



Soil saviours champion carbon call

“It really is a win-win-win.”

Innovation Climate Change Champions

As voting gets underway for Climate Change Champion 2021, CPM assesses the data and the discussion around arable soil's capacity to sequester carbon.

By Tom Allen-Stevens

If every arable farmer were to follow the same practices adopted by CPM's Climate Change Champions, UK Agriculture would already be more than halfway to net zero.

This is what current carbon calculations suggest about the potential for arable soils across the UK to sequester carbon, according to figures submitted by the champions themselves (see chart below). However, the reliability with which soils in an arable rotation can sequester carbon has been called into question.

Over the past ten months, CPM has visited nine farmers who stepped forward as potential Climate Change Champions. With each one supported by one of our sponsoring partners, we've taken a close look at how they run their business and achieve impressive reductions in their carbon emissions. All businesses are the right side of net zero, with an apparent carbon balance that sequesters more than they emit.

But which is the best? CPM readers now have the opportunity to decide — during October, you get the chance to vote for overall Climate Change Champion 2021 (see overleaf for details).

The farmers were asked to submit figures calculated by one of the available carbon tools to quantify the progress they've made. This showed an average amount sequestered across the 6775ha of 5.97t CO₂e/yr per ha.

Multiplied up across the UK's 4.4M ha, this would achieve a total of 25.5Mt CO₂e/yr, which would make a huge dent in the 45.6Mt CO₂e/yr UK farmers emit, according to official figures.

But just how reliable are these figures? Analysis of the data shows around 94% of the sequestration across the farms is apparently held in soil organic matter, achieved through improvements such as minimum soil disturbance, additions and cover crops.

NFU climate change adviser Ceris Jones notes that sequestration potential in UK arable soils is a “core area of continuing uncertainties that scientists, farmers and financiers all want answers to”.

“Any measures to improve your soil is good for your business and improves productivity. But any CO₂ taken out of the atmosphere needs to be stored for a long time in the soil to have any effect on climate change.

“What is clear, however, is that if UK Agriculture wants to maximise its path to net zero, the speed and scale of transformation required is unprecedented. So the more farmers who adopt practices such as those followed by the Climate Change Champions, the better,” she says.

NFU hosted a soil carbon workshop recently at which leading scientists from across the UK summarised current thinking.

When it comes to change of land use, Prof Pete Smith of Aberdeen University notes that switching pasture to crops loses most carbon — a drop of around 60% of a soil's stock — while changing crop to pasture can build its stock by around 20%. At a carbon price of \$20-100/t there's a global potential to lock up to 0.4-0.7Gt/yr of carbon he adds. “But the carbon sink of the soil eventually saturates, it's reversible and there's leakage. However, there is huge potential to raise yield — increasing soil carbon by 1t/ha per year globally would raise productivity of major crops by 30-50Mt/yr. And soil carbon contributes to just about all UN sustainability goals, so it really is a win-win-win.” ■

• The Soil Carbon Workshop can be viewed at www.nfuonline.com. NFU is one of a number of organisations that have come together as the Agriculture and Land Use Alliance, hosting Countryside COP on 11-15 October, a week of events to showcase and inspire net zero activity in rural communities and agri-food supply chains ahead of COP26 in November. www.cfeonline.org.uk ▶

How the champions' carbon balance compares



Source: Calculated using Farm Carbon Calculator, Cool Farm Tool or SRUC Agrecalc, based on figures supplied by the farmers. Figures shown are indicative.

Who will be Climate Change Champion 2021?

Throughout 2021, we've profiled nine growers — thought leaders who have already started their journey to meet the challenging target, set by the NFU, of Net Zero emissions by 2040. They have the ideas, the progressive outlook and the determination to shape positive change.

Now it's your turn to decide which of them should be awarded the accolade of Climate



Change Champion 2021. We've summarised their achievements here, while the full articles can be found on the CPM website. Use your smartphone to scan the QR code (left) or click the link on the website to score each contender on their innovative ideas, productivity push, cultivation care and bio-based boldness. Voting ends on 1 November 2021 and the winner will be announced shortly after.

