

# The secret to Fens farming is in the water

The carbon footprint of the nation's peat-rich breadbasket is too high. Luckily they have a plan, as **Ben Spencer** learns

The East Anglian fenlands live up to their reputation: vast fields stretch out beneath huge skies, an endless blanket of black soil and green crops broken only by ditches and dykes.

This landscape is very, very flat — but Martin Hammond is making it flatter. “We have laser-levelled all of this,” he says, pointing into the distance, where the far end of the ten-hectare plot is just visible. “From one side of this to the other, there’s a 5cm height difference.”

You could fit 14 football pitches on this field and still have room to spare. However, this is but a fragment of Hammond's domain. G's Norfolk Farms near Downham Market, of which he is general manager, contains 1,400 hectares of prime agricultural land, growing wheat, radishes, Chinese cabbage, celery, sugar beet and potatoes. The field in which we stand grows the cream of the crop: Romaine lettuces. A field of this variety generates four times the profit margin of a field of onions.

“We grow about 65 per cent of the Romaine lettuce in this country,” says Hammond, 58. “We supply all the major retailers. In the middle of the summer, we can grow a lettuce in about 35 days. We couldn't do that anywhere else. Nowhere else has the soil for it. We are growing on two and a half metres of peat here.”

Four hundred years ago, this land was under water: a vast expanse of swamp and marsh. From the 1650s, the Dutch engineer Cornelius Vermuyden started draining the Fens, and the black peaty soil that emerged from beneath the waters was a farmer's dream, comprising 70 per cent organic matter. “It is grow-bag type stuff,” says Hammond. “It is very fertile indeed.”

Peat is also an excellent store of carbon. “There is as much carbon in about 30cm depth of peat as there is above ground in a tropical rainforest,” says Professor Chris Evans, biogeochemist at the UK Centre for Ecology and Hydrology. However, as soon as peat dries out, it oxidises: stored carbon turns into carbon dioxide and floats into the atmosphere. The Fens may be Britain's breadbasket but it is also a huge source of greenhouse gases.

“Unless you can get this stuff wet, it's going to keep decomposing and keep emitting,” says Evans. “You can let it by switching the pumps off and letting it flood. But if you did that, you'd have a major crisis of UK food production, a major economic crisis, and you would have a lot of houses under water.”

The unique geology of the Fens makes this area a special case. But the challenge also encapsulates the wider agricultural dilemma facing ministers. Farming and land use contribute 11 per cent of Britain's carbon footprint, and that figure is expected to leapfrog the power sector when the latest data is released, moving into fourth place behind transport, buildings and industry. By 2037, agriculture is projected to be the country's biggest source of emissions.

Tom Lancaster, land, food and farming analyst at the Energy and Climate Intelligence Unit, says tackling this will be tough. “Labour's job is to grasp the challenge and adopt a much more strategic approach that safeguards food security, while reducing the role farming plays in fuelling climate change.”

Farmers are also experiencing the impact of the changing environment firsthand. Government figures published last week show that England has just had its second-worst harvest since 1983, following the wettest 18 months since records began.

“Slowing climate change is essential for farming,” says Lancaster.

In Norfolk, Hammond and his team have come up with a partial solution. Every ten metres across his fields, a pipe is buried a metre deep. In the winter, this acts as a drainage system, removing excess water from the fields; and in the summer, it provides subterranean irrigation. “We can hold the water level at 60cm below the surface,” he says. He shows me a hole dug in the lettuce field earlier that day and gets out a measuring tape. Exactly 60cm down into the peat, the hole is filled with water. It is why the fields have been so precisely laser-levelled. “Otherwise, we'd have dry spots and wet spots where the ground height varies,” he says. The system is an efficient way of irrigating the crops. “Even in hot summers, we are OK.”

By lifting the water table and rewetting the peat, more carbon is kept in the soil, rather than being puffed into the atmosphere. “We are reducing our carbon emissions by up to 50 per cent,” Hammond says. There is also another benefit: this approach is helping secure the future of this valuable resource.

