

## Profits linked to sustainability

“ There’s clear direction for a more sustainable farming system.”

### Sustainability

The results of new research show that while yields may suffer a knock under more sustainable farming systems, profitability isn’t adversely affected. CPM takes a closer look.

By Lucy de la Pasture

When enough people start whispering about something, then the whisper gradually becomes a roar. There’s no denying that there’s now an audible buzz around the systems that encourage farming in a more nature-friendly, sustainable way.

Farming in this way isn’t altogether new, though perhaps it’s been more fringe than mainstream. What has changed is the will and necessity to demonstrate environmental good and it’s something agchem manufacturers are getting behind with research and digital systems.

Syngenta has been at the forefront of helping growers implement environmental and ecological measures into their farming systems. The latest findings of the

company’s Conservation Agriculture and Sustainable Farming Initiative shows that conservation agriculture crop establishment techniques can deliver up to 18% uplift in growers net profits, while also providing significant enhancement of key environmental and ecological measures.

### Scientific data

The mid-term results of the five-year project were recently presented at Cereals 2021 in Lincolnshire and have shown positive returns for financial performance, biodiversity and soil health on the farms involved.

Syngenta head of sustainability for Europe, Africa and Middle East, Mark Hall, highlights that for the first time, farmers have independent scientific data which directly addresses the complex interaction between economic performance and environmental impacts on a field scale.

“The research has proven the potential for conservation agriculture techniques to hugely cut greenhouse gas (GhG) emissions by around 16%. The carbon footprint of crop establishment on both heavy and light land farms has also been reduced by nearly 10%.”

The project has also highlighted the link between sustainable practices and profitability, with increases in net profit of

18% on light land and 5% on heavier land in trials.

“With these results, when you combine the environmental gains with the improvement in net profit, there’s clear direction for a more sustainable farming system,” he comments.

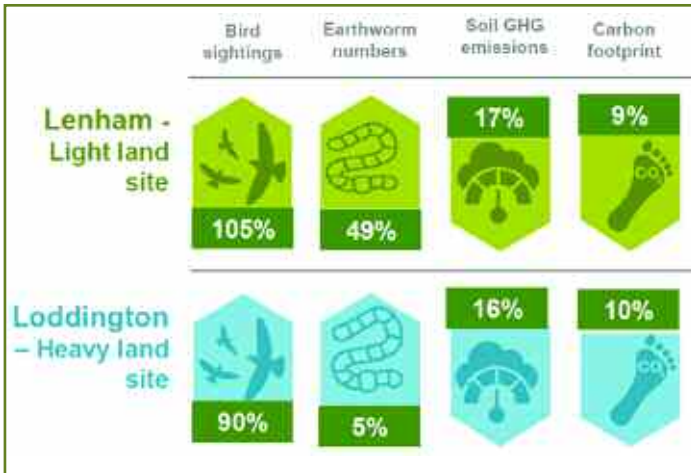
The Syngenta initiative is now in its fourth year of comparing the crop performance and financial results for crop establishment using three systems, namely conventional plough-based; non-plough tillage and direct-drilled. The UK research



Bird sightings on the areas established by direct drill were up 105% on the light land and 90% on the heavy land, compared with the plough-based establishment system, says Belinda Bailey.



The results of the Syngenta initiative cement the link between sustainable practices and profitability.



Positive biodiversity gains go hand-in-hand with decreased GhG emissions and carbon footprint in the trials.

is independently managed and monitored by NIAB and the Game & Wildlife Conservation Trust (GWCT) and covers a full five-year farm rotation on a heavy land site at Loddington in Leicestershire and a light land farm at Lenham in Kent.

Syngenta project manager Belinda Bailey adds that working on a farm scale, with two contrasting soil types, has identified some key practical challenges for growers moving to conservation agriculture establishment systems, but she also highlights the potential for future research to address those issues.

“Over the course of the trial, yields have been slightly lower with the direct/light till establishment, down by around 3% on light land and 9% on heavy land. That appears to be primarily due to correspondingly reduced crop establishment on both farms,” she says.

“But when you factor in the cost savings of up to 65% in

fuel costs, a 10% reduction in operating costs and over 50% improvement in work rate, the financial effects of yield penalties are largely mitigated. Add in the savings in the farm’s overall machinery requirement for direct-drill establishment and the net profit in both farm situations is extremely positive,” she added.

In addition to the GhG emission and carbon footprint reductions, which were monitored and calculated by GWCT soil health scientists, the research has shown a nearly 50% increase in earthworm numbers on the light land — where populations were historically lower — and a smaller but significant increase of 5% in their numbers on the heavier soils.

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► system. That reflects the greater availability of food resources on the surface over the winter and the overall enhanced soil health and biodiversity, comments Belinda.