CPM would like to thank our sponsors, leading agricultural suppliers who have a credible Net Zero aspiration and are working with farmers in a partnership approach to meet this ambitious

goal. They helped identify these individuals and bring them into the top-level discussion about how farming can position itself as the solution to climate change.

cpm-magazine.co.uk/climatechangechampions



Andy Bason

Newhouse Farm, Hants



Innovative ideas

Andy's enthusiasm and positive approach encourage a culture at Newhouse Farm to try new ideas, which are readily relayed to the farming and wider community. On-farm trials and drawing on authoritative advice, for example through LEAF, pave the way to a successful journey to a sustainable future.

Productivity push

Diligent improvements to the arable system have already delivered productivity benefits through input savings and these look set to continue with the current focus on nitrogen fertiliser use efficiency.

Cultivation care

A gradual reduction in cultivations to a minimal approach, along with cover cropping and controlled traffic have led to an impressive 1% increase in soil organic matter over the past six years.

Bio-based boldness

Sensitive woodland management with thinnings used to heat the main farmhouse and cottages bring further net carbon gains, while 10ha of woodland creation secure future carbon capture.

Jake Freestone

Overbury Enterprises, Worcs



Innovative ideas

The management of the estate's soils is geared towards ensuring there's a thriving biology driving the active carbon cycle responsible for sequestering an impressive carbon balance. Jake

refines and improves his system through on-farm trials and sharing ideas with others.

Productivity push

Close nutrient monitoring means nitrogen fertiliser is used at up to 82% efficiency. With the soil's microbial community continually improving, bolstered through careful additions, productivity is consistently maintained with a reducing balance of synthetic inputs.

Cultivation care

Direct drilling across the arable area, in conjunction with other soil improvement measures, has led to a rise in soil organic matter of 1.7% on average over seven years. Sensitive grazed, the management provides an excellent foundation for the microbial community it supports.

Bio-based boldness

Through good use of cover crops, tailored to the estate's environment, green cover is maintained all year round and maximised across the arable area, providing natural solar panels to optimise carbon capture opportunities.

Thomas Gent

Gentle Farming, Cambs



Innovative ideas

Driven by a conviction about the wider society benefits of regenerative agriculture, Thomas has started a new business for trading carbon, creating opportunities for a whole sector of the farming community.

Productivity push

A well-established system pushes out respectable yields over a wide cropping mix. Good use of chicken manure and anaerobic digestate has lowered dependence on synthetic

fertiliser, and this is set to go further using the frass from insect farming.

Cultivation care

From a family of pioneers of minimum disturbance and direct-drilling kit on difficult Fenland soils, Thomas carries on a legacy that has seen soil organic matter climb from 3-4% to 8-10%.

Bio-based boldness

Crops grown for a local AD plant producing biogas offset a fossil-fuel requirement, while insect farming will reduce dependence on soya imports. But it's the initiative Thomas has shown with Gentle Farming and its potential to reward farmers who offset CO₂ emissions that set him apart as a true pioneer.

Craig Livingstone

Lockerley Estate, Hants



Innovative ideas

Craig's focus is to use the best of technology, combine this with a recalibration of ideas — a change of mindset within the team at Lockerley — to deliver the estate's mission. This is clearly stated, and his progress towards the estate's goals are well evidenced.

Productivity push

Behind the headline achievements there's a planned approach to maintaining or increasing output sustainably, while lowering resource use with confidence. Craig plans to make greater efficiency gains through increasing the level of detail and granularity of the data he captures.

Cultivation care

A measured reduction in cultivations has 'earned' the estate its right to go no-till. A respect for the soil has driven impressive gains in organic matter content.

Bio-based boldness

Although the estate is clearly carbon positive, thanks to good use of its natural assets, Craig makes a distinction with the farm's operational carbon balance, that he also plans to bring to zero.

Tim May

Kingsclere Estate, Hants

Innovative ideas

At the heart of Kingsclere Estates lies an abundance mindset. Tim enables a sustainable growth and progression through a partnership approach, tailoring business plans to the individuals he shares the ventures with.



Productivity push

Enterprise stacking across the estate allows the waste stream of one farming activity to feed another. This ensures the livestock enterprises fully complement arable crops, building soil health and growing the business without depleting resources.

