

The agroecology mindset

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Helix agroecology

Hutchinsons has launched a new bespoke agroecology service for its farmer customers, linked to its Helix innovation network. CPM attends the launch at the Shropshire farm and asks what the term actually means.

By Tom Allen-Stevens

Not so long ago, if you'd told your agronomist you wanted to adopt a more agroecological approach to the way you grow crops, they would have looked at you in disgust.

Now it's been launched as a new bespoke service by Hutchinsons who have unveiled their first Agroecology Farm. This autumn will see the addition of Whitley Manor Farm in Newport, Shropshire (see panel on p75) to the Hutchinsons' national Helix network.

“As an industry, we're looking for answers as to how many of the practices associated with agroecology — such as reducing cultivations, using cover crops

and reintroducing livestock — can really make a sustainable and profitable difference to our farms,” explains Ed Brown, Hutchinsons head of agroecology.

“Our Helix farms were set up to test new technologies and practices in real farm scenarios and this is exactly what we are aiming to do with the Agroecology Helix Farm.

Bigger picture

“Our objective is not to look at the minutest details and trials but to look to answer some of the bigger-picture questions surrounding agroecology practices — there are plenty of observances and lofty objectives made with agroecology, but we want to gather the evidence.

“For example we want some clarity on questions such as when moving over to an agroecological approach, how are yields affected? Do they drop off and then pick up again? What are the direct benefits to soil health, biodiversity and soil nutrient availability? Are they measurable and definable?”

To answer these questions, Ed and the Helix team will take baseline measurements and evaluate the impact of agroecological technologies or agronomic practices on factors such as soil health, diversity and carbon, with the objective of improving economic and environmental sustainability.

For Ed, there are six key principles of agroecology:

1. Minimise soil disturbance
2. Always keep the soil covered
3. Maintain living roots throughout the year
4. Maximise diversity
5. Integrate livestock
6. Keep an open mind

“The really critical one is number six: you cannot follow an agroecological approach unless you're prepared to challenge the practices you currently follow,” he stresses.

And this is one of the key aspects of Hutchinsons' new service. Agroecology is not going to be pushed by the agronomist — the whole idea is that it comes from the grower, as the company's Dick Neale



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explains. "It starts with the grower coming forward and saying 'this is something we need to do'. Agroecological principles will work on any farm, but only where the grower is bought into it."

He points to a herbicide trial on the farm as an illustration. "One of the principles of agroecology is to use minimum soil disturbance. The key here is minimum, so the plough may be the right tool where it's appropriate. But you look at the soil first and the underlying issues, and judge the right approach from that."

In this light, cover crops take on a different role. "It's not about what they do directly to the grassweed, but what they're doing to the soil. Cover crops add diversity, but also structure. We're looking at how different species mixes and management practices influence the environment in which grassweeds grow."

Fertiliser use is also coming under scrutiny as Hutchinsons' Richard Watkins explains. "As a plant takes up inorganic nitrogen applied to the crop, it's an energy-intensive process that also leads to depletion of soil carbon. The more synthetic fertiliser you apply, the more you draw down on the soil reserves and drive degradation.

Meanwhile, the more artificial inputs you apply to the soil the more you shut off the relationship between plant and soil biology. The large canopy created is also a haven for disease and excessive nitrate in the leaves is also a magnet for pests."

Sap analysis

Richard and Ed are looking at tech developments and close measuring on N-Min levels, as well as sap analysis to help reduce fertiliser applications. Leaves are sampled three times during the spring, and the sap analysed for all macro and micronutrients. The farm's combination crop of beans and oats (boats) will also come under scrutiny for how the roots share out the available N. And the potential for foliar applications to reduce overall N use is also being investigated, Ed explains.

"We're also looking at the potential for a biological product from Corteva Agriscience. Utrisha N is claimed to increase a crop's fix approximately 30kg/ha of nitrogen from the atmosphere and feed it to the plant onto which it is applied. ■



The same mix of cover crop can produce very different results, depending on the nature of the soil, says Dick Neale. One pot contains basic compost while in the other, the same compost spent two years as a wormery before each were sown with the same cover crop mix. The wormery pot initially established better, but then the compost pot caught up. Species mix was the biggest difference though – brassicae dominate in the basic compost while legumes thrive in the wormery soil.

Mindset change as Whitley Manor embraces agroecology

Harry Heath took over the running of the family farm at Whitley Manor several years ago. Based in Shropshire on sandy loam soils, its primary business was pigs, with 550-600 breeding sows producing 17,000 piglets. But the arable side is now set to take the prominent role.

"We've taken the decision to leave pigs," he reports. "It's an enterprise with an extreme level of market uncertainty. But that puts additional pressure on the arable side — it must be profitable and sustainable."

The farm exited sugar beet in 2007. Potatoes were still in the rotation, with land let out to local producers. "But soil health has been in decline," says Harry. "They're very prone to slumping and you see evidence of erosion following rain events. We've been taking more out of the ground than we'd been putting in."

The move towards agroecology started in 2019. "With a legacy of heavy cultivations which cost money and were not doing very much for soil health, we needed to look at how we could manage this differently going forward. This was the real spring board into looking at how agroecological practices could help us to do this."

