

Regen potatoes: Only the brave?

Regenerative potatoes

Many battle with the concept of 'regenerative' potatoes and simply discount it for fear of risk. But small steps could pave the way for a more sustainable crop, as *CPM* investigates on one Shropshire farm.

By Emily Padfield

Change has never been something shied away from at Lynn South Farm. What started post-war as a typical Shropshire mixed farm of potatoes, sugar beet, cereals and dairy, has adapted through the generations and is now looking firmly to a more diverse, regenerative future.

The family-run farm currently consists of just over 800ha (2000acres) of rented and owned land, which currently grows a six-way rotation of potatoes (grown under contract for McCain), three winter feed wheats, oilseed rape, and flowers grown as

part of the family's hugely successful Shropshire Petals dried flower business.

"Almost 80% of the acreage is irrigated, lending itself to higher value crops, and our soils range from sand to sandy loams, with some heavier ground in places," explains family member John Bubbs, who is responsible for the arable and potato side of the business.

"Three years ago, our existing independent potato agronomist retired and we saw it as an opportunity to alter our system and explore more regenerative principles."

Time for change

As a result, John turned to Ed Brown, head of agroecology at Hutchinsons, to explore how potatoes could be grown in a more nature-and soil-friendly manner as part of the rotation.

"Crucially, it's the overall mindset that's the important bit. And you have to make sure that everybody on the farm or in the team is on the same wavelength, working to achieve the same goal. At the time it was very easy to see the lack of worms, soils were seriously degraded, and we were in a downward cycle in terms of overall soil health," says John.

Sugar beet formed part of the rotation

“ Many think you have to slam the door shut when it comes to potatoes in a regenerative system, but that's simply not the case. ”

until the local factory shut around 15 years ago. "We used to grow sugar beet and potatoes in a four-year rotation. So, for two years out of four we faced the very real threat of damaging soils should there be a wet autumn."

The length of time between potatoes has increased steadily since the 1970s, he goes on to add. "The farm has gone from cropping potatoes one in three in the 1970s, through one in four in the 1980s and 1990s, one in five from 2005 to 2015, and now it's one in six.

"Growing potatoes one year in six already marks a big shift in the right direction. Most of regenerative agriculture isn't difficult, it's logical," believes John. "It's effectively ▶

ADVERTORIAL

Growers and advisers must remain vigilant against aphids

Andrew Dear, head of agronomy at British Sugar

Growers should look out for peach potato aphids, which could be carrying one or more of the three yellowing viruses that can negatively affect sugar beet yields. This is particularly important following the recent wet spring coupled with later drilling dates, as some crops are further behind than usual.

Over fifty percent of this year's crop has been treated with Cruiser SB, which will give around 10 weeks of protection against aphids. But it's important to continue monitoring these crops, as follow-up foliar sprays may be needed.

As the British Beet Research Organisation (BBRO) predicts that aphid numbers will build throughout June, growers who did not use Cruiser SB should be vigilant and consider foliar applied insecticide when the threshold of one green wingless aphid per four plants (up to 12 true leaves) is reached. Five counts of ten plants should be completed across the field.

Where beneficial insect numbers are low, InSyst (acetamiprid) should be considered as a first spray for non-Cruiser crops, to give a good knockdown of aphids. If the threshold is triggered again, then Teppeki/Afinto (flonicamid) should be used, as it will have less impact on beneficial aphid predators.

Should aphid thresholds be exceeded again up to the 12-leaf stage, an emergency approval of Movento (spirotetramat) as a third spray is available for non-Cruiser crops only - this third spray was obtained under Emergency Authorisation.

BBRO monitors 12 yellow water pan traps, with another 34 aphid monitoring sites across the beet growing area. Results can be found on the BBRO website, giving early warnings if aphids may be active in the area. Each field should then be inspected: It is vital that growers and advisers remain vigilant to minimise aphid numbers and subsequent virus infection, protecting crop yields.

