

Carbon and Soils – the Intrinsic Relationship

Dick Neale (Hutchinsons Technical Manager) considers the vital link between soil carbon content and soil health and offers ways of mapping this key asset.



Dick Neale
(Hutchinsons Technical Manager)

Soil management, carbon, and the impact it may have on the environment is front and centre of discussion at the moment. Carbon footprints are central to many business decisions and trading of carbon credits and how this can be achieved is a feature of many meeting agendas.

Support funding is clearly switching to the promotion of less invasive soil management techniques and to this end it is disappointing that the advanced element of the horticulture and arable soil standards has been deferred until 2023.

Carbon's real value

Net zero objectives for the industry, and the constant increase in the marketing power of carbon neutrality across many sectors that our industry supplies, are bringing carbon within soils into sharp focus, and frankly, not before time.

As growers we cycle carbon, from the air, from the soil and from fuel, fertiliser, and inputs we apply to

crops. The commodities we produce and sell off farm are fundamentally a concentration of that carbon in a different form.

Trading carbon credits is potentially a distraction from the benefits that increasing carbon in our soils brings to an individual business. Soil structure, porosity, water and nutrient storage and release are all improved by maintaining carbon in soil both as longer-term Soil Organic Carbon (SOC) and Active Carbon that supports the functionality of soils in the crop growing cycle.

Carbon in the soil has been the victim of over 50 years of a 'move, measure and apply' mentality toward soils within agriculture. There is little point in being over critical of ourselves in that respect - it was widely taught and promoted and the productivity impacts where significant ...but we are realising that there are clear environmental and cost negatives attached to this practice in the longer term.



Evidence of low soil carbon

Soil carbon is now at critically low levels in many soils which is beginning to show as a stagnation in yields, reduced resilience to climate extremes, increased nutritional costs, clear environmental impacts such as erosion, and increased power requirements for cultivation.

The evidence has been accumulating for many years with Rothamsted Research showing the impact of nutrient levels needed to maintain yield at differing OM% within soil, the higher the OM% the lower the index needed to maintain yield. Other research shows a 60% reduction in crop biomass in arable soils only metres from the field edge >

> ...the impact of soil degradation via continuous cultivation and applied fertiliser which override the soil's natural cycles and microbial populations.

Measure to manage

Hutchinsons has been measuring and assessing soils via our Healthy Soils service since 2016. This service helps growers identify issues and focus management changes to improve their soils while avoiding the pitfalls that significant soil management changes can bring. UK soils are highly variable in their texture with more than 3 textural classes often present within a single field. Simple broadacre management changes are therefore often ineffective or detrimental in some

textural classes when being targeted at the largest textural area.

While mapping of obvious soil textural zones is relatively simple, it was done with hedges in the past, new technologies like **TerraMap** now allow us to map the finer details in high definition. Now, more accurately than ever before, we can visualise not only textural changes, but pH, and nutrient content, and more recently OM%, total SOC and Active Carbon allowing the broadacre changes to become small in-field adjustments, which are becoming ever more effective via tractor and machinery variable control technology.

Our latest development within **Omnia** is the potential to map carbon emissions with individual

fields, after allowing for all inputs and operations, which gives us the opportunity to identify where small changes in management practices can have a large impact upon the Carbon footprint.

Increasing SOC within soils underpins numerous soil functions and understanding how carbon fractions change and behave within the soil will be key to future management decisions ...decisions that have a significant long-term impact on the functionality and resilience of our arable soils.

Please contact us for advice on mapping and managing soil carbon on your farm:
information@hlhltd.co.uk

Your invitation to HUTCHINSONS NATIONAL CARBON CONFERENCE

Thursday 24th February 2022

9.00am - 1.30pm

***Peterborough Marriott Hotel**
Peterborough Business Park
Lynch Wood, Peterborough PE2 6GB

What will you learn?

- **Building Soil Carbon**
 - where are we now and how do we improve
- **Carbon observations on farms**
 - what are the key areas that can be improved
 - what can be done practically to improve carbon emissions
- **What do consumers and the markets want?**
 - hear views from a maltster and leading farmers on what customers and consumers are demanding
- **Individual carbon journeys**
 - what made growers look at Carbon on their farms, and what has happened so far
- **Two panel sessions**
 - your opportunity to ask the presenters key questions.

