

“ We’ll continue to work to improve our soils and become less reliant on artificial inputs. ”

Sustainable Solutions

Widening the crop rotation has been a vital tool for one farm manager in his drive to make the land both more productive and sustainable. CPM speaks to him to dig into the details.

By Melanie Jenkins

Becoming farm manager will always be a sizeable task, but doing so on a farm at one of the largest estates in Britain with the aim of turning the focus of the business around entirely, is a different challenge altogether.

But Chris Lovie has embraced this with both hands to drive sustainability at Dunecht Home Farms, which is part of Dunecht Estates in the North East of Scotland. Chris manages 6000ha in total, with 700ha of cropping grown around Dunecht, consisting of a mix of wheat, spring barley, winter barley, oats and oilseed rape, as well a running 100 cows and 300 ewes on the low ground and 2500 ewes on hill ground.

When he took on the management of the farm in March 2019, there were a number of challenges to overcome to improve cropping, sustainability, soil health and the commercial potential of the cash crops.

A wider viewpoint

One such challenge was that cropping had been kept in a very tight crop rotation under the previous management. To widen the rotation, Chris has shifted from a 3-4 year cycle to up to eight years with cereal crops. “The rotation was just too tight so we’ve increased the arable area on the farm by taking out grass,” he explains.

By broadening the rotation, this has allowed him to expand the hectareage of OSR he’s growing while using winter barley as an entry to it. Although the farm doesn’t have a significant problem with cabbage stem flea beetle, the pest was present in OSR in 2022, but luckily the weather usually kills it off when it does appear, says Chris.

Break crops

Winter oats are also now grown as a break crop for winter wheat to help extend the rotation. “We grow 200ha of wheat and it just wasn’t possible to maintain this with a short rotation,” he adds. “As well as being able to grow the crops we want to, we’re finding crops are now a lot cleaner with fewer weeds that are easier to control, disease pressure is much lower and soil structure has improved.”

When Chris joined the farm there was a significant issue with sterile brome that he’s since worked to get on top of with the help of Charlie Catto, Agrii agronomist. Before Charlie came on board, the same fields were used for the same three-year rotation – with spring crops cycling with grass in some and others always planted

with winter wheat, winter barley and OSR. This meant there was never a break.

Farm-saved seed was used but brome seed wasn’t removed, leading it to multiply across the farm, explains Charlie. “The herbicide programme being used wasn’t really tackling the brome, instead it was aimed at annual meadow grass.”

Widening the rotation and moving fields into a mix of winter and spring cropping helped to tackle this, he explains. ▶



Farm manager, Chris Lovie has embraced the task of driving sustainability at Dunecht Home Farms.



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► “We also bought new seed which was brome free and looked at using different cultivations such as ploughing deeper and not reinverting at the headlands, as well as using herbicides based on flufenacet and Avadex Factor (tri-allate). It’s been a combination of integrated pest management and agronomy to achieve control of the weed.”

A further benefit of widening the rotation and shifting between winter and spring cropping in all fields has surfaced in the form of increased organic matter and better crops, he says.

However, one approach that remains set on farm is the use of the plough, despite attempts to venture into minimum tillage. “Compactions was pretty bad on

the farm with headlands set like concrete. We’ve removed a lot of the pans and the compaction issues through different cultivations which has helped to bring up the yield average,” explains Charlie.

But when trialling min-till the drop in yield was too significant to justify continuing with this approach, says Chris. “We now tailor our approach to the situation, for example we have a Simba cultivator with a deep leg that’s useful on headlands, but a Horsch Pronto DC is the main drill. The ground can be quite wet in the winter so we have to be careful how we broach the soil structure as it has to have a good north-east wind to dry out.”

Chris has utilised green manure cover crops to help open up soil structure, add in organic matter and as a good entry for wheat. These are supported through government schemes – something the business had in place before Chris joined, but which he’s further tailored to suit the farm by directing them at less fertile ground.

iFarm trials

Dunecht Home Farms is in its first year of being an Agrii iFarm, but the business has been involved in trials with the company previously in a bid to fine-tune its approach and look at options for integrating the farm’s diverse operations.

“You can look at results from trials carried out on a farm just 30 miles away, but that’s no indication the same practices will work in your own situation,” suggests farm manager, Chris Lovie. “The beauty of being an iFarm is we can see the latest ideas so can hopefully keep ahead of the game, but also so we can establish what will deliver benefits here and what won’t.

“Moving forward, we’re particularly interested in ideas that can work across the arable and livestock enterprises to help us to establish a more sustainable base for the future.”

One such example has been the business’ trials with different cover crops, which are now entering their third winter, he says. “Spring barley tends to be harvested a bit later in the North East of Scotland, often into September and there are a lot of trials and tribulations with that so we have to plant cover crops which can handle the late sowing. But if we can work out a way of doing this, we’ll be right at the forefront and there are a lot of potential benefits.”

