



**Crop Production Specialists** 

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**Ed Brown** (Hutchinsons Head of Agroecology)

Rising costs, changes to farm support, and increasingly extreme weather events, have hastened the need to build more resilient production systems that harness natural processes and reduce the need for artificial inputs.

The quest for answers on how this can be achieved was reflected in the over-subscribed Hutchinsons inaugural Agroecology Conference in November, where industry leading experts and growers shared their views on how to make the transition to regenerative farming practices.

## Transition towards more sustainable farming

**Hutchinsons AgroEcology Conference** shows how small steps can help make the change to more sustainable farming practices.

Chairing the conference, Hutchinsons head of Agroecology **Ed Brown**, pointed out that Agroecology is not something to be considered in isolation but should be encompassed into best practice and can be achieved through a well thought out step by step transition process, that starts with asking WHY?

"Whether you're a farmer that has already moved to a more resilient farming model, or are just starting out, the most important question is to ask yourself WHY? Why are you doing what you are doing and how will changing this benefit your farm?"

"Then set yourself an action plan – don't try to do everything at once and avoid jumping onto trends - there is no silver bullet as every business has different aspirations and skill sets."

### Everything starts with the soil

Soil health is widely recognised as a cornerstone of sustainable farming systems, and establishing a baseline measurement will allow you to make the best decisions to move forward, said Hutchinsons head of soils, **Ian Robertson.** 

Being in a position to reduce inputs, change cultivation techniques or understand how cover or catch crops might benefit the soil, has to start with the soil, he said.

"I always say the machine is irrelevant - it is what the soil needs that should drive the decision - for example a change in cultivation strategy." "So before making any significant structural or operational changes, it is crucial to understand the physical, chemical and biological make up of the soil. These factors make up the unholy soil alliance and each is as important as the other."

"You cannot manage what you don't measure. By creating a baseline measurement of the soil it removes the guess work and helps to avoid making fundamentally wrong decisions," he says.

#### **Creating a soil benchmark** will allow you to:

- Understand the difference between pH and buffer pH - allows for an understanding of soil function
- Know the cation exchange capacity - how big is your soil?
- Bulk density and texture what is your soil's structure, chocolate sponge cake or brownie?
- Organic matter different layers from LOI OM, dumas carbon, active carbon, carbon to clay layer and C:N ratio

### **CASE STUDY**

### How to reduce reliance on bagged **Nitrogen using** the ESR Model

Plants need nitrogen to build proteins and for this they convert the nitrogen into a useable form i.e., of amino acids. However, nitrogen is generally applied to the plant in the form of inorganic bagged forms of ammonium or nitrate, on which the plant then expends energy converting into organic forms.

"So it would make sense to provide the plant with organic forms of nitrogen to reduce the energy needed for this process, making it more efficient." says Joel Williams

"There are two ways of doing this, by reducing losses or using a different form of Nitrogen, for example, foliar nitrogen."

"Foliar applications bypass soil imbalances, there are no nutrient lockups to navigate, no leaching, less volatilization and foliage can continue absorption when root

- Extractable nutrients what are your reserves, focus on cycle rather than more-on, how is soil structure affecting this?
- VESS physical soil structure test, water infiltration, worm count

"It is possible to do all of this using a Healthy Soils assessment and build on this using the unique data from **TerraMap**," said Mr Robertson and encouraged the audience to take advantage of these services.

However, for a clearer picture of the levels of biology in the soil, Mr Robertson suggested the Soil Life Monitor (PLFA) test which is a lab test measuring the levels of bacterial, fungi and protozoa in the soil, as well as the diversity of microbial biomass.

"This is a very useful test to see how diverse your soil biology really is, the more the diverse, the better nutrient cycling and the more the soil will give you back.

"Once a baseline of all these factors has been established, create a report or action plan that all of the teams across the business are fully engaged with it."

uptake is poor. So this generally means less N is required and the overall process is more efficient."

He acknowledged there are many variables that impact foliar efficiency around formulation, application, crop characteristics and environmental conditions.

"There is also a high nutrient requirement for this process," he added.

"If we are to take this further than simply improving the efficiency of the products we are using and look at a substitute for fertiliser this can be achieved using liquid forms such as bio fertilisers, fish hydrolysates or through a dry soil based application of compost or manure."

However, it is important not to get stuck in this stage or to react too quickly to poor results and to recognize that this substitution stage can be unreliable," he says. "For example, we know that there can be issues with consistency of some of these products and there are mineral constraints which can limit biological nitrogen fixation."

"So whatever the system or practice, it has to be managed, and importantly the product has to go into the system

"Highlight the shortcomings and find ways of overcoming them, be realistic about speed of change and introduce changes over a 8-10 year rotation. Most of all, Get Started!"

