



Taking soil management to the next level



Cat Dyer (Hutchinsons Soils Specialist)

It is five years since Hutchinsons launched TerraMap soil mapping, a system that revolutionised the way we can measure and map common soil nutrient properties, as well as defining textural changes within individual fields.

In all, TerraMap can analyse up to 48 'layers' of information, including 12 nutrients, pH, organic matter, organic and active carbon, soil texture, elevation, cation exchange capacity, and plant available water.

*TerraMap digital mapping allows soil properties to be analysed in unprecedented detail, paving the way for better informed management decisions through the season ahead. Soils specialist **Cat Dyer** explains how it can help.*

With 800 data reference points per hectare, maps give the highest definition available, and provide an accurate way of identifying issues or variations across the field, allowing management to be tailored accordingly. For some, that might involve variable rate lime or fertiliser plans based on soil status, while for others, better understanding the interactions between chemical, physical and biological soil properties helps improve overall soil management.

While every field and farm is different, below are some common ways TerraMap results can help.

pH

A key one is pH. The Gold-level soil analysis measures both water pH and buffer pH, and there is an important distinction between the two. Most standard tests use water pH, which shows the soil's acidity or alkalinity at the time of sampling. Buffer pH in contrast, measures reserve acidity in the soil, effectively the 'resting pH' determined by parent material.

Ideally, the two should be within 0.2 of each other, as a large disparity can compromise nutrient cycling and lead to nutritional imbalances.



Importantly in a season like 2023/24, water pH can decrease in very wet soils, whereas buffer pH remains stable.

Mapping pH variations across the field is far more accurate than standard 'W-pattern' sampling, which could miss high or low pH areas, so potentially allows lime applications to be targeted to problem areas, saving growers money over a flat-rate approach.

Ca:Mg ratio

Another useful measure is the calcium:magnesium ratio, which has important implications for soil structure, drainage and workability.

Calcium pushes soil particles apart, while magnesium binds them tighter together, hence high magnesium soils can have a 'tight' structure that is harder to work, and is sometimes mistaken for compaction.

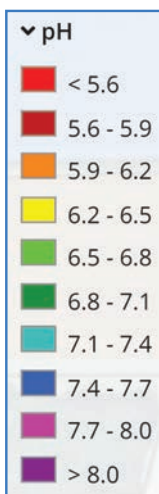
But this balance can be rectified, such as with the use of gypsum (calcium sulphate). Sulphate binds to magnesium, which leaches down the soil profile, while calcium opens the structure and improves friability. Understanding the chemistry therefore offers clear benefits and may remove the need for unnecessary cultivations.

Nutrient deficiencies

TerraMap's ability to reveal variations in key nutrients within fields offers many advantages, such as allowing fertilisers to be targeted exactly where required, or alerting growers to potential deficiencies through the season.

Sandy or peaty soils, for example, are often more prone to low manganese, but as soil applications are generally ineffective, by identifying potential problem areas, growers can monitor these more closely (e.g. with tissue testing) and treat with foliar manganese when required during the season.

It is worth noting TerraMap data can be used for variable nutrient applications, which are now part of the SFI (PRF1), attracting an annual payment of £27/ha.



Wicken Farms Co

- 950 ha mixed cropping
- Crops include winter wheat, barley, spring barley, peas, potatoes, onions, sugar beet, plus 160 ha of cover crops
- Soils range from blowing sands to sandy clay loam
- Fully irrigated
- Started TerraMapping in 2021

TerraMap drives soils and nutrition focus at Norfolk estate

The detailed information provided by TerraMap Gold soil analysis is bringing far greater precision to soil and nutrient management at the 950 ha Wicken Farm Co estate near Kings Lynn, with significant fertiliser savings already made.

Farm manager Toby Hogsbjerg started using TerraMap in 2021, focusing on fields going into potatoes, onions or sugar beet. Most of the farm is now mapped, with just 130 ha left to do this year.

This has built a large database of information that allows him, working with Hutchinsons soils specialist Ian Robertson and agronomist Toby Clack, to benchmark and better understand the interactions between soil properties, to make cost-effective management decisions that benefit the bottom line.

One change is the move to variable rate potash fertiliser, with applications tailored to crop requirements, offtake, and potassium availability shown on TerraMap soil analysis, rather than basic indices. Variable rate MOP is applied to all wheats, while variable rate Potashplus™ or MOP is used on potatoes and sugar beet.

