

ISSUE 20 | JANUARY 2023

# NORMAL FARMING

MAGAZINE

PERFECT SOILS FOR GROWTH

## Banking on the Environment

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Nitrogen - Page 10

No-till and Cattle - Page 58



Down to Earth  
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Supporting Knowledge transfer in Direct Driller



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# DIRECT DRILLER

MAGAZINE

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# WHAT'S IN A NAME?

## CHRIS FELLOWS

Welcome to the 5th Anniversary issue of Direct Driller / Normal Farming magazine. When we started the magazine, we really didn't know what to call it. We knew it should focus on soil health, reduced cultivation, conservation agriculture (remember when it was called that), sustainability, efficiency and profitability. Lots of good words and I'd hope we have done well to sticking with those goals over the past 2000 pages of content. But that also gave us a lot of options for a title.

No-Till farmer already existed in the USA – so that was out, as was TCS from France. We put about 20 options up on a white board. It's fair to say that none really grabbed us, but one was Direct Driller. It referenced more the machinery than the practice and that was our main reasons for not loving it. Because, while the right machinery is critical, we have always believed that to change anything requires a mindset change first. "Mindset Magazine" though didn't sound a lot like farming and also now exists. Zero-till, Reduced tiller, Zero tiller, Conservation Farming, Regen Farmer were all considered too but nothing grabbed us.

When considering such creative questions, beer should be used to help come to a decision. It didn't really help, in this instance, but as always made the process more enjoyable. After a couple of weeks, we settled on Direct Driller Magazine. We knew that most of the farmers who undertake this process will be using a direct drill of some sort, it seemed like common ground for all. The magazine was born.

You will see from the front cover we have changed to "Normal Farming Magazine" for this issue. We aren't changing the name permanently, mostly because this is an even worse title. However, we wanted to highlight just how much farming media and farming attitudes have changes over the past 5 years towards regenerative farming.

We often say the reason we started the magazine was because we were

told there was not room for a niche publication that only focused on regenerative agriculture. However we were in a unique position to be able to break new ground and launch something without a solid business plan behind it. This was at a time when companies were saying the print media didn't have a future and smaller publications were going to digital. Yet now all the mainstream printed magazines are now full of regenerative content. They are all pivoting fast to this new normal. ESG, sustainability, biodiversity and carbon credits are talked about everywhere. And this is my point behind the title. Regenerative farmers, like yourselves, have become trend setters, not followers.

*You are not outliers, those weird farmers who do things differently. You are now "normal". I realise some of you are going to be quite disappointed by this new status, but I'm afraid it's the truth.*

Those farmers who fight change are now seen as outliers, fighting for a past that clearly just doesn't work without governmental financial support. They are now realising they have to change, although that change could also be to move even further away from conservation practices. An odd consequence of what the government is trying to do.

*Regenerative farming is becoming the new normal – although with a long journey and a lot of learning still required.*

This new normal means this magazine will keep growing and growing. We never thought it would get to the size it has, but we see no reason why it won't eventually have more farmer readers than anyone else. Direct Driller magazine today, is the fastest growing agricultural magazine, created for and by farmers. Giving voices to those farmers who wanted to change and have not only changed their farms, but also influenced hundreds of other farmers to take steps that they would not have done without their support.

This is something for regenerative farmers to be proud of. I wrote an article in Issue 14 about the 3.5% rule. We have seen this change in farming being driven by farmers themselves. By reading this magazine, by going to Groundswell (and now Down to Earth as well), we have created a change in overall farming attitudes. Now everyone is reading about regen ag, even if they don't read this magazine.

For just one issue – here is to being "normal". Embrace it, tell your non-farmer friends about it and profit from it. Thank you to everyone who has helped make this magazine what it is over the past 5 years. Raise your glass to the next 5 years over a Xmas drink with your family and friends. Merry Christmas and a Happy New Year to all our readers.





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# FEATURED FARMER

## HARRY HEATH



### Farm Facts

**Arable & Pig Producer - Newport Shropshire**

**200ha Owned (Wheat / Barley / OSR / Sunflowers / Beans)**

**350ha Contracting**

**100 Sow Indoor/Outdoor Herd**

Our arable business has always traditionally been a poor relation to the livestock enterprise. It has however dutifully had the important task of growing combinable crops to feed the hungry mouths of a 600 sow herd producing 17,000 pigs per year, at least this was the case till very recently. Market volatility and spiralling input prices ultimately were the start of us questioning the status quo in 2021 and it didn't take too long to realise that our business needed to head down a different path.

*Big changes have happened within the last few years, with the biggest being the exit from the indoor pig industry and the move to put agroecology at the centre of everything we do on the farm.*

Before the pigs were the dominant enterprise on the farm, the arable land was farmed intensively with a three course rotation of potatoes / sugar beet and wheat. This, alongside a routine use of power harrowing and subsoiling took its toll in leaving our sandy soils prone to slumping and when tested scoring poorly in many other areas of soil health.

Our move to focusing on soil health started in 2018 with a change agronomist. We are extremely lucky to have Ed Brown (Head of Agroecology for Hutchinsons) as our agronomist and I have no doubt in my mind that he has been pivotal to our business in challenging what and more importantly why we do things. We were also kindly asked to be the national agroecology site for Hutchinsons as part of their Helix Farm network. Undoubtedly this has assisted in us running trials to find out what works and more often than not what doesn't



work on our farm. Trials and testing are now the cornerstone for how we make change whilst not exposing ourselves to additional risk.

One of the first changes was doing the thing that everyone told us not to do, which was to buy a new drill. This was in my eyes a necessity, as we had no choice but step away from the combination drill if we ever hoped to start and build better soil structure. We bought a demonstrator 750a and swiftly signed up to an operators course hosted by Simon Chiles. Straight away this gave us confidence that was needed in such a radical change in how we established our crops. The autumns of 2019 and 2020 allowed us to cut out teeth in less than ideal conditions, but the disappointment of slightly lower



yields were eased by lower costs which kept margins at parity. Nitrogen rates are starting to come back slowly (circa 20%) but it was only relatively recently that we brought legumes into the rotation and have now started to implement other tools such as foliar N and SAP Analysis to look at improving our efficiency further.

*No one really can prepare you for the change in mindset required when going down the regenerative route. From ignoring how the field looks after direct drilling to ignoring the itch of recreational tillage, it's been a learning curve every step of the way.*

Getting living roots in the ground for as much of the year as we can, feels right in line with all the other changes we've made. We grazed our cover crops with sheep last year and we'll look to repeat this again next spring. It's been our first season this autumn drilling everything directly into catch crops. The biggest benefit to date is how well the ground walks even after the monstrous deluges of rain that we have had in previous weeks.

We are now three years into using untreated home saved





wheat blends which seems to be assisting in lower fungicide usage as well as maximising genetic diversity within the crop. Companion crops of buckwheat and clover are grown with the OSR and a further drive to look at how best to use bi and poly cropping will begin again in the spring.

Our nemesis on the farm is undoubtedly herbicide resistant ryegrass. In a 5-6 year timeframe it has spread to a number of fields on the farm whilst we figured out transmission routes and resistance patterns. Now we are taking a much more robust approach to the weed. Firstly harvest hygiene is a number one priority with the combine being blown down with a compressor after every field. A chaff lining kit has been fitted to the combine in an effort to reduce weed seed return on either side of the swath. The one remaining change of the year will be to install a water treatment plant to clean up our

borehole water and make it more suitable for spraying and biological amendments.

Our main investment this season has been the move away from the John Deere 750a to a Horsch Avatar. We saw clear benefits from last year's demonstrator with a heavier closing wheel, more flexibility of drilling multiple products and easier calibration. The big move agronomically was to place liquid products down with the seed. We bought a second hand Opico Nitro Jet front tank and bought the rest of the kit from Simon at S&K Sprayers. With Johnson-Su bioreactors and vermicomposters in the shed, it has been great to make a start



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this year with placing these products down with the seed in furrow or as a seed drench. The OSR went in a little later than we had planned this year (Circa 21st August) but the addition of liquid fertiliser, seaweed and liquid fish seemed to improve crop vigour compared to control plots without any.

*Change has definitely brought about new opportunities for our farm in a way that I could never have anticipated. The move to direct drilling has really helped us grow and expand our arable contracting by helping other local farmers focus on improving soil health.*

From a previous life of out of hours breakdowns and alarms the initial prospect of being livestock free on the farm had an obvious appeal but the need for spreading risk and retaining a diversified income stream would always win out for us especially with modern livestock buildings with few options for alternative use. We made our decision to move from intensive to extensive production.

One thing that always struck me as odd with our previous pig enterprise was that meat eating quality was barely given a second thought. It was always increasing growth rates, reducing feed conversion or improving breeding performance but never actually the thing that ultimately mattered, what the



consumer thought when eating what you produced. We were very lucky to meet a chef in London who also shared this same thinking and it didn't take long to form a joint venture and make plans on how to take the pigs forward in the future. For now this venture is in its infancy but it will be great to see how we can best integrate the pigs with the arable so that both enterprises benefit from each other.

Like so many readers of this magazine I'm always pleased to see it land on the doormat. This inevitably leads to me pouring over its pages for the following few weeks when chance allows. I'm continually inspired by how many other growers are reducing their reliance on inputs, focusing on profit over yield and showing how regenerative farming can be a sustainable lower risk model for farmers to adopt.

With some many other changes on the horizon such as ELMS, carbon and biodiversity trading and the full effects of Brexit and trade deals yet still to be felt I feel we are as aligned as well as we can be for challenges that lay ahead.

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# THE CURIOUS CASE OF **DISAPPEARING** NITROGEN

Written by James Warne from Soil First Farming

It seems everyone is doing 'regen' these days. There is a lot of confusion and miscommunication around what it means. I was at a meeting recently where I heard someone proclaim that their arable business was carbon neutral even though they were still ploughing, combi-drilling and using an average of 230 kg/ha of nitrogen every year. I wondered which of the many carbon calculators threw out that spurious result, or the quality of the data fed into it?

Whilst on the subject of nitrogen, there is a lot of talk amongst farmers and growers over simply reducing nitrogen rates. Every grower on social media is now growing record yields of wheat with zero inputs. It's the latest form of alchemy, reduce inputs and conjure up something for nothing, its origins probably stem from Trussonomics.

But is it possible to reduce nitrogen by 80% and maintain output? Can you really grow 10 tonnes/ha wheat crop with only 40kg of applied nitrogen?

Research suggests the total nitrogen requirement for a wheat crop is somewhere between 280-360 kg/ha. That is for all the biomass of the crop, above and below ground. A 10 tonne crop of 11% protein wheat removes 190kg N alone. If we are reducing the total applied nitrogen, where is the balance going to come from?

If we consider the nitrogen cycle (below) for a moment it is clear that aside from inputs there are only three other sources of nitrogen the plant

can rely on;

1, Biological fixation

2, Deposition from the atmosphere,

mainly rainfall

3, Mineralisation from Soil Organic Matter (SOM)

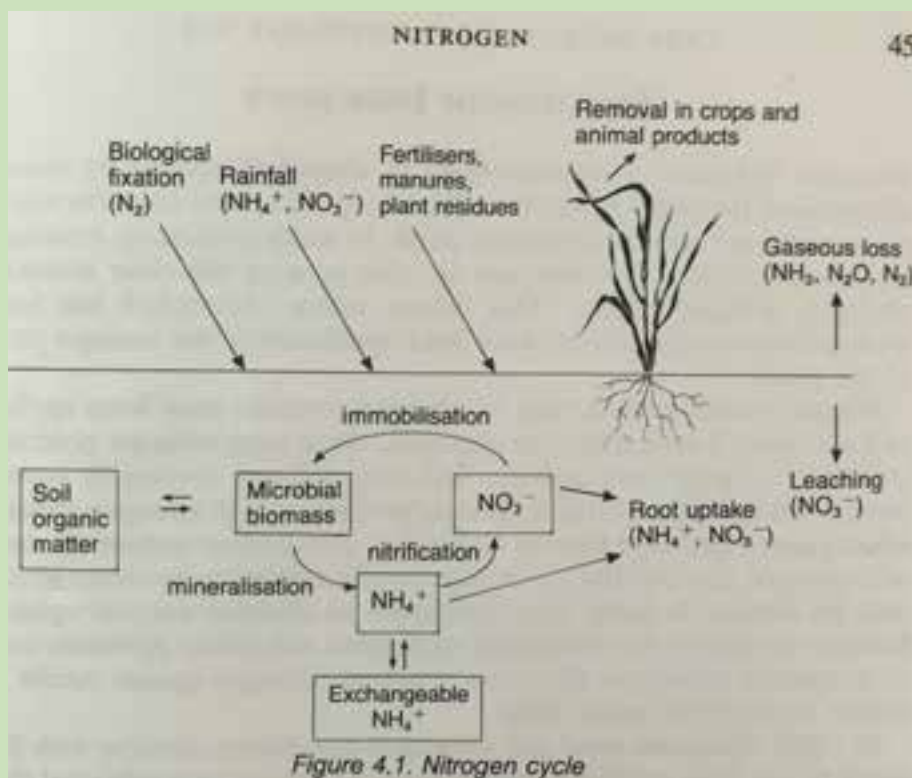


Figure 4.1. Nitrogen cycle

(reproduced from Crop Nutrition & Fertiliser Use, John Archer, 1985)



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Biological fixation and atmospheric deposition combined may contribute anywhere between 0-40 kg nitrogen per hectare per year. Biological fixation is carried out by soil-dwelling, free-living, nitrogen fixing bacteria, such as species of Azotobacter & Bacillus. These free-living bacteria are not to be confused with the symbiotic species (Rhizobium) that associate with legumes.

*As with all biological functions the bacteria need water, temperature, oxygen, carbon and a suitable pH in which to thrive. Remove, or reduce, any one of these requirements and they will stop reproducing and go dormant.*

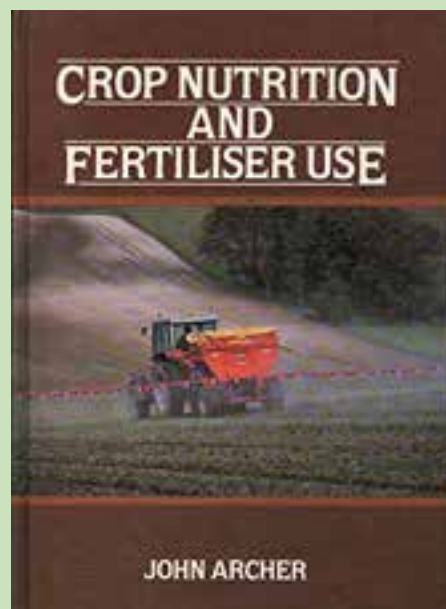
Mineralisation of SOM is also a

biological function and as such has the same requirements given above. The potential nitrogen contribution from a typical arable mineral soil with low organic matter maybe as much as 50kg/ha in a good season, but it depends upon rainfall! Organic soils and those high in SOM maybe able to release more than 200kg per hectare of nitrogen.

However, having a good biologically active soil is only part of the story, the crop still needs to be able to access and utilise the nitrogen with high efficiency. This relies upon soil structure and crop rooting to explore the soil reserves. Good crop nutrition, especially access to magnesium to allow maximum solar radiation interception, and sulphur to fully express amino acid and protein synthesis.

Steve and I have been conducting our own trials, on-farm, and independently, over several years now and we have no doubts that it is possible to reduce the total nitrogen applied, increase nitrogen utilisation considerably and

maintain yield. It is important to stress however that it can only be achieved in some very specific circumstances. If you are on a path of raising carbon levels in your soil it seems natural you may want to cut back on your nitrogen inputs, but this may not always be the most logical thing to do.



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# FARMER FOCUS

## TIM PARTON



**Wow, yet another dry Spring/Summer. Anybody who doesn't believe in climate change can hardly deny that temperature and weather conditions are changing!**

This, however especially just shows the importance of Carbon (as if it ever wasn't important!) the extra water holding capacity was vital to keep crops going for those extra days in conditions such as these are vital. Did you know it takes 82 litres of water to grow one apple! Which is why we had small apples around here this year as we just did not get the vital ingredient (Water), we can be fantastic farmers but without water we are going nowhere!



One crop which really stood out for me on that subject was my Spring Beans, since where I had not grazed my cover crops and drilled on the green using my crimper roller (made by TT engineering) to destroy the cover crop, I had got twice the crop of beans. This was because the soil had been thatched with cover crop, retaining water and keeping the soil cool, allowing biology to keep working for

longer. Once soils dry out, biology goes dormant. Once again, I have grown beans with no herbicides, fungicides or insecticides, making them a viable GM: the ungrazed fields came in at 4.8/ha which for the year I was happy with; unfortunately, the grazed fields came in at half that! Has this changed my opinion of sheep? Yes and No. I feel the answer lies in what works on your own farm (as ever) but for me they are a tool which I can use when needed (we do not own our own sheep, they just come when



invited). So, if I had a forward crop that needed reducing for different reasons as in disease etc I would use sheep as a tool to manage the crop! Will I be grazing in front of Beans? Definitely not!

Fungicides are, I feel, now a distant memory for me (touch wood!) as once again they have not been used here! The difference in residue breakdown since ceasing their use is remarkable with debris gone very quickly digested by fungi as nature intended, with no barrier there to stop the breakdown.

Wheat yields were very variable here from 7.5t/ha to 12t/ha; the highest yield coming from the foliar fed crop which was 50kg soil applied N and 28 l foliar applied N.







I did a larger acreage of foliar applied this year (thank goodness). Using sap testing to monitor the crop allows me to put into practice that of Intelligent Farming which allows me to make informed decisions all the way through the growing season. My aim being to achieve top yields with the least investment, but I still do not class myself as a low input farmer as I will spend money if the likely return is going to be there. That is intelligent farming.



Working with Edaphos Agronomy we ran a large Nitrogen trial this year, which was not the easiest of Springs to run the trial, but it gave some remarkably interesting results! The most noticeable being that the 240kg/N/ha did not yield any more than 160 kg/ha and was exactly the same for my farm average of 120kg plus 10 L of foliar N. So, is this down to my soils producing more N? Or, was it just the fact that we did not get enough water? Whichever the reason a lot of money was saved across the farm from the old norm of 240kg! Which would have burnt out a lot of Carbon in its excess. Also, my Carbon foot print for the crop is a lot lower giving me another income potential.

A new crop for me this year was growing Corn Marigolds and Corn Flowers for seed, for a company called "Yourgreen" who we work in partnership with as Green Farm Collective. These will go into seed packets

to be grown on by individuals or companies who want to grow their own biodiversity to make a difference to the planet in which we live. This was a new experience for me regarding combine settings due to the crops having to be cut green! This takes some careful setting up as not to block the combine! A job which should be avoided at all costs! With combining achieved, the next challenge was drying the crop - don't I just love a challenge! With such a small amount of seed, a different way was needed.....and with the use of pallets and a big fan (see pictures) the job was achieved (result!)

As you all know, high nutrition food is always my aim on this journey and this year I have invested in the Bionutrient meter which can really start to tell me how good the food is in my garden and on the farm! This to me is really what growing healthy food is all about. Please see the picture to show what polyphenols do for us all! I have tested my wheat against some conventional wheat, and you can guess which came out top by a long margin! This for me is where I see food production going and will be bought on its health benefits.

On a lighter note, we have installed a new bird hide on the farm which is a fantastic addition now that we are trading our biodiversity: which has been done through Green Farm Collective in the form of cover crops and flower/bird food margins. This is a valuable new income to the farm and one which I hope will grow year on year! The story involved is a valuable story and one which the sponsor will use to sell their business in what they are doing to their customers. Days will include bird watching and the planting of trees which is all part of the package. Remember we as farmers are the heroes of the world as we are the only ones that can feed a growing population and heal the planet at the same time! Which is why it's so important that we stand together (for once) and not sell ourselves short on the Carbon / Biodiversity market.



# HOW BIODIVERSITY NET GAIN (BNG) IS DELIVERING ALTERNATIVE FARM FUNDING

*With the farming landscape in the UK changing so dramatically in recent years, leaving many generational farmers facing reduced financial support as well as increased costs, the pressure is really on over how to make land generate a return.*

Many farmers today are facing the stark reality of dwindling subsidies, so it's never been more urgent for farmers and landowners to explore securing long-term methods of creating diversified and sustainable income streams to safeguard their future.

Understanding what is involved in new schemes in practical terms can be challenging and there are many questions around how land used for natural capital projects will impact on a farmer's core business. This is where Environment Bank can help.

## What is Environment Bank?

Environment Bank was established in 2006 and was the first business of its kind in the world to launch Biodiversity Net Gain (BNG) Units. Founded by UK ecologist Professor David Hill CBE, Environment Bank developed a concept where biodiversity net gain (BNG) would ensure land used by developers for building and infrastructure projects would help leave the environment in a better state than before the development began, by providing net gains to biodiversity to meet their

legal requirements.

BNG became a mandatory legal requirement in 2021 under The Environment Act, which David lobbied hard to secure in law over a 15-year period. Since then, Environment Bank was awarded £200m in private sustainable investment funding to begin establishing a nationwide network of Habitat Banks (parcels of land) totalling over 4,000 hectares across England that deliver BNG Units.

## What is a Habitat Bank?

Environment Bank actively began establishing its Habitat Banks across England in 2021, which is essentially securing a parcel of land that creates a significant uplift in biodiversity. Typically they are created on low-yielding land upwards of 10 hectares in size and can be made up of species-rich grassland, woodland, wetland, mixed scrub or rewilding sites. They provide a secure and long-term income to landowners and a biologically diverse haven for nature, leasing land throughout England to the Environment Bank to create biodiverse habitats that help restore



Toby Diggins, from Puddington Moor Farm, Devon

nature, selling the 'BNG Units', back to developers.

Ensuring the Habitat Banks don't impact national farming requirements, Environment Bank looks to utilise the marginal or low yielding land with the Environment Bank only taking a lease interest in the land, so the landowner retains ownership.

Environment Bank can then raise BNG Units on biodiversity uplift which they can use to help organisations meet their biodiversity net gain requirements, removing all risk and long-term liability from the landowner.

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Since launching its award-winning Habitat Bank scheme last year, Environment Bank has seen enquiries soar, with over 60 new sites expected to be established in 2023. It is partnering with farmers and landowners - including Tim Easby from Oak Stile Farm, North Yorkshire, and Toby Diggins, from Puddington Moor Farm, Devon - establishing Habitat Banks on their land through its privately funded management scheme that guarantees an income for 30 years.

### What type of land is required for a Habitat Bank?

All types of land are considered for Habitat Banks including currently unproductive areas, old pasture and scrubland as well as under-performing arable land. This is across the acreage on parcels of land upwards of 10 hectares in size and doesn't have to be in one block.

The ecologists work with landowners to establish habitats that work best for their land operations, and which creates the best outcomes for nature in their location. They won't change the entire face of your farm, they will simply help support the replacement of your existing EU farm subsidies as an alternative use of small parcels of land.

### How Habitat Banks benefit farmers

A crucial benefit is that farmers retain ownership of the land. A management plan, contracted to and delivered by the landholder, is tailored to suit the existing land management strategy and sources of funding, as well as ensuring the most tax-efficient solution. Environment Bank pays up to £27,000 per hectare over a 30 year period for the management and lease of the land, as well as a generous welcome bonus.

Being fully funded, Environment Bank typically arranges the lease and management payments within 20 weeks of registration, and covers all costs for establishing and managing the Habitat Banks, extending to legal and tax advice where appropriate. It has a ready-made solution, so unlike brokerage models, farmers do not have to manage the complex implementation process or take any of the risk of the scheme failing. All of that sits with Environment Bank.

Farmers receive an on-boarding fee, their first year's rent upfront, and then annual payments which increase with inflation for the 30-year term.

The goal of Environment Bank is to establish a network of Habitat Banks in every area of England to restore biodiversity and help farmers achieve this all whilst protecting their assets, making it a win-win situation for hard-pressed farmers.

There are many benefits to the scheme. It is uniquely designed to fit within existing farm enterprises including the production of food, tourism enterprises and other business streams, as well as alongside the government's new Sustainable Farming Initiatives (SFI).

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## The management schedule on a Habitat Bank

How the land is managed depends on the management plan agreed with the landowner and how the Habitat Bank will work alongside other farm enterprises. It will be monitored regularly by ecologists at Environment Bank, and the progress reported back annually to the local planning authority or responsible body as part of their BNG obligations.

For grassland, for example, each year, the fields will be closed off during flowering season and the land keeper can take a hay cut once wild flowers have bloomed. In the autumn, the ground can be used for grazing, before livestock come back off the land again in March to allow the flora and fauna to bloom again, attracting rare species including birds and insects.

Native shrubs are often planted around the perimeters of the grasslands and livestock fenced out from the area to allow new shrubs to grow. Once established, the fencing will come down and the livestock can graze in the open habitats. Ecologists may put in ponds and wet scrapes if required to attract bird species such as endangered curlew and lapwing to breed and encourage more rare species of wildlife.

The land is managed in this way by the landowner - or generations of landowner - over a minimum 30 year period to allow for a fully biodiverse habitat to be established.

## What do landowners



L-R - Cameron Chester, Ecologist; Rob Wreglesworth, Principal Ecologist; Tim Easby, Landowner

## involved in the scheme think?

Speaking of the establishment of a Habitat Bank at Oak Stile Farm, North Yorkshire, Tim Easby said: "We are delighted that Oak Stile Farm is hosting a Habitat Bank so that we can do our bit to enhance local biodiversity.

"We took ownership of this former dairy farm over 20 years ago and have begun to enhance areas for wildlife with sections of woodland planting and new hedgerows. We have always wanted to do more and Environment Bank's Habitat Bank scheme allows us to enhance large areas of our grasslands for wildlife at a scale we couldn't do before in a financially sustainable way."

Many landowners and farmers are signing up to the scheme, and there is none more passionate about the

benefits of Habitat Bank creation than one of the first farmer's to sign up to the programme, Toby Diggins from Puddington Moor Farm.

"Being involved in such a ground-breaking project was important to me, as it's one of the ways we can contribute to restoring nature and help reverse the environmental crisis," he said.

"There are so many benefits to protecting wildlife and nature fundamentally, but this partnership also allows us to guarantee an income for the next 30 years on land which we would have to conventionally farm very hard to see any profit."

To find out more about biodiversity net gain and Habitat Bank creation options for your land, please call our team on 01904 202 990 or visit [www.environmentbank.com](http://www.environmentbank.com).

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# FROM THE SEA TO THE SOIL

Inspired by history for the future of farming

Using fish in arable farming is not a new phenomenon. The practice can be traced back to the ancient Roman empire on this side of the Atlantic, and there are stories of Native Americans showing the Pilgrims how to grow corn by planting a fish with each seed. It may have all started as a happy coincidence when farmers observed that plants performed better when decomposing fish were left near them, but thanks to science and research, we now have a good understanding of how fish material positively affects crops and the soils that support them. Mindful of the Farm to Fork Strategy in Europe which is looking for a 20% decrease in the use of chemical fertilisers by 2030, Dr Geraldine Fox and the team at Pelagia has developed the UK's first liquid fish hydrolysate approved by Animal & Plant Health Agency (APHA) for use as an organic soil improver which is also approved as an input to organic farming systems by the Soil Association. Sea2Soil revives a traditional farming method that time has forgotten, one which aligns with the path of regenerative farming.