Plus:

- Access to a range of informative technical stands and helpful industry experts
- An invaluable opportunity to network with other like-minded growers
- Easy access from the main A1 and A47 trunk roads
- Coffee refreshments and lunch provided.

Considering Farm Carbon

What do I need to know? What should I do?

Hutchinsons National Carbon Conference aims to give a clearer perspective on managing farm carbon and to outline practical next steps you can take.

Greater responsibility for our carbon footprint is a hot topic and agriculture is continuously finding itself under tough scrutiny.



> Speculation is rife on what this means for UK farmers, and it is sometimes difficult to understand the steps we should be taking to make businesses both more sustainable and to move towards a net zero position.

Hutchinsons has brought together an expert panel of speakers from the NFU, the Farm Carbon Toolkit, Rothamsted Research, and Muntons Plc - to outline the future needs of markets and consumers.

Join us to hear how some UK farmers have already started their own carbon improvement journeys.



To find out more and to reserve your **FREE** place:

(N.B Space will be limited, so we recommend that you book early to secure your place.)

Apply for your Conference place(s) online via the Hutchinsons website:

<https://www.hlhlt.co.uk/event/NationalCarbonConference>

**Please note - in the unfortunate event of further Covid restrictions being imposed, the National Carbon conference will still be delivered to registered delegates as an online webinar.*

NRoSo and BASIS CPD points will be available for all who attend the conference.



Helix Farm network continues to expand

– now with two more new farms in the Borders and Scotland.

The Hutchinsons Helix project is a unique, farm scale, national technology-based initiative looking at improving farm decision-making for increased farm economic and environmental profitability.

How does it do this? By testing, developing and validating technologies and agronomic techniques that produce data, which are then interpreted by the agronomist and grower, to make better informed decisions.

Launched two years ago, and now with more than seven farms located across the country, the network is expanding even further this spring, to include two new farms, Barelees Farm in Northumberland and R K Fisher & Son in Fife.

Barelees Farm - Northumberland

Thomas Todd farms with his parents, wife Claire and son David at Barelees Farm, Cornhill-on-Tweed, near Coldstream. They grow winter wheat, oilseed rape, spring barley and vining peas on generally light sandy clay loams.

Mr Todd has always had a keen interest in, and hosted various trials over the years, as he looks to new approaches and technologies to improve profitability.

"Soil health is very important to us, cultivations are based on a min-till system and moving towards direct drilling, we have not ploughed here for twenty years," he explains.



"Cover cropping is an area of particular interest for us, we keep all of the farm green the whole year round, even behind the peas, so this will be a key part of what we are looking at within the context of the Helix project.

"We limit how much glyphosate we use, cover crops are cultivated out with the following crop drilled behind. If really needed, 0.5l/ha glyphosate goes in with the pre-em."



> "All of the fields at Barelees Farm have been scanned with TerraMap. So we have been able to produce high definition maps of all common nutrient properties, pH, soil texture, organic matter and CEC as well as elevation and plant available water."

"We have used this in-depth, extensive data on our soils to produce the most accurate variable rate plans possible. We variably drill, and all of our P, K and lime is also variably applied."

As part of the work within Helix we are looking at how we can use NDVI data to help us apply our Nitrogen more accurately.

"Bringing Barelees Farm on board to join the Helix Project is a really exciting step forward," says George Robson, agronomist for Thomas Todd.

"It's very much a team approach between myself and Thomas, as we work together to analyse first-hand how potential new technologies may enhance agricultural performance and equally dismiss those that don't. We look forward to sharing our experiences with other growers in the region."



George Robson (Agronomist)

Roy K Fisher & Co. - Fife
Roy Fisher of Roy K Fisher & Co, Anstruther, Fife is keen to look at any new approaches or technologies that will help him improve soil health and reduce input costs and still remain profitable.

"Current farming practices are being challenged; no longer can we continue using high levels of artificial inputs which create a false impression of yields nor can we rely on the labour force as we once did – we need to find more efficient ways of doing things."