The UK trials have evaluated over 10,000 data points while assessing the performance of the different establishment systems. Mark believes the findings of the research validate the potential for conservation agriculture, which he says has even greater resonance as the industry moves to more emphasis on Integrated Pest Management and more effective, targeted use of inputs.

"The time and cost savings highlighted by this work, and the fact it has been shown on both light and heavy soil farms, will be of immediate interest to all growers.

"When you factor in the direction of travel for agricultural policy, with environmental assets and carbon capture high on the agenda of payment for public goods, it will focus future Syngenta research on crop agronomy and utilising innovative new farming technologies to get back the yields from direct drill establishment to further

maximise conservation agriculture's potential."

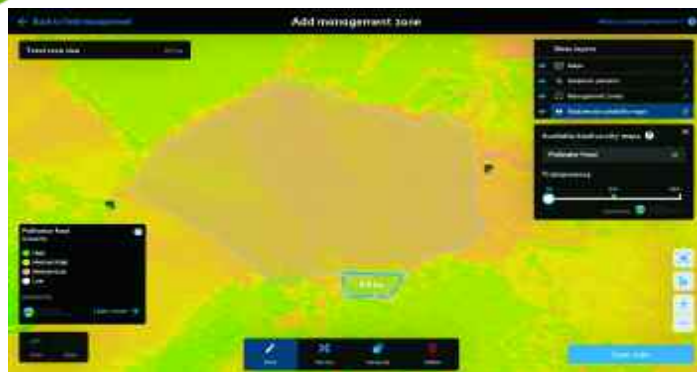
On the digital side, BASF Digital Farming has joined forces with the UK Centre for Ecology & Hydrology (UKCEH) to integrate their detailed environmental data in the ASSIST E-Planner tool, with xarvio's Field Manager.

The development of the E-Planner comes ahead of the introduction of Defra's Environmental Land Management (ELM) scheme. Under a principle of 'public money for public goods', farmers will be expected to deliver an increasing range of environmental benefits, as well as producing food, under the new subsidy schemes that will replace the Common Agriculture Policy in England following the UK's departure from the EU.

Field Manager already offers agronomic features and advice such as pest and disease forecasting and variable rate application maps, but the integration of E-planner will enable its users to accurately identify less productive areas, assess their suitability for a range of environmental management options and integrate those insights with their seeding, nutrition and crop protection maps.

"Integrating the E-Planner tool means farmers will have the information they require at their fingertips to optimise crop production, biodiversity and deliver environmental benefits," says Nicholas Corker, innovation manager at UKCEH.

Mike Green, sustainability manager for BASF agrees. "Growers under increasing pressure to use their land in different ways — from food production, to providing wildlife habitats and carbon sequestration. The integration of the E-Planner will allow them to make better, more-informed decisions and



*The integration of the E-Planner into xarvio will help farmers make better, more-informed decisions about implementing environmental initiatives.*

that will help ensure that where environmental management initiatives are integrated into the farming system, they deliver.

"Agricultural sciences and environmental sciences have never been incompatible, but too often they've been separate schools of thought. This project helps unify thinking and brings synergy to crop production and environmental management."

## E-Planner maps

Using historic biomass data from satellites, Field Manager's 'Power Zones maps' show the long-term yield potential of field areas. Growers using this feature can now overlay the Assist E-Planner maps, which show the suitability of potential biodiversity activities and allocate separate 'management zones' within the system. When creating digital application maps for their drill or sprayer, these management zones can be included and automatically considered during tasks.

"The E-Planner provides maps showing the most suitable locations in all the two million fields across Great Britain for a range of environmental management options, including sowing flower-rich pollinator habitats and winter bird food, creating woodland, restoring wet grassland and protecting water courses from pollution. They are all underpinned by detailed national datasets — including soils, nearby habitats, slope and shading to assess land suitability," explains Dr John Redhead, UKCEH's

technical lead.

"Together with Field Manager's Management Zones — which enable growers to allocate field areas for alternative management and integrate into seeding and spray maps — it's a powerful decision-making support and implementation tool," explains Nicolas Werner, xarvio's digital farming technology manager.

The E-Planner is just one of the practical digital tools being developed as part of the Achieving Sustainable Agricultural Systems (ASSIST) project. This six-year, £12 million research programme is funded by the Natural Environment Research Council (NERC) and Biotechnology and Biological Sciences Research Council (BBSRC), which are part of UK Research and Innovation UK, and is a partnership between UKCEH, Rothamsted Research and the British Geological Survey.

Professor Richard Pywell of UKCEH, programme manager of ASSIST, explains that the E-Planner has been rigorously tested in the field. "We're delighted to be able to bring its functionality to Field Manager — the combination provides a holistic farming tool.

"The ASSIST team is excited to be working in partnership with BASF Digital Farming to help increase the efficiency and sustainability of food production, whilst delivering multiple benefits to the environment and biodiversity." ■