Pelagia has an over 100-year history of utilising fish and fish by-products from human consumption processing to

produce valuable and highly nutritious feed materials. Long before circular economy waste management and waste valorisation became buzz words, Pelagia has been recycling 100% of fish waste to produce economically important products.

In 2019, our processing plant in Bressay on the Shetland Isles expanded its operations and obtained a licence to utilise the by-products from Scottish salmon farms with the aim of zero waste from this industry. Here in the UK, this type of product would ordinarily have gone into anaerobic digestion as a feedstock where the beneficial nutrients and characteristics of the hydrolysate are somewhat diluted by other stock materials. Our goal is to retain the integrity of the rich source of essential amino acids, fats, macro- and micronutrients contained in the hydrolysate and offer it in as pure a form as possible that can be easily incorporated into many formulations.

Sea2Soil acts by feeding your soil bacteria, in turn converting the macro and micro-nutrients contained into a form that is more readily available to the plants. We have evidence that Sea2Soil, which is naturally high in fat,

promotes the growth of fungi, which are hugely important in soil root systems, performing important functions within the soil in relation to nutrient cycling, disease suppression and water dynamics. The improved microbial populations also feed secondary and higher-level consumers like protozoa, nematodes, and earthworms, which work to improve soil structure by aerating the soil leading to better root development and reduction in abiotic stress. These macro-organisms also contribute to improved nutrient availability within the soil through excretion providing additional bioavailable nutrients to the growing plant.

For the past 3 years we have been refining our process to produce an organic soil improver that is affordable, delivers on yield responses, reduces reliance on chemical inputs and is farmer friendly. We have resisted the temptation to call it a fertiliser, because it is so much more than that. We see it as a prebiotic for your soil leading to:

- A healthier soil environment;
- Increased crop health;
- Reduced reliance on chemical fertilisers; and
- Promotion of a regenerative ecosystem, where the environment and its living populations can renew and recover from damage and stress.

Farm trials began in 2020 across various locations within the UK and on various crop types such as wheat, barley, oilseed rape, oats and beans. The aim was to identify how and if yield performance was affected and to identify any areas of further product development. We found that yield was either maintained or showed an increase, but what the results highlighted was that return on investment was higher, due to the reduction of chemical inputs. We continue to develop this knowledge portfolio testing its effects in vineyards, orchards and Christmas tree farms as







the herbal ley established in May which received a 10 lt/ha of Sea2Soil application through fertiliser streamer nozzles in June. This application stimulated a good deal of growth within three weeks in a very dry time. Two applications of 10 lt/ha of Sea2Soil on the spring beans during the same dry spell improved the canopy growth of the beans and removed the chlorotic symptoms of stress, significantly improving the verdancy of the plants."

Looking back not even a hundred years, it's easy to see how rapidly the industry has favoured chemical enhancement over natural counterparts – a change which we all know can be put down to countless societal and industry-specific pressures. None of us knew it at the time, but introducing chemicals was a case of solving one issue while causing many others, including topsoil erosion and the destruction of soil health which in turn has been detrimental to our crops. Sea2Soil can positively contribute to the recovery of soil health, by improving soil biology and soil microbial populations, hastening the restoration of our topsoil and improving overall plant health.

well collaborating with various research groups.

Paul Davey runs Girsby Farm Services, a progressive agricultural contractor with a commitment to providing high quality crop production services to customers with interests in conservation and regenerative agriculture, and has been using Sea2Soil on his land in

Lincolnshire.

Paul has seen first hand the positive effects of our product: "The dry conditions this last spring and summer presented challenges in a number of different crops, especially maintaining plant nutrition and managing the associated stresses. There were visible benefits for maintaining growth in



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# FARMER FOCUS

## ROB RAVEN



**After a very easy and early harvest, followed by a few stressful weeks of unbelievably dry conditions when most drilling and land work was impossible, we finally had the autumn we had all been waiting for. For us the rain fell little and often from mid-September until the beginning of November, when the heavens opened. By then we had comfortably drilled a larger than usual spread of winter crops in pretty much ideal conditions. Casualties have been cover crops and early oilseed rape on heavy land, both of which we chose to plant a reduced area due to the drought in August and early September. On a lighter block of land we did catch a single shower in late July, which allowed us to very quickly plant some cover crops after winter barley. These really suffered through August and early September, but they survived, and with such beautiful growing conditions in October they are now looking good, if a little brassica-heavy. The balmy autumn also allowed us to continue grazing marshes until 1st December, and leave the cover crops more time to bulk up. In September I was seriously concerned about how we would keep the livestock fed through winter, but the situation is now looking a lot more relaxed.**



Long-term DD land has coped with the wet November very well and walks clean and firm. Any land that had been moved is now very soft indeed. Unfortunately, the dry autumn means there was very little chit pre-drilling, even by late October. Pre-em effectiveness has no doubt been compromised as well, so it does not look like the cleanest year. There was also no mole draining, as I felt the clay subsoil was not moist enough to hold a mole. However, we used the dry conditions to get some low-disturbance subsoiling done on land which had historic compaction, which I hope will pay dividends.

I am a bit agnostic about the LD subsoiler. Last year we made one and used it to great effect on some "new" land which had been previously worked to death by a TopDown at 8" every year and was yielding very poorly. The top 8" were solid and airless like concrete, below that it was

lovely. We used the LD subsoiler at 10", then planted with a direct tine drill and had some fantastic crops, and have been able to DD the same land this year into lovely structure. So I think it is a great tool for the right situation, and particularly for land in conversion. The success with the LD subsoiler was too great to ignore, so I have used it this autumn for some trial areas on long-term DD land which is yielding OK, but has plateaued somewhat. I really hope the trials do not prove to embarrass the untouched land, or it is going to really mess with my convictions (and my status at Direct Driller!), but I do think it is correct to constantly challenge everything, especially our own ideas. Ask me next summer how it went.



I am generally pleased with my DD winter cropping, and spring beans seem to do well, but no-till spring barley does seem to underperform when the conditions are against it. I am in charge of some land which was in the last year of a sugarbeet contract, so we planted some spring barley into cultivated land after beet this year. I have to admit it outperformed the DD stuff by a large margin, despite being on light land in a super dry year. Again, this is too much to ignore when barley is £275/ton! I have now stopped growing sugarbeet everywhere- even at £40/t I can't bear the long-term soil damage I have seen from the heavy machinery in the middle of winter. But I do want to make spring barley perform consistently and talking to other DD'ers I am not the only one who finds this crop a particular challenge. So as a (fairly large) trial, we have broadcast cover crops and incorporated them with a shallow cultivation at about 3", leaving a rough and slightly corrugated seedbed, with cover crop growing out of it. I hope these corrugations will weather down over winter and give us some tilth to drill spring barley in to, rather than the rather flat, solid and cold surface we were getting from no-till cover crops. On one block we achieved this "cultivation" with a drill fitted with wide Bourghault VOS points, set deeper than normal and the harrow removed. On another we used a set of discs, and on another a TopDown. Again I will let you know how it



goes.

For a Direct Driller article, this column seems to contain a lot of talk about cultivation. My viewpoint has not changed and I have no intention of moving away from my low-disturbance farming and all the benefits it has brought. However I feel confident that biologically active soils with cover crops could cope with very occasional interventions such as those described above without a great deal of injury, quickly rebuilding the connections lost and filling the space created with living root. And if this slight modification to 100% DD does significantly improve yield for the same crop inputs, without messing up the land, then I for one need to know about it. Tin hat on!



### Food vs Feed

Everyone reading this magazine is likely to be aware of the enormous environmental (and dare I say health?) benefits of pasture-fed meat. I am lucky enough to produce, sell and consume some of it myself, and do it with the greatest of pride and pleasure. However, we also know that in contrast, the vast majority of the world's beef is produced by feeding grains to cattle in enormous concentrated feedlots, with a huge cost to the climate and environment (and again health?).

I am firmly of the belief that farmers should grow whatever they like. However, anyone claiming that their farming system can help save the world through GHG

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reduction and carbon sequestration should be ready for a bit of scrutiny over the downstream effects of their production- particularly if they are hoping to get paid for such climate friendly farming. It would be quite possible to be a direct driller and to produce 100% feed grains, and for all the carbon saved and sequestered on farm to be belched back in to the atmosphere on the feedlot. With this in mind, and with my conscience pricked by this thorny issue as I get old and soft, I have given myself a personal challenge to grow crops for human consumption as far as possible.

**Wheat:** As for wheat, we are not on classic milling wheat land, and the extra Nitrogen required to hit the required protein would run counter to our goal of reduced inputs, so full spec bread wheat is out. Instead I have been growing a combination of low-protein milling varieties and Group 4 soft wheats which have gone for human consumption with a small premium over feed, at no extra cost to us. We have also sold some high grain quality feed varieties into a niche market for malted grains.



**Barley:** Spring malting barley on heavy land is now much easier to achieve thanks to some great varieties and some high N contracts. Winter malting barley is more of a challenge, due mostly to problems controlling wheat volunteers in a no-till scenario. We are persevering and this year after a very shallow discing of wheat stubbles, followed by patience, glyphosate, and finally ULD disc drilled Flagon, we have some clean looking barley.

### OSR is pretty straightforward.

Beans are a struggle due to Bruchid beetle. We don't use insecticide to try to control it, and past experience suggests it doesn't work anyway. The cosmetic damage the beetles cause make the beans unsaleable for human

consumption and consequently downgraded to feed, even though they are perfectly fine to eat. I don't have a solution for this, and as beans are an essential part of the rotation I will have to press on in the hope that one day consumers will want beans with holes in them, as a mark of their true regen heritage. In the meantime, any feed beans we produce are seriously low input, great for the soil and the invertebrate population, and they do at least displace soya, which must have a higher environmental footprint.



Specialist crops: we grow a variety of specialist crops such as linseed, lupins, lentils, and peas for direct sale to some fantastic customers. All of them have had some good results, but consistency is difficult (the dull 2021 harvest meant the lentils never ripened for example), and storage and handling of small volumes is always an issue. However I do much prefer growing for a particular end market which values the provenance of the product, and it is always an interesting challenge to grow something a little out of the ordinary! I hope by continuing to support these markets they will grow, and allow these crops to fill a more significant part of the rotation.





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*GEORGE SLY - MANAGING DIRECTOR*





# SAP ANALYSIS

## PROVING VALUABLE FOR LARGE, DIVERSE FARMING BUSINESS

In the final part of our series on sap analysis, Mike Abram talks to a farming business that's incorporated sap analysis into a wide range of cropping

Extensive sap analysis, first in trials, but increasingly in commercial practice is starting to change the way Cambs Farms Growers, part of G's Growers, is managing its wide range of cropping.

Farming around 4000ha of land at the home farm in Cambridgeshire the business grows Little Gem and Iceberg lettuces, celery, potatoes, onions, wheat, barley and maize for anaerobic digestion.

A key target for the business is to reduce its use of inputs without sacrificing yield, says Harry Winslet, Future Farming Manager for CFG. His team conducts trials looking at how to reduce fertiliser and pesticide inputs, as well as how to implement other regenerative agriculture practices with the help of Ian Robertson from Sustainable Soil Management and RegenBen's Ben Taylor-Davies. Successful practices are then rolled out and scaled up into commercial production.

"We are essentially an in-house research group," says Mr Winslet.

To meet that business objective of reducing inputs, Mr Winslet says he needed to better understand what was going on in the crop. That's where sap analysis came in – starting with sending old and new leaf samples to

NovaCropControl in 2019.

"What we were hoping to achieve was not necessarily the fine detail about every nutrient and every sample but understand what the broad challenges on the farm were.

"Do we have excesses in one nutrient or deficiencies consistently in another, to begin to understand what the whole farm trends were, and then to try and correlate that to crops that are growing well, tasting good with good shelf life, or to crops that are not performing well, or have pest and disease challenges," he explains.

After four years of an extensive programme of sap analysis sampling the business has now identified nutrient markers for each of the crops that drive either good or poor performance, Mr Winslet says.

*"So now when we get a sap test back, we are able to home in on those markers."*

Most growers using sap analysis will understand excessively high ammonium is a marker for likely pest attack, and high nitrate content leaves crops at risk from disease, but the research by CFG has found high potassium is a marker for poor crop performance in celery, while excessively low phosphate generally is challenging early in salad crops.

Crops are tested fortnightly typically. For lettuce and celery that means three to four times during the growing period, while wheats are measured from the autumn through to senescence. A lot of the samples are for trials purposes, but representative samples from different varieties and soil types are used in commercial crops.

"This year we took over 1000 samples for sap analysis, at a cost of around £12.50 per sample."



Onions collected in the field for sampling before old leaves and young leaves are separated and bagged.

That investment is paying off, Mr Winslet says. "We wholeheartedly believe in the results we are getting and the changes we are able to make off the back of them. The data we have collected over the past four season has allowed us to identify some of our challenges and make significant changes to our agronomy to try to tackle them.

"With size of the business, if we can make significant reductions in fertiliser or improvements in yield, or preferably both, the return on investment is huge."

For example, in wheat, sap analysis is providing the evidence to make significant changes to micronutrient applications.

"Across the farm, we were consistently finding that we are probably over applying manganese and under applying others like boron, zinc and copper."

As a result, the whole farm practice changed from applying 3kg/ha of manganese and 3kg/ha of magnesium every three weeks during the spring to tank mixtures containing copper, boron, zinc with higher rates of magnesium and lower rates of manganese. Chelators such as fulvic acid were also added to try and improve the uptake of those nutrients.



Sampled onions (from 2021) before being shipped to Novacrop from two fields with different drip (fertiliser) treatments.





CFG's first potato field routinely tested and nutrient applications made based on analyses, from 2022.

"We saw a really positive yield in our wheat crops this year. That's not necessarily directly linked to those changes but later in the crop we saw significantly more balanced sap and tissue tests than before we made those interventions."

Visual observations during the season on a trial area not treated with any fungicide until flag leaf suggested the crop was also free from disease, but, in a dry season, Mr Winslet says it is difficult to draw any immediate conclusions on whether the balanced nutrition was a factor.

"The hope is that we will be able to reduce our fungicide inputs."

His team is now developing an automated Excel application that will generate a bespoke nutrient tank mix for the farm to apply from the sap analysis results and the crop's current biomass.

The biggest challenge CFG has faced, in common with other trying to use sap analysis, is the inconsistent delivery to NovaCropControl's laboratories in the Netherlands.

Prior to the new customs rules for exports from the UK began in January 2021, Mr Winslet says he was able to send leaf samples to NovaCropControl on a Wednesday and receive results on a Friday.

"Now there doesn't seem to be any rhyme or reason to when parcels get to the Netherlands – we've had samples that get there the following day, and then others that have taken two weeks."

That kind of delay makes trusting the data, especially around nitrogen, more difficult, he admits, which potentially could hamper some of the decision-making in key crops and the business aim to pull back on applying artificial nitrogen.

"For example, in celery we are pretty convinced that one of the issues surrounding quality and shelf life is over application of late nitrogen.

"But if you have a sample that has sat in customs for two weeks and you're trying to interpret a total nitrogen versus nitrate reading, how sure of that result can you be?"

not, we find we have a very successful celery crop.

"What we are ultimately aiming to do is to reduce our nitrogen inputs based on the results of the sap analysis."

Experience and visual observation are helping them deliver some of that nitrogen saving, but timely sap analysis results would make decision-making easier and give extra confidence, he says.

One big change the business is making is to switch from ammonium nitrate to injecting liquid urea on 80% of the celery crop.

"Moving away from ammonium nitrate is a big part of our future farming agenda. We would rather not use it because of the negative impacts on the very biology we are trying to build in our soils.

"But we didn't want to do that at the expense of the crop having the uptake of nitrogen it needed."

Sap analyses and biomass assessments comparing the two have shown no difference in uptake, and given the confidence to make the switch starting next season, he says. "The hope is the other salad crops will follow once we have built up the same confidence."

Ultimately, Mr Winslet is hoping the entire group adopts the sap testing strategy on farm, both on the UK farms and their farms in other parts of the world.

"On our farm, it is initially about validating the trends we are seeing, and become better at analysing the results, and either applying or not applying nutrition as a result.

"We've already starting to move away from being a farm that is largely applying bulk macronutrition NPK products to one applying small amounts of micronutrition.

"The hope is we will get better at that and build the confidence to apply less and less nitrogen and phosphorus fertilisers and balance our crop health to the point we can cut pesticide use because the crops are nutritionally balanced," he concludes.



Plant sap-sample		1 202206092207	Sample Date:	8-6-2022
Name:		2 202206092208	Location/plot:	Wheat
Address:		GS Growers Ltd	Cultivation:	WHE 2315SUMN
		Barway Rd	Crop:	Wheat
		CB7 5TZ Ely, Cambs	Plant part:	1 Leaf (young) 2 Leaf (old)
		United Kingdom		
Remarks				
Mineral		Current Level	Optimum	
Total Sugars	%	0,6	0,5 - 2,8	1
	%	0,8		2
pH		6,4	6,2 - 6,6	1
		6,1		2
EC	mS/cm	18,5	14,3 - 17,9	1
	mS/cm	16,8		2
K - Potassium	ppm	7436	6275 - 8050	1
	ppm	7124		2
Ca - Calcium	ppm	1440	575 - 1500	1
	ppm	1048		2
K / Ca		5,17		1
		6,80		2
Mg - Magnesium	ppm	534	250 - 430	1
	ppm	267		2
Na - Sodium	ppm	6	12 - 34	1
	ppm	9		2
NH4 - Ammonium	ppm	409	280 - 655	1
	ppm	291		2
NO3 - Nitrate	ppm	83	< 150	1
	ppm	981		2
N in Nitrate	ppm	19	< 34	1
	ppm	221		2
N - Total Nitrogen	ppm	4358	2600 - 4330	1
	ppm	3307		2
Cl - Chloride	ppm	1837	970 - 2120	1
	ppm	1448		2
S - Sulfur	ppm	2351	360 - 590	1
	ppm	1436		2
P - Phosphorus	ppm	543	370 - 620	1
	ppm	479		2
Si - Silica	ppm	63,6	36,0 - 63,9	1
	ppm	45,0		2
Fe - Iron	ppm	2,16	2,60 - 4,95	1
	ppm	1,54		2
Mn - Manganese	ppm	5,65	3,60 - 8,20	1
	ppm	14,37		2
Zn - Zinc	ppm	4,01	1,80 - 3,25	1
	ppm	2,60		2
B - Boron	ppm	2,92	0,40 - 1,20	1
	ppm	1,33		2
Cu - Copper	ppm	0,78	0,65 - 1,15	1
	ppm	0,48		2
Mo - Molybdenum	ppm	0,24	0,05 - 0,20	1
	ppm	0,12		2
Al - Aluminium	ppm	<0,50		1
	ppm	<0,50		2

Consult your adviser for appropriate fertilizer recommendations.

Because NovaCropControl has no effect and / or no control over the sampling, NovaCropControl accepts no liability for adverse effects as a result of its analysis or advice provided.

3011\_20220524

This is an example output that we receive back from Novacrop, in this case a wheat field from June 2022.

When the sap analysis results have been timely, the business has been using them to help improve nitrogen use efficiency in the celery crop, he says, finding it is important to have an ample supply of sulphur and magnesium in the crop, alongside a steady supply of nitrogen to build biomass.

"If we can ensure that more often than



# FARM WALK

## ARABLE SOIL FARMER OF THE YEAR - A FARM WALK WITH DAVID MILLER

*Written by Emma Adams on behalf of The Farm Carbon Toolkit*

The second in our series of farm walks was with David Miller in Hampshire. This year's Arable Soil Farmer of the Year, David is keen to demonstrate how a regenerative system can be both simple and profitable even on challenging soils.

Managing 700ha of majority Grade 3 land in a purely arable rotation, David focuses on four of the main pillars of regenerative farming - keeping the soil covered, diversifying the rotation, maintaining a living root and minimising soil movement - proving a regenerative system without livestock.

The 700ha farm has been managed under a regenerative system for the previous 7 years, focusing on minimising tillage and incorporating diverse cover crops into the rotation. The move was triggered by rising input costs without the reciprocal rise in expected yield - a change of system was needed to improve profitability and farm resilience. David explains, "The overriding ambition is for our soils to be much more biologically active and more resilient. Resilience can be defined as, being able to function and produce a healthy crop with minimal interference, either mechanical or chemical and to continue to do this year after year". Initially cautious to make the transition, due to the perceived cost of a system focusing on the soil, David conducted a series of trials over a 5 year period; following this the investment was made for a no-till drill to maximise the benefits of the cover crops within the rotation.

With the farm located around 600 ft above sea level and containing large quantities of flint, the soil David

manages is challenging from many perspectives. Moving to the no-till system has seen vast improvements to the fixed costs of the farm, "We have much less depreciation on machinery and save a lot of diesel compared to our previous practices." David reveals that prior to their transition when conventionally farming they averaged 85 litres/ha of diesel for the whole year compared to only 50 litres/ha now. The current system also means there is a lower staffing requirement, with the 700ha farm only having one full time member of staff supported by two part-time workers to assist with spraying and harvesting.

Reducing inputs has been a key focus of David's throughout the journey so far. Historically DAP (diammonium phosphate) has been used to establish crops alongside applications of potassium however now with the cover crop system in place this is deemed no longer necessary, "the harder you push a farm conventionally with high inputs the harder it is to come back"

- David suggests. Inputs were steadily reduced over time as the system came into balance, he explains "The cycling phosphate and potassium was actually at a deficit for a few years as it was tied up in our cover crops. Over time this system has equalised and now we are self-sufficient, cover crops mine the nutrients that were once unavailable within soil that we need for the arable system". The farm has had no phosphate or potassium fertiliser for 7 years and has reduced nitrogen fertiliser by 25%, when explaining how he has achieved this he states, "We have adopted a nitrogen dose reduction strategy alongside making cropping changes (spelt wheat or spring milling wheat rather than winter wheat) whilst lowering chemical costs through a more targeted approach combined with a more flexible risk strategy - we put less money at risk in each crop and therefore we are able to budget for lower yields and margin is our driver." David is a believer of testing theories and trialling ideas on the farm, a fertiliser rate trial demonstrated that





David Miller, this year's Arable Soil Farmer of the Year discusses his farming system - guiding the group through his approach to a direct drilled arable system utilising cover crops to build soil health and reduce the reliance on inputs.

up to half of the total nitrogen applied was used to produce the last tonne of yield (9 tonnes to 10 tonnes/ha) - "We are trying to get a consistent yield from a consistent application of fertiliser, if we can understand what's going on in the soil a little bit more we are likely to be able to reduce our synthetic fertiliser

even more.

Reducing the spray program has also made great savings from both an input and fuel perspective. Insecticides are rarely used on the farm despite the large OSR acreage, instead relying on providing habitats for invertebrate species and beneficial predators to

deliver pest control. This has been encouraged by establishing 4 metre margins around all the fields with indigenous species such as mayweed, speedwell and wild carrot which historically would have been considered arable weeds, but provide the habitat to encourage the species within their own local ecosystem. David describes this thinking, "A healthy, active soil is just one component of a healthy, active environment - getting the biological balance in the soil requires, or results in, getting a balance of invertebrates, predators, beneficials and pests". An example of this promotion of beneficials and biological influence on the cropping system is the companion crops used during establishment of the oilseed rape, David explains, "We try and keep the companions in for as long as we can to help with the mycorrhizal fungi but we avoid having them in the crop at harvest as it can make combining tricky - the species we choose are either not tolerant to the frost or can usually be taken out with the normal herbicide

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David explains his thinking behind an overwinter cover crop of sunflowers, phacelia, buckwheat, gold of pleasure, radish and vetch before planting spring wheat for milling.

program.” Establishing the crop using this system has meant no insecticide has been used in 4 years, with no requirement for starter fertiliser, “The seed and companion crop are about £30 per hectare, so if we lose a little bit it is not the end of the world - we’ve given up trying to keep a bad crop of rape”.

Having moved away into a no-till drilling system has itself presented new challenges with crop establishment as David tells the group “As we no longer apply fertiliser at drilling and have very little mineralisation of nitrogen through cultivation establishment can be much slower. However, once crops are established they seem far more resilient and having had a dig they have a far more developed root architecture than in our previous system.” The rooting patterns now achieved on the farm also provide the crops with a better foundation during tricky weather, with David observing that in particular the wheat can now stand longer periods of drought. Growing crops such as the spelt can leave a lot of straw residue behind after harvest, David explains that a proportion of the straw will be baled but the majority is chopped and left to biology to disperse, “If we are confident that we have a good worm population that helps with the straw management following harvest as they take it down into the soil and decompose it.”

When discussing cover crop choice and management David has a key strategy, “The cover crops which are deemed to be the ‘best’ are those with

big top growth and leafy canopies. I however am interested in what’s going on below ground - big cover crops with a lot of above ground biomass use a lot of the available nitrogen in the soil and we don’t tend to see the same benefit to the following crops”. David blends his own cover crop mixtures from straights, aiming to spend approximately £30/ha on the seed. David discusses his thinking in choosing cover crop combinations, “We used to have a lot of radish in the covers in the early days, we found this led to finding a massive amount of slugs. So we therefore decided to remove brassicas from the mixes for a few years, we are now just starting to put a couple back into the mix as they seem to dominate very quickly.” Crops are established either using a Horizon DSX drill or on occasion a Horsch C04 if there is a large quantity of straw when drilling cover crops. In regards to establishing the following crop after the cover David describes his approach, “If we get a chance in the winter with a hard enough frost we will come out with a set of cambridge rolls to start to terminate some of the leafier covers, but eventually we will use a low rate of glyphosate (2-3 litres of 360g) before we drill in the spring”.

David maintains flexibility within the system by not having a set rotation and also using environmental stewardship options to aid trickier areas of ground, he explains “I would say that our soil structure is improving across most of the farm - some heavier fields which have been more reluctant to accept no-till

have been included in our stewardship scheme and planted with AB15 or a 2-year legume mix. Also, active clovers in place for 2 years have formed very strong tap roots and improved the soil structure a lot.”

Since converting from a high-input, conventional system there has been many notable changes in the quality and condition of the soil, David explains “It has probably taken 4 or 5 years, but the soils are now visibly more friable and better structured - this is underpinned by the old and living roots as well as the many worm channels. Observational changes can happen in the first couple of years but the quantifiable changes become far more apparent after around 5.” David is keen on assessing the land through many different approaches to measure the resilience and functionality of the soil, he says “Slake tests are showing soils are less fragile and hold together better when we get heavy rain, this is seen in the fields as our infiltration rates have definitely increased and the fields are much cleaner following downpours.” David is also a strategic farmer for the AHDB where he looks to be able to quantify some of the anecdotal theories in partnership with NIAB, increasing the confidence in the practices for other farmers considering converting, “The regenerative system is such a long-term journey it is sometimes difficult to know what to try and measure, let alone how”. In particular being able to understand the best approach to lessening the usage of fungicides and nitrogen alongside the impact healthy soils has upon the nutritional density of the food produced.

The 2023 Soil Farmer of the Year competition launches on the 5th of December 2022. Established in 2015, the competition run by the Farm Carbon Toolkit helps find, promote and champion UK farmers who are passionate about their soils. With awards presented annually at Groundswell Agricultural Show, the competition is widely recognised within the industry and beyond as a fantastic platform for farmers to share their knowledge and experience. If you are interested in entering the competition or would like to read further articles about previous winners please visit the Farm Carbon Toolkit website.





