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Incentivising sustainable action

Crop production insights

Contracts providing incentives for sustainable production are becoming increasingly common. CPM finds out more from Frontier Agriculture.

By Mike Abram

Although somewhat limited in scope, area or tonnage, contracts which include incentives for growers to produce commodities with lower carbon footprints are gradually becoming more commonplace throughout industry.

Among the drivers behind this rise are climate change and regulation – around 11% of UK greenhouse gas emissions (GHG) come from the agricultural sector. As climate becomes more unpredictable with resulting episodes of flooding, drought, soil erosion and extreme temperatures, food brands have become progressively more aware of the risks to their supply chains.

Pressure on businesses is also increasing from a growing list of regulations – companies are required to report not only on their energy consumption and GHG emissions, but also on nature and climate-related impacts and risks, and specifically what actions they are taking to manage this risk.

All of this is pushing food brands to seek new ways to support farmers

with sustainable farming practices, including financial incentives. Typically, these are either for sharing data to help companies within the supply chain better understand the carbon footprint and associated emissions involved in producing crops, or for practice change, or a combination of both.

Complexities

Obtaining real-world carbon accounting data is crucial to help drive the on-farm practice changes which will reduce GHG emissions, but it's also complicated, says Frontier's sustainability manager Sarah Burgess. "For a start, the data isn't as precise as with financial accounting systems we've become accustomed to for the past 150 years.

"There are a lot of assumptions, estimations, modelling and methodology updates involved in carbon accounting – even more so when it comes to carbon sequestration numbers used. It's further complicated by the varied scope and boundaries taken to deal with different targets.

"For example, when you're looking at NFU or UK net zero targets, you're looking at whole farm carbon footprints and emissions, whereas the supply chain is generally looking at the product being sold into it."

Obtaining the correct data becomes more confusing in that instance, with the potential for various activities on farm to interact with each other and careful consideration is required for what to include, she says.

But while there's a reticence from some to give up crop and field specific information, it shouldn't stop conversations in the supply chain on what's possible, she stresses, not least because of the huge reputational risks for businesses following the green claims code which came out in 2021.

That code forces businesses making environmental claims to have clear traceability data and lay out any assumptions or extrapolations. Reduction targets can't be managed, let alone achieved, without greater efforts to collect as much accurate



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Tom Lingham (L) and Nick Peters (R) have been working together to utilise tools such as deep nitrogen testing pre-season, NDVI analysis using satellite imagery and Yara's N-tester.

information as possible, says Sarah.

While supply chains recognise the potential benefits of incentivising farmers to provide data which will ultimately help drive practice change and reduce carbon footprints of their products,

the sticking point is the requirement to quantify a return on investment.

To date, contracts based on this model have been limited to pilots so far, with more credibility of carbon accounting, calculator methodologies and modelling required to support greater investment.

One farmer involved in such pilots is Tom Lingham of Faulkners Hill Farm based in Sevenoaks, Kent. The mixed farm grows around 800ha of arable crops on heavy Weald clay, alongside around 100 suckler cows with followers, which are sold as stores.

Increasing media coverage of net zero targets piqued Tom's interest in reducing the farm's carbon footprint, and when approached by Frontier about a new collaborative project in 2019, he started to take more notice of his carbon usage and impact.

"It involved sustainably producing milling wheat and gave us some practices to adopt, with the trade-off of being capturing some data from the farm," says Tom.

The project was based around a sustainable wheat contract protocol requiring farmers to adopt techniques that improve soil health, reduce crop emissions as well as deploy land use practices that support wildlife. In

return, growers are paid £10/t premium over the price of milling wheat.

In practice for Tom, this has involved using reduced tillage, IPM techniques for targeting pesticide use appropriately and lower nitrogen rates, while still achieving the milling specification required. He also has to dedicate 5% of the farmed area to wildlife habitats such as winter bird food covers and pollen and nectar mixes, and manage hedgerows for biodiversity gains.

Reductions of nitrogen of around 10-15% on average on his Skyfall milling wheat have been achieved, reducing the total from 250-270kgN/ha to 220-240kgN/ha. While the required milling specification is still 13%, due to the nature of the particular project, a fallback to 11.5% has helped further support the adoption of sustainable practices.

A range of nitrogen products are used to maximise efficiency – usually that means a protected urea for the first application in February or early March, followed by liquid UAN for the first main dressing with Nitram (ammonium nitrate) for the second.

"Liquid is more targeted, while ammonium nitrate doesn't volatilise ammonia later in the season. It's using the right products, at the right stage to get the most efficient use," says Tom.

Trials show promise

Farmer Tom Lingham is involved in a project that will reduce the carbon footprint of growing wheat through using CCM Technologies' new pelleted, carbon negative organo-mineral fertiliser products made from either cocoa shells or digestate.

Frontier is a direct investor in CCM Technologies and has a distribution agreement in England, Scotland and Wales for the products.

Tom is one of 15 on-farm comparison trials testing the practicalities of these solutions, which have a negative carbon footprint, according to analysis by The Carbon Trust, as well as providing organic matter content for soil conditioning benefits.

The product was used in half field comparisons with his standard nitrogen programme fields of Skyfall, with it replacing standard nitrogen applications at the first and third applications. Each application supplied around 60-65kgN/ha together with small amounts of phosphate, potassium and sulphur, says agronomist Nick Peters.