He believes that R&D holds the answers – be that through technology or understanding and implementing different approaches to crop establishment and pushing yields.

"So it makes complete sense for us to be a Helix farm – our approach and that of Hutchinsons are in line - it's of mutual benefit to us both."

"Being a part of the project and hosting trials of new technologies, products and approaches means we get to see the results first hand with the support of technical experts, and ultimately the potential benefit to our farming business."

With over 50,000 broilers, Mr Fisher is always looking at ways of incorporating the poultry muck into his 600ha's of arable cropping.

Two years ago, Mr Fisher took on a new agronomist, Morven Anderson of Hutchinsons, who is very much aligned to his vision of how he wants to farm. "She introduced us to Omnia, and now all of our agronomy is integrated within this platform and is very much at the forefront of our decision making."

"We are also a LEAF Marque farm and use Omnia for data gathering to satisfy the LEAF Marque."



All of the farm has been TerraMapped, producing the most accurate variable rate plans for drilling and nutrition.

"As part of Helix we have put in some cover cropping trials – and this will allow us to see what works best on our fields through soil health improvements, whilst maintaining yields. We are also looking at trials with biological seed treatments."

"It's certainly going to be an interesting year!"

"I am incredibly excited to introduce Helix Fife into the Hutchinsons network for 2022," says Morven Anderson, agronomist for Roy Fisher.

"It brings a valuable opportunity for Scottish growers to engage with recent technological developments and we have a range of interesting trials that we hope to feedback on at open days throughout the year."

"A key aspect of R & D is transparency. Helix Fife will provide a platform for growers to gather and openly discuss what may or may not work under their own environmental conditions. It is this systems-based thinking that will allow us to use the measured data to support and optimise on farm decision making to benefit both farm profitability and the environment."

Keep up to date with all the latest developments within the Helix project by viewing our dedicated website: www.helixfarm.co.uk



Roy Fisher and Morven Anderson (Agronomist)

“Environmental Special

Countryside stewardship is a hot topic within the industry and this month Hannah Joy and Emma Willis (Hutchinsons Environmental Services Specialists) answer several of your questions:”

Fieldwise Answers

Q) “What do the changes to the Countryside Stewardship revenue payments mean for me?”

If you have a Countryside Stewardship agreement which began on or before 1st January 2022 the following changes to rates have been made. Where the new rate has:

- Increased – the new (higher) rate will be paid
- Decreased – the existing (higher) rate shown on the signed agreement will be paid
- Not changed – the existing rate shown on the signed agreement will be paid

If you are going to be applying for an agreement this year, to commence on 1st January 2023, all the new revenue rates will apply.

It is worth noting that if you are an agreement holder, you will not receive any updated agreement documents.

Q) “I haven’t had my Countryside Stewardship agreement offer back yet, should I be concerned?”

If you submitted a Countryside Stewardship application in 2021, it is likely you have not yet received an agreement offer. The RPA have sent out emails re-assuring applicants that eligibility checks are still ongoing for applications and that they will be in contact as soon as possible. If any additional information is required in the meantime, they will contact you for this.

“But what about my payment?”

The management options in your agreement will have started from the 1st January, regardless of when you receive your offer. Therefore, the RPA recognises that you may incur some costs before you receive your agreement offer and will make payments for any work or costs incurred if you need to start these before you receive your agreement. It is important to note that they



Emma Willis
(Environmental Services Specialist)



Hannah Joy
(Environmental Services Specialist)

will not pay for any work or costs incurred on capital items before you have accepted your agreement offer.

Q) “My farm is not currently in a scheme, should I apply for Countryside Stewardship this year or wait for ELMS?”

A Countryside Stewardship scheme (CSS) provides a secure source of income for your business. A scheme allows you to ‘get your foot in the door’ in implementing a scheme on your farm that works well with your business. It can be used to the business advantage; options can work well in rotations and help to increase soil health. By focusing on less productive areas of the farm, it helps to improve your farm’s productivity.

Entering a scheme now will provide you with 5 year’s guaranteed income. This means you have the choice over the next few years to decide which scheme will work best for your business, whether you continue with a CSS, or transition into ELMS once it is rolled out in 2024. Anyone entered into

a Countryside Stewardship scheme can, without penalty, transfer into ELMS if they are offered an agreement.