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# PASTURE AND PROFIT IN PROTECTED LANDSCAPES PROGRAMME

Pasture and Profit in Protected Landscapes is a free, farmer-led programme of farm walks, events and webinars open to everyone farming in the Protected Landscapes of Surrey Hills, High Weald and Kent Downs. The programme is being run by Pasture for Life in partnership with the Protected Landscapes. We believe that farmers learn best from other farmers, so over the next 15 months farmers in Surrey, Sussex and Kent are opening up their farms to share how their low input approach to grazing sheep and cattle has helped protect their farm business from the crippling increases in fertiliser, feed and fuel costs, and mitigate the effects of the drought.

From mob grazing to conservation grazing, they demonstrate a range of approaches for managing their land and the challenges and the opportunities of farming in this way. The benefits include:

- Financial gain
- Improved pasture
- Increased biodiversity
- Improved soil health and landscape management
- Reduced (or removed) workload associated with indoor housing
- Reduced worm burden on stock

By joining the programme, you are NOT expected to become Pasture for Life Certified or transition to a 100% pasture-fed or 100% mobile grazing system. The programme is designed to meet your needs and support you, whatever your current system or goals.

## Free Pasture for Life membership

When you register for the programme, if you are not already a Pfl member, you will automatically receive free Pfl membership until March 2024 which

normally costs £100 a year. This will enable you to additionally benefit from being part of our engaged and supportive community, as well as the work we do across areas such as the supply chain, marketing and academic research, and access to our forum, which is full of advice and support from other farmers who will often be facing the same challenges as you. You do not have to provide any financial details when signing up, and you can choose whether to continue with Pfl membership at the end of the programme.

## Mentoring



By registering for the Pasture and Profit in Protected Landscapes Programme, you can also apply to be mentored for up to a year by a farmer with experience of rotational grazing.

We have trained 12 Pasture for Life farmers as mentors across Surrey, Sussex and Kent who have a range of approaches to grazing with sheep and cattle. For instance, some house their cattle over the winter while some leave their cattle out year-round. What they have in common is that they are all 100% pasture-fed with no grain or feed inputs, and all have adopted some form of rotational grazing. Without exception, they find that the way

they now farm is more profitable than the system they inherited, that it has increased biodiversity and improved the health of their stock and pasture, and has made their farm business more resilient in times of extreme weather and spiralling costs. The experience has been transformative for them, and they are keen to share their learning with other farmers whether they are just curious to see other approaches or are wanting to change how they farm.

## Signing up

For more information or to register for the programme, please email Sarah at [Sarah@pastureforlife.org](mailto:Sarah@pastureforlife.org) and she will email you a simple registration form, or call Deborah on 07543286709. Please note you must be farming in the Protected Landscapes of the Surrey Hills, High Weald or Kent to qualify.

Pasture and Profit in Protected Landscapes is funded by the Farming in Protected Landscapes Fund (FiPL) and supported by the Surrey Hills, High Weald and Kent Downs Protected Landscape Partnerships.

## Meet a Mentor behind Pasture & Profit

Andrew Lingham, Court Farm Butchery, Rochester, Kent

Andrew runs a 320-hectare mixed farm, with 220 hectares of arable crops – including cereals, various beans, linseeds, millet and heritage wheat varieties – alongside his Pasture for Life Certified 30-40 strong herd of native breed store cattle and around 150 Romney store lambs.







Court Farm Butchers



For Andrew, this mixed, integrated system is key to his success. His animals offer a valuable additional revenue stream through his butcher's shop, but perhaps more importantly, they play a crucial role in building soil organic matter and recycling nutrients. He has very little permanent pasture, and for the most part grazes his animals on cover crops, using a 60/40 rule. In his words, "you don't let the animals graze down to the floorboards. Let them take 60%, and trample the remaining 40% back into the ground." This approach, he says, is "far superior" compared to just using cover crops alone, and means the animals are "feeding themselves, feeding the soil, maintaining soil structure and increasing organic matter." How long he leaves his animals on a crop depends on the conditions – in dry weather they will graze an area for around 3 days, but in wetter conditions it can be as little as 1-2 days to protect the ground from trampling.

"We actually see our animals gain more weight over winter by grazing on our cover crops than we do in the summer off the permanent pasture",



he remarks, demonstrating just how drastically different farming can look compared to conventional systems based on feeding costly inputs to grazing animals over winter. "This is a pretty low-cost system, and by low cost I don't mean low output, it is truly working with nature. I know it's an old cliché that's fairly overused, but the further you get into this the more you can see that natural processes actually work if you don't interfere with them too much."



Andrew has always been drawn to doing things differently and questioning the status quo – for example, he started treating his animals homoeopathically in the mid-90s. He now thinks he can bring that questioning mindset to his role as a mentor, for those who are also open-minded to new approaches and wanting to make some changes. "I don't have all the answers, but I'm happy to be a sounding board and guide people through the approach. And I don't like lecturing people, but if you're interested and want to learn, I've learnt a hell of a lot and I want to pass this on."

His approach is certainly working. "My veterinary bills are pretty much zero, and it's been years since I used antibiotics. Our worming treatment is pretty much just rotational grazing, and the use of some diatomaceous earth and seaweed kelp," he says, when asked about other ways this approach has benefited his farm. Andrew has particular interest in building both the gut microbiomes of his animals and microbiome of his soil, and speaks to the interconnectedness of the two. One way he does this is by brewing his own

microbial treatment, full of beneficial bacteria and fungi for his animals, which is put in their water. This keeps their gut microbiomes healthy and stable, and further inoculates the soil through their waste; another example of his holistic approach having multiple benefits across the farm.

Andrew talks with enthusiasm about how for him, every day is a learning day, grappling with new questions and challenges and thinking through how to approach them. This often sees him

tapping into a global network of farmers who are also turning to nature-led, low-input systems. 'It's so easy for the current generation to learn if they're interested. There is so much information available online. In mentoring I see myself as a bit of a guide towards people and resources who have been mentors for me, people across the world who you can tap into and who do actually respond. When they come back and answer some pertinent questions you have, you really feel that you are part of a global movement.'

If you're interested in being mentored by someone like Andrew, please email Sarah at [Sarah@pastureforlife.org](mailto:Sarah@pastureforlife.org) and she will email you a simple form, or call Deborah on 07543286709 to register for the programme, and state your interest in getting a mentor. Please note you must be farming in the Protected Landscapes of the Surrey Hills, High Weald or Kent to qualify.



# FARMER FOCUS

## JOHN PAWSEY



**I can't be certain when you will be reading this contribution to the UK's formative regenerative publication, but what I do know is that most of you will be about to, or will just have, sat around the Christmas table with your family.**

It can be tricky territory. Especially if you are all working together in a family farm situation where life expectations have never been discussed and/or familiarity has bred contempt. It does happen.

I'm not a fan of mirrors because whenever I pass one, a weird old bald man stares back at me. At fifty eight years old and with three young adults between the ages of nineteen and twenty four, I am reconciled to the fact that some kind of succession will have to be discussed as it's becoming increasingly obvious that the weird old bald man in the mirror is me. Knowing my lot, after a few late festive nights, lashings of wine from the West of France and endless cold turkey sandwiches, my offspring's future involvement in the family business will be discussed. I need to be prepared.

Unfortunately the days are gone when the reins of any business can be passed onto one's children just because they have sprung from your loins, or more accurately in my own situation, from Alice's loins, (I played a small part a few months earlier in the pregnancy, apparently) as we need the best people for the job. But what are the opportunities if your successors don't necessarily fit the traditional farming bill?

For many of us, having diversified our businesses over the last twenty years, it's not just about farming, which is a bit of a relief as my one of my daughters whilst hermetically sealed inside a luxury tractor cab, blasted with banging tunes, is quite capable of entering a field with an implement that she has assumed has been liberally greased and adorned with fresh wearing parts by the previous occupant. On exiting the field she has been known to turn around for the first time to discover that she has three punctured tyres and

the right hand wing of said implement is imbedded in the field's sole telegraph pole, or as we call them in the barren wastelands of East Anglia, a Suffolk tree.

When I joined our family company in the mid eighties when all we did was farm, persuading a son or daughter to join a family farming business was considered to be a form of child abuse, but possessing no qualifications due to being terribly naughty at school, I was grateful for any opportunity laid at my door. Also, there was a certain agricultural establishment in Gloucestershire that laughed in the face of scholastic achievements as long as your cheque didn't bounce. No longer the case these days I'm afraid.

The modern rural business is now able to offer a multitude of opportunities which weren't available to me in my early twenties, and anticipating a Christmas questioning, I have been considering how to engage my young adults and their various aptitudes, and have drawn up a list of new job titles to tempt them.

### The roles are as follows.

**An Enlightened Agronomist:** a few do exist but the majority of agronomic advisors are still happy to reach for the plastic bottle to cover their backs just in case. We have knocked the confidence out of our farmers with the complexity of chemically based agriculture making us feel unqualified to make even the most basic decisions. It's like raising the bonnet of a car and on seeing an expanse of plastic you close the lid, leaving the job to someone else because you can't see any recognisable components. You assume that it no longer contains the internal combustion engine that you have worked on for years. Enlightened agronomists can see through the plastic.

**Trial Designer and Data Analyser:** we are constantly trialling various agronomic scenarios but often don't complete the work with any rigour to get meaningful answers, or we just do it for a year and think that the results are good enough. We have been collecting data in terms of yield, crop quality, work rates, soil health and biodiversity but we haven't layered that information to really understand where the real opportunities are for efficient profitable food production with room for nature. It's not a full time job but when combined with the enlightened agronomist role, it could be.

**Administrator, Book Keeper and Inbox Curator:** to free us up to do all the creative things (see above). We need to get out of the office. Although mobile devices have allowed us to de-shackle ourselves from the swivel chair, my life is still plagued by administration. I remember being lectured by someone from our levy body about not being as productive





as other European farmers. It's because I'm spending too much time dealing with nonsense when I should be making better decisions for my business. The only inbox I had when I arrived on the farm was a physical paper one but now I have that and an ever expanding array of digital ones too. No, I don't want to join your f\*\*\*ing WhatsApp group!

**Contract Farming Massager:** although I like to feel that we give our undivided attention to our farmers we contract for, there is always more love to impart. Where agents are involved, our farmers get lots of juicy figures but we need to spend more time keeping them up to date with all the things that we are inventing and trialling on our own farm so they know that we are future proofing their businesses as well as our own. We have also missed opportunities to take on new contract farming arrangements mainly due to the lack of time to pursue them. It has to change.



**Crop Polisher and Value Adder:** part of the reason for converting to organic farming was to go more niche and make the market rather than take it. But we need to go nichier (is that a word?). The easy wins are to take back some of the processing and added value we give away. De-hulling our spelt, cleaning our home saved seed and mixing seed blends on the farm. Separating our own bi-crops and other multi-species crops. Putting in a bagging unit to direct sell some of our exotics. You are probably all doing it already.

**A Robotist:** a role that gets me thinking of the term motorist. Motorists were invented over a hundred years ago and were "a thing" because you couldn't just jump in a car and roar off. You had to check a multitude of lubricants, learn copious amounts of hand signals and something called

double-de-clutching. Nowadays we just drive a car, possibly own more than one and never check the oil. In a hundred years time I suspect that we will just instruct robots, possibly more than one and never check their (vegetable) oil. In the meantime, we need the skills of a roboticist.



And then there are all the jobs that we hand over to the man (it usually is) in the coloured corduroys: an Environmental Designer, a Net Zero Minder, a Carbon Creditor and a Green Washer. All new roles and crucial to capitalise on the opportunities that will be available to us in the coming years. Some expert help will be needed but we should be able to do a lot of the work ourselves. Biodiversity net gain needs to be our net gain and not somebody else's.

There is an opportunity for a Website Wizard, Social Media Schmooser and a Brand Manager. Our website is horribly old and clunky and needs immediate attention. You maybe aware that I love a bit of social media, and although @Hanslope on Twitter gets my full attention, @ShimplingPark does not. And then there is all the other platforms that we are blissfully ignoring like TicTac and SnipChit to name but two. Everyone needs a brand manager, don't they? The above is not a full time role, but an important one if we are to fully engage with our customers.

Although most of our redundant farm buildings have been re-purposed as offices, commercial lets and dwellings, there is always room for improving our offering and so two new roles could be created as a Property Tickler and an Asset Sweater.

The list goes on, and I suspect that reading this you have come up with several more positions of your own. Please do email me your inspired wisdom to [john@shimplingparkfarms.com](mailto:john@shimplingparkfarms.com) as soon as you can and they will be presented to my progeny.

You may be asking yourself at this point what any of this has to do with direct drilling? Absolutely nothing. But succession is something that we all have to grasp and if you are not doing so, then please make a New Year's resolution to do so. For the sake of you and your family.

**Wishing you an extremely Merry Christmas, the best New Year and an amazing Harvest 2023**

# DRILL MANUFACTURERS IN FOCUS...

## DALE DRILLS

## DALE DRILLS – TOP FEATURES FOR FARMERS

**James Dale reviews the key features and benefits of the Dale Drills range which tick the boxes for his customers.**

Like 2021, 2022 has been another very busy year for Dale Drills, with sales of seed drills up on previous years. A growing interest in no-till and regenerative agriculture along with funding in the form of the FETF grants have certainly helped, whilst our continuous drive to improve, and build versatility into our machines has also been well received.

A busy build schedule throughout spring and summer was made slightly more challenging with the global supply chain crisis. As a British manufacturer, we've always endeavoured to use UK products and suppliers where possible and our close working relationship has helped to reduce the impact of any supply issues, ensuring all our delivery deadlines were kept.



Autumn brought the opportunity to get out onto farms to commission the new machines. It is always interesting to meet with new customers and discuss their plans to incorporate a new machine into their farming strategy. Our focus on producing versatile seed drills mean they will suit almost all strategies from inversion tillage to no tillage and all things in between.

It always interests me to hear what particular features of our equipment lead to our customers 'taking the plunge'. Below is a list of some of the more common responses:

### High Output

Many of this year's new customers were looking to increase their output and had purchased drills with wider working widths than their outgoing machines. Pressure on farm labour, tighter drilling windows (delayed drilling for better weed control) and the lower horsepower requirement of our drills were the main drivers for going wider.

The Eco XL no till drill comes in widths of 8m – 13.5m and



achieves a typical output of 6 – 10.5 ha/hr ensuring plenty of ground is covered in good conditions and when the opportunity arises. The low draught requirement of around 25hp/m mean that many new customers have been able to use existing tractors on our much wider drills, avoiding the need to replace the drilling tractor at the same time as the drill.

### Lighter Footprint

All the drills in our range use our forward facing, 'J' shaped tungsten carbide tipped tine. At just 12mm wide, not only does the tine avoid excessive mixing of the soil, but it also 'pulls' itself into work as it is drawn through the soil. This reduces the need for excessive weight to be applied to the coulter to gain penetration, as is the case with many of the disc direct drills on the market. Consequently, our Eco range of drills are around 50% lighter than many of their competitors, preventing soil compaction at drilling and allowing the drills to continue running in more adverse conditions.

This reduced weight per coulter requirement has been further exploited by fitting more coulters per meter of drill allowing for row spacings as tight as 12.5cm. This narrower row spacing providing users with a more competitive crop, preventing weed growth between the rows.

### Dependable Depth Control

The Eco range of drills is fitted with Dale Drills' independent drilling assemblies. Each drilling assembly includes a pair of tines, a depth setting press wheel and a hydraulic ram which lifts, lowers and pressurises the tine into work. Because each drilling assembly can move independently from all others, it is able to follow the contours more accurately, offering excellent depth control across the width of the drill. Placing every seed at an even and accurate depth, even on rough ground, ensuring uniform emergence and improving management of the crop throughout its growth cycle.

Many farmers have found this to be a huge benefit to their establishment routine, particularly in wetter drilling situations where excessive drilling depth can lead to smearing of the





seed zone, and in drier situations where ensuring every seed is placed into moisture is critical for good establishment.

### Low Draught, Low Running Cost

As previously mentioned, our drills are fitted with a 12mm wide Tungsten carbide point. These points tend to last c. 500ac per meter of drill (tines on a 6m drill would on average last 3000ac). Not only does this keep the cost of wearing metal to a minimum (c. £1.20/ac), but it also reduces down time and ensures output stays high, as there is not the need to regularly stop to replace wearing metal.

The low draught requirement combined with the low weight of our seed drills mean smaller, lower hp tractors (typically 150-180hp on a 6m) can be used. The lower initial purchase price of these smaller tractors helps to keep the standing cost low, whilst the greater versatility (the tractor could also be used on a fert. spreader, sprayer, corn cart, hedger, etc) ensure that the machine cost/hour is also kept to a minimum.

With increasing input costs across the board now, many

farmers are looking for every opportunity to cut costs where they can. When these savings are combined with the financial and time savings from reduced tillage, the overall benefit is significant.

### Meir SC – Low Disturbance Soil Conditioner

Dale Drills sister company, Meir Agriculture, has been established to provide a range of cultivators designed to fit within a Conservation Agriculture system. The Meir Soil Conditioner (SC) is designed to effectively relieve compaction down to approx. 12" without excessive soil disturbance at the surface.



The Meir SC is now available with an optional tine seeder mounted to the rear of the roller. In this configuration the Meir has been used to establish OSR & cover crops. Initial trials have shown the use of low disturbance tillage combined with cover crops has given yield benefits to following crops.

LAMMA 2023

Dale Drills will be attending the LAMMA 2023 show at the NEC, Birmingham on the 10th & 11th January 2023. Come and see us to discuss our range of seed drills and cultivators in Hall 20 Stand 780.

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# SOIL-CENTRED WORCESTERSHIRE SUSTAINABILITY DRIVE

Home-made compost, massively reduced tillage and determined cover cropping have been central to the single-minded drive to improve the arable sustainability of the Green Horizons Network farm at Salford Lodge, Pitchill just outside Evesham over the past decade.



Tom Hughes and Kathryn Styan inspect a multispecies cover ahead of maize at Salford Lodge 1

A combination of challenging silty clay land contract-farmed with heavy kit for many years and lighter sandy gravel ground that continues to be rented out for field vegetable production, haven't made the task any easier. And Tom Hughes' effort to match both the productivity and low environmental impact of the substantial broiler business developed and run by his parents, Malcom and Liz remains very much 'a work in progress'.

Even so, the improvements he and his Agrii agronomist, Kathryn Styan have made so far are obvious in huge reductions in blackgrass and brome problems, in far better structured and more resilient soils, and in the all-important bottom line – not to mention results from the first year of ADAS YEN Zero benchmarking.

Fresh from working on a progressive Wiltshire downland unit, Tom came back to the family business in 2013 to take the land in-hand. He recalls 'jumping in



Tom Hughes and Kathryn Styan test the latest batch of Salford Lodge compost

at the deep end' with the 120ha of heavy ground not in vegetable production full of enthusiasm for the no-till approach.

"With all the land rented out until then, we had no machinery at all," he explains. "The ground had been demanding increasing amounts of horsepower to support deep-working and power-harrowing. Unsurprisingly too, given the poor soil conditions, black-grass counts were knocking on the door of 1500 heads/m<sup>2</sup>.



Lots of life and a vastly improved soil under a multi-species cover

"This certainly focused the mind, and drew us to Agrii's heavy land work at Stow Longa which has heavily influenced our thinking. We were tempted to do a reset with the plough. Instead, though, we decided on a winter of intensive multiple stale seedbeds followed by five years of no-till spring cropping. At the same time, we mole-ploughed the whole area to link-in with the drains my parents installed in the 'eighties.

"After alternating spring wheats and linseeds followed by canary seed, our first crop of winter wheat in 2019 averaged 10.75t/ha with no black-grass in sight. OK, it was a good year for wheat, but this clearly proved the value of our soil-centred approach."

In 2016, the vegetable ground was brought back into the rotation to address worryingly low organic matters and poor structure making the soils very prone to capping in the wet and baking hard in the dry.

Good quality land with irrigation is at a premium locally. So, it makes sound

economic sense to keep renting it out. But field vegetable growing is hardly the most compatible with a no-till approach. By cropping the ground themselves three years in every four and working closely with their vegetable-growing partners, the team has made sure their soil improvement efforts are not compromised by the land's year in vegetables.

"They've been very receptive to this," points out Tom. "We now have full overwinter cover ahead of every spring-sown crop, together with a programme of sustained annual organic matter addition.



A simple cover mix ahead of field vegetables at Salford Lodge

"When we hand ground back for the vegetables – generally after a winter cereal – our partners spread certified green waste. We then establish the winter cover with a mix of species designed to suit their following crop on contract. At the same time, we are working closely with them to reduce their tillage in a number of ways."

Integrating this land into the arable business instead of leaving it permanently rented out has added a further complication. Poultry litter from the family's 10 broiler sheds has been important in improving the rest of the acreage, but this cannot be applied directly within the vegetable rotation.

To address this issue, Tom has developed his own simple but very effective composting operation. This involves mixing the litter with chopped straw from the farm's 100ha of soft wheat – grown for the broiler rations – and grass silage from its 35ha of zero input grassland – which has to be





A good cover mix after field vegetables 2

removed annually under the Stewardship agreement.

"The grass silage adds extra green material which aids the composting process," notes Kathryn Styan. "With a nicely balanced analysis, including 24kg N/tonne and good amounts of phosphate, potash, magnesium, calcium and sulphur, the 1000 tonnes made annually has proved a much better manure than pure poultry litter.

"It's also just right for spring top dressing the winter wheat, overcoming the fundamental conflict between direct drilling and the requirement to incorporate organic manures. The active worm populations we now have in our soils naturally incorporated it in remarkably short order following application

"We've seen huge benefits from using the compost as widely as we can alongside our determined least cultivation, continuous green cover approach. Organic matter levels are up to 8% in places and all the soils both hold water and drain infinitely better. Ground we could seldom walk in the winter without getting covered in mud or sinking-in, now scarcely leaves a mark on our boots, or on the soil.

"Organic manures providing 20-35% of the nitrogen we apply to our wheat is a big financial win these days. What's more, we only used 180kg/ha of N overall on wheat averaging 9.8t/ha last season – 40kg/ha less than the year before.

"Results from the six fields of winter oats, winter wheat and forage maize we entered into the initial year of YEN Zero last season as part of the Green Horizons initiative are also very encouraging," she adds. "The yields Tom has been averaging for each crop are at the top end of the project results, whilst the greenhouse gas emissions remain some of the lowest. All crops scored especially well for emissions from the key areas of operations and synthetic nitrogen production and application."

Operational emissions reflect the extent to which cultivations have been minimised

at Salford Lodge. Central to this is the 4.8m trailed Weaving GD drill used for all arable and cover crop sowing, and chosen for the effectiveness of its angled double disc coulter system in cutting and closing the slot as well as the accuracy of its seed placement.

"Soil improvements are allowing us direct drill more crops more effectively every year," says Tom. "Our ground is becoming much more resilient to both weather and machinery too. But we still need to relieve the panning which is inevitable in our high silty clay soils. We also have to eliminate the system of beds used for vegetable growing and incorporate substantial crop residues."

*"We have three bits of the cultivation kit which we use as sparingly as possible – all from our local friends at Weaving. We started off by retro-fitting their ultra-low disturbance legs to a Subdisc for deeper working but now rely far more on the LD Topsoiler at just 6". After vegetables the light-weight Shortdisc is our first choice for tackling the residues left behind."*

While they accept some cultivation will remain inevitable at Salford Lodge for the foreseeable future, in no way does this lessen Tom and Kathryn's enthusiasm for cover crops. From a simple combination of mustard, black oats and tillage radish, they are currently trying a twelve-way mix based on vetch, sunflower and black oats with four species of clover, fodder and tillage radish, buckwheat and phacelia on the heavy ground ahead of linseed, and on the light ground ahead of maize.

In addition to widening the diversity of rooting and biology, they see this as the best insurance against changing conditions, knowing that some elements of the mix will always establish well but they are likely to be different ones in different seasons.

"We match our covers very much to the time of sowing as well as the following crop," Kathryn insists. "Early harvested vegetables give the best opportunity for them to work ahead of either autumn-sown cereals or maize in the spring so

we tend to use more complex mixes here. Even after vegetable crops coming off as late as October, though, we think it's important to get something in – generally something simpler and cheaper at a higher seed rate. This is more to protect the ground from rain impact than to do much good structurally."

With the particular challenge of making the 70ha of maize they grow annually for a local AD plant more sustainable, the Salford Lodge team tried establishing a crop into a more permanent clover mix last season.

They set up the ground with the LD topsoiler, applied compost then matched the drill to the LD's leg spacing with GPS and blocked-off coulters. Not having a precision drill, however, made for very uneven sowing, leading to much poorer yields than the 40t/ha they generally harvest. Serious weed problems which had to be sprayed off also meant the clover was lost.

Undeterred by this, Tom and Kathryn team remain both determined to maintain their pace of their sustainability improvement – especially as far as maize is concerned – and excited by the opportunities they see to do so.

Amongst their particularly positive experiences on the cereal side, they've been harnessing variable rate seeding to even-up field performance; using LiquiSafe liquid fertiliser treatment to eliminate at least one spring pass; better balancing crop nutrition to improve overall nutrient use efficiency; employing promising biologicals at T0 and T3 to reduce reliance on fungicides; and yield mapping and Gatekeeper to track their progress.

"We are putting lots of little things together within our broader soil-focussed approach to improve what we do in crop production alongside and as closely as we can with all the other environmental and carbon improvements being made by our broader family business," concludes Tom. "Most obvious here are 15ha of short rotation willow coppice and a wood-chipping operation; 10 biomass boilers 23 air source heat pumps and a new ground source installation; and a 10ha array of solar panels.

"Having my brother George so heavily involved at the sharp end of a renewable energy and carbon sequestration business is a great help here, making what we are doing part of a truly integrated family-wide effort."

# DRILL MANUFACTURERS IN FOCUS...



## EXCELLENT SOIL HEALTH IS FUNDAMENTAL FOR MAXIMUM FARM PRODUCTIVITY



**With autumn drilling on the Claydon farm completed and crops developing well, Jeff Claydon, inventor of the Opti-Till® direct strip seeding system, discusses the importance of excellent soil health and the role of effective stubble management in achieving it.**

**30 November 2022**

Excellent soil health is a prerequisite for maximum productivity on any farm. Soils in excellent condition will produce excellent yields and, conversely, those in poor shape will underperform.

The Claydon farm produced cracking yields this year, despite the driest spring/summer in decades and using up to 25% less nitrogen due to soaring prices and restricted availability. Our winter wheat averaged over 10t/ha, oilseed rape 4t/ha, and spring oats 6.11t/ha, so if your own results did not live up to expectations perhaps it is time to consider a different approach.

We operate on a commercial basis and earn our living by working in harmony with Mother Nature. Getting the best from the difficult-to-manage Hanslope series soils is a priority, so recent research data showing that reductions in tillage intensity benefit soil biology and health get my full attention. They confirm that the fundamental principles behind the Claydon Opti-Till® system, which we have used to establish crops since 2002, are correct.

One tell-tale sign of well-structured soils this year was that they did not crack deeply, unlike some I saw on other farms which were over-cultivated and had a dusty consistency, like dry cement powder. Where that was the case, the soil was bone hard when dry, so worms could no longer do their job, then after rain it went to mush and became unworkable. Inevitably, results were poor.

