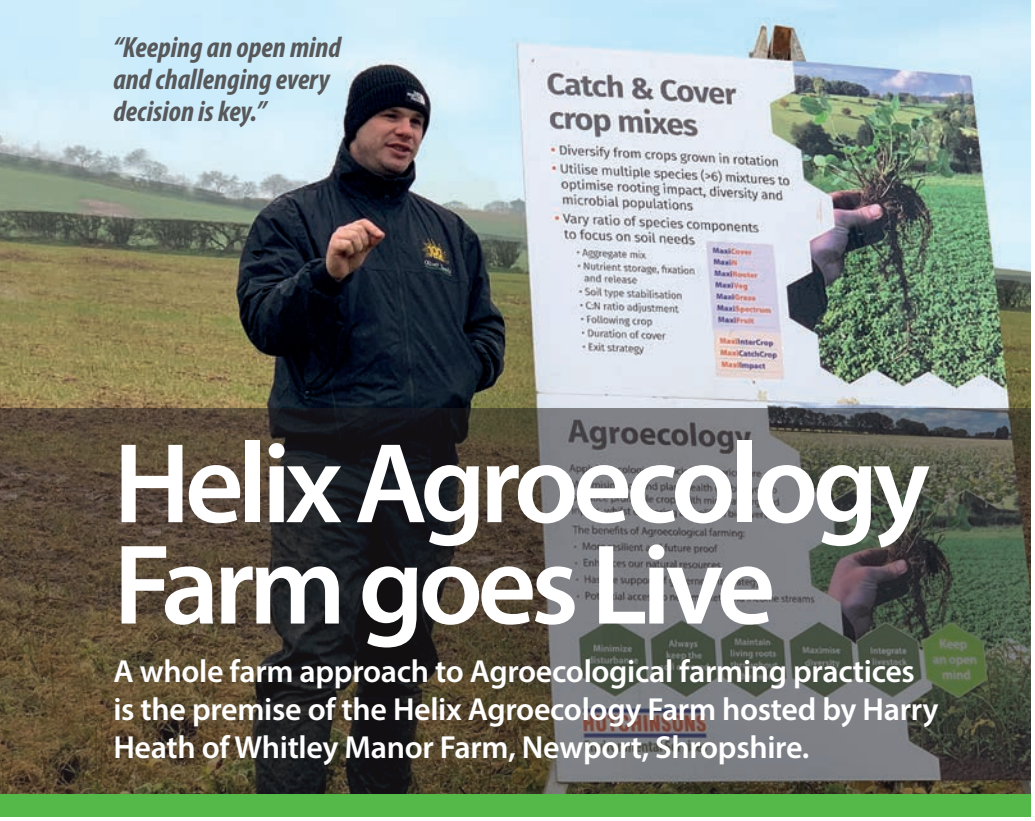
With fungicide-resistance becoming an increasing issue in Net blotch, pyraclostrobin can help.

The SDHIs fluxapyroxad, benzovindiflupyr or bixafen, give additional disease control, and offer physiological benefits. Twin SDHI products based on bixafen + fluopyram appear strong against a range of diseases.

Fungicide options at T2 (GS 39-45) are similar to T1, although the focus is more on later developing diseases like Ramularia, which is often exacerbated in stressed crops.

Fluxapyroxad + mefentrifluconazole is particularly effective against a broad disease spectrum, including Ramularia, and protection can be boosted with the addition of folpet. This may be especially important where resistance to other actives is present. Folpet can also help against Rhynchosporium, which tends to be an issue in cool, wet conditions, whereas Net blotch favours warm and wet weather.

For mildew control in barley and wheat, products based on cyflufenamid offer good curative control, while proquinazid gives lasting protection.



"Keeping an open mind and challenging every decision is key."

Helix Agroecology Farm goes Live

A whole farm approach to Agroecological farming practices is the premise of the Helix Agroecology Farm hosted by Harry Heath of Whitley Manor Farm, Newport, Shropshire.

As an industry we are still not able to clearly define all the benefits of many of the practices that we associate with agroecology, says Stuart Hill, Hutchinsons Head of Innovation and Technology.

The Helix Agroecology farm allows us to use technology to measure and monitor change as agroecological practices are implemented on a farm- scale level so that we can determine the real benefits they offer in particular situations.

"This is a long term project that will allow us to look at the whole farm as a biological system, not just certain fields or parts of the farm, and that's significant. All the key areas of focus are intrinsically linked and will produce data to allow Harry and his agronomist Ed Brown, to make the best decisions in an agroecologically sympathetic, but profitable and sustainable way" he adds.

Five key focus areas across Whitley Manor Farm

- How can data improve farm sustainability
- How do we measure and improve soils
- How do we manage nutrition
- How do crop genetics benefit the grower
- Delivering tangible Integrated Crop Management

Whitley Farm **challenges**

1. Controlling Italian rye-grass

Ed Brown outlines the key principles of tackling the challenges within an agroecological remit:

Minimise soil disturbance.
"Sometimes zero-till is not an option where there are challenging weed burdens. In this situation, we have had to bring back the plough to control the rye-grass but importantly the depth of the plough is kept to minimum, and occasionally it is necessary to reset and start again."