For non-Cruiser treated crops:

T1 – Teppeki/Afinto or InSyst

T2 – Whichever chemical not applied at T1

T3 – Movento

For Cruiser treated crops:

T1 - Teppeki/Afinto

T2 – InSyst



Andrew joined British Sugar in 1996, based in the trials team at Holmewood Hall before becoming an area manager supporting growers for Bardney, Newark and York factories. He moved into agriculture operations and business manager roles at Wisington and Cantley before becoming Head of Agriculture at Bury St Edmunds. Today, Andrew leads the Technical Support Team, giving support to growers and the wider industry. He is also on the British Beet Research Organisation Stakeholder Committee.



Instead of ploughing, a Simba DTX is used as a single-pass cultivator post-spraying. For the majority of ground this is then followed by a bed former, destoner and finally planter.

► simpler than what we were previously doing, in some ways. It's looking at the 'how and why' we do every step rather than applying a broad-brush approach and working with nature, not against it."

John sees one of the biggest hurdles to the transition as the existing herbicide residue in the soil, as well as how the farm has been managed. "Our soils are used to high levels of ammonium nitrate as well as other inputs. We can all see and know the benefits for the future but it's managing the risk and vulnerability in this transition period that's the tricky bit. We, like all farmers, can't risk not getting a saleable crop."

In terms of applying these approaches on rented land, John believes it's just as important as on his own ground.

"For us to be good tenants going forward, we need to be seen to be doing things differently and hopefully adopting these principles will be a point of difference when it comes to renewing or being considered as tenants."

Which is where some of the difficulty in regen can come from, he believes. "In an ideal world, we should be growing two acres of potatoes, two of carrots, two of everything else and running a load of livestock.

"That's just not feasible for us or most commercial growers. That doesn't mean we can't at least try to integrate the principles where we can. We work closely with McCain and it's a constant conversation with them about what 'regenerative' means."

The processing company has



In the future there might be an opportunity for re-ridging potatoes, planting into shallower soil and ridging up later. This would enable mechanical weeding and reduce reliance on herbicides.

If you have any questions, please contact your British Sugar account manager. You can also read the British Beet Research Organisation's advisory bulletins at www.bbroy.co.uk



made the bold statement that, by 2030, all potatoes sourced will come from farms that use regenerative practices. Alongside other growers, John is on a steering group with McCain to put together a schedule of what regenerative means and a way of measuring it as a company and on farm.

Spring established flower and potato crops provide ample opportunity for cover cropping, which was one of the first steps the farm took in order to improve soil structure and increase soil life, and these have formed part of the rotation for the past six years.

“The scary bit when using cover crops in potatoes is that, potentially, you’re feeding wireworm and subsequent nematodes throughout the winter months, whereas we used to overwinter with a clean stubble.

“Growers are understandably nervous of cover crops as if you have a whole crop affected, it’s a disaster. Touch wood, we haven’t seen any yet and my philosophy is of the bigger picture, we are hopefully encouraging the good nematodes, not just the bad.”

The cover crop of choice at Lynn South Farm is Hutchinsons’ MaxiVeg, which consists of linseed, buckwheat, phacelia, vetch and clover, plus oats. Sheep are grazed from January to mid-February, before the cover crop is terminated using glyphosate a couple of weeks ahead of planting, ideally in mid-March.

“It doesn’t always go to plan; this year has been hard work with 70% planted by the beginning of May.”

One of the major changes to cultivation is the reduction in ploughing, which is now only used in exceptional circumstances. Instead of ploughing, a Simba DTX is used as a single-pass cultivator post-spraying. For the majority of ground this is then followed by a bed former, destoner and finally planter.

“Our main cultivation change is skipping bed tilling, when and where we can, thanks to soil structure improvements which I believe to be mostly down to cover cropping,” explains John.

“We still have to destone because we have a major potential problem, or at least we think we do,” he admits. “Obviously, if you have stones in the trailer at harvesting, you stand a risk of bruising the end product. It’s more about risk management as we just can’t afford to suffer that damage.

“We’re trying the odd acre here and there without destoning and there are a couple of local farmers that aren’t

destoning at all, but it’s very much a case of soil type.”

Planting now takes place with a tine to reduce run-off and disturb the wheeling. Three varieties of potatoes were planted this year – Morene, Maris Piper and Royal.

“In the future there might be an opportunity for re-ridging potatoes. They do this in the US, where you plant the potatoes shallower in warmer conditions and then ridge them up later.”