Soil health is a combination of its physical health, biological health, and chemical health, but what exactly do we mean by those terms?

- Biological health relates to soil biodiversity, feeding the

soil regularly through plants and organic matter inputs, moving the soil only when you must and diversifying plants in both space and time.

- Physical health involves the texture and structure of the soil, the porosity and pore size distribution, water retention and transmission, together with aeration.
- Chemical health involves maintaining optimum pH, providing plant nutrients in the right amounts, in the right place, at the right time, as well as knowing your textures and mineral buffering capacity to optimally mine this supply of nutrients.

Once these things are right, we need the soil biology, which involves carrying out the right cultivations at the right time and having the right diversity of plants, which can encompass the use of cover crops.

### A system with benefits

A German soil scientist who visited the Claydon farm described our Hanslope Series soil as 'minute land', namely that one minute it can be worked without too many issues using appropriate techniques, but the next it becomes unworkable, so timeliness is essential.

The other interesting fact brought to my attention on the Claydon stand at SIMA 2022 in the November was that a 1% increase in soil organic matter increases the amount of water available to the growing crop by 27,000 litres per hectare. That is a staggering amount, so when considering soil health appreciate that it embraces a wide range of factors, from drainage and water retention to worm counts, cultivations, and stubble management.

Claydon Opti-Till® originated in 2002 when wheat prices were under £60/t and for the farm to survive we had to reduce costs without adversely impacting output. Today, the cost of establishing crops using Opti-Till® is £59/ha, including stubble management with a Claydon Straw Harrow and seeding with a Claydon drill. This compares with £158/ha for a reduced tillage system and £195 for a plough-based approach. The economic advantages are significant.

As Opti-Till® has evolved many secondary benefits have become apparent. Time saving is considerable, allowing crops to be sown in the optimum drilling window and optimum conditions, promoting strong, even emergence. Major changes to the soil are also apparent where it is used, including a huge reduction in soil erosion. This coincides with a considerable increase in soil biota, soil is more stable, drainage is improved, difficult fields become easier to work, water holding properties increase, plant rooting is



more prolific and its ability to cope with heavy axle loads is increased.

### Focus on fundamentals

Good drainage is fundamental for excellent soil health. When this aspect is right you will never see standing water in fields, so that must be the starting point. After harvest, conditions were ideal for installing new drainage and luckily, we had 60mm of rain at the end of August, enabling us to mole areas that needed it, so we did that then cleared outfalls of obstructions and cleaned out ditches which had become overgrown or silted.



*Free flowing outfalls and clear ditches are essential so surplus water can drain from fields*

The baking hot weather meant that conventional cultivations would have been very time consuming and expensive in terms of wear and tear on machinery, ground-engaging metal, and fuel. Instead, we used Claydon Opti-Till® stubble management techniques to move no more than 2cm of topsoil. The Straw Harrow achieved remarkable results very quickly, at minimal cost, enabling weeds and volunteers to be controlled mechanically so that only one full-rate application of glyphosate was required prior to drilling. This approach also helped to eliminate the 'green bridge' effect and reduce the aphid vectors of Barley Yellow Dwarf Virus (BYDV).

'80-acre' is one of our fields which I use as a reference point and have mentioned previously in Direct Driller. This season, we went in with the Straw Harrow immediately behind the combine, then carried out three further passes at seven to ten-day intervals. By mid-November, most stubble and crop residue had disappeared. This was due to the elevated level

of worm activity, which was evident from the vast number of casts covering the surface.



*Worm casts covered the surface of '80-acre' field on the Claydon farm*

### Optimising soil health

A combination of structure and worm activity, good soil health is readily apparent. Soil in tip top condition smells fresh and breaks up easily when squeezed between the fingers. If it congeals and smells 'off' the right management techniques will be required to turn it around.

Worms play a key role in achieving this. These incredible creatures do a wonderful job, aerating the soil, allowing it to dissipate water in wet weather yet retain it in dry conditions. In combination with good drainage, they condition the soil and prevent it from slumping into a structureless, lifeless anaerobic mess, so we must do everything possible to encourage them.

Good times to check worm numbers are when the soil is damp in late autumn or early spring. Counting them is very easy using the AHDB guide (<https://ahdb.org.uk/knowledge-library/how-to-count-earthworms>) which also provides information on how to identify the various species. On the Claydon farm a respectable number in the spring is 20 to 50 worms in a 20cm x 20cm x 20cm AHDB sample plot, these figures highlighting the benefits of Opti-Till® over time.

In October, I had the pleasure of discussing our harvest results with fifty agricultural students from the University of Helsinki, Finland's oldest and largest academic institution. They came to learn how direct strip seeding could enable farmers there to operate more efficiently and better utilise the extremely limited time window available for establishing autumn and spring-sown crops. Many came from the largest, most progressive farms in Finland which still use the same techniques as previous generations, but that is changing.

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Increasing economic pressures, more variable weather, and a greater emphasis on establishing crops in the autumn to increase yields, require a more timely, efficient, and cost-effective approach.

Our young visitors were quick to appreciate the benefits of Claydon Opti-Till® and the need for effective stubble management, a cornerstone of any efficient, sustainable, profitable crop production system regardless of where you farm, or which establishment method is used.

Worms only flourish where there is sufficient food and although that can come from many sources they thrive on straw, which must be managed correctly so that they can easily pull it into the ground and feed off the bacteria. That is difficult if the straw is too long, so it should be finely chopped – we aim for 5cm – and be on the ground. That is where the Claydon Straw Harrow comes into its own. On our own farm, this fast, low-cost process is used extensively as a part mechanical, part chemical approach. Where we must use glyphosate, we only do so under conditions which allow it to work most efficiently and apply a full rate to reduce the risk of resistance developing.

## Fast and efficient

Claydon began developing the Straw Harrow in 2007 and after extensive trials launched the first production version in 2010. Now a key part of the Opti-Till® System, it is available in 3m, 7.5m and 9m mounted versions, and as a 12.5m or 15m trailed unit.

All versions create a micro tilth in the top 30mm of soil, using the retained moisture to promote fast, even weed germination. They rake out and destroy weeds at the cotyledon and one-leaf stage, removing a food source for slugs, break up slug nests and desiccate their eggs by mixing up and exposing damp chaff and straw to sunlight. In warmer climates this fast, efficient implement creates a mulch of crop residue over the soil surface, insulating it against evaporation, preserving valuable moisture and aiding seed germination, particularly for early sown cover crops and oilseed rape.

The first pass with the Straw Harrow immediately behind the combine is targeted at knocking chopped straw off the stubble onto the ground. At the same time, it creates a

shallow micro tilth, 1cm to 2cm deep which prevents the ground from drying out and provides ideal conditions for weed seeds and volunteers to start growing quickly, within seven to 10 days if sufficient moisture is available.

Only cultivating the top 30 mm of soil eventually diminishes the seed bank, providing that seed return is kept to a minimum. Working at an angle and using the specially designed tines to move the soil across the working width of the Straw Harrow encourages volunteers, grass, and broadleaved weeds to germinate. Subsequent passes destroy the germinated growth without the need for chemicals.

Effective stubble management using Opti-Till® is the key to controlling weeds and volunteers and the extensive



*The Claydon Straw Harrow is simple, robust, fast, and highly effective. Operating at 15 - 25km/h, its sprung steel tines pulverise chopped straw and crop residues, breaking it up for fast decomposition, uprooting weeds, and volunteers, as well as destroying slugs and their eggs. The operation is so fast and cheap that it can be repeated every 7 to 14 days when conditions are favourable. So little soil is moved that even if the weather does turn wet the fine micro-tilth it creates in the top 20-30mm of soil will quickly dry out allowing subsequent operations, either another pass with the Straw Harrow or drilling the next crop. The photograph above shows the first pass with the Straw Harrow on 80-acre field in July, immediately after combining. The one below shows the same field on 25 November, by which time worms had taken down nearly all the straw. The field will be drilled with spring oats.*



testing which we have conducted with the Straw Harrow highlights that the frequency of the following passes is crucial to controlling weed flushes with this method. Timing is key, so every time new shoots or growth appear another pass with the Straw Harrow should be carried out and



subsequent flushes removed to ensure that the plants do not get too large and that the implement operates most effectively.

In a trial area on land that we took on this autumn the Straw Harrow was used twice. Weeds and volunteers developed strongly, producing a lot of green material that was too large to eliminate mechanically and had to be sprayed off. With red diesel now around £1.25 per litre, the cost of four passes with the Claydon Straw Harrow is less than one full-rate application of herbicide, so it is very cost effective and reduces the pressure on increasingly costly agrochemicals.

The exact nature of the stubble management process depends on the season. This year for example harvest was incredibly early, so we were able to carry out a first pass with the Straw Harrow in July and subsequently every 7 to 10 days until three or four weeks before drilling, at which point we sprayed off any remaining greenery. The biggest issue after harvest was that the land was so dry and hard weeds and volunteers did not germinate until rain fell. But had we used cultivations behind the combine seeds would have been buried, only to emerge with the growing crop, increasing reliance on pre-/post-emergence herbicides and costs.

### We're not perfect!

All autumn-sown crops on the Claydon farm were drilled

with a 6m version of the new Claydon Evolution mounted drill behind our John Deere 8345. The output from this combination was such that after our oilseed rape had been drilled, we hired it to another farm, generating extra revenue. When it returned, we established all our winter wheat in six days, finishing on 11 October, by which time the combination had drilled our own one thousand acres plus a considerable area on contract.

While most of our crops are in excellent condition not everything has gone quite to plan, and lessons have been learned. Oilseed rape on the 40-acre field beside the access road to the Claydon factory looks a little patchy due to cabbage stem flea beetle and slug damage. The exceptionally dry summer weather forced slugs to go down deep into the soil to avoid dehydration and, when the weather turned wet, they returned to the surface ravenously hungry to feast on the emerging crop.

From that, we learned two things; without the use of the Straw Harrow, given the weather and with no application of slug pellets when drilling oilseed rape, the slugs find it as soon as it surfaces. We applied slug pellets immediately after it rained, but that was too late – we should have pre-empted the slugs' appearance!

**In the next issue I will track the progress of our crops and highlight the benefits which some customers are experiencing from using Claydon Opti-Till®.**

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## Made it Myself Workshop Projects in Issue #121

**Buckrake:** A transport frame carries what the forage harvest team needs.

**Slurry:** A hydraulic powered tower slurry stirrer based on a telehandler arm

**Logs:** stored in modified potato boxes - stackable, easy unload modification

**Salt gritter:** uses Vicon spreader with ground wheel drive trailer towed by panel van

**Seed drill:** Drawbar extension makes tight turns easy

**Grazing:** Grant aid under Sustainable Farming Incentive. Chain Harrows vs Aerators vs Sward Lifters.

**LAMMA report:** Mechanical weeders. Novel ventilated roof ridge. Hydrogen-diesel engine adds 17% efficiency

**FarmWalk:** shows a 500 acre arable farm transformed to regenerative

**Financial Focus:** the investment puzzle, and the financial importance of pensions

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The Claydon Straw Harrow rakes out and destroys weeds and volunteers at the cotyledon and one-leaf stage, removing a key food source for slugs



Excellent soil health is hugely beneficial whether the season is wet or dry, says Jeff Claydon



This photograph was taken on 11 October in a field which Jeff Claydon took on recently. For many years, the field had been min-tilled to a depth of about 150mm and was full of grassweeds which were difficult to deal with, so it received two passes with a Claydon Straw Harrow in early September. The first moved the chopped straw from the stubble onto the ground so that worms could easily draw it down into the soil, while a second encouraged seeds to germinate quickly. The field is destined for spring oats and will be sprayed off prior to drilling



Blackgrass emerging after the Straw Harrow has been used can be taken out with subsequent passes



Large numbers of birds on bare soil indicate a healthy worm population. This photograph was taken in a field on the Claydon farm after it had been drilled with winter wheat in October, then Straw Harrowed to firm the seed in prior to rolling



This photograph, taken on 25 October, shows the effect of four passes with the Claydon Straw Harrow at seven to ten-day intervals, starting in July. Clearly, it has been very effectively controlled weeds and volunteers which would otherwise have emerged, while much of the straw has been taken down by worms. The field was sprayed off with herbicide at the end of October and will be left in this state until drilled with spring oats. Using the Opti-Till® system to manage stubbles helps to eliminate the 'green bridge' effect and reduce the potential for BYDV to develop. It also enables drilling to be delayed, but that means getting the crop in the ground quickly and not having too many operations before sowing.



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# FARMER FOCUS

## TOM SEWELL



**Well here we are again! It's the end of November and as I sit down on a wet Sunday afternoon to write this article at 3.35pm its getting dark outside! Yesterday we heard of the very sad loss of Scottish rugby great Doddy Weir to MND after a brave and long battle with this cruel disease. Life is quite often over so quickly and at times like this at the beginning of winter I always take time to question why we do what we do and how we can improve for next year.**

As farmers we always have that benefit of seasons and harvest. The ability to learn from the last years mistakes and make the necessary changes for next year. Having said that we have a business model so dependant on the weather that quite often making knee-jerk decisions is not the most prudent move. 2021 gave us in the South East a pretty damp and gloomy summer. Hay was made in June and July with very damp soils and almost every ton of harvested wheat needed to be dried. Compare that with the harvest this year where virtually every ton was harvested too dry, ground was so hard and dry that cover crops couldn't be planted and we actually stopped harvesting on 2 days due to temperatures over 40 degrees Celsius! To try and make decisions with the past 2 years as reference points when they have been so extreme is probably unwise.

Last week when Chris asked me for an article for this edition of Direct Driller he mentioned that it was the 5th anniversary and perhaps I'd like to look back on the past 5 years and how things had changed. So I thought I'd look back at where we were 5 years ago, where we are now and what our plans are for the future.

In 2017 we were a good 4 years into our no-till adventure. After gaining a Nuffield Scholarship in November 2012 and travelling in 2013/14 we had been using our cross-slot drill, planting cover crops and not cultivating for enough years to know it worked. Yields and establishment were consistent, we were farming using lower inputs and we continued to seek ways to improve. Having said that we were still using a

relatively conventional agronomist, albeit independent, and applying somewhere near 300kg N/ha in order to get "full-spec" milling wheat. Much of the machinery was very similar to what we are using today with the exception of the drill. Fast forward to this year and over the past 2-3 years we have made a few changes that have had a dramatic effect. The first was to change agronomist and drastically reduce our nitrogen usage. We now use a company that take care of crop agronomy and nutrition as well as soils, and monitoring what's needed. I get access to a team of experts willing to think so far out of the box that farming has become interesting and fun again.

For those of you that aren't aware of our farming system, we farm as a family partnership with my wife Sarah and my parents. My parents are first generation farmers and of the 17 landowners who we work with we only own 4% of the land. Both Dad and myself are Nuffield Scholars and there are a few sayings and helpful quotes that we farm by. When Dad returned from his Nuffield travels in 1991 his conclusion was quite simple "Debt = Vulnerability".

Another one of his sayings is "we make money because we don't spend money". What we mean is that we aim to eliminate all unnecessary costs from the business which allows us to make profit, even in difficult years. There are a number of things that we don't do and each one is our choice and not a criticism of those who do partake in them. Some of these are...the use of P&K from a bag for 18+ years now, borrowing money or the use of an overdraft, buying machinery on finance, working Sundays, paying agents or consultants, using insecticides, seed treatments or 3C growth regulators. We don't bale straw (except for Oat straw before wheat), we don't cultivate other than to lift compaction where necessary, our children don't go to fee paying schools and we are not members of the NFU.

There are a number of marginal gains that are achieved which when combined add up to a significant saving and can turn what would be a loss into a profit.



*Our old combination drill is for sale!*



*No words needed!*



*New shed extension going up*





Avatar planted wheat at 10" row spacing



12m drill! Big IS beautiful!!



But she's a lump!

On the back of my office desk I have a couple of post-it notes stuck to the wall reminding me of important things! One is the dates of birth of my 4 children as I have spectacularly forgotten this in the past when asked to fill in important forms!!

The second one is taken from a Nicole Masters talk which simply lists the following, "MINDSET, MANAGEMENT, MICROBES, MINERALS, ORGANIC MATTER"



Cross-slot and Horsch sprinter left the farm

The other 2 are.. "Need or Want?" and "Watching or Doing?"

I mentioned that we had recently changed our drill. The 4.8m cross-slot drill which we had built on farm in the spring of 2014 had served us well and 2 years ago was backed up by a second hand 4m Horsch Sprinter as we had increased our acreage. With the development of technology, wider drills and a £25k grant on offer we chose to order a 12m Horsch Avatar. This is two and a half times the width of the cross-slot but pulled comfortably with the same tractor! This has dramatically increased our output and reduced our fuel usage. This has meant we can start drilling later in the autumn allowing black grass to germinate and sprayed off pre-drilling. To be honest we didn't need it but the added capacity has been really appreciated this year allowing us to get all the wheat and beans planted in good conditions before the rain arrived.

This year we planted our first wheats all direct into stubbles (bean, grass & linseed) with the avatar. We used home saved seed that was not treated. We didn't roll after planting and then applied pre-em or peri-em herbicides. The drilling was carried out with a 16 year old tractor using roughly 4 litres of diesel per hectare. The crops have all emerged evenly and look well-set going into the winter.

This is where we are currently at! I'm struggling to see where we can save much more money in terms of establishment. Looking to the future there are a few things on my mind that we need to be prepared for.

Firstly getting our yards, stores and basic infrastructure sorted whilst we still have BPS payments. This year we have put up another grain store/general purpose extension to a shed at home giving us another 500 square metres of storage which equates to roughly 1200 tons of wheat. We will spend this winter and next spring putting up the concrete wall panels, spill plates and sorting the yard drainage. In late spring the floor will be laid and the concrete apron finished. Electrics are currently being installed and we'll finish by installing a sectional door. This will then give us three covered bunkers capable of 4000t of wheat storage at home as well as storage at Weald Granary which offers us drying and blending capability. We are continuing to clear out old and unused machinery with the sale of our 3m power harrow combination drill and an Amazon fert spreader which have been unused for the past 5-6yrs+!!

We are looking closely at collaboration with a couple of neighbours to see how we can be even more efficient when it comes to spraying and harvest. And with the run up to Christmas its very easy to spend time and money going all over the country attending conferences, meetings and as my wife would say "jollies"!! I've reduced my meeting attendance to those I deem essential and valuable and would much rather spend a day in the workshop in my overalls with the wood burning fired up listening to the radio whilst fabricating my new workbench! Of course there are some meetings that are just downright enjoyable such as "Nutters meetings" (our local cover crop group) and "farmers fat-boy breakfast meeting"!!! (Nutters plus selected others where we occasionally meet up to have breakfast together)

Meeting up with other farmers for no other reason that to chew the fat and put the world to rights is very important given how much time we spend isolated for long parts of the year. Many may not see it as essential but in order to be successful I believe you have to enjoy what you are doing. I'm optimistic about the future given the changes that we have made over the past 5-10 years.

Finally can I wish you all a very relaxing Christmas and a New Year in which you look out for a neighbour, give that friend a call and take time to occasionally sit back and enjoy the view.

# CARBON FARMING IS GAINING GROUND... BUT NOT FAST ENOUGH

*Rasmus Bjerre-Edberg  
Strategic Business Development Lead, Agreena*

The opportunity for farmers to simultaneously capture carbon and improve their incomes is spreading in agricultural communities across the European continent and beyond. But a new report says the shift is “far too slow” and must speed up or risk “destroying the planet”.

Toby Simpson thinks more could be done to encourage regenerative farming adoption in the UK. “Farmers don’t receive enough support in making big transitions in their farming systems,” he laments. “There’s a lot of information out there, but it’s often hard to come by and to consolidate into a few places. There needs to be a lot more centralised support.”

Growing up on a farm in Northamptonshire, Toby is a graduate from the Royal Agriculture University and a current Nuffield Farming Scholar who farms in a regenerative way via cover crops and no-till planting. He has just finished travelling around Scandinavia, visiting like-minded farmers and seed breeders, to see how adaptable they are at establishing cover crops in a very short window of time due to inclement weather.

Their results have proved successful, but the takeaway is that the overall lack of awareness and education around regenerative farming isn’t an isolated issue. According to the study “Perception of Regenerative Agriculture in Poland”, commissioned by bank BNP Paribas and conducted by research firm Martin & Jacob, 38 percent of Polish farmers participating in the study did not know what regenerative agriculture is (although they were able to correctly associate it with environmental protection, improvement of soil properties and reduction of greenhouse gases).

“It is difficult to have widespread knowledge about regenerative agriculture, since there is a lack of sources of knowledge on the subject in Poland (...) Lack of information is a fundamental barrier to the uptake of regenerative practices,” admits Michal Siwek, Head of the International Food & Agri Hub Department at BNP Paribas.



*Toby Simpson*

## **A warming warning from a top task force**

A recent report conducted by the Agribusiness Task Force, a network of global CEOs focused on climate issues and assembled under the Sustainable Markets Initiative, seems to echo the sentiments of both Toby and Michal. It claims that there needs to be more of a regenerative push and, unless something is done to immediately change the world’s agricultural practices, the planet runs the risk of ruin.

These words might sound draconian, but the lethargic pace of regenerative adoption has the world’s largest and most influential agribusiness companies and organisations worried enough to launch an action plan to scale regenerative farming globally in order to tackle the impacts of climate change and biodiversity loss.

“Regenerative farming is a critical part of the solution, and our report shows all too clearly that – despite pockets of great work – adoption rates are far too slow as the short-term economic case for change is not compelling enough for farmers,” says Task Force Chair and outgoing Mars CEO, Grant Reid. His outlook is shared by other task force members who act as CEOs for global conglomerates Bayer, HowGood, Indigo Agriculture, McCain Foods, McDonald’s, Mondelez, Olam, PepsiCo, Sustainable Food Trust, Waitrose & Partners and Yara International.

Their report goes on to state that the worldwide adoption pace must triple by 2030 to have any chance of keeping global warming under 1.5 degree Celsius. The 1.5 degree Celsius target is the goal of the Paris Agreement, which calls on countries to take concerted action to limit global warming by reducing greenhouse gas emissions. Scientists argue that if this temperature level is breached, it will unleash even more catastrophic climate change on the planet. “The 1.5 degree Celsius figure is not some random statistic”, warns World Meteorological Organization (WMO) Secretary-General, Petteri Taalas. It’s “rather an indicator of the point at which climate impacts will become increasingly harmful for people







and indeed the entire planet.” And if that wasn’t enough to put adoption into action, the WMO goes on to claim that there is a fifty-fifty chance of the average global temperature reaching 1.5 degrees Celsius within the next five years, and the likelihood is increasing with time.

The Intergovernmental Panel on Climate Change (IPCC) has also recognised that carbon removals are critical to addressing climate change, reporting that greenhouse gas (GHG) emission reductions will not be enough to meet the 1.5 degree warming target. One billion metric tonnes of carbon will need to be removed annually by 2030 and five to ten billion metric tonnes

annually by 2050. With <10,000 metric tonnes worth of CO<sub>2</sub> removals thus far, the industry needs to scale and develop rapidly to avert catastrophic results<sup>1</sup>.

### Scaling voluntary action carries enormous potential

With COP27 freshly in (but hopefully not disappearing) the rear-view mirror, the subject of catalysing growth in green businesses and innovation to initiate carbon removals and combat climate change was a hot topic on the agenda. And while agriculture has historically been singled out to blame for the climate crisis, accounting for approximately 20% of global GHG emissions, the sector is now seen as a windfall of opportunity to become part of the solution, with farmers acting as climate heroes for our future.

But transitioning away from conventional practices to more regenerative ones is easier said than done. That’s because farmers don’t know why they should change their production model in the first place,

and they don’t know what benefits and losses they will have from doing so, although most seem to assume it involves some level of bureaucracy and are not interested in these solutions, regardless of the benefits they may incur.

The carbon market is changing that assumption, representing a new revenue stream for farmers who voluntarily join the green economy, with rewards that can be reaped annually. In fact, McKinsey & Company estimates that the market for carbon credits could be worth upward of \$50B in 2030. And nature-based solutions, such as soil carbon, are estimated to account for 65-85% of the total credit supply.

“This is about opportunity, and it’s about playing offence,” says UN special envoy on climate action and finance Mark Carney. “It’s an industry getting together; because of what [leaders] are doing through their supply chain and business processes, [they’re] re-engineering and reorganising competitiveness. That’s fundamental. That’s offense.”

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## Scale with a little help from friends

Farmers simply cannot carry the burden of solving the climate crises alone. To scale the uptake of carbon removal practices, private entities, such as Science Based Targets and Greenhouse Gas Protocol, need to collaborate with public programmes and policymakers on local, regional and national levels in order to advance the climate-smart agriculture agenda and move the industry forward to net zero. This means clarity across the board when it comes to scaling carbon removals, including:

- Wider recognition for the carbon certificates generated in the agricultural sector
- Standard setter being more open to agriculture-based projects
- More clarity across the relationship between countries' Nationally Determined Contributions (NDCs) and carbon-related projects
- A healthy relationship between the

supply-chain / carbon neutrality process – avoidance of double counting

Scaling green carbon initiatives and technology holds enormous promise for a net-zero transition. Interestingly, global carbon projects financed by the voluntary private sector have already reduced over 450M tonnes of CO<sub>2</sub>e, which demonstrates tremendous potential. But it will require more massive leaps in progression to “hyperscale” climate technology innovation to the



level needed to comply with targets. In fact, McKinsey partner Anna Granskog has suggested the need for 200 to 300 green decacorns (unicorn companies worth at least \$10 billion) by 2030 to meet climate targets.

“You need partners, you need friends,” admits Anna during a COP27 panel discussion on scaling new green businesses. “There’s no silver bullet. We need huge amounts of deployments toward all technology.”

Agreena provides innovative technology that scales knowledge through their soil carbon programme, AgreenaCarbon, allowing farmers to take active, accelerated participation in the carbon market and help in the fight against climate change. Agreena is currently live in 14 countries and will expand to seven more before the year’s end.

