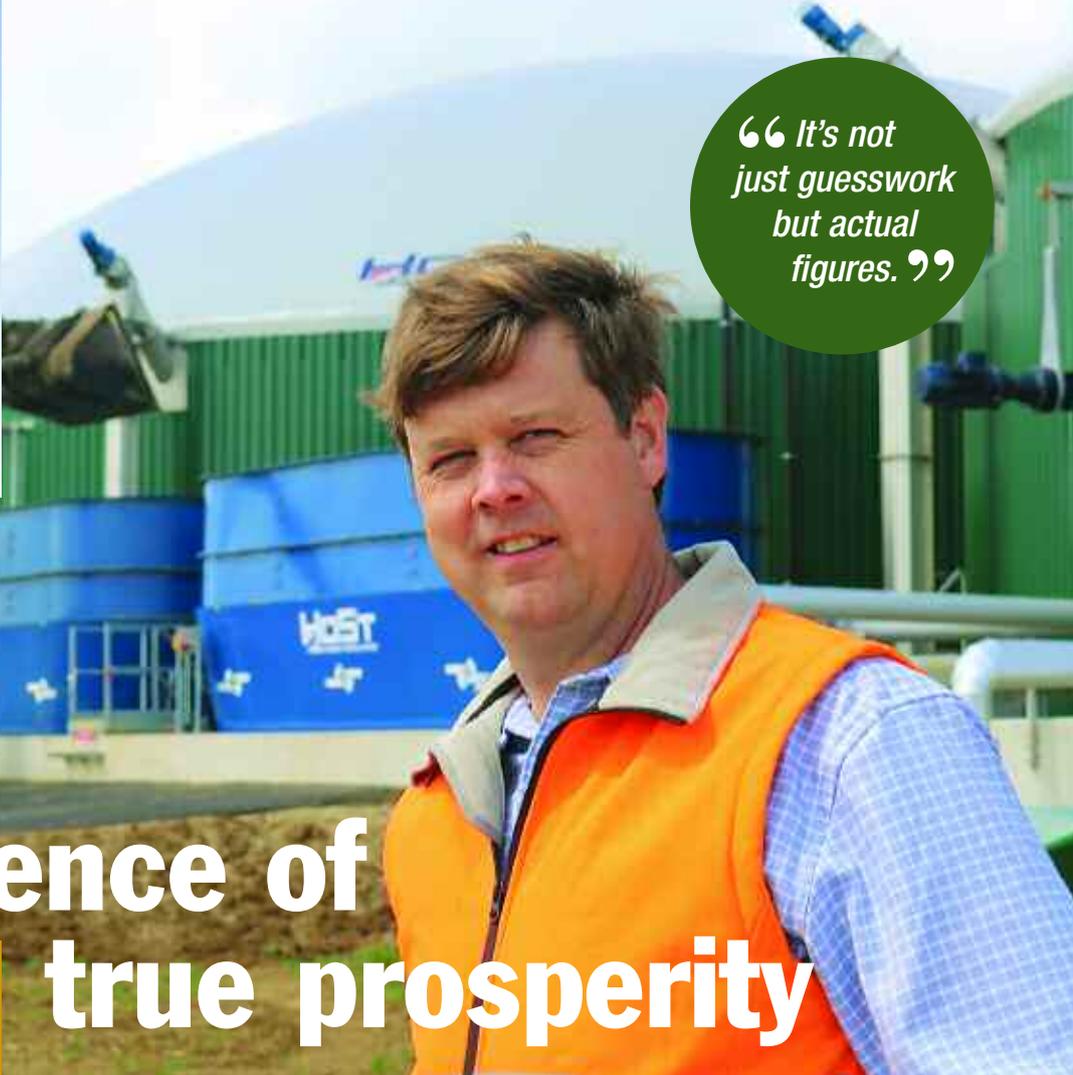




“It’s not just guesswork but actual figures.”



The evidence of true prosperity

Climate Change Champions

Managing the estate’s assets to maximise profitability has always been the core aim for Charlton Park in Wiltshire. CPM visits to find out how the same measured approach is now being applied to its natural capital.

