

ISSUE 38 | OCTOBER 2026

TECH FARMER

TECH MAGAZINE

TECHNOLOGY FOR FARMING

Stronger Under Stress?



Getting your Org Agentic AI-ready

- Identify strategic business outcomes to be supported by AI
- Build a business case for AI, showing the value it can bring
- Build a culture of AI, showing the value it can bring
- Build a culture of AI, showing the value it can bring



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With the Money

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WHAT'S YOUR KIT ACTUALLY WORTH? HELP US FIND OUT

Farmers and contractors wanted to trial a free online tool that values your machinery for insurance, ideally if your renewal falls between January and April 2027.

Most of us know the drill: the insurance renewal lands, there's a schedule of kit on it, and half the values were typed in years ago and rolled forward ever since or depreciated by the accountants. Renewal falls at a point where you don't have the time to go through every tractor, trailer, drill and implement properly, so you tick it and move on. Then something gets nicked or burnt out, and you find the payout doesn't come close to buying a replacement.

With second-hand prices where they've been the last couple of years, a value that was right three years ago probably isn't now. Some second-hand prices have even gone up. And it's rarely the big tractor that catches people out; it's the GPS kit, the compressor, the pressure washer, the gator or the tools in the workshop that never made it onto the schedule at all.

That's the problem the Virtual Shed is aiming to solve. It's a project funded through Innovate UK and Defra's ADOPT scheme, led by Clive Bailye at TWB Farms with Stephen Butler of North West Services, alongside Agri Web Media (Direct Driller Magazine and The Farming Forum), Acres Insurance Brokers and AMTEC Machinery. The idea is simple enough. You list your kit in your own private online shed, and the tool checks real prices from dealers, classifieds and auctions to give you three figures per machine: what it would sell for, what you'd get as a trade-in and what it would cost to replace for insurance. It then gives you a report you can send straight to your broker, and it

can refresh those values every month rather than once a year.

We're not asking anyone to take that on trust, and this is a trial. Before a single farmer touches it, the tool will value 500 machines, and those same machines will be valued independently by Acres and AMTEC as well. We want it within 10 per cent on at least eight in every ten machines. If it can't do that, it doesn't go out. But the aim is to always produce a range, say £48,000 - £51,000.

Picking which 500 machines to test wasn't guesswork either. The Farming Forum's classifieds now carry over 4,000 dealer and private adverts, which gave us a decent picture of what's actually for sale out there. Tractors are over a fifth of it, while tractors, cultivation kit, drills and telehandlers make up nearly half between them. However, two-thirds of the dated tractors are 2020 or newer, and most farm sheds don't look like that. So, the test set leans further towards older kit than the adverts do, and every category gets enough machines – not just the obvious ones – to prove whether it works or not. The classifieds themselves are a separate thing, but the data saved us a lot of head scratching.

Where you come in

The trial runs from 1 December 2026 to the end of April 2027, and we're looking for farmers and contractors in England to use it for real. It's most useful if your machinery insurance renews somewhere in that window, because the whole point is to test

it against a genuine renewal, not a made-up one.

A core group of 20 to 30 will do it properly: time how long the usual manual revaluation takes, then do the same job in the Virtual Shed, and tell us honestly how the two compare. Changes will be monitored monthly, and changes logged as percentages. There'll be a short catch-up every fortnight and a survey in February. Alongside the core group, we want a wider group of up to around 200, who simply use it at their own renewal and let us know how they got on alongside their own research. Arable, livestock, mixed, big or small, a couple of tractors or a full contracting fleet – we want the lot.

It costs nothing to take part, and your data stays private. When the trial's done, we will evaluate how good the tool is and see if it is ready to be launched live. We want the tool to be free for farmers to use at the point of insurance renewal, and we'll publish a plain guide to valuing machinery on The Farming Forum for anyone who wants it.

If you're up for it, scan the QR code or follow the link to register your interest. It takes about two minutes. And if you've been caught short on a claim before, we'd like to hear about that too.

Register
your
interest:



CAN FARMING GET STRONGER UNDER STRESS? NOT IF NOBODY PAYS FOR THE RISK

Written by Chris Fellows from Direct Driller Magazine

At World Agri-Tech in London, a panel including former Defra Secretary of State George Eustice asked whether agriculture can do more than just survive the next shock. The answer came down to who carries the cost.

Resilience has become one of those words that gets used so often it's stopped meaning much. Most farmers would say they've been resilient for years, mainly because the alternative was going bust. So the main stage session at World Agri-Tech London on 22 September set itself a harder question: can farming actually come out of a shock stronger, rather than just limping through it?

Justin McCarthy, former editor of the Irish Farmers Journal and now CEO of GlasPort Bio, chaired a panel of George Eustice, Christine Gould of GIGA Futures, Dionys Forster of the SAI Platform, Jurgen Tack of the European Landowners' Organization and Geert Maesmans, who heads R&D for Cargill in Europe, the Middle East and Africa.