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# FARMER FOCUS

## SIMON COWELL



### Autumn Drilling

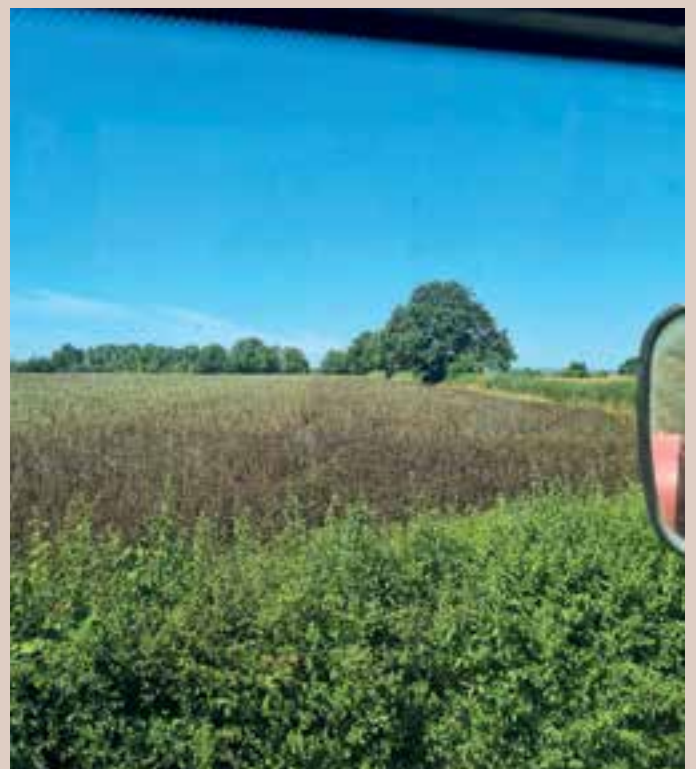
After the summer's hot, dry and easy harvest, my drilling season proved to be somewhat frustrating. Soils were baked hard and cracked right through until the middle of October, small bits of 3 to 5 millimetres of rain dried within twenty-four hours meaning that even if I could get seed into the ground, it would have had to sit and wait for considerable rain to trigger germination. By about the fifteenth of October, land after winter beans and lucerne were just moist enough down to about an inch and so I was able to drill into this shallow layer with the Sim-tech. Pre-em herbicides and Avadex went on the day after and have done a brilliant job of stopping blackgrass emerging with the wheat. Unfortunately, wheat stubbles and land after linseed were so cracked to depth, and with my high magnesium levels setting the surface like concrete, there was no way they could be drilled. Of course, then the weather turned and it was then a case of trying to find a couple of consecutive dry days to do any more drilling. I did manage to get some winter barley into some wheat stubbles around the tenth of November, and although it was sort of "kicking mud of your welly boots getting back in the cab" conditions, it has now come well, albeit with a little blackgrass for company. I still haven't drilled the ex-linseed ground and don't think there is much chance now. This is proving to be a bit of a flaw in my system. Linseed is a fantastic crop for me, I always get the best wheat yields afterwards and it leaves the soil in perfect condition. It doesn't need to be drilled too early in the Spring allowing time for the soil to dry and because I have a Stripper Header, it is quick and easy to harvest. The only problem is that for the following crop, I have to use my Moore Uni-drill to get through the standing linseed, the tined Sim-tech bungs up within a few yards. Whereas the Sim-tech will go in wet or dry conditions, the Moore is much fussy, too dry and it just rolls along on top, too wet and it smears the slots and just make a mess. Unless the weather co-operates, I can end up not getting a crop in, which has happened once or twice before.

### Headland Effect

Like several other longer term no-tillers I have spoken to, my headlands are yielding more than the rest of the field. When this started to show a few years ago, I thought that maybe there was some sort of benefit from natural biology encroaching from the hedges and trees around the outside. It is now obvious though, that from the sharp drop off in parallel lines around the headlands, the effect is directly related to where I am turning with drilling, harrowing and rolling operations; the outside of the field is being compressed twice or three times as much as the centre of the fields. All my field operations are done at different angles, straw raking at 45 degrees, drilling 15 degrees from the previous year, post drilling harrowing and/or rolling at up

to 90 degrees; this means that every headland is a turning headland so the effect goes right round every field. I now think that the headlands are how things should be and that there is something going wrong with the rest. It appears that this no-till soil is becoming too loose, too free draining and too aerobic. It seems to me that the physical is affecting the biological, and therefore there is a difference in the chemical (nutrient availability).

Back in the summer I decided to do some investigations, taking soil and tissue samples from obviously good headlands and out in the main parts of fields of wheat and beans. I now have Olson, Albrecht, La Motte and Total test results, tissue analysis, mycorrhizal colonisation and comprehensive soil biology analysis. There is a marked difference in Phosphate availability on the Olson tests but all the other soil tests show the same levels across all samples. Mycorrhizae are no different, but there are some big differences in fungal:bacteria ratios and the numbers of some protozoa are vastly different. I am starting to build a picture of what is going on and will be doing more complex biology tests when the soil warms up in the spring. I would like to thank Robert Plumb of Soil Fertility Services for his help in organising the testing, sending samples to many different laboratories across the country. Robert recognised the importance of finding out what is going on in the soil, and whether it had implications to the general idea as to whether we should be striving for more aerobic and fungal dominated soils.



Headland effect in beans





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# DRILL MANUFACTURERS IN FOCUS...



*Written by Mark Hatton*

**When you get asked by one of the world's biggest machinery manufacturers to attend the press launch of its new drill, it's pretty difficult to say no!**

On a recent trip to Germany, with Vaderstad UK, I had the opportunity to find out much more about the company, its history and a little insight into their future plans.

60 years of agricultural machinery innovation is quite some achievement.



From its origins in Sweden to its now global market, Vaderstad has been manufacturing tillage and sowing equipment since 1962.

Now in its third generation of family ownership, headed up by its president and CEO Henrick Gilstring since February 2022, the company's 13 shareholders are all very much part of the family.

With its roots still very firmly in Sweden, Vaderstad is now represented in over 40 countries worldwide, employs over 2000 people, manufactures over 7000 machines and over 1,000,000 genuine wear parts annually.

2022 has seen an overall growth of 25% on the previous year, with new markets, such as North America expanding by over 40% with acquisitions of brands such as Wil-Rich, Concorde and Wishek.

Vaderstad is truly a global brand.

The company has, in many ways, led the industry in terms of technology and innovation.

Since its first rigid tine harrow in 1962, right through to present day and the new Proceed Drill, the brand has been synonymous with machines such as the Rapid, Carrier, Topdown and Tempo.



Its four worldwide research and development sites continue to combine agronomic science and trends with technological development, producing machines that will aid farmers around the world combat the challenges of a growing population, climate change, sustainability and rising input costs.

Complementing the R&D sites is the new Vaderstad Farm Germany, a purpose built facility for training, networking and farming trials.

The farm offers a one stop facility, that allows Vaderstad to share its knowledge with its employees, external partners and farmers alike,

This includes field trials with external partners, such as Sygenta, allows for knowledge exchange, such as transition from a wheat dominated to a multi-crop rotation new crop trials and Cover Crops permanently integrated in-crop rotation allow for machine demo plots throughout the whole year.

One of the Vaderstad Farm's design features is its viewing





area, perfect for showcasing the company's machinery.

One of the best known and most successful Vaderstad machines has been the Carrier disc cultivator range, mounted or trailed from 3-12m widths, with multiple options of discs and packers.

The latest innovation to the Vaderstad disc range is the Crosscutter disc Aggressive, designed to give better penetration in hard, challenging field conditions, a further benefit of the CrossCutter Disc Aggressive is that it will act more aggressively in heavy residues such as silage maize, heavy oilseed rape stalks, or sunflower stubble, aiding the breakdown of large volumes of material.

The latest revolution in planting technology from Vaderstad is the new Proceed. The challenge, accurate seed placement, accurate seed depth, by reducing seed rates at planting while not affecting overall yield at harvest, impossible?

Proceed is a whole new category of seeding machinery. With an unmatched level of precision, it works with full capacity to fit every farmer's needs. This one machine can increase the yield potential of a full range of crops, such as cereals, oilseed rape, sugar beet, peas, maize and more. Proceed simply offers more than any previous seeding machine, making farmers ready for a fast changing future.

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With the overall goal of using lower seed rates, the requirement for huge hopper capacity isn't needed, this in turn reduces overall machine weight, which ultimately benefits the soil structure and a reduction in fuel usage.

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Expected to be available to purchase later in 2023, the results so far have been very encouraging.

If the last 60 years is anything to go by, the future of Vaderstad looks to be in safe hands.

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# DE-RISKING OSR ESTABLISHMENT

*Farmers are reporting positive benefits of drilling primed seed*

Despite 37 years' industry experience, Agrii agronomist David Vine readily admits that growing oilseed rape successfully year-in, year-out can still be a huge gamble for many growers with significant challenges posed by slugs, pigeons, cabbage stem flea beetle (CSFB) and, given this year's weather, the often-difficult task of finding adequate soil moisture.

*David says: "It's still a lottery and, over the last 37 years, I'd argue that it has become even more difficult, with serious blackgrass resistance and the neonicotinoid ban to add to that list of challenges."*

"However, there are new ways in which rape growers can stack the odds in their favour. The advent of priming technology into oilseed rape in the last two years has made a difference. It's a proven technology that increases early plant vigour, offers more even crop germination and, given that there are no chemicals involved, it's a sustainable and environmentally friendly process" he adds.

Working with farming business A & E Beckett, based near Birmingham, David recommended a trial on 21ha of primed Tennyson, the only primed hybrid OSR variety available in the UK. Direct drilled for minimum soil disturbance on August 12th, at a rate of 50 seeds per M2 along with two unprimed varieties, David confirms that the early results have been extremely promising.

"We drilled the primed Tennyson in fields that had been left fallow for one year, but despite this unusual scenario, combined with only 30mm of rain in

the first 3 weeks post-drilling, the crop came through with great uniformity and continued to grow well despite the combined attention of CSFB and significant pigeon populations. By the 3-4 leaf stage the Tennyson still looked healthy with only small shot-holing on the leaves from the CSFB grazing.

*"Unfortunately, the two unprimed varieties suffered heavy attacks from flea beetle on August 24th and 25th and we were forced to spray some growth stimulants to help them. However, the primed Tennyson crop didn't require a spray due to its advanced early growth stage."*

Beyond the priming technology, Tennyson is an impressively resilient variety with a strong disease profile. Its

verticillium resistance trait could also be a major positive on farms with tight rotations and I will be following its progress closely" he concludes.

Based on the Lambourn Downs, between Wantage and Lambourn in Oxfordshire, farm manager Piers Cowling of Sparsholt Manor Farms direct drilled 62ha of primed Tennyson at 40 seeds per M2 on Sept 3rd, having achieved 3.45t/ha on a 50ha crop of unprimed Tennyson earlier this year.

Piers says: "With no rain in August we were forced to drill later this time, although there was a lot of confidence behind Tennyson, given we knew it had displayed significant early vigour last year.

"Of the rape varieties we selected, Tennyson was the last to be drilled but - despite the staggered starts, all 3 varieties emerged together during the week commencing September 11th, with the Tennyson crop the most uniform of the 3. With the benefit of some much-needed October rain all our rape is progressing well, successfully overcoming some CSFB grazing at the expanded cotyledon



*The dense canopy and even crop coverage of primed Tennyson discourages pigeons from settling in the crop*





9 weeks post-drilling farmer Peter Legge's crop of primed Tennyson was a uniform 25cm in height and at the 10-12 leaf growth stage.

from pest activity. We've been working closely with Simon Hobbs for over 15 years now and, having seen Agrii's trial results on primed OSR seed, it was a no-brainer to trial a primed variety.

"The early visual signs were very positive with the crop showing very even emergence 6 days post-drilling. During the second week of September, we did see some CSFB grazing activity, but we were quick to react, adding an insecticide to our post-emergence herbicide tank mix that kept the crop on course, with only low-level shot-holing noted in most of the young OSR plants.

"I think we were more confident this time with primed Tennyson, evidenced by our decisiveness with the herbicide spray. In other years, following a flea beetle attack, we'd have occasionally held back on applying further inputs until we'd properly assessed levels of crop damage. As of late October, 9 weeks post drilling, the Tennyson crop was at the 10-12 leaf stage with a healthy, dense canopy that tends to stop pigeons from settling in the crop as an additional positive" concludes Peter.

stage" concludes Piers.

Farmer Peter Legge of Legge Farms Limited, based on the Norfolk-Cambridgeshire border, has been growing OSR for the last 15 years across soil types ranging from heavy clay to sharp sands and organic black fen. Working with Simon Hobbs of Agrii, Peter direct drilled 50ha of primed

Tennyson on August 25th-26th, later than planned due to the prolonged dry spell.

Peter says: "The first month is always critical, and you have to give the young rape crop every advantage available during the first 4-5 weeks of its existence to try to ensure good germination and rapid growth away

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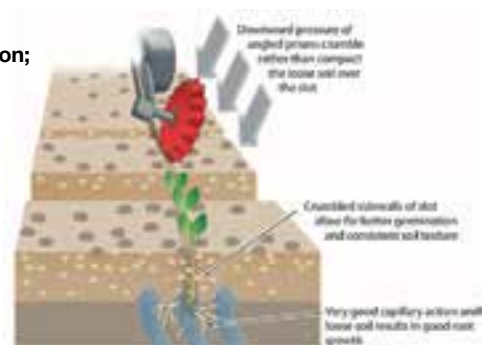
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# FARMER FOCUS

## BEN MARTIN



Well, the last few weeks have been exciting! A few weeks back I finished a 7yr stint managing a large veg and cereal operation in West Suffolk and am now taking a bit of time off to explore what direction I want to take myself and my little family next. Taking a bit of time out has come at a great time for me personally, we have come through yet another season of intense pressure to get crops to harvest (thanks mainly to that wonderful draught we had) and I need this time to decompress, to see what is out there (potentially outside that farm management bubble) and to start the new year in a rejuvenated mindset. Oh, and I turn 40yrs old shortly – talk about a midlife re-evaluation!!



So, how did I arrive at this point? Before I come to that, a quick intro. I'm Ben, I live in a glorious part of West Suffolk, with my amazingly supportive wife Emma, our beautiful little girl Maeve and our spaniels. I love spending as much time with them all as possible, but I enjoy my own company as well – out walking and exploring, cooking and watching the mighty Ipswich Town Football Club.

Farming is all I have ever known really, I don't come from a farming family as such, but Dad and Grandad worked for the local farmer for most of their careers. We lived in a tied farm cottage on one of the farms, it was just the best environment to grow up in. We were lucky enough to been bought up around plenty of animals, sheep, pigs, chickens, and goats were all family pets during our childhoods. My teenage summers were spent working for a neighbouring farming family, they gave me the most wonderful start to farming and instilled into me early on, how to work hard, attention to detail and how to look after people (the best harvest teas ever!!).

An Agricultural degree from Writtle College came next and like most old Agri students will say, that was the best 3 years ever! Learning a lot, socialising A LOT and making the best friends. Friends that are still very much part of my life 20yrs later. I spent the rest of my twenties gaining so much real-life experience of farms. Working on remote sheep farms in the darkest depths of mid Wales, silage seasons in Yorkshire and big arable farms in East Anglia. I loved them seasoning rolls, traveling around and meeting some great people.



The backend of my twenties I met my now wife Emma, another Young Farmers success story! During that time I was really enjoying things, as everyone should in their late 20s. I was working with a really kind and supportive farmer, where I was able to use spare bits of his farm to establish a firewood business and rear rare breed pigs in his woodlands. It was a great time, hard work but so rewarding. I was also lucky enough to secure a 6yr FBT of my own, on 32ha of arable land, what an eye opener that was – growing and financing my own crops. An experience not many farm managers can say they have had and one that I learnt so much from. It was during this time that I had my first real exposure to cover crops and direct drilling. I established a basic mustard cover crop on my land in front of potatoes and using a Claydon Drill with the chap I was working for.

In my 30th year, after much saving, my wife and I had a once in a lifetime trip to New Zealand. We travelled the South Island in a camper and had the time of our lives. With no real time pressures etc, we just plotted a big loop around the Island and spent the next 4 weeks in our camper cruising around exploring the amazing South Island. An unbelievable experience, as everyone says who has been to NZ, but also an experience where I had time to reflect on things and concluded







that as much as I had enjoyed my late 20s, I wasn't going to have the structure or security by carrying on, to support a family in the future. So, when we got back, I had a final year doing what I had been before we went and then decided to try and carve out a career in farm management.

The next 7yrs was spent as assistant, then manager, on a 1300ha veg and cereal business. A massive opportunity and one where I learnt a huge amount. A complex operation, with high value crops, irrigation, several full-time staff, draught prone light sandy soils and working with various landowners. During my time there I had support and a real driving passion to try my hardest to repair and improve the soils on the farms involved, without removing the veg crops from the rotation. Not an easy task – but one that I was not alone in tackling. Taking things cautiously and steady, I started with 10ha of over winter cover crops in my first year to cover cropping all land in front of spring crops in my last couple of seasons (400ha) and integrating livestock into the system by having sheep on farm to over winter on these cover crops. The farm staff bought into my vision, that was very important. Cover crops were a vital tool to helping the soils improve, as was working the light soils a lot less and only cultivating deep where absolutely necessary. Companion crops were grown alongside OSR crops, catch crops between early lifted veg and following cereal crops and a 4ha regenerative potato trial grown alongside a very supportive processor. Introducing a 1 pass drilling system, using a new low disturbance subsoiler tool bar and the existing drill (Horsch Pronto) hooked on the back, was a real success. Financially, there was a huge reduction in establishment costs but also a much-improved timeliness of the operation as it cut out 2 cultivation passes.



I was fortunate in being able to bring inspiring and highly experienced people on the farm, such as Ian Robert and Ben Taylor Davis, to help us along with what we were trying to do. Getting the whole team around a soil pit on the farm, with Ian stood in the bottom of it was one of the best spent days we all had as a collective!

However, things move on and as a lot of people have told me recently – a change is as good as a rest!

So, what now...?

This is where it gets exciting!

Since posting on Twitter that I was moving on and looking into future opportunities, I have had several conversations with people about future roles and direction. Areas of agriculture I hadn't really considered historically but ones that now look attractive. I am approaching all of this with a very open mind – you have too, that farm management bubble I had been in for several years does seem to prevent you at times to see the bigger, industry wide picture.



I am focused on an environmentally sensitive farming approach; I would certainly be keen to stay in farm management and work with a landowner who is of a similar mindset. I have known great people like Adam Driver and John Pawsey for along time now, they are good friends, I have worked for them both and in my opinion, they epitomise how large farms can work closer with the environment, albeit using 2 differing approaches to farming their land.

My short-term aim is to get out and about, meeting and chatting with as many people around the UK as possible. People that will lend me an hour or 2 of their time, just to chat and have a wonder around their businesses maybe. Not just chatting farming, but life, business and general stuff too. I have got recruiters lined up to chat with, companies to chat with who have approached me, but I want to speak with individuals as well.

As I said earlier, I am open to all discussions going forward. I know I have a lot to offer, its just finding that opportunity that fits right for me and my family going forward. Please do drop me a message if you would like to have a natter and have an hour spare! So, for now, I am going to enjoy some quality time off with my beautiful girls. And some long dog walks!

Email – [bencmartin@hotmail.co.uk](mailto:bencmartin@hotmail.co.uk)

# NO-TILL, CATTLE & DIVERSE COVER CROPS MIX WELL

Written By Sarah Hill and originally published by No-Till Farmer in the USA



**SHORT GROWING SEASON.** No-tiller Kurt Stiefvater has a very short fall season to get cover crops planted, and the weather plays heavily into his selection of which cover crop species for a mix.

The combination of a 3-way crop rotation, covers and grazing is resulting in big savings by reducing the number of tillage passes, increasing yields and improving soil health.

In farming, it's the little things that will get you — or add up to more profits if they're done right.

Salem, South Dakota, farmer Kurt Stiefvater, knows something about that. He started no-tilling 20 years ago to save soil moisture and save more money by reducing the number of tillage passes.

He added small grains and cover crops to the 1,800-acre operation 8 years ago, and those decisions have improved Kurt's yields, soil health and the condition of his cattle herd.

## No Hard Formula.

Kurt has a very short fall season to get cover crops planted, and the weather plays heavily into his selection of which cover crop species for a mix. If a field has more alkali spots, he'll add barley. He tends to be careful with brassicas and doesn't use buckwheat much as he doesn't feel it's very easy to control.

His 8-10 species cover crop mix typically includes 10 pounds of oats; 12 pounds of winter wheat; 2 pounds of sorghum; 15 pounds of soybeans; 1 pound of red clover; 2 pounds of sunflowers; ½ pound of flax; ½ pound of turnip; and ½ pound of radish. He might also throw in rye, legumes, millet or common vetch.

In addition to the weather, Kurt looks at the different characteristics of each cover crop species when choosing which ones to use in his mixes, as well as what his 130 pairs of Black and Red Angus cattle will graze. He uses an oil variety of sunflowers because even though the seeds aren't viable, the cows love to eat them.

"That's why I tend to use more small grains and sorghum in my cover crop mixes," he says.



**MILLION SEEDS PER ACRE.** Oats are part of Kurt Stiefvater's 3-way rotation, planted around April 1. He plants 80-85 pounds per acre of oats with a goal of seeding 1 million seeds per acre.

Most of his cover crops either winterkill or are grazed, but for any cereal rye or winter wheat that survive, he uses a pre-emergence herbicide application to terminate them.

"We've had more problems with winter annuals, dandelion, etc.," he says. "I add a little 2,4-D to knock it back."

He adds that using cover crops has allowed him to cut his rates of nitrogen (N), phosphorus (P) and potassium (K) by about 20% each. Kurt only uses 0.8 pounds of N per bushel of yield goal now, compared to the 1.2 pounds per bushel of yield goal that he used to use, without yield loss. He has added

some sulphur and boron to his fertilizer plan, too.

## Waiting Game.

He uses a 3-way rotation of corn, soybeans and oats, but he has to wait sometimes for the right conditions to plant, compared to his neighbours.

Oats are planted around April 1. Corn planting starts around April 20-25 with beans following that.

Kurt plants 80-85 pounds per acre of oats with a goal of seeding 1 million seeds per acre. He plants with a Case IH SDX with a 2330 air cart at 7½-inch spacing.

He seeds 32,000 seeds per acre of corn using a Case IH 1245 drill with Yetter SharkTooth row cleaners out in front to clear away extra residue. A Case IH MX 255 pulls the planter and the drill.

"We've used untreated corn before with no problems," says Kurt. "It's hard to order corn seed without a seed treatment, so then we're stuck with that variety. We tried planting some corn with the air drill and had fair success with it. We're trying to figure that out because it needs to be more accurate."

Soybeans are seeded at 120,000 seeds per acre. He's transitioning to using an air drill for planting all crops.

"We were using 38-inch rows in the late '90s," he says. "We bought a planter with a splitter attachment so we could go down to 19-inch rows of corn."

The narrower rows on the 100% no-tilled ground created a canopy quicker in the corn, blocking weeds and saving moisture because the sun wasn't beating on the soil.

"As we upgraded equipment, we stuck with 22-inch rows," Kurt explains.

Kurt says he applies a 6-24-6 fertilizer starter and broadcasts a light rate of P, K and N as a dry fertilizer before planting.

"I apply half of the N before planting, then come back at the end of June and sidedress with 28% urea using drop nozzles on my AGCO 854 Rogator



sprayer," he says. "Dry fertilizer is put on soybeans, but it's spread out over 2 years."

Kurt applies enough P and K to the corn that the soybeans have some for the following year. He applies 25 pounds of N, 35 pounds of P and 45 pounds of K to soybeans; 70 pounds of N, 45 pounds of P and 45 pounds of K to oats; and 0.8 pounds of N for corn. Soybeans are inoculated with a bacterium.

When his corn and bean yields plateaued, Kurt says he had to figure out a way to make more P and K available in the soil.

"We achieved that goal by working more nutrients in the rotation and adding more crops, like oats, to our rotation," he says.

*"Adding winter wheat to the rotation was an experiment..."*

*Kurt Stiefvater*

Oats are harvested the first week of August, and covers are planted after that.

"We yield 100-130 bushels per acre with oats, which is 10-15 bushels better than the historical average in our area," he says. "If it really grows well, and we have a good year, I can sell part of the oat straw for extra income."

Corn and soybeans are usually harvested mid-October through November using a Case IH 7120 combine. Kurt has a Case IH draper head for soybean harvest and a Capello corn head for corn harvest. Corn yields have been in the 190 bushels per acre range, and Kurt goal is 200 bushels per acre (13.5 tons per hectare). On average, soybean yields have been 50-55 bushels per acre (Approx 3.4 tons per hectare).

Kurt says he experimented with planting flax and oats with a Case IH planter, switching the discs on it for more uniform planting depth.

"We planted 22-inch rows, coming back and offsetting 11 inches for the oats," he says. "We got good emergence,

and we used a lot less seed and had more accurate planting.

"Adding winter wheat to the rotation was an experiment," Kurt says. "It was food grade wheat, hardy enough to meet the necessary specifications for the food market."

### **More Days, More Grass.**

Kurt says he wants covers in his program that will provide enough growth to be used for winter feed for his cattle in their rotational grazing program.

Kurt manages 600 acres of pasture, renting three-quarters of that acreage from family members and neighbours. He has 9 paddocks where cow/calf pairs graze and utilizes conservation stewardship programs through NRCS.

He has pasture taps or water lines centred in each pasture that makes a pie shape away from the tank for a water source. He uses electric fence to divide up the pasture into equal acres and rotates the cattle so they still have access to water.

Since switching calving from March/

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April to mid-May and June, he says that mother cows are milking better on the larger amounts of grass available.

"The cows also get more water in their diet, compared to eating dry hay," Kurt says. "That's helped with calving problems."

Calves are healthier at birth because cows aren't experiencing their last trimester during the coldest part of winter. And since they're not fighting the weather, the cows don't need such a high requirement diet for a stressful season. He keeps pairs in groups of 10-20, and they're out on pasture until the grass gets short. In November, he moves them to a cover crop field.

The cattle have seemed to really like the diversity of the cover crops, according to Kurt.

"They eat more, and it's easier on the cows," he says. "Calves get a variety to eat, and I can tell they're gaining. The cows have better body condition scores. I keep salt and mineral in front of cattle year-round so they get a better balance of nutrition. When the cattle are grazing cover crops, they hardly use any of it."

Calves are weaned the first week of December and sold the first week of March.

Kurt notes that the fall was dry in 2020, so the covers didn't grow much. But most years, grazing cover crops cuts his hay usage by 40%.

**Tracking Soil Organic Matter.** The farm's soil organic matter was going down before they switched to no-till, Kurt says. He began doing soil testing every 3 years after soybean harvest to track organic matter levels.

"When we first started no-tilling, we were getting a 2-2.5%," he says. "We've seen some fields increase to above 4%."

## Cows' preference.

Because Kurt Stiefvater grazes his covers, he includes more small grains and sorghum in cover crop mixes. He uses an oil variety of sunflowers because even though the seeds aren't viable, the cows love to eat them.

Kurt has a wide variety of soils, from gravel to heavier loam to sand and even higher clay content. Their soil has 6-10 inches of black soil and then turns to clay, so water tends to be held toward the surface.



To boost soil health, Kurt likes to incorporate legumes and sunflowers in his cover crop mixes for their taproots that burrow down into the soil.

"I try to have lots of living roots to keep the soil active as long as I can, even after a freeze," he says.

The cover crops provide protection to the soil throughout the winter, resulting in less blowing soil and erosion from the wind and water. An extra benefit for Kurt is the wildlife like deer, pheasant and partridge flock to the covers as a food source.

"We're still in transition phase," he says. "We keep learning more about how different plants interact with the soil and how to manage that. We're trying to maximize the soil and keep a living root as many days out of the year that we can and incorporating livestock. I really like the soil biology component that cattle traffic stimulation does to the soil, the way the cattle cycle nutrients and spread them across the field."

Kurt says that the soil biology helps his cash crops take off once the plants get rooted.

"I really like having mycorrhizae in the soil, since they help plants capture the nutrients and water in the soil," he says. "The soil biology needs oxygen, too."

Kurt has seen improvements in the water-holding capacity of his soil. He gives the example of a dry spell in 2020.

"Having that protection with residue and more earthworms and other insects digging around in the soil really helped," he says. "I like to get out and sidedress fertiliser or spray right after a rain, but I don't have to worry about getting stuck. The soil can hold the equipment better on wetter soil."