"Since changing to variable rates, yields are unchanged, yet there's been a significant saving of 20-30 tonnes of Potashplus™ fertiliser on potatoes and sugar beet alone. It's a nice system for keeping things balanced."

Elsewhere, gypsum is being used to improve soil workability where TerraMap indicates high magnesium may be causing tight structure, and last autumn, Mr Hogsbjerg also tried variable seed rates on winter wheats, based on the silt/clay fraction.

"We use a simple three-layer system of heavy, medium and light. Headlands get a fixed seed rate, while field centres get variable rates. Typically seed rates vary by 20-30 kg/ha, but that's from a relatively low base. It's early days and we're still learning, but as we move forward it'll become more important."

TerraMap's carbon mapping functionality is also of interest, and this year, Mr Hogsbjerg started analysing cover crops to assess their biomass, carbon sequestration and nutrition benefits, with data added into Omnia.

"It helps us identify the physical and environmental benefits cover crops bring, and how that affects following crops."

"TerraMap won't give all the answers overnight, but on a rotation as diverse as ours, it has a real place within the business, and will be essential moving forward for managing soils and reducing our fertiliser reliance. There's no way of doing that without fully understanding your start point."

For more information, please visit our website <https://omniadigital.co.uk/terra-map/> or contact the team: soils@hlhlt.co.uk

Time to rethink rotations?

The weather upset many cropping plans in 2023/24, with growers understandably keen to get back on track this autumn. However, as farm support shifts further towards crop-specific measures within the SFI, now is an ideal time to review rotation planning.

The demise of Basic Payments and rollout of the Sustainable Farming Incentive (SFI) marks a big milestone for agriculture that could catalyse significant changes to some crop rotations.

"People often argue BPS is linked to crop production, but that's not the case," explains Hutchinsons farm business consultant, Will Foyle. "Providing land is in good agricultural condition, farmers receive BPS regardless of the crops grown or agronomic decisions made. That never incentivised rotational change or made anybody question whether rotations were correct within the bigger picture."

"In contrast, the SFI is the first scheme this century to incentivise good husbandry and crop production, and drive growers to think more about crops they select. Ignoring this and continuing doing what you've always done without question is wrong."

Technical manager Dick Neale agrees, adding that rotational choices are too often dictated by factors beyond growers' control, notably the weather, or in the case of oilseed rape, crop failures caused by pests such as flea beetle.

"People are sometimes 'led by the tail', getting forced down an alternative route because they're not in control of rotational choices."

There's been a need to revisit rotations for several years, not just this season."

Weighing-up options

Of course, not every farm has to change its rotation just because new schemes are available, and doing so to "chase payments" is wrong.

"Every farm is different, and what works for one might not work for another," says Mr Foyle. "The important thing is to look at the numbers carefully to see what's working, what's not, and build a sustainable rotation."

Some farms that can grow a good range of commercial crops, including productive, reliable break crops, may not need to change, but equally, there are others where the "farm standard" may no longer be working, he says.

In particular, farms growing predominantly cereals, where winter wheat is the mainstay, but there are no reliable break crops.

"Growing cereals without breaks is not sustainable, so the question is, how do we get breaks into the rotation given the unreliability of oilseed rape, and uncertain profitability of legumes like peas and beans?"

Many minority crops are available, such as borage, sunflowers, lupins, crambe, linseed, spring rape, soya, or grain maize, for instance, which may work in some situations.



Will Foyle (Farm Business Consultant)

But, in UK conditions, risk and yields are often no more reliable than oilseed rape or pulses, especially for crops harvested later in the season, adds Mr Neale. There can also be issues given limited chemistry available for minority crops.

Utilising SFI

It is in these cereals-based rotations with few break crop options that the SFI could help.

"Winter wheat remains the highest gross margin crop, so we need to support that, but in a different way to the perceived norm," says Mr Neale. "Often that's based on 12-month cycles of winter wheat, a break, then wheat, and maybe a second wheat if possible."

But SFI options open the door to what he terms the "3C Rotation", integrating catch, cover and companion crops, and utilising the resilience of cereals.

"We might, for example, grow a cover crop from August to mid-January/ mid-February, then a spring cereal, then a catch or summer cover crop, depending on how early the commercial crop is harvested, then a winter crop, which may also be grown with a supporting companion plant."

Another possibility is to grow successive winter, spring and summer cover crops to provide a 12-month break, before going back into first wheat. It may also be possible to retain legume species from the final summer cover mix to provide a companion in the following wheat.