The Fens are sinking. When peat oxidises, it is lost for ever. Across the region, peat is disappearing at a rate of 12mm to 20mm a year. “We have cut that rate of loss significantly,” says

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Hammond. “We are now losing about 5mm a year.”

He is taking this approach a step further, participating in a small government-funded “paludiculture” trial, in which the water table is raised almost to the soil's surface to grow celery, Chinese leaf and miscanthus, a type of grass that can be used for biofuel.

Ten miles south, where the counties of Norfolk, Suffolk and Cambridgeshire meet, the RSPB is demonstrating what happens when Vermuyden's work is reversed. “Thirty years ago, this was all carrot fields,” says Dave Rogers, site manager of Lakenheath Fen wildlife reserve, looking out on to a watery landscape of reeds and sedges.

This project has been an unmitigated success. In 1995, when the charity took over the area, the bittern, a thickset species of heron, was almost extinct in the UK. There were thought to be only 11 male bitterns, nicknamed boomers for their mating call, nationwide. “We've had 17 boomers here at Lakenheath this year. We've smashed our previous record of 12,” says Rogers.

The reserve was transformed by blocking the drainage ditches and raising the water level to restore the birds' natural habitat. However, Rogers insists this is not rewilding. “It's advanced engineering, whether it's for nature, food or climate. It's not rewilding because it's not wild. This is still an artificial landscape. We are pumping constantly. We catch the water in what we call the interceptor drain and then we pump it back round into a high-level ditch near the river.”

The reserve is expanding. Rogers drives me to a set of newly acquired fields, which just 12 months ago were growing wheat and barley. The peat here is already degraded, far more so than at Hammond's farm, with just 65cm of peat left in the ground.

The ditches have been dammed and the water table raised to 10cm below the surface. The field is wild with barren brome, charlock and thistles, unrecognisable from the agricultural landscape that surrounds it.

On cue, a hare runs in front of the 4x4, yards away, a roe deer hops over a stream; a mother goose paddles through a waterlogged section, followed by a gaggle of goslings. “You did all this, just by blocking up a ditch?” I ask. “This is just the start. It will get better and better,” he says.

Handing the Fens back to nature is one solution, benefiting both wildlife and climate. Lakenheath is carbon-negative: it keeps carbon in the ground and the new vegetation sucks CO<sub>2</sub> from the atmosphere. However, aside from attracting tourists and creating a few jobs, it does nothing for food security.