By Tom Allen-Stevens

Standing on the edge of the near-empty digestate lagoon at the new AD plant, you get a good view of the operation. Over the far side, a Manitou telehandler is beetling back and forth, feeding maize silage into the 40t hoppers.

“It’s currently fed about 60t per day, but that will increase as the plant builds to full capacity,” explains Robin Aird, estate manager at Charlton Park, near Malmsbury, Wiltshire. A small portion of the estate’s 1667ha has been given over to a gas-to-grid plant that was commissioned in April, fed by a significant area of its crops. This is set to put 500m³/hr of renewable, home-produced biomethane into the network, reducing the UK’s reliance on gas from abroad and

energy from fossil fuels by around 2MW. In the foreground are three tall siloes with a network of steel tubes that glint in the sunlight. These thrust out in front, ready to receive a share of the 25,000t/yr of food waste that makes up around 50% of the digester’s diet. Then in the middle, there’s a block-wall structure, with what looks like a cage and a box on top, dropping fragments of a fibrous substance into a heap below.

Switch to digestate

Robin wanders over, picks up a handful and runs it through his fingers. “This for me is what it’s all about. We’ll receive a total of around 45,000t/yr of digestate in both solid and liquid form to help us reduce reliance on synthetic fertiliser and build life into our soils.

“But it has to pay dividends. If you’re haemorrhaging cash, it doesn’t matter what environmental achievements you’ve made — they’ll be undone. Our approach has always been to keep the land in good heart, but we’ll sweat the estate’s assets, and ensure first and foremost that it’s a profitable business. That goes as much for its natural capital as it does for the crops we grow.”

Since he arrived in 2003 at Charlton Park, an estate that’s been in the same family since the late 16C, Robin’s carefully evolved its farming system on soil types that vary from gravel to brash to loam to clay.

Sometimes these all appear in the same field, and the resulting yield rarely scrapes above the national average. However, benchmarking puts the farm’s financial performance in the nation’s top 25%, and his aim is to achieve this across its natural capital assets, too — not just carbon, but biodiversity and water quality.

“Whenever a new scheme or opportunity in farming comes along, we take a good look at it and work out what works within our system without affecting the bottom line. There has to be a clear benefit for both profitability and the estate’s biodiversity,” he states.

It’s this measured approach that led the farm to exit Entry Level Stewardship just over five years ago, to focus on improving arable ▶



Three tall siloes store a share of the 25,000t/yr of food waste that makes up around 50% of the digester’s diet.

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The digestate makes a big difference in helping the estate reduce reliance on synthetic fertiliser.

► profitability. Now it's back in, with a Countryside Stewardship (CS) agreement that started last year.

It's no accident that the AD plant has come on stream at the same time. This is a joint venture, with the estate's main involvement being a land rental for the site plus the contract to

grow its crops and take the digestate. Robin's carefully adapted the cropping to take advantage of this new direction, feathering in a CS agreement that achieves the productivity aims, while attracting an additional payment.

Leaving the AD plant behind, he stops off in a field of spring wheat to explain the new rotation. “We have four roughly equal blocks of 240ha with winter wheat grown across one, then we've introduced hybrid rye for the digester over another. A low input spring cereal is grown on the third, after stubble turnips and the new crop for us is maize. In front of this there's a cover crop of oats, vetch, crimson clover and phacelia,” he says.

“Previously I wasn't a fan of cover crops, but if we're being

What makes Robin Aird a Climate Change Champion?

Innovative ideas

If there's a confidence about the way Robin presents Charlton Park and its farming prospects, it's because this is based on a solid grasp of the underlying figures. Applying the same approach to its natural assets sets the estate up for a bright future.