While such an approach may not dramatically increase average gross margin across a typical six-year rotation, it does provide a lower-risk break than oilseed rape or beans, guaranteed income paid quarterly, and



➤ several agronomic benefits, not least for black-grass control, says Mr Neale. Head of environmental services, Georgina Wallis, warns that integrating SFI options into the rotation is complex, so must be well planned and managed to avoid creating new problems. “You can’t just put cover or companion crops in and forget about them. They are there to support productive cereals on a rotational level. “There can be strong financial and environmental benefits, but it requires a change of attitude, change of agronomy and new approach. The agronomist has to be fully involved, to help guide you through the best options, where to put them and how to manage them to deliver the desired outcomes.

“Be careful with the options you chose and how you manage them.”

Consider numbers carefully

Indeed, gross margin analysis by Mr Foyle illustrates how different figures can look if the wrong approach is taken. In one scenario, a legume fallow under the 2023 SFI is used for two years to replace unreliable break crops (note, the revised 2024 SFI only permits a non-rotational legume fallow). This is followed by a first wheat, second wheat, spring barley, winter barley, then back into legume fallow.

“On paper, the payments look great, but you’re taking one-third of the farm out of production, which doesn’t work for fixed costs. In this scenario, the average gross margin across the rotation fell by £200/ha to £825/ha.”

Ms Wallis concludes: “The SFI represents a fundamental change. Consider options carefully to decide what fits your situation long-term, understand if they are manageable, and whether payments justify the work required to succeed. Remember, you can build agreements up, so maybe try things first and add to it later.”



Register your details for our free Gross Margin guide to help plan your cropping choices
- www.hutchinsons.co.uk/gross-margins-2024/

Example SFI 2024 options for a “3C scenario”

Code/action	Payment
CSAM1 soil management plan	£6/ha plus £97 per agreement
CSAM2 multi-species winter cover crop	£129/ha
CNUM1 Nutrient management plan	£652
CIPM1 Integrated Pest Management plan	£1129
CIPM3 companion crops	£55/ha
SOH1 no-till farming	£73/ha
SOH2 Multi-species spring cover crop	£163/ha
SOH3 Multi-species summer cover crop	£163/ha
AHW10 Low input cereal crop	£354/ha

Questions about this article? Please contact us: information@hlhlt.co.uk



Simple steps to accurate yield data this harvest

*Yield mapping is a valuable management tool on many farms, so data must be as accurate as possible. Omnia specialist **Rowan Duckworth** highlights some key things to consider.*



Rowan Duckworth (Omnia Specialist)

Yield mapping data can be used in many ways, from a basic overview of total tonnage from every field, to detailed analysis of in-field variations to help target inputs more precisely.

Understanding why you are yield mapping, how the data will be used, and what you want to achieve, is therefore essential, and drives the accuracy and fine-tuning required. ➤

10 steps to accurate yield data

1. Understand data aims
2. Map boundaries correctly
3. Exclude in-field features
4. Clean and service yield monitors
5. Ensure accurate combine operation
6. Lift the header properly
7. Record bare patches
8. Calibrate results during harvest
9. Transfer data quickly
10. Clean data afterwards

Harvested yield map within Omnia

For growers seeking ultra-precise accuracy, remember that the resolution of yield maps is largely determined by the combine header width - a large machine cutting a 12m swath has a lower mapping resolution than a smaller machine making more passes. In most cases this is not an issue given the working widths of other operations, but should be considered when deciding your aims for yield mapping. All staff, especially combine operators, should also understand how yield mapping data will be used and recognise how combine operation affects data accuracy (see below).

Accurate boundaries

Accurate boundaries are fundamental to accurate yield maps. The wrong size or shape boundary means everything within that area will be wrong to differing degrees depending on how far out they are.

For yield mapping, identify the cropped area, not the whole field boundary, particularly as many fields have some kind of stewardship margin which must be excluded from the cropped area.

Also remember to exclude any permanent in-field features, such as pylons, telegraph poles, ponds, or hedgerows extending into fields.

This is best done using RTK mapping, but alternatively, manual adjustments can be made in the software platform data is used in (e.g. Omnia).

Combine operation

Before harvest, the combine yield monitor should be cleaned and serviced to ensure it is in good working order, as should any other parts that affect yield monitoring equipment, such as the clean grain elevator.

Yield data accuracy is influenced by various aspects of combine operation, such as procedures for opening fields, turning, and cutting part-swaths.

Most modern combines fitted with GPS-linked coverage maps will detect smaller swath widths automatically, but some older machines require operators to manually select when a full, half or quarter width is being cut.