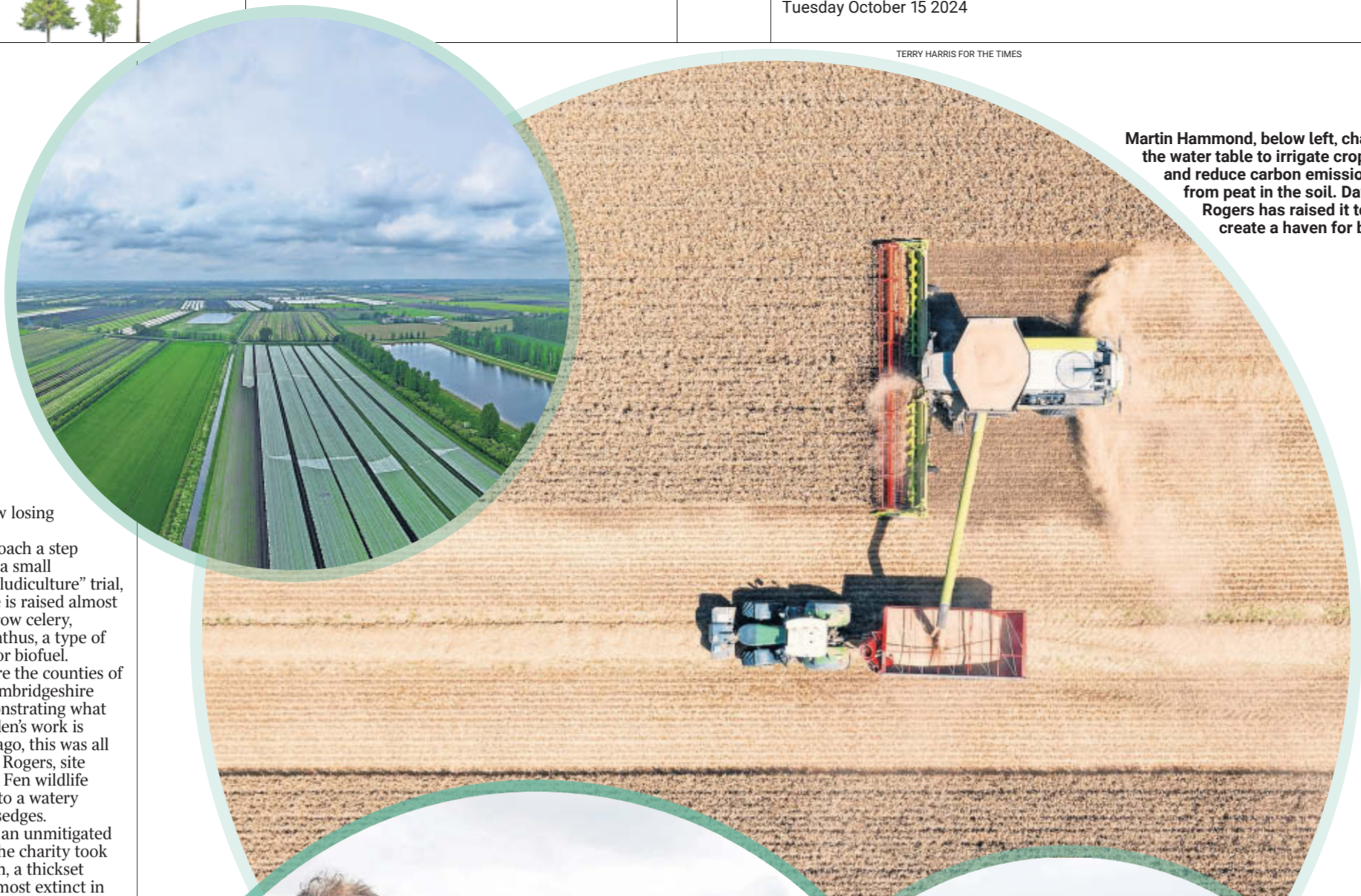
Twenty miles to the west, near Ely in Cambridgeshire, Luke Palmer grows potatoes, sugar beet, barley, peas and beans on his family farm. Like the conservationists at Lakenheath, he has experimented with raising the water

table. In the baking hot summer of 2022, he took part in a trial to grow wheat with the water table 30cm below the surface. “It was like standing on a sponge,” he says. “It wobbled as you stood on it.”

This is a smaller operation than G's — there is no laser-levelling technology. The field in which we stand is a metre higher at one end.

Palmer's wheat trial quickly ran into problems. “Every field, every farm, is connected,” the 42-year-old says. When he raised the water table in one

TERRY HARRIS FOR THE TIMES



Martin Hammond, below left, changes the water table to irrigate crops and reduce carbon emissions from peat in the soil. Dave Rogers has raised it to create a haven for birds



field, he found other fields became boggy. “I got stuck in the combine across the way. I lost the trailer and everything.” Harvesting at such water levels, he says, would be a challenge. Nevertheless, the wheat trial started to look good. “The crop was really happy: the high water table was saving it in those dry conditions.”

Then a neighbouring farmer decided to use the water from a ditch utilised by both farms. “We lost the water overnight,” Palmer says. The wheat had grown very short roots. When the water table dropped, the crop died.

Palmer says that to tackle climate change, those working the land need more support. “Farmers have been left

high and dry,” he says, referring to last year's closure of EU-era farming subsidies. “If we want to grow good, nutritious food, the best place to grow that is on the Fens.”

Megan Hudson, general manager at the Fenland Soil farming group, says a mixed approach is needed: a “mosaic” of different land uses. “It will be impossible to rewet the Fens to a point where the whole thing is carbon-negative. We now need to come up with the least-worst option that is also fair to farmers.”