The improvements he's seen to his

soils go beyond the top layer. Kurt says he's dug soil pits and used a shovel to evaluate his soil and he's been impressed with the results, as roots are expanding better and there are more places for the roots to grow through earthworm holes.

The South Dakota Soybean Association conducted nematode tests on his property and found that they were way down. Kurt seeks to keep improving his soil by increasing organic matter and cutting down on erosion, while not using any insecticides or fungicides.

"When things are all in balance, you shouldn't have any rootworms or an imbalance of nematodes to treat," he says. "We don't use insecticide or fungicide because they might disrupt what's going on in the soil. Insecticides and fungicides don't just kill the bad stuff — they kill the good bugs, too."

## Savings That Add Up.

Kurt says he's looking for ways to change things up to save money and time. One example of that is selling seed oats, which he says are relatively cheap. He has saved \$100-110 per cow per year on extra feed costs.

"If we get hailed out or if it's too dry and we can't harvest the oats for grain, we can use them as a winter back up feed source for the cattle to graze or even harvest it by putting it in big round bales," he says. "It's a versatile crop. Barley is the same."

Switching to no-till has already saved Kurt a bundle. He says that cutting just one tillage pass has saved \$15-20 per acre.



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# NITROGEN STABILISERS

## (PART 2): CARBON INPUTS

Joel Williams, Integrated Soils

In part 1 of this article, we highlighted that both urease and nitrification inhibitors have a minor impact on soil biology but there remains some concern over the negative impact of urease inhibitors on the plants ability to take up and metabolise the urea form of nitrogen [N] – a favourable and efficient form of N for plant growth. Outside of these phytotoxicity concerns, synthetic inhibitors also have other drawbacks, including difficulties in application, cost, degradation, pollution and entry into the food system<sup>1,2</sup>. Beyond these chemical inhibitors, there are other compounds of interest that can bring similar benefits – naturally occurring, biological inhibitors and carbon-based compounds that can stabilise N inputs and slow the conversion of N to reactive and unstable forms.

### Biological Inhibitors

We will discuss below the potential of humic substances to bind to and stabilise N inputs however they have also demonstrated both urease and nitrification inhibitory properties<sup>3-6</sup>, no doubt part of their modes of action. Additionally, a range of plant compounds (plant/tissue extracts) have also been identified – generally discussed in the context of decaying residues of cash or cover crops – but also, plant extracts such as garlic or aloe vera have demonstrated urease inhibition properties. All this said, it is plant root exudates that are currently a noteworthy emerging area of research into identifying novel biological nitrification inhibitors<sup>1,2</sup>. A potential pool of hundreds of compounds may have these properties and currently, five compounds exuded from sorghum (*Sorghum bicolor*), signalgrass (*Brachiaria humidicola*) and rice (*Oryza sativa*) have been identified; while inhibition has also been observed in wheat (*Triticum aestivum*) but the specific biochemical has not been identified<sup>2</sup>. Brassicas are of course well known nitrate accumulators<sup>7,8</sup> but perhaps there is merit in including sorghum and rice in cover crop blends to support nitrogen retention.

### C-based Inputs

C-based inputs that have demonstrated an ability to stabilise N include humic and fulvic acids, molasses, biochar, oil-based compounds and raw humates (Figure 1). Beyond C inputs, coating fertiliser granules with inorganic nutrients such as sulphur, ammonium

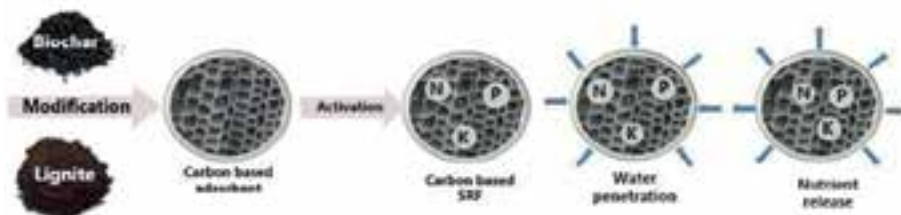


Figure 1: C-based inputs such as biochar and humates help induce a slow-release fertiliser effect when combined with nutrients.

thiosulphate, zinc or boron has also been demonstrated to induce a slow-release mechanism of the N.

The mode of action of C-based inputs is really quite straight forward – rather than apply highly available and reactive N as simple ions in an inorganic form, by combining them with a C source, the C acts like a sponge to bind and complex the N into a larger C-N based molecule. Figure 2 depicts the complexing of a simple ion into an organically bound, larger molecule. The C atoms that bind to the N ultimately stabilise the N preventing volatilisation and/or conversion into nitrates and also prevents the leaching of nitrates due the highly charged surfaces of the C sponge that attaches to soil particles and keeps the complex in the root zone.

By combining nitrogen inputs with

humic and/or fulvic acids, studies have demonstrated reductions in ammonia volatilisation<sup>4-6,9,10</sup>, reductions in nitrous oxide emissions<sup>5,11</sup>, increases in soil ammonium<sup>3,5,9-12</sup> and nitrate<sup>10,11</sup> retention, increases in yield/biomass/plant growth<sup>11-16</sup> and nitrogen use efficiency<sup>11-14,16</sup>. Even humates or the raw brown coals that humic and fulvic acids are typically extracted from have also been used to stabilise N and improve N retention in the soil<sup>17-19</sup>. Of course, even composts and manures contain a range of humic type substances which can also provide this benefit when these organic amendments are used in conjunction with conventional fertilisers – a best of both worlds approach.

Despite molasses having nowhere near as high exchange capacity as humic or fulvic acids, a study from Australia in sugarcane demonstrated that

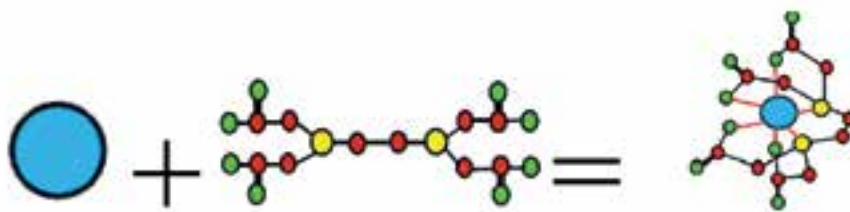


Figure 2: Including a carbon source with soluble nutrients forms a carbon-nutrient complex with greater stability.



when combined with liquid fertiliser, molasses stimulated the soil biology to immobilise the nitrogen by consuming it along with the carbohydrates from the molasses. This essentially tied up the N within the living microbial biomass which created a slow-release mechanism for N release at a later date. This study demonstrated that the biology immobilised 18% of the nitrate within 2 hours and 95% of the nitrate by the fourth day of incubation<sup>20</sup>. This highlights the high digestibility (and biostimulant effect) of the C in molasses provides an alternative pathway for N stabilisation as compared the C sponge provided by humic substances that binds to the nutrient.

Lastly, the number of studies on biochar has truly exploded in recent years, it astounds me how many papers are coming out exploring the various benefits to this input. Whether it's combining it with compost, fertilisers, biofertilisers, animal feed or direct soil application, biochar has great potential to be an invaluable input, providing the economics of use can stack up (which they don't always at this stage). In relation to combining with fertilisers, biochar has demonstrated an ability to reduce nitrogen losses from the soil, improve nitrogen retention, increase

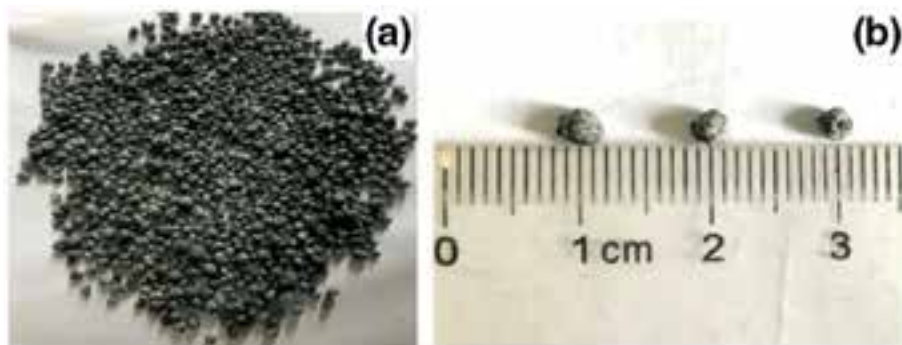


Figure 3: Example of C coated fertiliser granules.

nitrogen use efficiency and increase plant growth<sup>21-23</sup>.

## In Practice

Carbon based inputs are most easily and effectively implemented with fluid fertilisers as the fully soluble C and N can easily bind together when in liquid suspension. Liquids can also be used to coat fertiliser prills, typically used at a rate of around 6-8 L of C source per tonne of fertiliser. Dry powders can also be used to coat or dust fertiliser granules such as depicted in Figure 3 using biochar. Although it is more effective to physically combine the C and nutrients in the same application, it is still possible in a more general sense to apply this concept in an integrated manner wherever organic amendments are used in conjunction

with fertiliser inputs. The various strategies that can be used to build soil C ultimately will help provide a C sponge for stabilisation in the soil. That said, the argument for additionally including external C sources with fertiliser inputs is so that the soil C can be preserved whilst using/cycling the added C. In closing, synthetic inhibitors are powerful and targeted tools to help minimise nitrogen losses and I broadly support their judicious use in highly leaky and vulnerable contexts. However, C-based inputs provide additional soil health related benefits beyond N stabilisation and without concerns of plant toxicity. Consequently, C-based inputs have my vote due to the multifunctionality and multiple benefits that their use can bring over and above N stabilisation.

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# FARMER FOCUS

## JOHN CHERRY



**It's certainly been an odd year. The hot and dry summer made for an easy harvest, but our spring crops were very poor with the slow, or even non-existent start, that most of them had. I'm sure I was whinging about this in the June edition. We didn't even plant a lot of the planned spring crops as the ground was too dry, we substituted millet for linseed as it seemed feasible that we'd at least get a crop of that from an early June sowing.**

So we slotted some Mammoth millet in after we had a nice little half an inch of rain in early June and most of it came, but unfortunately it never got much taller than six inches, which made combining (in October) interesting, but didn't exactly keep the corn-carts busy. In fact we got forty acres worth in one combine tank, but it was better than nothing and very cheap to grow.

Mulika spring wheat was drilled earlier and started growing but rather lost its way and didn't bring us much more than a tonne an acre, the spring oats looked fantastic, but were burnt off by the really hot spell and again just hobbled over the finish line with a disappointing little heap in the grainstore. Luckily the winter crops did fill the sheds and they are happily valuable!

We had a field or two where we never sprayed off the over-winter cover crops as we couldn't see the point of having bare ground over summer if it wasn't going to ever rain again and these gave us some welcome silage, having a bit of westerwolds in the mix paid dividends on that front. Likewise, a field of grass seed that was too dirty to make the grade for seed gave us several hundred very welcome round bales of hay, which we are only just beginning to feed to the cattle now that they've finally caught up with the wedge of grass that we'd managed to keep in front of them all summer.

The cattle have done well this year, although their growth rates suffered a little in the heat, they look great going into winter. We bang on about the five principles of regenerative farming, but there's no hiding the fact that we fall short on a lot of our arable land...there's often exposed soil, single species cropping and the only grazing animals they might encounter are deer and the odd hare. I think a multi-species grazable summer cover crop would have a far better chance of getting going in these cold dry springs (or indeed any other kind of spring) than a monoculture of spring barley or wheat and be a lot more fun to harvest with a mob of fattening cattle.

A crop like that ticks all the boxes when it comes to the principles: no disturbance, living roots in the ground all year, constant ground cover, lots of diversity and grazing animals would be there. Herbal leys are even better as you get four years of maximum box ticking for your money. Once established they don't need anything spent on them, which always helps with cash-flow. And the ground is transformed at the end.

We're now beginning to work on another exciting Groundswell programme for next year (stick it in your diaries if you haven't already done so: 28th and 29th of June 2023...it doesn't clash

with Glastonbury this year for those of you that worry about that sort of thing!). The sessions application process is open now for anybody who fancies giving a talk or creating a panel to discuss any aspect pertinent to Regeneration, just fill in the form on the website:

<https://groundswellag.com/session-applications-for-groundswell-2023-are-open/>

We'll go through them all in the spring and try to find the best!

We have a few trial plots already established and all sorts of new things in the pipeline to pique the interest of attendees. It is extraordinary and pleasing how quickly the whole RA scene is evolving and growing, especially how much attention that it is getting from people outside agriculture. This is inevitably resulting in calls for some kind of accreditation scheme so that the food industry can cash in by selling 'regeneratively grown' food at a premium.

Personally I think this would be counter-productive as one of the joys about the regenerative approach is the option of dipping your feet in by trying different things that complement conventional techniques and just working out what works best on your farm. The organic lobby managed to create a set of rules that practitioners have to follow, which works quite well, but it did make for a bit of a 'them and us' world, where, for instance, conventional farmers didn't think of using cover crops (which have been an organic staple for years) as they didn't think it was relevant or useful for their farms.

We're working on a definition of regenerative agriculture on this basis, we are all on a journey, it's a movement after all, we're just moving at different speeds. We are going to ramp up our colour coding for sessions this year, so we hope it'll be easier to pick out talks that are relevant to where you are on your journey. We are planning some meatier topics and talks for those who have heard the general guff too many times. We're particularly excited that Nicole Masters is going to be there. Having just attended her two day course organised by the Land Gardeners at Althorp, I know just how mind-bendingly fascinating she can be.

We had a wonderful day here in October with the Understanding Ag team from America (Gabe Brown, Allen Williams and Shane New), who were over this side of the pond for other reasons and had a spare day in their schedule, so we grabbed them and 300 of you came to hear them talk and inspire. It gave me renewed enthusiasm to expand Groundswell beyond a once a year event. We are currently working on a Groundswell X type mini festival in Scotland sometime in the summer, more on which later. There is so much dynamic stuff going on in Scotland and we always have an amazing contingent who come all the way down to Hertfordshire...I don't want them not to come but I think a Northern focussed event would be fantastic to go to as well!



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# SOIL FERTILITY SERVICES

*Written by Steve Hollaway, Soil Fertility Services*

Ask anyone to define healthy soil and you will get a multitude of varying replies that will probably include having a good number of worms; friable soil with a texture that's similar to chocolate cake; unhindered vigorous crop rooting and so on... But, have you considered what must happen first? After all, these factors must surely be a consequence of having healthy soil.

Some will say that no-till will, by its own action (or lack of it), over time encourage natural improvements; after all, you minimise soil disturbance thereby allowing its inhabitants to carry about their daily business and fungi will be free to make their intertwining networks throughout the soil's profile, symbiotically extending a crop's root system and liberating vital locked up elements. So if the mere mention of using steel to aerate sounds like heresy, then you need to read on!

Ask yourself, what would a soil do if left alone? It would first begin the process of self-healing, covering itself with natural protection against the harmful and sometimes damaging elements - that might involve growing weeds. As this armour continues to spread across the surface, it also sets down its sugar factories (it's roots) into the earth, each one creating tiny biological highways that act like conduits for water and air. As the atmosphere in these biomes begins to improve, so too does its 'Bio' inhabitants' ability to maintain and build a more resilient soil ecosystem.

Unlike bacterial life, fungi are slower to develop their associations and networks, but remember, they are picky bedfellows

and won't choose to communicate with every plant. In general terms it is agreed, that the longer a soil gets left to its own devices, the more it shifts to be fungal-dominated; but is that what you really want, after all, cereals prefer a slightly bacterial-dominated soil.

In a nature-led system, you would see migrating animals both grazing and fertilising, cycling nutrients and often the mere act of travelling through would create some soil disturbance, so the system supports itself quite well without any intervention either chemically or from steel. If we said that steel is the answer to improving soil aeration you would probably throw your hands in the air but hear me out first...

*"The heresy of one age becomes the orthodoxy of the next" - Helen Keller*

When Grandad had his Massey 35 and went ploughing, it was done by eye - slow and steady and considered; with minimal horsepower came the limiting restriction on how deep and how much soil could actually be turned over. He felt that when he ploughed, the soil was

actively getting a reset and it probably was, but you do not need a reset every year, far better to have a prescriptive tillage approach to match individual field needs.

Over 50 years ago Americans started using anionic surfactants as a way of 'opening up' their soils; these products were applied with a sprayer directly to the soil, whereby they allowed bound water and locked together elements to move more freely, thus creating a much-improved soil environment for roots and biological life to flourish.

As gravity pulled these products down through the contours of the soil they continued to condition and improve air and water infiltration; with sustained use, these would become very efficient pan busters.

Back in the 1990's Soil Fertility Services was the first to bring this sometimes called "Snake Oil" across the water, whereby it evolved into the product that it is today.

So, you're still 'Re-gen'? Remember that does not necessarily make you 'New-gen'; make the most of the lessons and experiences of the past as you move to the future.

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# **DALE DRILLS**

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# DRILL MANUFACTURERS IN FOCUS...



## KUHN LAUNCHES NEW LIGHTWEIGHT DRILL

**KUHN has unveiled an updated, lightweight Megant drill featuring new tine coulters, an updated terminal, and the option to add a second hopper. The Megant 602R shares functionality with the previous 600 model, but features half width shut off and can be specified with an additional SH 1120, 110 litre hopper to drill two crops in the same pass.**

Due to its lightweight design, the Megant can be operated by tractors with as little as 150 horsepower. Three types of tines can be specified on the Megant, including reversible forward action, straight, and a new narrow 12mm straight tine coulters which reduces soil displacement through improved penetration and also reduces wear on the tine thanks to the addition of carbide plated points.

A new VT 30 terminal makes the Megant suitable for tractors with and without ISOBUS. Large buttons, a shock proof casing and ergonomic design make the terminal easier to operate and more durable. Compatibility with both KUHN CC1 800-1200 and other ISOBUS terminals will make the Megant more accessible to all users and will offer the economy of not needing to purchase a second control terminal for tractors already fitted with a compatible model.

The 602R has inherited some features from the larger ESPRO drill including spring loaded nonstop track eradicators and side markers that are better suited to dry conditions. A new welded 1800 litre hopper capable of holding 1200 kilos of wheat and drilling 60 hectares a day replaces a riveted hopper on the previous model. The new hopper also includes internal steps to improve access to the distribution head.

The improved hopper features a shut off door enabling operators to isolate the two compartments. This makes it possible to adjust the metering unit when the hopper is full and helps to prevent seed settling in the metering unit when the Megant is in transit.

The Megant has been fitted with KUHN's VISTAFLOW valves which can be configured and controlled from the terminal. This enables operators to program the flow of seed with the option to save settings for future use. VISTAFLOW also records tramlining configurations such as the working width and wheel track to enable more accurate use of sprayers and fertiliser spreaders which will help to reduce input costs.

**The Megant 602R is available to order in the UK with RRP's starting at £42,760.**



*The new lightweight Megant 602R drill can be operated by tractors with just 150 horsepower.*



*New tines, half width shut off, greater connectivity and the ability to add a second hopper will make the Megant an attractive option*

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# FARMER FOCUS

## DAVID ALGEN



### What livestock means at BHF?

Balbirnie Home Farms in hand farming operation comprises some 1200ha, two thirds of which is in an arable rotation, the remainder is permanent grass. Additionally, there is 380ha woodland and commercial forestry. The arable rotation currently consists of winter wheat, winter and spring beans, winter and spring oats, spring barley, kale, carrots, potatoes, cauliflower and some short-term herbal leys.

Our crop establishment system is 'as little as we can get away with'. We aim to direct drill as much as we can but will cultivate appropriately as and when necessary. Obviously, the vegetable and root crops necessitate this to a greater degree.

We have 150 suckler cows, aiming to finish all progeny under



2022 Sumer cover crop

the 'Pasture for Life' banner. The cows have been a fixture at Balbirnie forever and a day. They are grazed on grass throughout the summer with large mobs on daily moves to ensure maximum productivity from the grass. We have moved over to this system of grazing over the last 8 years.

This change to the cattle grazing was spurred on by a requirement to reduce costs and to make more of the resources we have on the farm. We have moved from a system where cattle grazed grass in summer, were housed all winter, and the only interaction with the arable land was the application of dung and the removal of copious amounts of straw for bedding and grains for feed. We were always busy on the ground feeding, bedding and mucking out etc, whilst the farm office was always

busy writing cheques!

From 2013 we spent a few years feeding cows on stubbles through part of the winter, still harvesting and carting all the feed mechanically. We introduced kale as a winter forage crop in 2018. The intention was to winter all cattle outside, including youngstock. The realisation that the animals are all equipped with an in-built harvesting, processing and dung spreading system, has transformed how we manage them now. It's amazing how we can get stuck in a mindset of repetition because we are worried about change. Instead of taking the food to the cow, we now take the cow to the food, and she does her thing.

Outwintering youngstock has been the steepest learning curve, we have made plenty mistakes and had days that could have, at best, been described as, 'not our finest hour'. However, errors are now far fewer, cattle thrive within the system and costs have fallen off a cliff. The cows now work for us, previously we seemed to do an awful lot of work to keep them happy. Output has shrunk a bit, but we are confident that will return and generally life is a lot easier.

The introduction of kale gave us another break crop in the arable rotation, leaving a wealth of fertility in its wake each year. This allows us to cut the nitrogen applied to spring crops to 40kg/ha the following season, whilst maintaining good yields. This was a promising start to the integration of the livestock back onto the arable land.

The obvious drawback is the cows are heavy and the soil is wet during the winter, so there is some structural damage. The aim is to direct drill the forage crops. Generally, the cows will only sink in a little more than the depth of the cultivation, so reduce the cultivation depth at establishment, and the intensity of the remedial work after the winter is reduced.

But at 40ha a year, we are going to take a long time to get round all the arable land, added to this is the fact that cattle outwintered are not especially conducive to direct drilling the following spring. So, what is the answer?

We need to build the fertility and integration over a far larger area. So, we need to find a lighter and more numerous



2022 Sumer cover crop



2022 Summer cover crop

fertility processor. The answer we hope, is sheep. We were fortunate enough to have been approached by a pair of enthusiastic sheep keepers this summer. Our businesses had potential to dovetail into one-another and after some thought, we took the plunge. Current thinking is to grow greenery on every acre we can through the winter and use the sheep to recycle this fertility round to the following

season. To this end, we have cover crops on all but 8ha at the moment. They are now being eaten by 800 store lambs and 700 breeding ewes.

It seems daft looking back now, but we had always thought we would have to own the sheep in order to get the management we required. Our minds have been opened up now to all sorts of possibilities as to how we develop the business going forward.

We have had our fair share of failures on the cover crop front over the years. The later season in Scotland makes establishing the more fashionable small seeded species risky and uncertain. We have settled on using beans, peas, oats and rye as our main stays. The larger seeds can cope with later sowing and still produce a worthwhile result.

Prior to the arrival of a year-round sheep enterprise, we had tried to grow a 16 way multi-species cover crops during the summer. The idea was to create a feasible break crop that could feed cattle during the warmer and drier times of the year. This would serve to expand our fertility building options over a larger area using the livestock we already had. 2021 was the first attempt, we grew 90t/ha fresh-weight of lush green biomass over 14ha. This seemed too easy with only the seed as a cost, no fertiliser or other inputs. Summer 2022 came, we upped the area to 60ha... I didn't even bother to measure the result, the photographs will do all the explaining. Suffice to say, we won't be repeating the exercise next year.



Weaned calves on Kale winter '20/'21

The team are hard at work upgrading our water supply at one end of the farm as we have been relying on natural springs for much of the grazing area. The flow reduced on one and ceased on another this summer due to the dry weather. This has become a repetitive issue with the larger groups of cattle. Fencing also continues at pace as we try to ensure the farm is stock proof, but this will take a lot of years to complete.

The routine of moving electric fences will continue through the winter, ensuring all livestock thrive as intended and we minimise the structural damage to the soil and maximise the fertility benefits they can bring to the farm. Lots of time will be spent planning how we operate our grazing system with the additional stock in the coming growing season. Can we run a mob of sheep and cattle together? Can we refine cover crop establishment to allow more diversity? We are confident of our ability to grow sufficient food for the winter, but how will our grass hold up in the drier seasons? Our journey will continue through our own tinkering and constant learning by talking to other producers, exchanging ideas. Now is the time to push the system.

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FUTURE PROOF FARMING



# LEARNING FROM THE BOTTOM UP

*Last week I was at an event where inspiring farmers – in this case Nick Down, David Miller, and Nik Renison – showcased, with the pictures to prove it, some of the brilliant innovations they have pioneered on their farms. And they really were inspiring, with a palpable buzz in the full-house audience as they spoke.*



*Conferences like this one last week make clear that farmers want to learn from other farmers*

*Credit: @PhilipCaseFW / Mark Allen Group / Twitter 2022*

Moments like this highlight - at least to me - that farmers really want to learn from other farmers. Or consider other examples like Groundswell or Carbon Calling. Or the farmer clusters that have sprouted like mushrooms. Or the networks of Monitor Farms and Demonstration Farms and Strategic Farms. Or the countless discussions on Twitter and The Farming Forum. Together it seems glaringly obvious that farmers want to learn in this way: from each other.

But if this is so, why is agricultural research conducted in almost precisely the opposite way?



*Agricultural research is based on plot trials, not farmers learning from other farmers. Why?*

*Credit: Michael Trolove / Cereal trial plot, Cereals 2010 / CC BY-SA 2.0*

There are plot trials in carefully controlled conditions, with replicates, and then peer reviewed results are trickled down to farmers. Surely Liz Truss proved to destruction that trickle down is not the best way of running things? The results of studies and trials are too often irrelevant to farmers who are in different contexts to those the trial was conducted in – on different soils say, or with a different climate. Or they simply couldn't work at the scale of a real farming system.

What if we could do agricultural research in a different way? What if we could harness the fact that farmers are naturally scientists who have already been experimenting on their fields for decades in most cases. As Nick and David and Nik all showed, there are new innovations already being proven on farms and, by definition, these are actually working at farm scale. And if we look at all the farms trying new things – i.e., practically every farm in one way or another – between them there are innovations there that any other farm could benefit from.

Can we harness these on-farm innovations in order to help every farm maximise its potential to grow healthy food, profitably, and in a way that restores rather than degrades the land? Can we make farmer to farmer learning the basis of agricultural research?

I think the answer is yes, but to do so we will need to get past some challenges.

**1. Farmers aren't running replicated trials or monitoring a thousand parameters in every field – is this really valid science other farmers can learn from?**

The key here is zooming out. One farm – say an arable farm with 30 fields – is in effect conducting 30 experiments each year. That's not much compared

to a researcher with many tens or hundreds of replicates. But when you start looking at many farms, going back many years, you quickly see that farmers have effectively run thousands, if not millions of on-farm 'experiments'.

And while they haven't been monitoring each one as precisely as a scientific trial, there is still a wealth of information that is usually recorded - from soil samples, to yields, to inputs applied, to tillage practices used - on each of those 'experiments'. This information is currently just sitting siloed and under-utilised on most farms.

Projects like the AHDB funded SMIS have shown that by looking at this siloed information together it's possible to uncover new insights that are practically useful for farmers. Things like:

- On what soil types does sugar beet have the least impact on subsequent yields?
- What rotation most improves organic matter levels on different soil types?