Q) “What is the difference between the different Two-year sown legume fallow (AB15) mixes?”

As you may have seen at our Environmental Trials Day, you now have the option whether to include grass in your seed mix. Including a grass is best placed where you are putting the option in as part of a grass weed control strategy, as it is more competitive and will provide ground cover throughout its lifetime. By choosing to no longer include a grass, this creates a better opportunity to follow this option with an autumn sown cereal as it removes the presence of a dense thatch of decaying grass roots.

If you would like an Environmental seed brochure or any stewardship advice, please contact the Environmental Services team: enviro@hlhlt.co.uk

Great year for maize, but work goes on

Last season proved an excellent year for maize at the Hutchinsons demonstration in Cumbria, where even open ground crops performed well in unseasonably good growing conditions.

Although most crops fulfilled the promise shown throughout the season, agronomist and trials coordinator Jim Clark, is fully aware conditions could be very different this year. He is therefore eager to keep exploring the various varieties and growing techniques at the Smalmstown Farm site near Carlisle, with the aim of identifying what does and does not work in the (usually) more challenging maize-growing area; vital lessons that can inform farm practices.

Risk versus reward

One significant result from 2021 was the strong performance of open ground maize, notably **Prospect**, which was among the top varieties for fresh weight (61.6 t/ha) and dry matter yield (19.71 t/ha).

"It did exceptionally well and was the best result we've had for a non-film variety at this site," says Mr Clark. "It's partly due to the variety's characteristics, but we also had an excellent summer. I think it will gain market share this season and some growers will gamble on growing it in the open.

"Last year's results show it is possible to grow decent maize crops without film in Cumbria, but only if the weather's kind; unfortunately, that's not guaranteed, so it's down to individual attitudes to risk."

Growing maize under film remains the main way of managing weather risks, and even last year, **Pioneer 7034** grown under a new 100% biodegradable film, once again produced the highest dry matter yield (20.91 t/ha), for the third year running.

The film's cost (around £60/acre more than conventional film) is the biggest issue, so a narrow row version is being trialed. Mr Clark says further research is needed into this system, as DM yields were around 5 t/ha below the

wide-row version, possibly due to lower soil temperatures.

Starter fertilisers, such as Biolite, Primary-P or Crystal Green, often show a benefit in trickier establishment conditions so could help mitigate any temperature reduction under narrow films and is something Mr Clark is investigating further.

DM is key

Starch and dry matter are essential requirements for maize varieties, and this was clearly highlighted by analysis of harvest results from 20 varieties, that showed marked differences in potential crop value.

For example, milk yield predictions, assuming 5.3 MJ/litre and a price of 30p/litre, showed total output varied by more than £5,000/ha between the top and bottom performing varieties for DM (20.91 t/ha and 13.46 t/ha respectively).

"Varieties can look great in the field, but you don't really know how good the crop is until you've tested starch and DM. Bigger plants don't necessarily mean more dry matter."

Refining undersowing techniques

Recent seasons have shown clear benefits from undersowing maize with grass, and 2021 was no exception. However, Mr Clark acknowledges there were issues with sulfonylurea herbicide residues affecting establishment of the Italian ryegrass mix.

Grass grew best where straight mesotrione had been applied, whereas yellowing was seen in plots that received products based on nicosulfuron or prosulfuron, indicating the SU element of mixes had an effect. He suggests this may have been exacerbated by dry conditions early in the season which meant herbicides lasted longer in the soil and when rain eventually came, it activated the chemistry.

This year's research aims to find ways of mitigating residue risks by using different grass species, such as fescues which are thought to offer some tolerance.

Keep up to date with all Hutchinsons crop trial activity online – see www.hlhld.co.uk/fieldwiselive

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

HUTCHINSONS


Crop Production Specialists

H L Hutchinson Limited • Weasenhall Lane
Wisbech • Cambridgeshire PE13 2RN

Tel: 01945 461177

Fax: 01945 474837

Email: information@hlhltd.co.uk

 @Hutchinsons_Ag  HLHutchinsons

www.hlhld.co.uk

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Jim Clark (Agronomist)