Similarly, operators should pay attention to the preset header "stop height" - the point at which the combine stops recording yield data. Turning at the end of bouts or other manoeuvres with the header still running below the stop height means yield is still being recorded and could lead to inaccuracies.

It may be tempting to lift the header when passing over bare patches, such as those caused by flood or pest damage earlier in the year, but doing so means those areas are not recorded on yield maps. Where possible, (i.e. no deep ruts or very wet patches), consider keeping the header running over such areas, so they are mapped, or record and geotag them separately before combining.

Check results

Where there is access to a weighbridge, weighing loads coming off the field and checking moisture content helps ensure mapping data is accurate.

Follow manufacturer recommendations for regular calibration, but in general, once per crop is a good start.

During harvest, it is also worth ground-truthing high and low-yielding areas in the field to identify any obvious causes, particularly if issues need addressing before the next crop.

Using data

Once data is recorded, it should ideally be transferred straight onto a digital platform such as Omnia, where it can be processed, analysed, and potentially used to inform decisions for following crops.

Phosphate and potash, for example, may be varied to account for crop offtake, while poor areas highlighted on yield maps could be targeted for closer inspection to identify the cause.

Modern cloud-based telematics allow almost instant data transfer, but systems using memory cards still require data to be physically transferred to the office.

Before producing final yield maps, raw data should be "cleaned" to remove any anomalies and inaccuracies. These can occur for various reasons, such as not cutting full widths, blockages, turning/reversing with mapping still running, or very high/low forward speeds.

Individual systems clean data differently, so the important thing is to understand what those parameters are, and how clean maps differ from raw data.

An important aspect to consider is the yield scale, which in Omnia can be easily adjusted to account for different crop types, yield ranges, and seasonal variations. In some crops that produce a comparatively low tonnage (e.g. linseed, oilseed rape, poppies, grass seed), it may be necessary to set a bespoke yield scale so variations can be highlighted more clearly.

For more details about using yield mapping data, please contact your agronomist or Omnia representative, alternatively please visit the Omnia website: <https://omniadigital.co.uk>

SFI - what next?

Wondering what you should be doing in light of the evolving SFI offers? Georgina Wallis, Hutchinsons Head of Environmental Services offers insight on the current offer.



Georgina Wallis
(Hutchinsons Head of Environmental Services)

Q: What have been the most recent SFI developments to be aware of?

A: The key development has been the announcement of detail on the 2024 Sustainable Farming Incentive (SFI), and the subsequent closure of new applications for the 2023 SFI offer.

Q: What does that mean for 2024 applications?

A: In a nutshell, unless you already have an SFI 2023 application open in the Rural Payment Agency (RPA) portal, and it is under 60 days old, you now cannot apply for the 2023 SFI offer. Growers must wait for the release of the SFI 2024 offer (at the time of writing, due on 22nd July).

Q: What's the difference between SFI 2023 and SFI 2024?

A: Big question! The basics of the scheme are the same, in that it is a rolling application window, with quarterly payments, an SFI Management Payment, flexible, rotational actions with the ability to decrease area by 50% on an annual basis. Some of the new actions will be familiar, as they are existing Countryside Stewardship options and have simply moved over to the SFI. Some of these actions create five-year agreements.

The key differences are:

- There are over 100 actions available in SFI 2024
- Some of the action prescriptions have changed, such as legume fallow now being a non-rotational action
- The action codes for some actions now have a 'C' in front of them to indicate they are part of SFI 2024
- It is important to read the guidance and prescriptions of the 2024 SFI to pick out any changes which might be relevant to you and your farm

Q: Is it possible to have a 2024 SFI agreement if already in SFI 2023, or Countryside Stewardship Mid-Tier?

A: Yes! So long as you are utilising actions which are compatible (this information is given in the guidance) and aren't claiming for the same action twice.

Q: Is it possible to add SFI 2024 actions to an SFI 2023 scheme?

A: Unfortunately not at present. If you have a 2023 SFI agreement and would like to access some of the 2024 actions, such as No-Till, you will need to set up a separate agreement under a 2024 scheme to host these.

Q: So what should be done now?

A: At the time of writing, we await the opening of the 2024 SFI on 22nd July and can be putting plans in place. Consider whether you can utilise any of the new actions on the farm. If you are in a 2023 scheme, remember that you need to meet the action requirements. Some agreements will be coming up to their first claim submission window, so watch out for that opening in the coming months.

If you would like advice on your 2024 SFI application, please contact our specialists: enviro@hlhlt.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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