There are so many potential questions that can be answered in this way. And this one resource of on-farm information can answer many more specific questions than the 'one problem at a time' approach of traditional replicated trials can. Added to that, traditional research approaches struggle to look at the long cycle of a full rotation because of time-limited funding cycles. In contrast, looking at the existing information going back over one or two rotations from a range of farms can answer specific questions that reflect on-farm practice.

**2. Even if on-farm innovation can be the basis for research, how are the findings any more relevant than in the current top down system?**





Every crop grown in every field each year is in effect an 'experiment' – why don't we use this as a basis for agricultural research? Credit: Jan Kopřiva / Unsplash

Clearly all the initiatives outlined earlier, from conferences to monitor farms to magazines like the one you are reading now, are a good way of disseminating knowledge. And even if new research, like that outlined above, was based on existing on-farm information this would still apply. But this new approach could also enable a new dissemination option - one which more directly links to that original observation: farmers learn best from other farmers.

For example, if we combine information on how all of these on-farm 'experiments' have been conducted with the rich array of environmental data that we're fortunate to have in the UK, we can allow farms to compare themselves against other similar farms based on any combination of variables including farm type, geology, soil type, and climate. This then allows the findings of this new, farm-based research, to be tailored so that farmers are presented with the research that is relevant for each one of their fields.

This new approach could not only uncover new types of insight and knowledge that no plot trial would ever have the scale to discover. But it would also nip in the bud one of the biggest gripes levelled at agricultural research: 'that wouldn't work on my farm'. The insights that farmers see could be based on the fields of other farms that are like theirs. They could even be put in touch with those other farmers directly to discuss the findings.

### Join the bottom-up approach!

We have launched a new partnership between Soil Benchmark and Cranfield University to build this new model for bottom-up agricultural research. For the approach to work it needs the participation of farmers from across the country, whose fields together cover every major soil type and every major cropping system. We are welcoming farmers from all over England to join us, with 65,000 acres already signed up.

Get in touch if you'd like to get involved, and turn the existing information you've already collected on your fields into the research of tomorrow!

*Dr Ben Butler is the Chief Scientific Officer of Soil Benchmark, a DEFRA funded start-up working alongside NIAB and ADAS, looking to help farmers learn from the existing data they have already collected on their farms.*

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# CORRECTING MYTHS AROUND CARBON MARKETS **COULD UNLOCK INCOME OF THOUSANDS OF POUNDS FOR UK FARMERS**

*Written by Andrew Voysey, Chief Impact Officer, Soil Capital*

UK agriculture could benefit from payments worth as much as £500m every year if myths around carbon markets are corrected. But the industry must work harder to ensure farmers are presented with the best information about the opportunities on offer.



*Andrew Voysey, Chief Impact Officer, Soil Capital*

This was the conclusion of an industry roundtable that the agronomy firm I represent, Soil Capital, convened this Autumn with farmer, Andrew Randall, at his farm in Maidenhead. As well as farmers, the event was attended by representatives from industry bodies like the NFU, CLA, AHDB and the Association of Independent Crop Consultants, as well as land agents and all of the major distributors.

Recently published minimum requirements for Soil Carbon Codes in the UK should provide reassurance that those already using international standards are taking high integrity approaches to measuring, reporting and verifying soil carbon improvements.

But other deep-rooted beliefs, some of them based on conflicting and incomplete information, that currently hold farmers back will still persist even when clarity on standards is improved.

The event therefore focused on how to correct the most important misunderstandings about how carbon markets work so that more growers feel empowered to enter the market. Let's review the key talking points.



## **Myth 1: If I trade all my carbon now, I may regret it if I need it in the future**

Even degraded soil still contains carbon and many farmers believe that "carbon trading" relates to all of the stock of carbon that exists in their soil before they even enter a carbon payment scheme. Therefore, the decision can take on significant implications – as if it was about trading away mining rights – and even appear to be potentially life-changing.

In reality, carbon markets only pay for carbon added to the soil on-farm each year a farmer participates in a carbon payment scheme – not for any carbon that was already locked up in the soil many years before the farmer joined the scheme.

## **Myth 2: If I trade carbon, I am just giving big emitters the right to pollute**

When thinking about what carbon markets do, most of us think quickly of offsetting – enabling high polluting companies to compensate for their emissions by paying others to reduce theirs.

Farmers undertaking the risk of changing their management practices to achieve such reductions can feel that this is either an unfair exchange or, frankly, an immoral one.

In practice, there are two quite different types of carbon trading within the carbon markets:

Offsetting outside your supply chain – when the claim to the farmer's carbon improvements is transferred to an unrelated organisation outside of the farmer's own supply chain

Insetting within your supply chain – when a company that buys the farmer's crops also pays for the farmer's carbon improvements, on the basis that the farmer's carbon footprint is actually already part of the food brand's carbon footprint by virtue of their supply chain connection

With this knowledge, farmers can see that trading carbon does not have to be about enabling big emitters to offset their emissions.

## **Myth 3: If I trade carbon now, I won't be able to meet 'net zero' requirements in the future**

Farmers are aware that the supply chain may impose net zero requirements at



some point. Since many believe that offsetting is the only way to engage with carbon markets – and when an offsetting company buys the rights to the farmer's carbon improvements, the farmer can no longer claim those carbon improvements – this can understandably make farmers nervous about making such a commitment.

But when a farmer's carbon improvements are sold within the supply chain, as insets, those carbon improvements can be claimed by the farmer as well as the crop buyer and food brand. This is on the logic that there was already overlap between the carbon footprints of these entities before the trade happened because of the way that the carbon footprint of supply chains are constructed.

This means that, if they engage in inseting, farmers do not need to be concerned about being able to meet supply chain net zero requirements. To the contrary, by inseting, they will have benefited from payments that help them arrive at (and go beyond) this point.

**Myth 4: I have to get to 'net zero' before I can get paid for carbon**



The typical farm today emits carbon overall, but many farm systems have the potential to not only get to net zero but go beyond that and take carbon out of the atmosphere on a net basis each year. Many farmers believe that the carbon markets are only accessible once you have got to net zero.

Carbon markets have always existed, first and foremost, to reward people for reducing emissions. This is true across all industries. This is because reducing greenhouse gas emissions in the most economically efficient way has always been a firm priority in combatting climate change.

From the market's point of view therefore, farmers do not have to already be 'net zero' in order to get paid for carbon. For a farm that is net emitting greenhouse gas emissions today, revenue from a carbon payment scheme can be part of a transition payment to change management practices, up to and beyond net zero.

**Myth 5: Carbon prices will only rise, so it's in my interests to wait before I value my carbon**

Carbon credits tend to have higher

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value when they have been more recently generated through a verified scheme, since the market recognises that over time, the standards and approaches underpinning such schemes will generally improve. Generating carbon credits and then holding on to them to sell later may therefore actually not generate the best prices.

## Farmer Focus

Berkshire farmer Andrew Randall, who hosted the round table on his 240ha arable farm, signed up to our certified carbon payment scheme earlier this year after researching the market and realising much of what he'd heard about carbon markets was incorrect.

He told attendees he expects to make about £50/ha in his first year



by implementing practices such as direct drilling, growing multi-species cover crops, reducing nitrogen use and spreading sewage sludge.

"When people started talking about carbon payments I realised we were ticking a lot of boxes with what we wanted to do on farm and that we could capitalise on that," he said.

"A lot of the farm-level chat has been 'don't sell the rights to all the carbon under your feet', which is a huge myth that needs to be busted. I'm not selling a bank of carbon – I'm benefitting annually from the practices we do on farm, and if we don't benefit financially from those environmental gains we're making, it's simply a wasted opportunity," he added.

Mr Randall said with the combination of his planned practices, he expected to net sequester at least 2 tonnes of carbon per hectare/year.

"That will hopefully see us make over £10,000 this year, which is a useful way of starting to get back what we're losing from the basic payment scheme," he added.

"It has been a leap of faith in some respects, but by doing my research and getting good advice I don't regret signing up, and I'm considering whether to bring another farm into the scheme.

previous season.

Today more than 650 farmers have enrolled overall. The programme was introduced to the UK last year, with 50 farmers having completed their first carbon assessments so far. Soil Capital targets the inset market, with the vast majority of carbon payments coming from the food and agri supply chain from agribusinesses like Cargill, AB InBev and Royal Canin (Mars Group) in support of those companies' commitments to reduce their supply chain emissions.

These payments are the first new revenues Soil Capital has generated for farmers in Western Europe from reducing the carbon footprint of agriculture. Until now, all this has been a bit abstract. What's more, these carbon payments are higher than the initial commitment made to farmers. Thanks to better sales prices secured with buyers, Soil Capital's minimum guaranteed price of £23/t was raised to £27, which is a good sign. On average, farmers received £8,500 per farm in their first year.

These first payments confirm the robustness and credibility of the Soil Capital programme with farmers and food companies. It is clear that farmers value the fertility and resilience benefits of improving soil health by holding more carbon in their soils. The carbon payments Soil Capital unlocks offer a meaningful incentive to farmers to undertake the difficult work of changing practices or, in some cases, maintaining those with a net positive impact. Some of the concerns in farmers' minds are based on misunderstandings and must be corrected. Others are perfectly reasonable and need careful consideration - for which Soil Capital is happy to help.



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Following an external audit against the ISO standard that the scheme is certified against, Soil Capital Carbon has already disbursed its first payments to European arable farmers in June this year. Nearly €1 million was paid to 100 French and Belgian farmers on the back of practices they implemented in the





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# FARMER FOCUS

## ANDY HOWARD



### French Style Harvest

Since my last article in May harvest has been and gone (very quickly) and all the winter crops have been established and are looking well. This harvest it felt like we were farming in France. Most was done by the end of the first week in August and due to everything being so dry we couldn't plant any grass seed or cover crops. I have always been jealous of the French farmers being able to take most of August off and enjoy the summer. I got a taste of it this year, for the first time in our relationship I spent the day with my other half on her birthday (I took the 11th of August off!!). I saw my children a lot and had days out with them during their summer holidays. It was great to have so much family time, maybe I need to start searching for farms in France or maybe climate change will make this a regular occurrence?

### Trials

In my May article I talked a lot about the trials we had in the ground and I was going to go through the results in this article. With the talk of hot weather in the previous paragraph, this links in well to our experiment with growing Lentils and Camelina together (see picture). This seemed to be the only spring crop that coped with the 40 degree C temperatures and yielded well. We tried various seed rates of camelina and have come to the conclusion that the best thing will be to roll twice and add a few slug pellets when drilling in the future. The best establishment of Camelina was on the headland, which is always telling.

We had various trials in wheat. The first one was using Nurture 60 foliar to replace bagged Nitrogen. One area had 70/kg/ha/N bagged and then Nurture 60. The other had 140kg/ha/N and no Nurture 60. There was no noticeable difference in yield between the two. There was also no



noticeable visual difference either as I did not tell anyone about this trial, and no one could pick it out as it all looked the same.

The second trial in wheat was comparing various foliar nitrogen treatments for lifting protein content. We had a control plot, AF nitrogen plot and a Nufol plot. The clear winner by a decent margin was Nufol. It increased our protein by 1.5% in this trial and has allowed our wheat to go for milling. Even though I grumbled at the exorbitant cost of it at the time it has had a great ROI this year.

The final trial in wheat this year was comparing our variety blend to a single variety (Crusoe). I had two trials in two separate fields. In the first the yield increase from the blend was 1.2t/ha and in the second field it was 0.6t/ha. This is a great result but does need some context. The trials were on light land and the variety was Crusoe which can in dry years struggle with the lack of water. Next year if the trials are on heavier ground and comparing to Extase for example and we get enough moisture, we may not see such dramatic results. Though, I was recently speaking at The Association of





Applied Biologists conference and NIAB presented their trial results on variety blends, which showed very encouraging results as well. At the same conference I heard a researcher talk about coffee growing in Java. She talked about how the government in the 1990's promoted and backed IPM and this led to a 90% reduction in pesticide usage. It is amazing what can happen if government, academia and farmers work together! DEFRA are you listening?

Finally, we did a small trial on spring linseed to look at whether adding compost extract down with the seed would have any effect. We did see 13% yield bump, which is encouraging, though it was only a small area in just one year. I know that Ben Taylor Davies had phenomenal results using extracts on potatoes. All this has encouraged me to widen our usage of extracts this year. All our wheat had compost extract, except for numerous control strips in fields. I still feel we have a lot to learn about using them, but early results are encouraging. (Picture of the compost extract in the vortex extractor is attached).

## Observations

Before I finish, I wanted to talk about an observation from this autumn. We have drilled 2nd wheat into various situations this year, but one sticks out particularly. The wheat pictured is a second wheat where the crop 2 years ago was herbage



seed. These crops are twice the size of other 2nd wheats that haven't had grass in the rotation. This really highlights the long-term fertility benefits of having grass in your rotation.

My winter is partly going to be spent looking into new projects for the future and I am currently on the train to Edinburgh to investigate one such exciting development.

I wish you all luck with your own new projects, Merry Christmas.



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# TRINITY NATURAL CAPITAL MARKETS WELCOMES THE DEVELOPMENT OF THE UK SOIL CARBON CODE

Commenting on the development of the UK Soil Carbon Code, Trinity Natural Capital Markets managing director, Juan Palomares, explains that this is a positive step forward for farmers as it offers the minimum necessary protection and compliance in UK carbon markets.

"Our involvement in the formation of the code by the Sustainable Soils Alliance included extensive contributions to several sessions during the consultation process. We recognise the carbon landscape is an unfamiliar concept for many farmers so wanted to use our scientific expertise and our extensive practical experience to help shape the basic carbon standards that our sector needs as a minimum," he adds.



Juan Palomares, Managing director of Trinity Natural Capital Markets

"To ensure the carbon trading landscape is designed with farmers in mind, an important inclusion to the code after our input was to make sure the code covers reduction, removal and retention practices allowing a more holistic approach to carbon management on-farm."

Another important outcome is linked to the permanence of carbon trading and projects, explains Mr Palomares. "The code now establishes a 10-year period for permanence which ensures carbon trading will be more attainable for more farmers," he adds.



"Then arguably the most important section within the code that protects farmers and ensures rigorous compliance within the market is the requirement that all models that the code will allow 'must be validated using the latest scientific guidance for the geography, crops and practices'.

"This is something we have always felt must be included as our industry needs to be basing all work and decisions on the latest science if we are to progress and be accountable on a global playing field."

Mr Palomares highlights that farmers are aware of carbon sequestration

playing a more prominent role going forward for profitability, productivity, and sustainability purposes. "On-farm carbon optimisation is going to be vital for the resilience of UK agriculture and the Code will form the foundations of ensuring this is done in a lawful and compliant way," he says.

"However, we view these standards very much as the minimum necessary baseline. The ambition should be for a marketplace that is fair, efficient and importantly, virtuous. Farmers should be the ones reaping the benefits of any financial gain from natural capital.

"Otherwise, there is a risk that the market will neither preserve nor produce the outcomes for which it was intended and people become alienated. Trinity Natural Capital Markets was designed with high integrity at the heart, unleashing the full power of the global financial system for the benefit of rural farming communities."

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# MAJOR REVIEW OF THE AHDB RECOMMENDED LISTS GETS UNDERWAY



The first phase of a major review of the Recommended Lists for cereals and oilseeds (RL) is taking place this winter.

Initially, people are being asked to complete a questionnaire as part of efforts to improve the variety trialling project.

The announcement follows a strong endorsement of the RL by levy payers in spring 2022, where the project scored 4.2/5.0 for importance during the Shape the future process, and a pledge by the AHDB Cereals & Oilseeds sector council to conduct a major review of the RL in its five-year sector plan.

Jenna Watts, AHDB Head of Crop Health and IPM, said: "We need to hear from farmers to help us hone the RL so it continues to fit the complex decision-making needs of modern farming businesses.

"This is a thorough review and will leave no stone unturned. It will cover many aspects, from the type and nature of the trials to the way data is analysed and variety decisions are made. It will also investigate how results reach farmers and ensure that the RL continues to deliver the best value to industry."

*Typically, the main RL project runs in five-year phases, with a large-scale public review conducted during each project phase to inform subsequent activity.*

During the previous project phase (2016–21), AHDB conducted the 'Look Ahead' review. This highlighted the importance of the whole variety package rather than the more traditional focus on yields. In response, the RL changed the way it assessed many traits, including disease resistance and lodging traits. It also led to the development of enhanced digital formats, providing powerful ways to view RL data, such as through the RL app and variety selection tools.

The questionnaire, which can be accessed on the AHDB website by clicking on the QR Code, focuses on levy payer requirements. However, in-depth discussions will also take place at stakeholder meetings and focus groups over the winter to capture the wider requirements of the industry.

*A dedicated review steering committee has been established to lead the project and provide recommendations to AHDB on potential improvements to the RL.*

Patrick Stephenson, independent crop consultant, AHDB Cereals & Oilseeds sector council member and chair of the

RL wheat crop committee, has been appointed to lead the review steering committee.

Patrick said: "This review looks forward and aims to keep the RL robust in the face of numerous challenges facing the industry. With constraints on budgets and small-plot trials, it is not possible to do everything. However, the review will help us focus activity. I am particularly keen to squeeze every ounce of value out of data to make the RL even more relevant to farmers."

*The questionnaire is open until 17 February 2023, with initial results due to be published next spring.*

The results will inform the next phase of the review, which involves planning and costing the actions required to improve the RL over the short, medium, and long term.



# FARMER FOCUS

## NEIL WHITE



As I write on this very wet December day (yes very last minute) it's nice to look back on such a dry year. I wrote in June that the area looked the best it had ever looked, crops were full of potential, and for once they carried that into what was our record-breaking hottest and driest harvest ever. We had a great harvest, with good yields, quality and prices, my best ever but I will try not go on about that! I do think we have to enjoy these harvests not just push on and quickly forget how important and rewarding they can be.

Once again, the direct drilled crops did as well or better than the ploughed ground crops and this has given me the confidence to finally direct drill all my winter crops at home this year. Using the Mzuri to sow everything allows me to use variable rate seed rates and add a starter fertiliser as required. I also plan to direct drill all my spring crop too making it a 100% for the first time. It doesn't sound like a big deal, but I grow winter brewing barley following wheat in my rotation, so a good chit is essential. I gave the ground a late straw rake, a tool I would never be without as its now my only pre-drill machine and I think I achieved as good a chit as possible in the very dry conditions, time will tell. I have other direct drilled winter barley, but it follows spring barley so not such an issue. Ground conditions at sowing were first class, the ground despite being very dry had a nice tilth and a crumbly texture with moisture below that due to the lack of soil movement. I have been using my penetrometer this autumn to help make an informed decision on how deep to run the leading leg on my Mzuri. I have been reassured that the dry harvest and my improving soils have meant that I have been able to raise the leg 1 to 2 inches in most wheat fields, saving metal and fuel.



Cover crop. Spring beans, phacelia, radish, buckwheat, clover.

This autumn I was asked to join a Profit and Biodiversity group, government funded through Nourish Scotland, the facilitators get the money not the participants, maybe it is us who are being farmed? We have had one on farm meeting, next one is here, and some online ones too. These meetings have been very informative and have created some very interesting discussions, but I do feel that we are really choosing between maintaining production or vastly reducing it. I had hoped by cutting out almost all tillage, maintaining my hedgerows, margins, pond etc, having renewables provide power and heat, I could continue to grow for the market and tick enough boxes to prove that what I do provides the smallest environmental footprint for the desired outcomes. Am I producing to my Maximum Sustainable



Pearl Winter Barley direct into wheat stubble

Output? I think I am, maybe others disagree!

In June I was cajoled by colleagues to enter the Agriscot arable farmer of the year competition. I enjoyed the process, and the judges visit in July made me look and think hard about my farm and my system, this can only be a good thing. In the end I didn't win, I was one of 2 runners up. A patron of the Direct Driller magazine, Colin McGregor from McGregor farms was the worthy winner. I think the fact I made it to the final reflects the success of the system I run and the huge soil health and margin improvements made, but also the acceptance that this is a direction we can/must go in to satisfy those who demand change from us. I was recently offered a wheat contract which paid a premium for soft wheat produced in a system like mine. It was a decent premium and I'm already doing the practices required, but my concern is that this is how quality assurance was first sold to us and now it's mandatory. Once again, we must make sure we are not the ones being farmed.

I recently took part in a Q and A session with SRUC which



Stubble turnips eaten by pests





*Stubble turnips looking good*

was very well attended. Four farmers with different systems doing varying degrees of reduced tillage. The answers given were honest and varied, at events like this I always think of DD editor Chris telling me that I could write whatever I like, as long as it is true, and reflects what is actually going on at my farm. I think this advice rings true through the farmer discussions and is the only way to make knowledge transfer worthwhile.

On that note, I have been putting in stubble turnips again hoping to graze next doors sheep on them over the winter. I have had very mixed results this year. My field at home, sown in 10 x 1-acre blocks with 3 metres between for electric fencing, seed went into great conditions but has not been a great success. At least half the area has already been completely decimated by slugs, flea beetle and pigeons.

This will mean a rather poor negotiating position for me in the deal. These are low input, seed and sowing cost only, no spray or fertiliser. The idea is to use these to tidy up hedge backs, put dung onto the ground and make a pound or two on the way, looks like it will achieve only the first two goals. The cover crops however have done well this year. My mix of home saved spring beans, radish, phacelia, buckwheat and clover is looking strong going into winter and is looking like it may provide some grazing opportunities, but only if the weather stays dry. I have found in the past grazing cover in a wet winter caused capping of the soil in any areas where crops were thinner. I will be careful this year as this cover will be direct drilled with Diablo malting barley rather than spring oats.

I have done some demo and contract work again this year. I do get asked to sow wheat direct into grass leys, this works well but is something I can't do at home as I don't have grass. It always feels strange doing work for others that I don't do



*Tartan Tractor in MyName's5Doddie tartan*

at home. It is a wide row spacing with the single coulter but if the conditions are right the plants fill that space in spring and the feedback has been good. I also did some winter beans direct into cereal stubble. The farmer was looking to direct drill without subsoiling tramlines or compacted areas as they had done in the past. I ran the front leg in deep at around 6 inches and the coulter 3 inches which does use more fuel, but he says the crop looks very even across the whole field.

I will say it again this year, this area has never looked greener or better, and hopefully like last year that carries on through harvest. We will need good crops and margins to provide some resilience for whatever comes down the line.

Sadly, this week we lost a great friend to MND. Doddie Weir was a family man, a farmer, a Melrose RFC teammate, a Scottish and British Lion legend and for the last 6 years an amazing campaigner and fundraiser for MND through his charity the My Name's5 Doddie Foundation. The My Name's5 Doddie tartan was designed on this farm by my wife's business, ScotlandShop, taking Doddie's idea and designed in-house by Emily Redman. It is worn by millions around the world to raise awareness of MND and will continue to be worn by my tractor for years to come. Like him it raises a smile wherever it goes. Thanks for everything Doddie.

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# REGENERATIVE FARMING: A BUZZWORD OR HERE TO STAY?

This year's inaugural Down to Earth Event in Shropshire highlighted livestock farmers' thirst for knowledge for regenerative farming. RABDF Managing Director Matt Knight discusses the event and plans for next year.

Down to Earth was born out of a demand by farmers, the government, milk processors, and consumers to produce dairy products sustainably. The event provided a platform where the livestock industry could come together and see regenerative farming in action and hear from experts about the practical ways to implement it on their farms.

We knew there was a demand for this. Still, we never expected almost 2,000 farmers and industry representatives to descend on Tim Downes' organic dairy farm in Shropshire in July for the first event.

Regenerative Farming is a buzzword of the moment. You can't turn on the radio or TV without seeing it mentioned somewhere. It even appeared on billboards at Coldplay's World Tour, highlighting the demand for such change.

## Taking the regenerative farming approach

But the question is, how much change is required by farmers to take a regenerative approach? And is it a word that will die out?

I believe regenerative farming isn't something that is going away any time soon. The reality is most farmers are probably already doing things on their farms that fall into the regenerative category.

Whether composting their manure, soil testing and directing the correct nutrients and management to their land, or grazing livestock in a way that benefits the mixed grass species they are growing- that could all be branded under the regenerative farming hat.

What is interesting is how it all ties

together. Perhaps a better name for it should be 'circular farming'- changing one thing on your farm can influence another.

This year's Down to Earth farmer, Tim Downes, said regenerative farming for him was all part of becoming more resilient. He said it captured the farm's energy, helped maintain profits, and created a better environment for cows and staff.

He focuses on many regenerative farming elements such as water management, agroforestry, using bugs on the farm, and protecting and managing soil health, all of which are interlinked.

The buzz from this year's event was fantastic, and as such, next year, we will be hosting two Down to Earth events- one in the North and one in the South. Both farms, however, couldn't be more different. It will give people a flavour of how individual the regenerative farming journey is.

## Down to Earth 2023

In Cumbria, our 2023 host farmer is Mark and Jenny Lee, Park House Farm, Torpenhow. They run an organic unit with 175 milking crossbred cows, with 50% of their milk going into their own cheese-making business and the rest sold to First Milk. They aim to achieve their milk's true value, proofing their farm for the future.

They are certified 100% pasture fed by Pasture for Life and mob-graze their cattle on a 30-40 day rotation using 2.5km of grazing tracks.

They also have areas of silvopasture for grazing and have incorporated 80 pigs into the rotation, which work in poorly performing fields to help improve

them. Before bird flu restrictions, 1,800-2,000 free-range broiler chickens were also reared a year, helping improve the pasture through their organic muck.

Our southern host farmer, Neil Baker, couldn't be more contrasting. He runs a high input, high output indoor herd of 1,800 predominately Holstein cows, which are milked three times a day and produce 55,000l of milk a day. He also has sheep on keep and farms 3,200 acres of owned, rented and contract-farmed land.

He is one of Arla's regenerative pilot farms and says for him, regenerative farming encompasses much more than simply focussing on the soil. Whilst he admits soils are a big area, he prefers the use of the word 'circular farming' over the regenerative farming phrase.

As part of the pilot project, he will be looking to grow maize without any chemical inputs, as well as understanding the economic side by calculating carbon emissions from 'ghost acres'.

Neil uses digestate from the AD plant on his land on the crops he grows, including wheat, barley, peas and grass. He has started establishing important pollinator corridors, which also provide a barrier for wildlife.

Next year's Down to Earth events are taking place in the North and in the South. Both events are guaranteed to be interesting, and informative and provide much learning about the regenerative/ circular farming journey. Keep posted for more information at [projectdowntoearth.com](https://projectdowntoearth.com)





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# HOW CAN WE SCALE REGENERATIVE FARMING?

*Written by Belinda Clarke from Agri-Tech E*

How can we scale regenerative farming? Following the COP27 discussions in Egypt, this month we look at mindset, money and markets, and how to harness them to influence a more regenerative approach to food production.

A recent report from the Sustainable Markets Initiative (SMI) Task Force suggests a tripling of land under such a management approach is needed (up to around 40% of cropped land globally) to reach the climate goals by 2050 and mitigate the predicted 1.5°C rise in the Earth's temperature.