Cultivation care

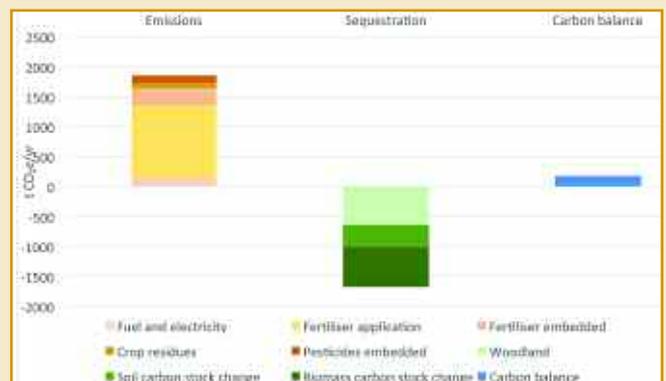
A gradual, sustained reduction in cultivation is already bringing benefits in terms of reduced costs and improved soil organic matter. Maize presents a challenge, but the business now has the measurement tools to bring optimum results.

Productivity push

The move to digestate away from synthetic fertiliser makes a massive difference for the farm's sustainable productivity. Robin has pushed this further by exploring every opportunity to maximise returns through both crop management and stewardship.

Bio-based boldness

The wider, societal benefit of the AD unit arguably sits outside the business. But Robin has carefully ensured maximum opportunities for the estate and the WOMAD festival presents an ideal and direct route to market to capitalise on its natural assets.



Source: Charlton Park, 2022, calculated using Sandy by Trinity Agtech. Figures shown are indicative and exclude pasture.

paid to grow them, we can ensure they work. I don't like to see land go bare, so the crop in front of the maize works well, with the green cover sprayed off about two weeks prior to planting. Sheep are brought in to graze the stubble turnips, and you have to take care they don't puddle the ground."

It's early days but, judging from the vibrant crop of low-input spring wheat he stoops to inspect, it's a system that's working. He takes a spade to the soil to reveal a throng of roots and other life below that appears to be delivering the above-ground goodness.

"We think we're delivering benefits, and on paper it all seems to work financially. But 'think' is a big word with a lot riding on it. We need to know for sure that this system is taking us to where we plan the estate to be — that its natural capital assets are performing at the same level as the profit and loss account and balance sheet are telling us," he says.

Scientific analysis

This is why Robin has chosen to bring the estate on board with Sandy, the software from Trinity AgTech he's using to capture all of the management information (see panel on p58). This is brought in from the farm's Gatekeeper records and other sources and then analysed by powerful algorithms. Trinity claims the methodology behind this is backed by a 37-strong scientific board of leading experts in natural capital who have gathered together the peer-reviewed evidence.

Combining this in Sandy with the farm's management data gives Robin a set of metrics on the estate's carbon emissions, sequestration, biodiversity and water quality, and how these will develop over time. "What I'm hoping is that with Sandy I can quantify changes or practices — it's not just guesswork but actual figures," he says.

Fertiliser is the big one — Robin calculates the digestate



A throng of roots and other life in the soil appears to be delivering the above-ground goodness.

brings down synthetic nitrogen applications from 210kgN/ha for a typical wheat crop to just 100kgN/ha. But this is on the back of reductions already achieved. "We haven't applied any compound fertiliser for 19 years, and have maintained indices through spreading around 4-5000t/yr of farmyard manure, chicken litter and biosolids. This has also raised soil organic matter from around 1% when we started monitoring it to around 2-3% now, and allowed us to sell straw off the farm.

"What we want to know now is how the new cropping will affect indices — rye is hungry for both P and K, while maize also takes a lot of K, although the idea is that we replenish this through the digestate."

By now, Robin has arrived at the block of maize just emerging through soils that are drier than he'd like. "We're still learning with this crop — for example, this year we made an extra cultivation because the seedbed just didn't look right," he admits.

Ploughing ceased when Robin arrived on the farm, with a 4.7m Grégoire Besson Discordon the main cultivation tool. The number of passes and depth have gradually reduced over the years, guided by plenty of monitoring and spadework, with a 6m Väderstad Carrier now playing a more prominent role.

"Diesel use has reduced by 23% between 2015 and 2020, showing the cultivation policy works, but the addition of maize into the rotation has knocked this up again by 10%. Going forward we want to have a plan that ►

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The non-cropped areas are given the same approach of delivering sustainable performance as the cash crops.

► brings it down again but measures the results more accurately in terms of carbon emissions,” notes Robin.