Re-ridging benefits

There are two advantages to this, he goes on to add. “One is that the plant gets to crop earlier, and secondly, it minimises risk of disease rather than sitting in cold, wet soil as the plant is up and growing quicker.

“An additional advantage of this method is that it lends itself to mechanical weed control, which could in turn reduce our reliance on herbicides. It’s only a theory though,” he’s quick to add.

“GPS technology is opening the doors to a lot of these mechanical options, allowing us to accurately carry out interrow cultivation with no fear of damaging the crop or making a mess.”

Harvesters are run on wide tyres or are self-propelled track machines and tractors, with trailers kept to a minimum during harvesting, where possible. “But again, we still have learning to do when it comes to harvesting at busy times into store, which needs thinking about,” adds John.

Other tools the farm has been making use of are SSM in-depth soil tests and regular SAP analysis. “SAP analysis is



John Bubb says that most of regenerative agriculture isn’t difficult, it’s logical – looking at the ‘how and why’ rather than applying a broad-brush approach, working with nature, not against it.

carried out every three weeks or so during the growing season on both potatoes and arable crops. With putting on less or at least reduced fertiliser, we’ve got to be careful there isn’t a yield penalty, so it’s a no brainer to measure it more accurately than we have in the past.”

The main benefit of SAP analysis is to get a true picture of the plant’s actual health, adds John. “We take a sample of the old and new leaf and send it to Novacrop, allowing us the chance to remedy things if levels aren’t correct. We’ve learnt a lot from it so far and now we’re not applying any phosphate, 15% less nitrogen and 30% less potassium.” ▶

The agronomist’s view

For Ed Brown, there’s no strict formula to growing regenerative potatoes, it’s more about learning where and how to grow them better and without such a detrimental impact on soils.

Ed was primarily a potato agronomist before he joined Hutchinsons, which put him in a good place to advise John in terms of adapting growing methods to embrace soil food web principles. “I could identify where improvements in each process could be made, hopefully so as not to detriment the crop.

“It’s about looking at each field, each crop and each set of environmental conditions and determining what it actually needs at the time, rather than a broadacre approach. Many think you have to slam the door shut when it comes to potatoes in a regenerative system, but that’s simply not the case.

“You can have a regenerative rotation that

includes potatoes. In Shropshire, where ground lends itself so well to potato growing, it’s been possible to see the improvements after just three years in John Bubb’s soils in terms of better soil structure and the number of soil fauna.”

The farm is host to several trials using companion planting of peas and beans, planted at the same time as potatoes, to not only add diversity but also fix nitrogen and add root structure, while attracting beneficials.

“We’re also drilling cover crops into tramlines and unplanted areas, which not only enhances diversity but has benefits when it comes to travel for machines like the sprayer. We’re never going to get away from tillage of some sort for potatoes, but hopefully by rebalancing the soil food web and getting crop nutrition right, we should be able to get away with a lot less inputs and tillage.”



Flowers for drying now occupy 120ha at Lynn South Farm in Shropshire, a crop that marked the first departure from the norm for the Bubb family.

▶ Seed dressings are now rarely used on potatoes and John is actively trying not to use any nematicides, falling back on Nemathorin (fosthiazate), if and when required. “This is helped by using new varieties that can resist and tolerate nematodes. I believe nematicides to be one of our worst enemies when it comes to soil and wider ecosystem damage.”

Molasses and seaweed, alongside humic acid, is applied at planting with base fertiliser as well as foliar N during the growing season. Since going down the regenerative route, John is adamant that no ammonium nitrate is applied, only urea-based products.

“All other crops, bar potatoes, use controlled traffic farming systems and we’re adopting many of the same principles as we employ in potatoes, such as SAP analysis on the wheat and OSR, allowing us to reduce nitrogen, phosphate and potash applications overall.”

Living mulches

A Horizon strip-till cultivator and Horizon drill is used to establish both flowers and OSR. “One idea we’re looking at is a living clover mulch, strip tilled alongside crops for five years. The strip of clover would remain while either side of the strip could be wheat, flowers or OSR.

“Where we’re trying the living mulch, we’re drilling wheat with an older Weaving tine drill with two tines positioned close together, planting in a 15cm (six-inch) wide band rather than a row,” he explains.