## How will farmers be rewarded for regenerative agriculture?



The Sustainable Markets Initiative Agribusiness Task Force report 'Scaling Regenerative Farming: An action plan' reveals three main reasons why regenerative approaches are not scaling:

1. The short-term economic case is not compelling enough for the average farmer
2. There is a knowledge gap in how to implement regenerative farming
3. Drivers in the value chain aren't aligned

The reasons why regenerative approaches are yet to be widely adopted are not rocket science – either the economic case is weak, there is a knowledge gap around implementation, or the drivers in the value chain are misaligned with the positive (sometimes costly) changes that farmers are making on the ground.

Co-authored by the CEOs of some of the major global agri-businesses (including retailers, processors and input suppliers),

the SMI report identified a set of solutions needed to at least tackle the economic barrier to adoption – named “the Big 5” (detailed in the next article). These include:

- Agreement of common environmental metrics, around which additional income for farmers can be generated.
- Creating mechanisms to share the cost of farmers' transition to regenerative agriculture
- Policy reform to reward farmers
- Sharing costs across the value chain.

It is this latter point which we'd like more detail on. Many governments are already incentivising a shift to more regenerative and sustainable solutions for farmers, and the common environmental metrics has a lot of people working on them in both the public and private sector (spoiler alert – but not quite there yet!).

Yet sharing costs across the value chain – and, crucially, being fair to farmers – is something that can and must be implemented as a matter of urgency.

At the recent World Agri-Tech Investment Forum, there was much talk of consumers not being willing to pay extra, and hence the farmers likely bearing the brunt of the transition at their own risk and cost.

## Collaborative approach across the value chain

Improving collaboration (always an easy one to call for!) and a change in mindset (ditto!) are cited as ways of achieving this by the report authors, along with taking evidence-based methodologies to decisions and accepting ambiguity. There is also a call – not quite a commitment – to assign regenerative agriculture approaches across commercial and procurement teams in big corporates, not just within the sustainability teams.

The report also contains a call-to-arms of actions for different players across the value chain, from landowners, to farm advisors, retailers to input suppliers, and governments to the financial services industry.

So, everyone has the opportunity to contribute to the shift to regenerative agriculture.

But to paraphrase George Orwell's *Animal Farm*, while all animals are equal, some are more equal than others. And while everyone has a part to play in the world embracing regenerative agriculture, it is clear that some have a greater part than others.





# WHY REGENERATIVE FARMING IS NOT SCALING

Extract from the 'Scaling Regenerative Farming: An action plan' Click the QR Code to read the whole report.



The work showed that there are three main reasons why regenerative farming is not scaling:

- The short-term economic case is not compelling enough for the average farmer
- There is a knowledge gap in how to implement regenerative farming
- Drivers in the value chain aren't aligned to encourage regenerative farming

## What we can do about it: the big five

Addressing the economic case is the most important and also the most complex challenge. We believe there are five big things we need to work on collaboratively across the whole food system to solve this problem – the Big Five. Progress on the Big Five will take time and cooperation. In the meantime, there are a number of actions companies can take to make it more attractive for farmers to transition to regenerative agriculture. These are outlined in Part 2, where you'll also find a guide to which actions your sector should progress and how.



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# FARMER FOCUS

## BILLY LEWIS

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In some parts of the country getting livestock back out onto farms after decades of their absence has been the cause for much excitement of late, this is great to see. If managed carefully the inclusion of grazing ruminants within a farming system can provide a very large piece of the jigsaw needed to complete the overall soil health puzzle, not to mention the countless wider ecosystem benefits that having animals out on the land can deliver. To the advantage of the soil in our little patch of Herefordshire the livestock never left.

We are very much a mixed farm and have been from day one, with a flock of sheep, a herd of pedigree Hereford cattle and an area of combinable crops each accountable for a similar portion of our income stream. It is this mix of enterprises that is now enabling us to farm in a low input – high output manner. We've always had the pieces of the jigsaw puzzle. However, it is only in recent years that we started fully joining them together. By intertwining each enterprise with one another we've been able form the basis of a farming system we know is on track to become highly sustainable and with a bit of luck completely future proof.

In the past it would be fair to say we were sometimes guilty of segregating the livestock and arable elements of the farm. With the animals mainly sticking to grazing our permanent pastures and the then 'arable blocks' receiving manure from the cattle sheds as well as being put down to silage leys as a way of maintaining soil health. We've changed tack slightly now; the hoofs roam free over all areas! I should point out that in reality they certainly don't roam free; they are very carefully



manipulated around the farm behind a series of electric fences in order to achieve the perfect level of animal impact on the land.

Half of our farm is permanent pasture. This receives no inputs – be that fertiliser (inorganic/organic), lime or any form of metal through the ground. The other half of the farm makes up our arable rotation. Across this area we generally work on the basis of three years in cereals followed by three years in diverse clover or herbal leys. Recently we have begun a share farming arrangement with a local farm owner. Here the crop rotation will differ slightly from our home farm. We are running a trial over a third of their farm whereby livestock are completely excluded from the land; as a result, this also means that we cannot use any manure-based compost. Instead on this area we'll be relying on methods such as growing & mulching green manures, using pulses in the rotation and chopping rather than baling the straw to maintain soil fertility. The remaining area of the farm will be more traditionally managed using livestock as a means of maintaining soil fertility. I already have a suspicion







which area will perform best, but ultimately time will tell and it's a very interesting trial to be conducting.

During the three years a field is down to a herbal ley it is grazed by our sheep and occasionally cut for silage. The beauty of grazing temporary leys is the reduction in the parasitic worm burden. In the first year following cereals it is zero, by year three when it begins to become significant the field reverts back to arable cropping and the slate is wiped clean. This approach along with tall grass grazing & long rest periods is allowing us

to drastically reduce our use of anthelmintics across the farm, a small but vital piece of that ever so convoluted jigsaw puzzle. The herbal leys much like our permanent pasture also receive zero fertiliser. Instead, we are reliant upon a diverse mix of legumes coupled with long rest periods between grazing events to ensure we grow enough grass. In theory this three-year break from any artificial N is allowing the nitrogen cycle in the soil to gradually start functioning effectively again. My aim is that over the course of the next 5-10 years I'll be able to completely eliminate the use of fertiliser over the whole farm, whilst still obtaining wheat yields in the region of 9-10T/Ha.

At peak growth during the summer ewes and lambs are on 48-hour paddock moves, kept behind electric fences at a stocking density of 300 head/acre. They enter a paddock at a cover of around 3500 kgDM/ha and come out at 2000kgDM/ha. A paddock is typically then rested for about a month before it is grazed again. A similar formula is used when grazing our cattle, who mainly stick to the permanent pasture, the difference being is that we put them into higher covers and leave more of a residual behind, as well as a longer rest period of around 50 days. These long rest periods alongside intense, fleeting animal impact are resulting in the natural seedbank in



**BASE-UK is an independent, nationwide, farmer-led knowledge exchange organisation, encouraging members to make agriculture sustainable by using conversation systems - no-till; cover cropping; integrating livestock; diversifying rotations; using less invasive, cost-effective establishments. Growing Confidence for a Decade!**

Following a successful show at Croptec in November, the Committee have decided that we should have a presence at LAMMA on 10th and 11th January 2023 at the NEC. Visit us in Hall 18, stand number 545. Stephen Goodwin, Edwin Taylor, and Steve Townsend at Croptec 22

**Bookings for the Conference are going fast but we still have availability.**

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Frederic Thomas, founder of BASE France and mentor of our group will be joining us and speaking on both days of our event. Speakers on Tuesday 7th February: Frederic Thomas, Vicki Robinson, Duncan Wilson, Tom Storr, Alastair Leake, Becky Willson, Liz Stockdale, and David Hyner. Wednesday 8th February: Frederic Thomas, Steve Townsend, James Warne, Lance Charity, Ian Waller, and Joel Williams. A fantastic mix of science and farmer knowledge exchange to be savoured. More details and booking information are available on our website.



**If you would like to know more about how to join BASE-UK, please visit our website: [www.base-uk.co.uk](http://www.base-uk.co.uk) or email [Rebecca@base-uk.co.uk](mailto:Rebecca@base-uk.co.uk)**



the soil bouncing back into life. Plants such as native red and white clovers, plantains, vetches, sorrel, and birds foot trefoil are becoming common place now, as well as a more diverse range of grasses – all contributing towards improving soil and animal health.

As well as grazing the grass leys we use our replacement ewe lambs to graze off winter cover crops. This year we planted 15ha to a seven way mix of Vetch, Forage Rape, Linseed, Crimson Clover, Mustard, Kale & Phacelia. Prior to planting composted FYM is spread straight behind the combine, the cover crop is then drilled in one pass with a Vaderstad Rapid with the system disc just moving the top couple of inches of soil. We plant all of our 6-8 week catch crops between winter cereals and overwinter covers by going straight into stubble with the Rapid and so far, it seems to have been a pretty bombproof establishment method.

We've had success in the previous two years carrying the white clover over from our temporary leys through into our first wheats to form a clover living mulch. 2022-23 is the third year we have done this and so far, so good, with wheat rowing up nicely amongst the clover once again. This is a very opportunistic method of utilising a clover living mulch, just one of the benefits of having a mixed rotation I suppose. If I couldn't get it to work like this, I certainly wouldn't be going out of my way to establish a special micro-clover before planting a cereal. The method is to graze the sward down before spraying off with 2.5l/ha

glyphosate mixed with fulvic and citric acid. This takes the grass out but leaves the clover unharmed. We're able to grow clover for fun on this farm so it is generally unphased by the glyphosate, however, this may well not be the case everywhere. The wheat – this year a three-way blend of Graham, Extase & Costello is then direct drilled into the clover using a John Deere 750A. Our cereal drilling is shared between the John Deere and a Weaving Sabre Tine. Last year our Costello winter wheat grown in a clover living mulch yielded 10.1T/Ha, using 60kgN/Ha and one fungicide application at T2 - the jury is out as to whether the fungicide was really needed. Interestingly just over the hedge in a more conventionally treated field (the last field on the farm to transition into a regenerative regime) growing the same variety, using more than double the N (125kgN/Ha), alongside a much more rigorous spray programme only managed a yield of 8.2T/Ha. The difference between the two: the higher yielding field followed a three year zero input herbal ley, mob grazed with sheep, the lower yielding field came out of a long stint of conventional arable cropping. The proof is in the pudding as they say.



The final piece of the jigsaw puzzle for me is how we manage our manure. A couple of years ago I was lucky enough to buy a compost turner from one of my mates. This has enabled us to transform the 500T of FYM we produce annually into a far more balanced product. The turner which is essentially a massive cork screw allows us to break up the clumps of manure and keep windrows aerobic, allowing the biology within to get to work. I tend to turn a windrow 4-6 times over a two-month period depending upon how busy I am at the time. The final result is a far superior product that is able to be utilised by the soil life a lot more effectively than raw FYM we used to spread.

I'm content we are heading in the right direction, and every little step we take compounds the efficacy of our system. What has surprised me over the past couple of years is how quickly soil health and pasture quality have been changing on the farm. Needless to say, we still have things to improve and a lot of work to do. That puzzle is still far from complete!



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# 2023 NUFFIELD FARMING SCHOLARS ANNOUNCED

The Nuffield Farming Scholarships Trust announced their newest cohort of Scholars in October, and many of their studies will be focused on topics like market challenges, soil improvement, vertical farming, cut flowers and energy production.

"Over the past 75 years, Nuffield Farming Scholars have contributed immensely to the food and farming industry, leading the way during challenging times," says Mike Vacher, Director of the Nuffield Farming Scholarship Trust. "We have no doubt that our new Scholars will continue this tradition, offering both knowledge and leadership in their chosen topics. Coming from a range of sectors, they will investigate some of our most pertinent issues and explore new ways of meeting the future needs of the industry."

"Sharing knowledge and learnings will be more important than ever moving forward. Nuffield Farming Scholars not only become experts in their chosen topics, but leaders who are able to navigate change. This year's Scholars have not only been chosen for the passion they hold for their topic, but also for their leadership traits and potential to shape the future of agriculture."

## MEET SOME OF THE NEWEST COHORT...



**Harry Barnett, Norfolk**

- Topic: 'How to counteract the agronomic and market challenges facing UK potato growers'
- Generously supported jointly by McDonald's UK & Ireland and Royal Norfolk Agricultural Association

Harry Barnett runs a potato growing enterprise on the Holkham Estate in North

Norfolk, growing approximately 420 hectares of potatoes annually. Specialising in salad varieties for the pre-pack and export market, he has a keen interest in making the business more competitive and reducing risk. For his topic, Harry will learn how UK potato growers can counteract the agronomic and market challenges they are facing. He will focus on options for grower marketing strategies and managing potatoes as part of a regenerative agriculture system.

### **Luke Breedon, Wiltshire**

- Topic: 'The New Black Gold: Can Biochar help to improve agricultural efficiency, productivity and carbon sequestration in the UK?'
  - Generously supported by Alan and Anne Beckett NSchs
- Luke Breedon runs Slate Hill Charcoal alongside his wife, producing sustainable British charcoal and biochar. As there is already an international market for biochar, he believes



that it also has the potential to be a valuable product for British agriculture and forestry. His study will see him explore how biochar can help to improve agricultural efficiency, productivity, and carbon sequestration in the UK. During his travels he will also explore production methods for biochar and whether there should be a certified standard for the product in the UK.

### **William Brown, Oxfordshire**

- Topic: 'Finding synergy between the traditional farming model and vertical farms'
- Generously supported jointly by Central Region Farmers Trust and the Food Chain Scholarships

William Brown works on his family's mixed farm in Oxfordshire and runs his own

vertical farming venture, OX3 Greens. He has ambitious plans to integrate vertical farming with conventional farming and believes that the technology provides an opportunity to address some of the challenges seen in conventional production. For his scholarship, William will look opportunities for collaboration between the two - especially regarding energy requirements, space and infrastructure, human resource and product mix. He will also explore the barriers to vertical farming and consider what both vertical and conventional farmers can learn from each other.



### **Thomas Clark, Perthshire**

- Topic: 'Gate to grid, a responsible model for integrated energy production'
- Generously supported by Elizabeth Creak Charitable Trust (a Clyde Higgs Scholarship)

Thomas Clark works in partnership with his father on



a 1,200-acre mixed arable farm, where he takes a modern approach to a traditional system. Keen to bring stability to the business in changing times, his interests lie in how traditional farming systems can successfully integrate energy production in a balanced and responsible manner. During his Scholarship Thomas aims to create a model for doing so on both small and large farms, without impacting on the local landscape, community and biodiversity.



aspects of soil. He passionately believes that the management of waste organic matter can address some of the biggest issues in agriculture: rising fertiliser prices, degraded soils, and environmental pressures. As part of his Scholarship, he will explore how farmers can make the most of their organic manures, exploring different

management techniques, their effectiveness and practicality, as well as scalability.



#### **Dr Hannah Flower, Yorkshire**

- Topic: 'Displacing empty calories with nutrient dense food: How can UK farmers be rewarded for practices that promote nutrient density?'
- Generously supported jointly by Yorkshire Agricultural Society and Worshipful Company of Fruiterers

Dr Hannah Flower is both a practising doctor and arable farmer with a passion for lifestyle medicine. She has witnessed first-hand the dissociation between farmers and healthcare and believes strongly that they should be reconnected for the benefit of food, farming and health. As part of her Scholarship Hannah will investigate whether farming methods can have a measurable effect on the nutrient density of food and if farmers can be incentivised to use methods which prioritise this.

#### **Andrew Sincock, Devon**

- Topic: 'Waste not, want not - How to maximise your organic manures'
- Generously supported by McDonald's UK & Ireland

Andrew Sincock is Director of a Devon-based company who manufactures, sources and supplies a range of products that focus on improving one or more chemical, physical or biological



#### **Roisin Taylor, Tyne & Wear**

- Topic: 'Revival and Survival: Adapting for a 2-degree warming world within the British cut flower industry'
- Generously supported by The John Oldacre Foundation

Roisin Taylor runs a business producing British cut flowers alongside her work as a

Climate Change Project Manager at the RSPB. She has ambitious plans to turn her business into a test case for what climate mitigation and adaption can look like for a flower farm. During her Scholarship she will explore if the British cut flower industry is prepared for the extreme impacts of climate change on production systems and if they can cope with the combination of climate instability and increased consumer demand.

Applications for 2024 Nuffield Farming Scholarship are open from mid-January to 31st July 2023. Applications are completed online at [www.NuffieldScholar.org](http://www.NuffieldScholar.org), where additional details about the awards and the process of applying can be found.



# FARMER FOCUS

## STEVE LEAR



### Attempting to make farming less of a gamble.....

**In my very early years of farming, I remember chatting to a good friend of mine who works in the investment banking world. He trades daily on the commodity markets. I mentioned to him that I didn't think I could deal with the stress of the gamble on the markets. He quickly pointed out that it was actually me that was the gambler. He has a wealth of knowledge and a team of researchers to call upon before he makes calls. I on the other hand was risking all the costs of growing a crop or livestock with no way of knowing how much it would yield, what quality it would be and whether the rest of the world has over produced. Well these past two years have highlighted the gamble that we take as producers and the gamble that we take has become a high stakes game. How much fertilizer has been brought this year at high prices with the hope that wheat will be over £270/ton come harvest 2023?**

Reducing the risk, we are exposed too has been a mission of mine for some time but the further we travel down the efficiency route the more I realise that we need to be collecting data from the farm more effectively. New technology will be at the front of this as well as software that can help make use of the data sets. I've made it my new years resolution to make collecting data on the farm more efficient and to embrace the new tech that is available. Moving to cloud based solutions has certainly been an eye opener to us in terms of collecting data. Now all of our employees have an array of apps on their phones to enable a whole range of tasks. The Breedr app has allowed easy collection of data with the cattle herd, the merit ag app has meant all employees can log machinery and building repairs as well as having access to all our health and safety documents, and I'm now looking for a solution to collecting arable data better (if you have any suggestions please let me know).

### Back to 2022

Any way back to the farming, the 2022 harvest was a good average one for us. No huge yields but no disasters. We seemed to hold onto moisture well throughout the drought with only spring beans seeing a below average yield. We delayed drilling cover crops and OSR until the third week of September as soil moisture was non-existent. At the time I thought we may have been a bit late with the OSR. It was drilled with our Crossslot, emerged out of the soil after a bit of rain and never looked back. The flea beetle seemed to have migrated to their winter homes by the time ours was trying to put out its first true leaf so once again didn't

receive an insecticide. I think the digestate that we applied at emergence also may have played a role in keeping the beetle at bay.

The winter barley is still my biggest fear. Drilled in the second week of October with the Crossslot it emerged with fantastic vigour. With all the mild weather into November it was absolutely flying and then the inevitable aphids appeared. We have a no insecticide policy which has been easy up to this year as we haven't had too much pressure from the insect pests. However, it has always played at the back of my mind that if we had a bad infestation of aphids in the winter barley we may have to spray to reduce the risk of BYDV. I decided that we would stick by our guns and haven't applied any, ill let you know in the spring if it was the right choice or not. I'm hoping for a very cold week to kill them naturally.

*The cover crops all went in late September and I didn't expect too much from them but we probably have some of the best covers we have ever had. I haven't seen the solar radiation figures for our area through autumn but I suspect it was fairly high. The cover we have used this year will be ahead of spring beans and spring oat/vetch crop for forage. The spring beans have a thick oat cover in front of them and the oat/vetch have a multi species cover in front of them.*

On top of the winter cropping, we also over seeded over 200ha of grass pasture. The drought had meant that the grazing ground was fairly bare at the beginning of autumn. This gave us a great opportunity to get the pastures reseeded without losing production. The Crossslot was used to drill grass seed at standard rate into the existing sward. The cattle were left in the fields with the plan to take them out when the new seeds were poking through. When it came to it we actually never moved the herd off as the new grass seemed to establish quickly and anchored itself in well. The herd is still out as I write this in December as the grass growth was probably at its highest this year throughout November. We will bring them inside just before Christmas which is incredibly late for us but a welcome bonus as feeding cattle is an expensive past time these days.

**I hope this article finds you all well and I wish you all joy, prosperity and improved soil structure in the new year.**



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# WHAT DO YOU READ?

If you are like us, then you don't know where to start when it comes to other reading apart from farming magazines. However, there is so much information out there that can help us understand our businesses, farm better and understand the position of non-farmers.

We have listed a few more books you might find interesting, challenge the way you currently think and help you farm better.

## One Size Fits None: A Farm Girl's Search for the Promise of Regenerative Agriculture



"Sustainable" has long been the rallying cry of

agricultural progressives; given that much of our nation's farm and ranch land is already degraded, however, sustainable agriculture often means maintaining a less-than-ideal status quo. Industrial agriculture has also co-opted the term for marketing purposes without implementing better practices. Stephanie Anderson argues that in order to provide nutrient-rich food and fight climate change, we need to move beyond sustainable to regenerative agriculture, a practice that is highly tailored to local environments and renews resources.

In *One Size Fits None*, Anderson follows diverse farmers across the United States: A South Dakota bison rancher who provides an alternative to the industrial feedlot; an organic vegetable farmer in Florida who harvests microgreens; a New Mexico super-small farmer who revitalizes communities; and a North Dakota midsize farmer who combines livestock and grain farming to convert expensive farmland back to native prairie. The use of these nontraditional agricultural techniques show how varied operations can give back to the earth rather than degrade it.

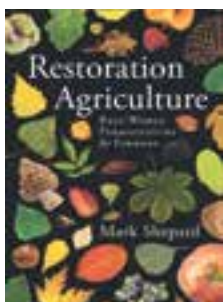
The book is published by University of Nebraska Press. The audiobook is published by University Press Audiobooks.

"An invaluable resource, a step in the right direction of imagining alternative

way of doing and organizing life around the soil and farming." (*Grist: A Journal of the Literary Arts*)

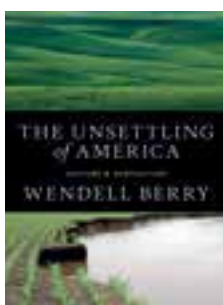
"A brave and clear-eyed book by a farmer's daughter about the problems in our agriculture and the factors that keep farmers from making it better." (Kristin Ohlson, author of *The Soil Will Save Us*)

"Should be required listening for anyone who yearns for a clear-headed and informed account of our dysfunctional corporate food system." (Andrew Furman, author of *Bitten: My Unexpected Love Affair with Florida*)



## Restoration Agriculture

Around the globe most people get their calories from annual agriculture - plants that grow fast for one season, produce lots of seeds, then die. Every single human society that has relied on annual crops for staple foods has collapsed. *Restoration Agriculture* explains how we can have all of the benefits of natural, perennial ecosystems and create agricultural systems that imitate nature in form and function while still providing for our food, building, fuel and many other needs - in your own backyard, farm or ranch. This book, based on real-world practices, presents an alternative to the agriculture system of eradication and offers exciting hope for our future.



## The Unsettling of America: Culture & Agriculture

Since its publication in 1977, *The Unsettling of America* has been recognized as a

classic of American letters. In it, Wendell Berry argues that good farming is a cultural and spiritual discipline. Today's agribusiness, however, takes farming out of its cultural context and away from families. As a result, we as a nation are more estranged from the land—from the intimate knowledge, love, and care of it.

Sadly, his arguments and observations are more relevant than ever. Although "this book has not had the happy fate of being proved wrong," Berry writes, there are people working "to make something comely and enduring of our life on this earth." Wendell Berry is one of those people, writing and working, as ever, with passion, eloquence, and conviction.



## What Your Food Ate: How to Heal Our Land and Reclaim Our Health

David R. Montgomery and Anne Biklé take us far beyond

the well-worn adage to deliver a new truth: the roots of good health start on farms. *What Your Food Ate* marshals evidence from recent and forgotten science to illustrate how the health of the soil ripples through to that of crops, livestock, and ultimately us.

The long-running partnerships through which crops and soil life nourish one another suffuse plant and animal foods in the human diet with an array of compounds and nutrients our bodies need to protect us from pathogens and chronic ailments. Unfortunately, conventional agricultural practices unravel these vital partnerships and thereby undercut our well-being. Can farmers and ranchers produce enough nutrient-dense food to feed us all? Can we have quality and quantity?

With their trademark thoroughness and knack for integrating information across numerous scientific fields,



Montgomery and Biklé chart the way forward. Navigating discoveries and epiphanies about the world beneath our feet, they reveal why regenerative farming practices hold the key to healing sick soil and untapped potential for improving human health.

Humanity's hallmark endeavors of agriculture and medicine emerged from our understanding of the natural world—and still depend on it. Montgomery and Biklé eloquently update this fundamental reality and show us why what's good for the land is good for us, too. *What Your Food Ate* is a must-read for farmers, eaters, chefs, doctors, and anyone concerned with reversing the modern epidemic of chronic diseases and mitigating climate change.

### Farmacology: Total Health from the Ground Up



that it's the farm where that food is

In *Farmacology*, practicing family physician and renowned nutrition explorer Daphne Miller brings us beyond the simple concept of "food as medicine" and introduces us to the critical idea

grown that offers us the real medicine.

By venturing out of her clinic and spending time on seven family farms, Miller uncovers all the aspects of farming—from seed choice to soil management—that have a direct and powerful impact on our health. Bridging the traditional divide between agriculture and medicine, Miller shares lessons learned from inspiring farmers and biomedical researchers and artfully weaves their insights and discoveries, along with stories from her patients, into the narrative. The result is a compelling new vision for sustainable healing and a treasure trove of farm-to-body lessons that have immense value in our daily lives.

In *Farmacology* you will meet:

- a vegetable farmer in Washington State who shows us how the principles he uses to rejuvenate his soil apply just as well to our own bodies. Here we also discover the direct links between healthy soil and healthy humans.
- a beef farmer in Missouri who shows how a holistic cattle-grazing method can grow resilient calves and resilient children.
- an egg farmer in Arkansas who introduces us to the counterintuitive idea that stress can keep us productive and healthy. We discover

why the stressors associated with a pasture-based farming system are beneficial to animals and humans while the duress of factory farming can make us ill.

- a vintner in Sonoma, California, who reveals the principles of Integrated Pest Management and helps us understand how this gentler approach to controlling unwanted bugs and weeds might be used to treat invasive cancers in humans.
- a farmer in the Bronx who shows us how a network of gardens offers health benefits that extend far beyond the nutrient value of the fruits and vegetables grown in the raised beds. For example, did you know that urban farming can lower the incidence of alcoholism and crime?
- finally, an aromatic herb farmer in Washington State who teaches us about the secret chemical messages we exchange with plants—messages that can affect our mood and even keep us looking youthful. In each chapter, *Farmacology* reveals the surprising ways that the ecology of our body and the ecology of our farms are intimately linked. This is a paradigm-changing adventure that has huge implications for our personal health and the health of the planet.



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We urge everyone reading to consider how much value you have gained from the information in the magazine. Has it saved you money? Inspired you to try something different? Entertained you? Helped you understand or solve a problem? If the answer is “Yes”, please become a patron so that we can attract more new readers to the magazine and they can in turn learn without any barriers to knowledge.

Simply scan the QR code to become a patron and support the continued growth and success of the magazine. Pay it forward and pass on the ability to read the magazine to another farmer.

***Clive and the rest of the Direct Driller team***

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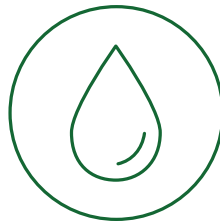
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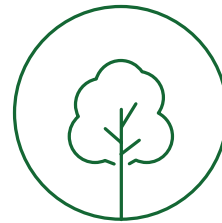
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