a by-product of regenerative farming in the future. Done properly it's a tangible commodity."

66 If I can produce the same wheat as my neighbour with lower input costs, I'm in a financially more stable, risk-free situation.??

Regenerative agriculture is all about diversity, so Ben says he finds it strange that he's being asked to sell something very narrow, as in carbon. "I'd like to see a system — maybe a ten-point process — where you were scored out of ten on things like carbon, pesticide use, fertiliser use, integration of livestock,

hedgerows, insect life, water, birds, etc. I'd be keen to sell into something like that."

Do you need to add biology from a can?

It's often said that if you build the right environment the right biology will come. But you can't just flick a switch, suggests Will. "I would love for the soil to provide everything my crop needs, and that's what we're working towards. But if I just stop giving it everything, it will fail dramatically, so I think it's a weaning process."

Ben has a "problem with artificial bugs in jugs" after trialling them extensively. "In healthy soils we're looking for 6-7 billion microbes in a teaspoon of healthy soil, and we're buying 4-6 species and expecting it to make the difference.

"If you want to speed up the system, make your own compost."

Was your farm in a bad state when you started this journey?

"Our farm was in an awful state," says Will. "It was potatoes and pigs, and consequently it looked like the Somme. Back in 2004 we couldn't find one earthworm, so I don't think it could have been any worse. This prompted us to do something."

For Ed the farm wasn't in that bad a place, but his father made a point that he didn't want him to be the last generation to see certain wildlife on the farm. "But it was more of a commercial reason for us — lowering our risk and removing our exposure to risk from outside sources."

Can you grow potatoes in a regen system?

Despite the 'holier than thou' attitude of some practicing regen ag, Will says it's okay to cultivate when you need to, which includes when growing roots. "It's about trying to disturb the soil mechanically as

Regen tips and surprise admissions

CropTec

Three farmers were quizzed by a CropTec seminar audience about how and why they had implemented regenerative approaches on their farms. *CPM* picks out the highlights.

By Mike Abram

There were some surprising admissions in an 'ask me anything' seminar at the CropTec event in late November, but certainly no regrets from the three farmers following regenerative practices on their farms.

Put on the spot, Will Goff, Ed Horton and Ben Taylor-Davies, tackled some robust questions from an audience keen to know why they're heading in a different direction to the conventional model of farming.

How can data justify the use of livestock?

Benchmarking is key — knowing your base level is the only way you can know if you are improving, says Ed Horton. He suggests measuring performance benchmarks from both arable and livestock entities separately, so that you can start to look at how they work together. "For instance, we graze oilseed rape at this time of year [November] to remove top growth and this removes the need for fungicides and growth regulators. From a crop point of view there's less cost/ha, while from a livestock point of view our lamb performance has increased because growth rates have shot through the roof at a weird time of year."

How about managing livestock in the arable rotation?

Livestock management is crucial, says Will Goff. "That comes down to people. You can make an awful mess by keeping livestock on the field for too long and be in danger of over-grazing. You have to be strict on how you manage the grazing undoing all the good work you've done, and the visual impact can look horrible."

Is regen possible without livestock?

Yes, says Ben Taylor-Davies. "The most important thing to focus on is soil. We're all livestock farmers — it just depends on whether you look above or below ground.

"Focus on the livestock you have already [below ground], and how you feed it. You'd never give a cow a day off from feeding it, and it's exactly the same with your underground biology."

What's your attitude to selling carbon?

It's a hugely exciting market, but it is still in its infancy and there are a lot of potential pitfalls, says Will. "But I do think it will be

CropTec

The panellists and their farms

Will Goff

Will Goff's Foxburrow Farm in mid-Norfolk is a mixed farm spread over 2200ha of drought-prone, light sandy soils.

Ten years ago the farm moved to a controlled traffic system — which led into a regenerative system — to help mitigate against the risk of drought, with an eye on improving soil organic matter levels.

"We'd always had livestock on the farm, so when we started peeling back the layers, we realised we were just integrating the livestock into our arable rotation. We're already growing cover crops — we just need to do this in a more joined up manner."

Ed Horton

Ed Horton manages a 3,500ha mixed farm in the Cotwolds, using a low-input, fully integrated system to drive down spiralling costs and increase gross margins.

Trying to aim for 9t/ha wheat crops on yield-limiting Cotswold Brash is pointless, he says, and with a strong fixation on driving down costs, he uses biodiversity to remove the need for insecticides, and crop management with livestock to reduce fungicides and growth regulators.

"If I can produce the same wheat as my neighbour with lower input costs, I'm in a financially more stable, risk-free situation."

Ben Taylor-Davies

Ben Taylor-Davies farms 220ha near Ross-on-Wye, Herefordshire. He stacks multiple enterprises, aiming to enhance all ecosystems on offer in each crop to maximise the output/ha.

A key moment for changing his system was in 2016, following the passing of his father, when he found that in 1987 the farm grew 10t/ha of wheat using 120kgN/ha and very low inputs. By 2015 the inputs costs were six times higher without any increase in yield.

"If I was going to increase gross margin, or more importantly profitability, then rather than continuously increase yield, we needed to reduce the costs of growing crops," he says. "That's what started me on my journey."



The regen debate at CropTec with Ben Taylor-Davis (left), Will Goff (centre) and Ed Horton (right).

little as possible."

"It's doing what's right financially," adds Ed. "You're aware that potatoes might have a detrimental impact, but you can mitigate some of that either before or after planting. I'm in no way an advocate of you must direct drill and never move any soil ever again."

Ben has been trying to grow potatoes in a regen system. "It's not impossible we're growing them quite successfully, meeting our farm average [yields]."

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