Agrii agronomist Charlie Catto agrees, saying the trials are focused on identifying

mixtures that will grow and work when later drilled while comparing the performance for the following spring barley in both minimum tillage and ploughing scenarios.

“We’re measuring subsequent crop yield but also nutrients, particularly nitrogen, phosphate and potash, that are fixed by the cover crop. The idea is that we can establish something in the autumn that’s going to give us a good green mass and which will also work well with the farm’s sheep – lambs can come down off the high ground and graze the green cover crop in the spring.

“We can also reduce fertiliser inputs off the back of this which can lead to some potential end market benefits. Distillers are looking to reduce their scope-3 emissions, so if we can demonstrate we’re using reduced inputs but getting similar yields, and also being more sustainable through using cover crops, then in the long run Chris and Dunecht are going to achieve a higher premium for their grain.

“It’s a good example of trying to work all of the systems together – improving the soil structure, using the cover crop for the high ground sheep, and then trying to achieve a better end market for the grain.”

Other opportunities being looked at in the new iFarm initiative are using nitrification inhibitors to drive greater nitrogen use efficiency (NUE) and making more cost-effective use of phosphate, he says. “We’re



Other opportunities being looked at in the iFarm are using nitrification inhibitors to drive greater NUE and making more cost-effective use of phosphate, says Agrii’s Charlie Catto.

using Liqui-Safe with the farm’s liquid fertiliser approach, so when the temperature warms up later in the season, or there are wet spells, the risk of greater nitrification and volatilisation can be reduced. This should allow us to reduce nitrogen use by around 10% while cutting out on a pass of the sprayer. Again, it’s another way of trying to be more sustainable while using our nitrogen more effectively.

“The use of Agrii Start Release is also being explored to make more use of the available phosphate. Phosphate levels are high at the moment so we want to see if we can make this more available to plants without making further applications. Hopefully, we’ll be able to draw some of that phosphate back out of the soil and into the crop.”



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Soil sampling

Turning his attention to further improving soil health, Chris has adopted a practice of regular sampling to look at pH, phosphate, potash, magnesium and organic carbon levels. “This is something we’re constantly trying to improve and so have created soil maps and are soil sampling as well as applying lime every five years to ensure the target pH of 6.5 is met and never falls below 6.”

He also uses soil and tissue analysis to determine where macro- and micronutrients should be applied to best benefit crops, such as magnesium, sulphur, manganese, zinc, boron and copper.

The loamy soils on the farm have a high stone content but also have a high level of organic matter, ranging between 5-7%. “The farm has had constant applications of muck during the years, and I’ve stopped selling straw straight off the back of the combine and either arrange straw for muck deals or I chop it. I’ve also introduced the use of digestate to the farm to try and constantly improve organic matter.”

A notable improvement that Charlie’s observed where muck or digestate have been applied is when the farm has a really dry or an extremely wet summer, with these areas coping much better. “This has improved both the durability of the soil and the crops.”

A further change Chris has



Sterile brome had become rife on the farm due to the use of farm-saved seed and split spring and winter crop rotations.

implemented has involved moving to liquid fertiliser to improve application. “We’re now applying a lot less P and K and when we combination drill, the rates of fertiliser used have almost halved compared with what they were previously because of our soil indexes. But going forward I’d like to bring in variable nitrogen and seed rates to achieve the best out of what we’re applying.”

In the long term, Chris feels some uncertainty around the subsidy outlook in Scotland, which doesn’t have the Sustainable Farming Incentive (SFI). “Until we hear a clearer message from the Scottish Government, we’ll continue to work to improve our soils and become less reliant on artificial inputs.” ■

Sustainable Solutions

The leading agronomy development network

Extending from the tip of Cornwall to the Black Isle, north of Inverness, iFarms are part of the country’s most comprehensive arable agronomy development network.

Hosted by forward-thinking growers, the network undertakes a range of practical trials and demonstrations overseen by Agrii agronomists in parallel with detailed scientific research delivered by R&D teams at Agrii’s six principal Technology Centres.

Each of the 18 main iFarms has its own unique set of conditions, requirements and challenges which are reflected in the trial work undertaken and solutions explored and developed.

The current programme includes fully-replicated national and regional trials as well as field-scale demonstrations with the widest possible range of winter and spring wheat, barley, oats, rye, oilseed rape and maize varieties.

Specific studies are also conducted with a broad range of integrated crop management strategies including pest, disease and weed management, macro and micro-nutrition approaches,



and tillage regimes; cover, companion and alternative cropping options; and a variety of biological, soil improvement and environmental land management opportunities.

A full programme of meetings throughout the year and summer open days give growers the chance to experience the latest iFarm and Technology Centre work first hand — share in their most-up-to-date findings while discussing innovative agronomic thinking in thoroughly local contexts. Don’t miss opportunities from the network this season — scan the QR code below to explore what’s happening where and when, and link to ‘invitation-only’ events which might be of interest.