For nearly 400 years, humans have played God with this landscape, using the miracles of engineering to shape it to our will. That is not going to change any time soon. As Rogers puts it: “What does society want the Fens to look like in 50 years' time?”



Teresa Dent, chief executive of the Game and Wildlife Conservation Trust, says farmers have found peer-to-peer support invaluable

## Giant hedge is a highway for wildlife and a nice little earner

Lottie Hayton

In the Tove Valley in Northamptonshire, birds and hedgehogs are being nurtured like never before. An 18-mile “megahedge”, linked across seven farms, forms the central artery of a new wildlife corridor rich in habitat.

The megahedge may never have come about had these seven farms not joined the Environmental Farmers Group (EFG), an organisation that helps farmers restore nature, improve river health and move to net-zero carbon by 2040 — all while making extra money.

The EFG is alerting farmers that, thanks to stringent new environmental regulations, many businesses are willing to pay them to restore nature.

Companies that want to hit their climate targets are willing to pay farmers to lock carbon dioxide in their soil. Housebuilders, meanwhile, are now required to pay for the replacement of habitats destroyed by new estates. At a time when farmers are struggling to cope with the withdrawal of pre-Brexit subsidies, these are lifelines.

EFG's six cells — in Northamptonshire, Leicestershire, northern Lincolnshire, Isle of Wight, Dorset, Wiltshire and Hampshire, plus its sister co-operatives — cover 660,000 acres managed by 560 farmers.

Dr Johnny Wake, a doctor turned farmer who chairs the central England EFG collective and is guardian of a portion of the megahedge, says: “This is on a scale and ambition that I haven't seen before. The biggest, exciting thing for me, as somebody who has come to the industry from outside, is the level of co-operation and the optimism and dynamism from farmers.”

Each cluster must tailor its environmental projects to the area's landscape. For Josh Stratton, a founding EFG member who farms on the River Wyle in Wiltshire, chalk streams were an obvious target. In partnership with Rothamsted Research, a not-for-profit organisation, Wyle valley farmers have established on-farm water testing labs to check if rivers have too many nutrients in them, as required by the Environment Agency. They also analyse river sediments to trace the sources of pollution. There are plans to expand this to other catchments with chalk streams.

“The bottom-up approach is key,” Stratton says. “By taking ownership of

collecting and managing the data, farmers can avoid being wrongly blamed for pollution incidents and better understand how to adapt their operations to improve water quality.

“It is also a great example of how the shared learning, resources and the scale of EFG can improve access to grant money, in this case Rothamsted.”

Brexit stemmed the flow of EU subsidies to farmers. Last year was the final year farmers could apply for the Basic Payment Scheme (BPS), introduced across the EU in 2015, which paid about £200 per hectare.

The EFG estimates that its central England cluster alone will lose as much as £125 million annually as a result of the end of BPS payments. Last month The Times reported that about £100 million could be slashed from another public funding source for farmers: the £2.4 billion annual nature-friendly farming subsidy scheme.

In response to shortfalls in public funding, EFG is seeking to tap into private alternatives. New “natural capital markets” allow farmers to generate credits by restoring nature then sell them. These credits can be for storing carbon, reintroducing species or keeping nutrients out of waterways. Traders can speculate on these credits, and sell them to companies who need them to comply with environmental regulations. The EFG is also helping farmers to bypass this market and sell directly to those companies. “I think a lot of soil carbon schemes will end up being seen to be Ponzi,” Stratton says. “But farmers in EFG can genuinely ensure the carbon is worth something. It's not created by an algorithm, it's created by dirty boots on our farms, digging holes in the soil and testing.”

Teresa Dent, chief executive of the Game and Wildlife Conservation Trust and co-founder of the EFG, says: “I think there is a genuine willingness within businesses to look at these opportunities, so we should be cautiously optimistic, but there is still a way to go because these markets are nascent.”

“What farmers often say is most valuable is the peer-to-peer support, working with neighbour farmers they may never have met. We're witnessing how you motivate people to manage the land, and how you harness that motivation and emotional energy to achieve fantastic outcomes.”

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