Keeping the soil covered. Maintain living roots throughout the year. Maximise diversity

"A mix of cover crops is important in offering a diversity of rooting habits, to build structure and help address the slump of the predominantly sandy soils. We used Maxi Cover mix containing radish, vetch, clover, linseed, phacelia and buckwheat."

Integrate livestock Sheep grazed off the cover crops.

2. Rebuilding soil structure

"A thorough baseline soil measurement was taken measuring the physical, chemical and biological aspects of the soil. A Gold SSM soil test provided us with this detailed information to help us plan a long-term soil strategy.

Fields were TerraMapped to provide us with accurate soil type maps, from which we could pinpoint where to carry out further assessments."

3. Nitrogen

Improving Nitrogen Use Efficiency. It is imperative that we only use what is needed by the crop – to ensure nitrogen use is at its most efficient we will be examining the following:

- Soil, leaf and sap analysis of N
- Replicated farm tramline trials looking at farm standard N vs reduced N, foliar N and bacterial fixation of N.
- What impact does undersown clover have on nitrogen?

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Harry Heath took over the running of the family farm back in 2010. Pigs were the mainstay of the business with between 550-600 breeding sows producing 17,000 pigs /year and 200ha's of arable with previous cropping of potatoes and sugar beet.

Today there are no pigs, contracting and combinable cropping dominates the farm business. A move to agroecological practices in 2019 means that crops are established with minimal cultivations.

Cover and catch crops are grown wherever possible. Liquid fertiliser is applied with molasses to feed soil biology. Omnia is integral to all crop and nutrition planning and cost of production analysis is crucial.

Harry hopes that his work with Helix will help to address specific challenges such as controlling resistant populations of rye-grass, replacing lost soil structure and looking to reduce inputs without compromising crop performance or profit.

Choosing an effective Foliar N

Tim Kerr (Hutchinsons Nutrition Manager)

Tim Kerr (Hutchinsons Nutrition Manager) **describes a foliar N option that can help crops reach their yield potential.**

No sooner were we perhaps becoming accustomed to the cost of nitrogen fertiliser reaching £2 per kg, than we face new and unprecedented values of nearer £3 per kg.

The Nutrient Management Guide, RB209 has only just been updated in March to take account of the previous record high prices and may yet need a further update to reflect the latest nitrogen costs.

The updated tables in RB209 that show recommended adjustments of the economic optimum rates of N are still worth checking – calculating your average N price for fertiliser is key – and for many growers the table will show little or no adjustment at today's crop prices.

There are certainly foliar N options that could help this season's crops meet yield potential, thus reducing the reliance on fertiliser N.

One commonly asked question is **"How can foliar nitrogen be more efficient than N applied to the soil?**

It ***can*** be more efficient – however, it is not a given.

Soil applied nitrogen fertiliser can get involved in the complex soil nitrogen cycle – rendering it temporarily unavailable to the crop in the ground. It can also be lost via leaching, volatilisation or de-nitrification. Also, crucially, in dry conditions the root uptake of nitrogen can quickly fall short of crop requirement due to a lack of transpiration.

Foliar N still gets to work in dry conditions, because it is passing through the leaf and not relying on transpiration. However, crop safety is paramount – which is why the **choice of foliar nitrogen** is paramount.

Another factor is the energy required by the plant to assimilate Nitrate N. This is the favoured source of N through the roots – but it undergoes four biochemical changes that each require energy to convert nitrate N to amino acids.

Choice of foliar nitrogen

The use of methylene urea products has become more widespread in recent years.

Methylene Urea is a crop-safe, polymerised source of N that supplies N over a period of weeks. Compare this with foliar urea – which supplies a rapid hit of nitrogen and can be volatilised off the leaf surface – these are two very different ingredients in foliar products, and getting good advice on what products to use is very important.

Methylene urea supplies the plant with Amine N. Unlike Nitrate N – the Amine N is already in the form that plants can convert into Amino acids

Benefits of Methylene Urea:

- Applying Amine N is very safe and has very low risk of causing scorch – and it supplies phase release Nitrogen with minimal losses – meaning the NUE is higher than conventional fertilisers.
- It is not reliant on rainfall, or soil moisture to be effective.
- Not tied up in the soil nitrogen cycle – so does not carry the risks and losses associated with soil applied N.
- Very compatible for tank-mixing – reducing the number of passes required – and considering diesel prices this only has greater significance.

There may be a temporary shortage of nitrogen fertiliser – so the use of Methylene urea might be the best option for some this season.

Challenging, extraordinary, unchartered, unprecedented – however you choose to describe the circumstances we face – sometimes, out of just such conditions, we improve our understanding of what we do – and learning more about ways of improving NUE will stand us all in good stead for the future.

Please speak to your Hutchinsons Agronomist for more information on this subject, or email: information@hlhltd.co.uk