“Getting the clover established has been

our problem, but I believe it’s coming back to the residuals and the transition period. We’ve got to get a crop at the end of the day, so we’re still reliant on herbicides at the moment.”

A pioneering spirit runs in the genes of the Bubb family. In the mid-1980s, what started as small cottage garden business run by John’s grandmother, supplying flowers to local WRI markets, started to grow into a crop in its own right. And by the 1990s, dried flowers made up 60ha of the rotation.

“By the end of the decade the popularity of Laura Ashley-inspired dried flowers waned, so my father and brother decided that, instead of keeping the petals on the stems, we could market the petals themselves as natural petal confetti. By 2014 the farm was growing over 45,000 flowers and they now make up 120ha of the rotation,” says John.

“Change is always challenging, doing the same thing is often easier and it can be hard work to do things differently when it’s what you’ve done for the past 50 years, but I strongly believe in what we are moving towards and so does our team.” ■

Insights into soil

A new soil analysis and nutrient planning service, SoilSense, has recently been launched by ProCam and has been designed to help farmers gain a deeper understanding of their soil and take practical steps towards protecting and improving it.

With soil health now a priority for many growers and a key element of the SFI options under ELMs, it’s arrived at just the right time, believes ProCam technical development manager, Rob Adamson.

“Current soil testing practices may provide information on soil macro- and micronutrient levels, but these figures don’t necessarily reflect what’s available to the plant,” he explains. “Nutrient availability is complex due to the interactions between different cations and the soil’s physical and biological properties.

“SoilSense aims to give clarity by providing information on the levels of nutrients available to the crop and the amount in the soil using a range of key nutrient extraction methods. This gives a more in-depth understanding of the soil and its potential.

“Most farmers carry out some degree of soil testing, but there’s a lot more that can be done to understand the results of these tests, and a lot more to be learned if the right soil characteristics

are measured.”

Examining this in more detail, Rob says soil functionality is a combination of soil biology, physics and chemistry, plus soil organic carbon. Effective soil management requires an understanding of all of these and the relationship between them.

“Understanding what is plant-available is key to making agronomic decisions and growing crops efficiently. Basic macronutrient tests may tick a box — for example, measuring indices of phosphorous and potassium — but they don’t necessarily reflect what’s available to the crop.

“The same is true for nitrogen and sulphur. These elements work hand-in-hand and have an intrinsic relationship with soil carbon and soil organic matter. SoilSense offers an understanding of how these interact and takes in a wide range of factors, specific to the soil in question, to determine the amount of nitrogen likely to be available to the plant. This has the potential to improve the accuracy of nutrient management plans and to optimise crop performance.”

Although building soil carbon and organic matter has environmental appeal, Rob says it’s also fundamental to crop resilience. One of the benefits of higher SOM is that it helps soils to retain moisture — which is of particular



Rob Adamson says effective management requires an understanding of soil biology, physics, chemistry and soil organic carbon, as well as the relationship between them.

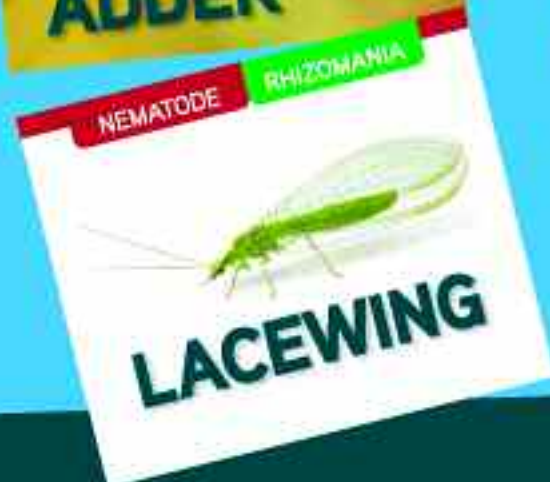
importance during periods of summer drought.

“The pressure to manage carbon is increasing. Unlike many industries, farmers are in a strong position to make positive and measurable changes to carbon sequestration. By offering a comprehensive analysis of SOM and carbon, SoilSense helps growers to understand their carbon levels more accurately to chart soil health. It will also allow them to make positive changes to sequester more and reduce CO₂ emissions with better soil management.”

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