On the way back to the estate office, you're treated to some of the estate's most stunning natural capital assets — there's 180ha of permanent pasture along with 60ha of temporary grass and 100ha of woodland. Together with field margins and corners, ponds, streams and wildlife corridors, the estate has a total of 168ha in non-woodland stewardship, with the parkland and the Grade one listed mansion itself a fitting jewel in the crown.

So is financial performance ever compromised for the looks and heritage of the historic estate? “Absolutely not,” comes Robin's quick reply. “We have 122ha of non-productive areas outside stewardship, but take the same approach with all our non-cropped areas of delivering sustainable

Climate Change Champions

UK Farming has set itself the challenging target of Net Zero emissions by 2040. Although led by the NFU, it will take the entire industry, working together in a partnership approach to meet this ambitious goal.

But there are individual growers, thought leaders who have already started on this journey. They have the ideas, the progressive outlook and the determination to shape positive change. CPM has teamed up with leading agricultural suppliers who have a credible Net Zero aspiration to identify these individuals and bring

them into the top-level discussion about how farming can position itself as the solution to climate change.

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performance as we do with the cash crops.”

Silage from the temporary grass and pasture forms an essential constituent of the diet for the AD unit. Again, management of these areas has been carefully feathered into the CS scheme to make the most of the grassland options and payments available. But rural stewardship isn't the only way this Wiltshire estate works its natural assets.

The centrepiece here is the WOMAD Festival (World of Music, Arts and Dance), a regular feature at Charlton Park, that will take place this summer after a two-year COVID-enforced break. Started by Genesis singer Peter Gabriel, WOMAD has held the record as the biggest international music festival and is celebrating its 40th year in 2022. Some of the most highly regarded musical and performance acts from across

the world are coming to Charlton Park for four days at the end of July and are expected to bring around 35,000 people onto the estate.

And Robin's looking beyond the headline acts to what he believes may become another important new income stream for the estate. “Sustainability sells,” he points out. “Every festival goer and the festival itself will have a carbon footprint to offset. What we can sell here are the biodiversity co-benefits too.

“We're already looking at offering electric-scooter tours, dog-walking areas and rough-runner races. Against a credible, sustainable scientifically evidenced background, we can offer festival goers a four-day experience that also contributes tangibly to a lasting rural legacy.” ■

Evidence puts the estate in a strong carbon position

Joining the tour of Charlton Park is Sian Rowlands who's been helping Robin understand the position of the farm's natural capital, including its carbon emissions.

“Initial results from the estate's arable and woodland enterprises indicate net emissions of 174t CO₂e. That includes total emissions of 1846t and sequestration of 1672t, of which 631t is attributable to the woodland. The figures for pasture are currently being incorporated, which will likely contribute to sequestration.”

Robin was keen to understand the impact of the AD plant. Sian explains that current fertiliser usage accounts for around 1500t of emissions. “That should reduce with the switch to digestate, which would make a difference to the net arable balance, before you take any soil improvement into account,” she adds.

Sandy has an optimisation feature that allows you to run scenarios to reduce emissions, showing financial, yield, and carbon implications. The software enables users to set target

budgets and yields, and Sandy will recommend carbon reduction strategies that fall within these targets. This could include changing tillage, agroforestry, or nitrogen applications.

Robin feels that maize cultivations would be the one to look at here. “Maize is a much-maligned crop, and while we're following best practice, the figures suggest to me there's scope to bring down emissions. One aspect that seems to make a difference is the addition of a cover crop in front of it, especially a leguminous mix,” he says.

The figures produced so far indicate the switch to digestate away from synthetic fertiliser may have tipped Charlton Park the right side of net zero. The Trinity team believes this would put the estate in a strong position to benefit from the emerging natural capital markets, including carbon, biodiversity, and water quality. “Robin's worked hard to implement more sustainable farming practices and has set a journey towards net zero. We reckon that's a great way to



Charlton Park is in a strong position to benefit both from the emerging carbon market and add value to this through selling biodiversity co-benefits, says Sian Rowlands.

prepare to access the new income streams if he chooses to do so, which is why Trinity AgTech is pleased to support his nomination as Climate Change Champion 2022,” concludes Sian.