Ed Brown took on the agronomy for the farm and helped take discussions forward on the options available to address these issues. So the farm purchased a John Deere 750A drill. "We're

moving to no-till but recognise that we need to be patient and be guided by what's best for the soil and the challenges an arable system presents," notes Harry.

One of these is herbicide-resistant Italian ryegrass. "One field in particular has high ryegrass populations, so after much debate on the various options available to us to get on top of it, the answer was clear, we decided to plough it. It's not what fits into an agroecological agenda, but it's what the field needed to re-set and now we can move forward and focus on building soil health," he points out.

"This has taken a real mindset change, so we are taking each step at a time. It's not a rigid and defined approach but one that's about responding to the field or situation that we have in front of us. So we've learnt to be much more flexible."

Changes to the rotation have seen potatoes dropped out with hybrid rye introduced. "We're also trying a combined crop of beans and oats." Cover crops have come in, grazed off by sheep that are now a valued part of the system.

"We've moved to liquid fertiliser, and that allows us to add molasses to the soil, which feeds its biology," adds Harry. "Manganese lock-up is an issue, and we have good levels of phosphate and potash but struggle to access



Harry Heath is moving to no-till but recognises the need to be guided by what's best for the soil.

them. I want to get the biology in to unlock them, and I'm comfortable we can pull back on nitrate, fungicides and insecticides without compromising productivity."

That certainly doesn't mean turning his back on technology. Trying the best of what's new remains firmly within the farm's strategy as it progresses on its agroecological journey, says Harry. "We want to farm in a manner that maintains our livelihood, but we want to farm with Nature, not battle against it."

Harry has now started offering agroecology contracting services to help farmers in the vicinity looking to improve their sustainability.

What is Agroecology?

Like regenerative agriculture, agroecology is a term that's been used by scientists, environmental activists and politicians alike to describe a suitable direction for agricultural systems to make them more sustainable.

It has its roots in science, and is referred to in scientific literature as far back as the 1920s. A 2009 Royal Society report calls it "the science of sustainable agriculture, studying interactions between plants, animals, humans and the environment within agricultural systems." This is generally today's accepted definition, but just how broad its influence and what you can class as agroecological is left very much open to interpretation.

Importantly, it's an approach the Soil Association favours, but that's not to say it's organic. Most of those who favour agroecology promote it as a way of farming that spurns "intensive agriculture". But the scientists who compiled the Royal Society report promote "sustainable intensification" of agriculture as an essential element required to feed a growing population.

One UK-based approach to agroecology that has received perhaps the widest endorsement has come from the Food, Farming and Countryside Commission, that delivered its report *Our Future in the Land* in July 2019.

"Agroecology is nothing new," says FFCC chief executive Sue Pritchard. "The Food and Agriculture Organisation (FAO) of the UN has promoted its benefits for some time. It includes no-till, cover cropping, livestock in the rotation, enhancing the health of the soil and improving habitats and natural corridors for wildlife.

"For FFCC, it's also about paying attention to the governance of farming systems and how regulatory arrangements are made and upheld. We want to ensure there's a fair and equitable system in place for both farmers and consumers that encourages agroecological practice, that knowledge exchange and farmer-led innovation get the support they deserve. For us, it's not just about what happens in the field, but how that impacts on broader society."

The FAO 10 Elements of Agroecology, was approved by its Council in December 2019 and emanate from a considerable body of work carried out across the globe, culminating in regional seminars. With these 10 Elements, FAO says it aims to "operationalise" agroecology and they form a guide for policymakers, practitioners and stakeholders in planning, managing and evaluating agroecological transitions.

FAO places agroecology at the heart of its

vision for sustainable food and agriculture. "It's a key part of the global response to this climate of instability, offering a unique approach to meeting significant increases in our food needs of the future while ensuring no one is left behind," it says.

The 10 elements (see infographic below) can be broken down into three categories, but all are inter-linked:

- Diversity; synergies; efficiency; resilience; recycling; co-creation and sharing of knowledge. These describe common characteristics of agroecological systems, foundational practices and innovation approaches — you could call them the farm-based elements.
- Human and social values; culture and food traditions. These are the context features, and may be how society interacts with agriculture.
- Responsible governance; circular and solidarity economy. These are geared more towards policy-makers for enabling the environment of positive change.

Lying at the heart of the 10 elements is what FAO says makes agroecology fundamentally different from other approaches to sustainable development: it's based on bottom-up and territorial processes, helping to deliver contextualised solutions to local problems. "Agroecological innovations are based on the co-creation of knowledge, combining science with the traditional, practical and local knowledge of producers. By enhancing their autonomy and adaptive capacity, agroecology empowers producers and communities as key agents of change," says FAO.

So agroecology is neither organic nor intensive — it's up to the individual farmer



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how they interpret what it means and how to implement it. But it's not about "tweaking" the practices of unsustainable agricultural systems, stresses FAO — business as usual is not welcome in the agroecology camp. Rather, it seeks to transform food and agricultural systems — farmers are encouraged to address the root causes of problems in an integrated way and provide holistic and long-term solutions.

What's more, there's an explicit focus on social and economic dimensions of food systems. Agroecology places a strong focus on the rights of women, youth and indigenous peoples. So if you choose to engage with agroecology, you may have to prepare yourself for some uncomfortable truths.



The FAO 10 Elements of Agroecology.