Cultivation care

Mob-grazing, cover and companion crops together with undersowing to ensure continuous crop cover deliver an active and thriving soil biology. This allows judicious use of the plough to alleviate compaction.

Bio-based boldness

Identifying a local need for woodland, Tim has turned this into a sustainable business venture through the green burial ground. Where woodland is replanted, trees are chosen that form the foundation of a forest garden. The miscanthus utilises and improves poor soil while providing a source of green energy.

Will Oliver

AH Oliver & Son, Leics

Innovative ideas

Will has introduced some bold changes, but has the data to justify the decisions the business has taken. It's his mastery of the data, along with the impressive results he can show, that stand out.



Productivity push

The business has achieved massive reductions in synthetic inputs through use of chicken litter and digestate, while it has also moved to a more sustainable rotation. Both agronomic and financial performance are monitored closely and this has resulted in improved cost of production.

Cultivation care

Will takes stock of the principles of good practice, but takes a flexible approach to cultivations and trafficking, which is carefully monitored. Despite moving away from direct drilling, the farm's soil organic matter has increased considerably.

Bio-based boldness

Geothermal heat pumps and solar panels ensure the poultry unit uses minimal non-renewable energy.

Mike Purnell

Southill Estate, Beds

Innovative ideas

Practices such as companion cropping, intercropping, and drilling into a white clover understorey demonstrate that Mike is keen to try new ideas to improve the sustainability of the Southill Estate's arable enterprise. The strategy threads through every aspect of the farm with a conviction that would inspire others.



Productivity push

Yields have been maintained while synthetic nitrogen inputs have significantly reduced by using novel approaches that continually evolve. A focus on quality markets, with opportunities sought for low carbon produce, underpin a truly sustainable food offering.

Cultivation care

Soil health lies at the heart of the move to zero tillage and this has resulted in a steady improvement in soil organic matter, responsible for the majority of the estate's carbon sequestration. Mike's set a course to continue this impressive progress.

Bio-based boldness

The way the estate's environmental assets are managed not only bring improvements in its biodiversity but have given rise to offsetting opportunities.

James Taylor

Taylor Farms, Oxon

Innovative ideas

James has taken what's he's learnt from how microbes perform best in his anaerobic digester and applied this to his soils. The biology lies at the heart of a soil health improvement programme that goes beyond securing a sustainable future for the farm business — it addresses the misconceptions around energy generation from AD.



Productivity push

Mono-cropping has been abandoned in favour of a blend of crop types and varieties that support each other, bringing maximum productivity for minimum resource outlay. There's on-going success in driving down inorganic N applications, switching to more sustainable sources.

Cultivation care

It's a challenge to reduce cultivations sustainably in maize, but James has achieved this through the strip-till system he's adopted. With this and the direct-drilled cereals, again the focus is on the right environment for the soil biology to thrive.

Bio-based boldness

Freed from commodity production, James adds value to the crops he produces through the digester, deriving income from the electric and heat it produces, as well as supporting a new micro-greens enterprise. In addition, he's displacing impressive amounts of fossil fuel.

Doug Wanstall

J Wanstall & Sons, Kent

Innovative ideas

Doug's sequestering massive amounts of carbon into his soils and looks for every opportunity to turn this into a business venture to complement the farm's diversified enterprises. The lucerne crop and agroforestry project are notable aspects that put the business in a strong position to benefit as a provider of climate change solutions.



Productivity push

Productivity from the cereals revolves around getting good biological activity in the soils. This has been carefully built up through the addition of composted manures and management of the grass and herbal leys, ensuring a very sustainable level of production.

Cultivation care

Soil movement is minimised to keep the carbon cycling in the uppermost layer. The lucerne enterprise and the planned agroforestry venture take the carbon down deeper, making better use of the whole soil profile as a valuable resource. Biodiversity and water-quality benefits are built into the strategy.

Bio-based boldness

Re-Generation Earth has set a direction for the business to benefit from its net carbon-sequestering position — there are bright prospects, in particular, for the agroforestry timber as a carbon-friendly construction material.