### **Efficiency Substitution** and Redesign

Internationally-renowned agroecology consultant, Joel Williams, presented a technical insight into a methodology to help make the transition from conventional farming practices to a more sustainable agroecological approach.



### that is designed for it to work."

Mr Williams pointed out that to take the next step to Redesign, consider a practice that decouples from input dependency, which in this example could be diversification with legumes into the system through field margins, or in the field with cover crops.

### "How can legumes really help reduce N dependency? he asked.

"It's not just about integrating them as cover crops so they release their N on decay. It is also possible to share N in real time from legume to cash crop through companion cropping or intercropping.

"As legumes grow they are releasing root exudates some of which are amino acids, so when a legume root system and non-legume root system grow side by side, the legume releases amino acids as root exudates and the non-legume companion can scavenge these."

He pointed out this is emerging work and not yet truly optimized. "There is more work to be done on this and we are finding new answers all the time to help redesign systems to help the transitional process."

"Efficiency is about ensuring that any conventional practices are implemented to their full optimum. Substitution is the replacing of these conventional practices by more alternative practices or ecologically intensive models. Redesign is the final stage where the practices are completely decoupled from input dependency to being compatible with nature conservation and establishing a reliance on biodiversity and natural regulation," he explained.

"The first two steps are very important, but it is Redesign that will make the bigger impact and change to the farming system, so it's important not to get trapped in these initial stages," he warned.

### Two farmer speakers, at different stages of their agroecology journeys, shared their respective journeys into agroecology.



Ben Taylor-Davies, aka "regen Ben", is well along his journey of adopting regenerative practices on the farm at Rosson-Wye. His approach is to focus wholly and solely on four basic principles.

Ben Taylor-Davies (aka "regen Ben")

- 1. Public integration of the farm
- 2. Diversity, diversity, diversity
- 3. KISS Keep it simple stupid
- 4. Appreciation of depreciation

### Harry Heath, who hosts the Helix Agroecology farm, believed the best

advice he could give was to be open minded."To get off the conventional treadmill, you have to think differently, recognise it's not all about the crop and continually guestion everything you do."

Harry Heath (Host of Helix Agroecology site)

To listen to the arowers or if you missed the conference: https://www.hlhltd.co.uk/ resources/

## **Nutrition trials** show value ofadapting to the season

Improving the efficiency of crop nutrition was the focus of several Hutchinsons trials last season. Fertiliser manager Tim Kerr reviews the results to see what we can take away for the year ahead.

#### The 2021/22 season was undoubtedly challenging from a crop nutrition perspective, given yet another dry spring, followed by a record-breaking hot, dry summer.

Fortunately, most winter crops went into this in fairly good condition, following favourable establishment conditions last autumn and a relatively mild, dry winter. That meant a good quantity of nitrogen had already been taken up by crops as the growing season commenced.

Soil residual nitrogen was also higher than normal, due to fewer winter losses from leaching and denitrification, both of which are exacerbated by wet conditions. Warm soils further boosted mineralisation of organic nitrogen into plant-available forms.

Indeed, measurements of Soil Mineral Nitrogen (SMN) in February 2022 showed levels were typically 20-30 kg N/ha higher than normal across many sites.

### **Reducing rates**

This high level of residual nitrogen in the soil and crop reinforces the importance of adapting crop nutrition programmes to individual crops, fields and seasons.

Ideally this begins by checking soil levels with SMN testing in February, or slightly earlier if conditions allow, then fine tuning decisions through the season using tools such as Green Area Index apps, biomass imagery, leaf assessments, tissue or sap analysis.

Hutchinsons trials last year show that in years such as 2021/22, there may well be scope for fertiliser savings by accounting for what is in the crop and soil.

Illustrating this, is the nitrogen response from applied fertiliser across three Helix sites in Yorkshire, Northamptonshire and Suffolk, which plateaued at around 160 kg N/ha, some 40 kg N/ha less than 2021. Higher soil residual N and legacy N in the crop were a key reason, although increased fertiliser costs also impacted the economic optimum rate.

Other years could look very different though, hence the importance of reacting to individual seasons.







### Slow release N benefit

As part of ongoing work to improve fertiliser use efficiency, several trials investigated whether traditional bagged nitrogen use could be reduced by including slow-release foliar N, such as Persist-N, based on methylene urea.

Trials at Helix East in Septembersown LG Astronomer first wheat after oilseed rape on clay loam soil showed promising results. Plots that received 20 L/ha of Persist-N yielded 0.22 t/ha more than the standard 160 kg N/ha programme of bagged nitrogen, applied in two equal splits. Both results were, however, slightly lower than the farm standard of 200 kg N/ha in three splits, which yielded 10.27 t/ha.

At Helix Fife, a similar strategy also delivered a yield benefit of around 0.5 t/ha where Persist-N was used.