Total applied nitrogen in these trials was the same in both CCM and standard programmes,

although their potentially slower release nature may provide opportunities to reduce how much is applied, he adds. "Which could help with some of the practical constraints that might limit the viability of rolling out the product more widely."

According to Tom, it's a really bulky product. "And because you apply it at 500-650kg/ha, forward speeds were around 2-3km/h compared with the usual 14km/h to get an accurate flow rate from the spreader."

Using a lime spreader type machine or a deliver and spread service might also be solutions to the practicality concerns, but in this first year of wider-scale trials, Frontier is seeking to understand whether the product works on farm as hoped before refining agronomic practice.

"I was a bit sceptical," admits Tom. "But I've been pleasantly surprised and while we haven't harvested the crop yet, there's no visual difference in it between the CCM product and our standard nitrogen programme."

The wet conditions this season may have helped with the pellet breakdown, but further



Tom Lingham is involved in a project that aims to reduce the carbon footprint of growing wheat using CCM Technologies' pelleted, carbon negative organo-mineral fertiliser products.

work during the coming seasons is required to fully understand how the products perform both agronomically and practically, notes Nick.



Rob Nightingale believes Frontier's role is about making sure data is used fairly and correctly.

Tools such as deep nitrogen testing pre-season, NDVI analysis using satellite imagery and Yara's N-tester are also proving helpful to targeting nitrogen applications, says Frontier agronomist, Nick Peters.

"We're using the N-tester on the flag leaf quite specifically now – we input a yield expectation, variety, and growth stage and it gives back some analysis and a recommendation," he adds.

Typically, the farm applies between 20-50kgN/ha at that timing, but having the live data from the N-tester is helping to tailor that application, says Nick, which can quite easily be a 10-20% saving.

Across other farms, Nick is also trialling the Hill Court Farm Research service which tests root extracts to predict grain protein levels, with a view to using that next season at Tom's. "It's been quite bold in the prediction that I've received back so it'll be interesting to see the results," he comments.

Nick has also been challenged to be more targeted with fungicide use, although he says growing Skyfall does limit options. "All milling wheat varieties have their challenges and yellow rust is the key one for Skyfall. On Tom's farm we missed the T0 this year, partly because yellow rust pressure at the time wasn't there, but also because conditions to apply anything were testing.

"So being fluid with the season, climate and what you're seeing is important – we don't have a blueprint we follow."

Tom also grows lower carbon oilseed

rape on a sustainability contract. Unlike the wheat contract, this pays for more sustainable practices rather than providing a premium on the harvested product.

"There are three tiers – bronze, silver and gold," explains Rob Nightingale, Frontier's national technical sustainability specialist. "Tom qualifies for silver which means he direct drills, uses SOYL services on his OSR, grows it with a companion crop and uses variable rate nitrogen."

Employing those practices earns him £70/ha. "We pay per hectare because it's easier to administer and gives clarity to all parties," says Rob. "And it makes it fair across geographies and farms where average yields may differ significantly."

Similar contracts are being rolled out for wheat and barley via other supply chain partners too. "We talk to the supply chain about carbon and natural capital, but we speak to farmers about what this looks like in a practical sense so any sustainability programmes model what both want," he adds.

A key requirement is the sharing of data – Frontier strives to make that as easy for growers as possible via a simple form which provides around 80% of the information required to produce a carbon footprint, usually calculated using the Cool Farm Tool.

Some industry standard data can be used to fill most other requirements, but Frontier uses its agronomists alongside information from Greenlight, SOYL and MyFarm Analytics where appropriate, particularly around field operations – all with the farmer's knowledge and involvement.

"We have a number of financial mechanisms to support farmers to provide data," says Sarah. "That can be inherent in the contract, or a separate premium where there's usually an onus on providing more specific information, or for particular 'practice change' contracts where data is required to highlight the outcomes to the funder."

Frontier's biggest contract requiring data sharing involves up to 220 farms, while the smallest has just five growers. Having real life data helps drive change, stresses Sarah. "If you're just using average conversion factors the only way to make change as a buyer of crops is to reduce the volume when using a 'standard' emission factor of feed wheat – i.e. reducing the emission number by reducing the tonnes used. If we have a lower emission factor from better data, we can reduce the footprint in other ways.

"We can't just use averages – we have to understand what it means within specific supply chains and what levers we can use to drive change."

Global supply chains are further along in understanding some of these factors, she notes. "They recognise they're never going to achieve 100% primary data, but they know now what will make a difference."

Aligning data with those brands has partly pushed Frontier to use the Cool Farm Tool, which is widely used by such firms, but Sarah envisages grower data may end up being used in more than one calculator.

"While few contracts are large scale currently, we see that changing during the next few years. It just requires investment from the supply chain, how fast they're willing to go, and the percentage of their supply chain they want to involve.

"Smaller supply chains might want to involve 100% of their grain supply from farmers like a few of our customers, but if you have large volume grain flows from all over the country the approach may be different."

The data is also helping to change incorrect supply chain and government assumptions, proving that via some regions or practices farmers are already producing crops sustainably, adds Rob. "In that case, there might not be further action required as the farms are already efficient.

"Frontier's role is also about making sure data is used fairly and correctly. Supply chains aren't looking to use it to tell farmers what to do; through collaboration it's about developing the right incentives and understanding how we can support growers to make the right changes."

But farmers can't change incorrect narratives without engaging, adds Sarah. "And to do that there has to be more transparency with information." ■

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