Results were less conclusive at Helix Northumberland though (LG Spotlight, sandy loam), where there was minimal yield variation across all treatments.

In general, the results indicate that in a season like 2021/22, there may be scope to apply traditional nitrogen early in anticipation of dry conditions, then use slow-release foliar nitrogen, such as Persist-N or N-Durance, at T2,

to save an application, and maintain nitrogen uptake through subsequent dry weather.

### Placement fertiliser boost

Another way of improving crop resilience could be with placement fertiliser.

A trial at Helix East, suggests that placing microgranular phosphate fertiliser with seed at drilling, could improve nutrient use efficiency, even when establishment conditions are relatively favourable, such as autumn 2021.

Targeted P in the rooting zone at planting ensures sufficient P is available to support rapid root growth during establishment, thereby improving the subsequent scavenging ability for nutrients and water.

The work found a significant yield benefit from two placement fertilisers over the untreated control, with Primary-P and Crystal Green delivering yield uplifts of 0.62 and 0.79 t/ha respectively over the control (10.29 t/ha).

Placement fertilisers are a good risk management strategy in autumn or spring, and with higher fertiliser prices, are likely to become more popular given relatively poor efficiency of traditional broadcast phosphate fertilisers. There is an environmental benefit too, as using more targeted placement fertiliser reduces the risk of run-off losses.

### Cover crops

The nutritional benefit from cover crops is another area being investigated within the Helix network, and work suggests there can be a benefit to SMN in following crops.

Trials examining the residual N after three mixes - MaxiRooter, MaxiCover and MaxiGraze - showed a slight increase in soil N-Min results taken in February 2022. MaxiRooter was the highest at 87 kg N/ha, compared with 79 kg N/ha in bare stubble.

A yield benefit was also seen in the following crop of Laureate spring barley, drilled on 1 March, which yielded 8.57 t/ha after the MaxiRooter mix and 8.1 t/ha after the MaxiGraze, whereas barley after bare stubble did nearer 7.25 t/ha, with an overall average of 7.76 t/ha.

Again, this highlights the importance of measuring what is in the soil and adapting fertiliser programmes accordingly.

So too does Hillcourt research investigating the SMN after a range of previous crops (see chart below). Interestingly, and perhaps contrary to expectations, it shows SMN after peas and beans can be no higher than after any other crop. This suggests that while peas and beans fix atmospheric nitrogen, they fix what is required and do not leave a significant excess. For the past two years, sugar beet has left the highest residual nitrogen, possibly due to the return of green leaf material at lifting, which has time to breakdown over winter.

For more on improving nitrogen efficiency, see next month's extra edition, our Nutrition Special. If you have questions about this article, please contact us: information@hlhltd.co.uk

C Hill Court Farm Research



### SMN in relation to previous crop in 2022 compared to 2021 (n=>20)

Hillcourt research investigating the SMN after a range of previous crops

### **Creating opportunity** in times of uncertainty

Gwilym Jenkins, Farm Business Consultant with Hutchinsons, looks at how a flexible and adaptable farm business can navigate market uncertainty and emerge stronger than ever.

### Top tips for managing Business Resilience

- Update Gross Margins & Cashflow forecast.
- Review working capital requirements more frequently.
- Consider cropping choices in light of working capital requirement.

Farming is saturated with many variables which cannot be controlled, but understanding your individual business and creating a stable, reduced-risk environment is imperative to those businesses looking to lead the charge this growing season.

There's no doubt this last year has seen unprecedented volatility in commodity markets, alongside rising input prices and energy costs, creating a confusing start to the 2023 season. However, uncertainty also breeds opportunity and those business that are prepared, calculated and well informed, will be well placed to take advantage of this opportunity. In fact, gross margins are looking better than they have done for a number of years for certain crops, due to increasing output markets which offer great opportunity, despite the difference in capital needed.

### Harvest Capital Requirement 2023 vs 2022

A case study on a 420-hectare farm carried out in June this year by our farm business consultancy team,



The graph shows the difference in cashflow volatility during the growing season – ultimately ending up with a better outcome if managed and highlights the importance of cashflow management to smoothen peaks and troughs.

### Harvest 2023 Capital Requirement – Increase in budgeted costs between June & October 2022

showed an increase of £202,258.00 in capital expenditure to grow the same crop from 2022 in 2023 harvest year. This equates to an increase of £481.57/ha as an average across the farm.

#### The output markets have also significantly increased in value, so there is still a great opportunity to profit in 2023, as long as the cashflow is managed correctly.

Following the case study carried out earlier in the year, the table below shows a further variation in input prices between June and October of this year, which solidifies the fact that cashflow will be an important tool during this growing season.

It also shows the importance of keeping gross margins up to date and the knock on effect on strike price to achieve good profit from sales throughout the year. Overall this means a total increase in input prices of £247,618 (£589.57/ha) over the 420ha farm.

If you have questions about this article, contact our team: farmbusiness@hlhltd.co.uk

### Other considerations Finance charges

- The rate of borrowing should also be considered when managing a more volatile cashflow.
- The Bank of England base rate has increased over 2.5% in the last year. UK lenders use this base rate to determine their own rate of borrowing. They often increase their interest rate with current rates approximately ranging from 1.5% - 3% over base, depending on the amount borrowed.
- Using your overdraft will prove more expensive than before, reinforcing the importance of a managed cashflow throughout the growing season.

Crop	Area	Jun 2022 VC £/ha	Jun 2022 VC (£/Total)	Jun 2022 FC (£/Total)	0ct 2022 VC £/ha	Oct 2022 VC (£/Total)	Oct 2022 FC (£/Total)
WW	210	£1,055.00	£221,550.00	£101,304.00	£1,184.00	£248,640.00	£101,304.00
OSR	70	£1,082.00	£75,740.00	£33,768.00	£1,135.00	£79,450.00	£33,768.00
S Beans	70	£441.00	£30,870.00	£33,768.00	£495.00	£34,650.00	£33,768.00
W Barley	70	£711.00	£49,770.00	£33,768.00	£865.00	£60,550.00	£33,768.00
Total	420		£377,930.00	£202,608.00		£423,290.00	£202,608.00
				£580,538.00			£625,898.00
Additional working capital requirement							£45,360.00

# Weighing up spring crop options

Favourable conditions for autumn sowing are likely to mean less reliance on spring cropping in 2023, however it remains important to the rotation for many growers. Hutchinsons national seeds manager, **David Bouch**, picks some leading varieties to consider.



### Spring barley

LG Diablo, Laureate and RGT Planet have dominated the market in recent years. With dual brewing and distilling approval, LG Diablo and Laureate are likely to remain popular, showing very little difference in yield or agronomics.

However, RGT Planet's position in the brewing sector could be challenged by **Skyway**, which offers the greatest yield potential of all maltsters at 105, 6% higher than RGT Planet. At the time of writing, Skyway is only provisionally approved though, and spring seed availability may be tight.

Of the feed varieties, **Fairway** is highest yielding, followed by newcomer **Malvern**, but both are 1-2% behind Skyway, which may still be the better option, even if not going into malting. **Skyway** has the yield and straw, and performs well across all regions, although perhaps suits the east and west better.

### Spring wheat

Spring milling wheat could be in demand where winter sowing was incomplete, and of the Group 1s, newcomer **KWS Ladum**, and **Mulika** are lead contenders. KWS Ladum is the highest yielding Group 1 at 102, representing a big step-up from old favourite Mulika (94), which has been around for 11 years. KWS Ladum also has sound disease resistance and grain quality.

Of the Group 2s, **KWS Cochise** is still most widely grown, performing consistently in recent years.

Group 4 spring wheats have also seen a step-change in yield, with the arrival of **KWS Fixum** (108) and **WPB Escape** (105).

However, seed availability for many newcomers may be tight given relatively small areas entered for harvest 2022, so get in early if you want a particular variety.

### Spring oats

There has been little change among spring oats, with **WPB Isabel** remaining the preferred variety by end users, then **Merlin** and **Canyon**.

### Pulses

Pulse options have seen some significant changes, with the recent arrival of two field peas promising big yield improvements. The large blue, **Carrington**, was recommended last year, and is 7% higher yielding than next-best on the list, **Bluetime**, and 15% better than **Blueman**, which has been widely grown, with decent quality.

There appears to be no agronomic penalty either, as like Bluetime, Carrington is strong against mildew, stands well with short straw, is resistant to pea wilt, and early to mature.

Again, the challenge is seed supply, as the hot, dry summer created difficulties for harvesting and processing seed with low moisture content, plus there was only a relatively small amount of Carrington grown in 2022.

**Kameleon** and **Orchestra** are the main white peas, both representing a decent yield improvement over previous varieties, such as Karpate. Orchestra is 4% better, while Kameleon yields 8% more.

For bean growers, **Lynx** is a widelygrown favourite, topping the list for yield, with good agronomics. It is slightly higher yielding and better against downy mildew than **Ghengis**, but otherwise little separates them.

Ghengis is a BIPO variety, so having to pay a £30/ha premium may deter some growers, even though the seed royalty is less than Lynx.

### Linseed

Juliet and Bingo are the top two linseed varieties. Juliet has been around since 2001, so has proven its yielding ability. It is latest to mature, although that is not usually an issue. Bingo is also a decent variety that proved popular last year.

Speak to your agronomist about appropriate spring seed choices, or contact us: information@hlhltd.co.uk

For more information on any of our products or services, please contact your local Hutchinsons agronomist, or contact us at:

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