Efficiency isn't enough

The word doing the rounds was "antifragile", meaning a system that gets better because of the shocks it takes, not just one that bounces back. Christine Gould's research through GIGA Futures was the most interesting part of this for me. Her point, as I took it, was that efficiency and optimisation on their own are not enough. A system squeezed for every last per cent has nothing spare when the weather, a war or the markets turn. Sustainability and quality have to be built in as well.

That chimes with a lot of what direct drillers have been saying for years. A field with better structure, more organic matter and some cover on it copes with a wet autumn or a dry spring better than one that's been run on a knife edge. The question the panel kept coming back to was what we learn from surviving stress, and how we make sure the next one doesn't hit as hard.

There was talk of landscape-scale



working too, with Landscape Enterprise Networks (LENs) held up as something that needs scaling up. That's the model where water companies and food firms club together to pay farmers across a catchment for specific outcomes. It's a decent idea, and it at least puts the people who want the outcome in charge of paying for it.

Top-down R&D and a question of trust

One thing that struck me was how much of the innovation talk was top-down. The R&D is done by the big players, Cargill included, and the farmer is then expected to pick up what they've developed. Geert Maesmans was honest that a business like Cargill moves cautiously because of risk and cost.

Fair enough. But if farmers don't trust where the product or the data has come from, it won't scale, however good it is. And trust isn't helped when farmers are told yet again they need to change. McCarthy told a good story from his days as a young adviser. An older adviser told him, "If you think change is easy, go home and try and get into the other side of the bed tonight." The sector keeps telling farmers they're doing it wrong, he said, and people forget how that lands.

That came through strongly on data. Liz Bowles of the Farm Carbon Toolkit, and a farmer herself, asked from the floor why it's always the customers asking farmers for carbon data, rather than farmers coming together to collect it for their own use. The panel's answer was blunt: farm data is being hoovered up from satellites to tractors, and one panellist claimed some machinery companies now make more money selling data than selling machinery. A big company can guess your harvest three weeks after drilling, six months before the market knows. "I do think not enough of that is coming back to the farmer."

There was a sensible point on net zero too. If we're going to be measured, let's have a proper benchmark way of collecting what farms are actually doing, and judge on carbon per tonne of output,



not per hectare. That's a far fairer test for a productive farm than some of the calculators doing the rounds.

Europe the museum?

McCarthy's sharpest question was whether Europe is becoming "the museum of modern agriculture". Eustice said that was putting it too strongly, but Europe is "definitely a place that's got at a severe disadvantage."

His examples were biopesticides and gene editing. "We shouldn't be regulating them like we do synthetic chemistry," he said about the compounds the environment has dealt with for thousands of years. He wants something closer to what the UK did on precision breeding and thinks the EU should copy it. Jurgen Tack made the same point on speed. Other countries get products to market faster, and they get the benefit.

One panellist went further. "At the moment, the environmental legislation in Europe is the biggest threat to environmental conservation." McCarthy called it "very well said", and plenty of farmers dealing with derogations and approvals would nod along. Not everyone agreed. Another argued Europe has one of the most resilient food systems in the world and should be proud of it.

Asked for the one thing needed to get technology onto farms, the answers varied. Stop thinking there's one thing, said one, because it's a whole system that needs scaling. Build an environment where innovation can thrive again, with landscape projects to show it working, said another. Eustice wanted these rules handed back to national governments, so countries could compete on getting the regulation right.

Who pays?

Which brings it to the bit that matters. McCarthy asked Eustice whether consumers will accept paying more for a secure food supply. His answer was that it's "not their decision. It will be a decision of the market."

Governments face both ways, he said. They want farming profitable and food cheap at the same time. Failing to deal with climate change has a cost, and if people won't pay it on their energy bills, it will turn up somewhere else. McCarthy wasn't going to let that sit. UK farmers won't carry that cost, he said. "They'll be out of business. Or a lower-grade imported product is brought into the market to compete against." That's the bit plenty of us would have said from the floor.

The session ended with a yes or no. Can agriculture get stronger under stress if food prices don't rise? Four of the panel said yes. Eustice said no, "because I think risk has a cost."

On that one, I think he's right. You can build a farm that copes better with shocks, and plenty of readers are doing just that with healthier soils and lower input bills. But somebody has to carry the risk, and for too long it's been the farmer alone. If the supply chain wants antifragile farming, it'll have to pay for some of it.

So, is your system getting stronger under stress, or just getting used to it?



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BIOLOGICALS: "GROWERS HAVE CHOICES"

Written by Chris Fellows, Direct Driller Magazine

At World Agri-Tech in London, Corteva's Tom Greene told the main stage that biologicals will only go mainstream if they beat chemistry on the two things farmers care about: how well they work and what they cost.

We've been told biologicals are the next big wave in farming for a few years now. Most of us have a can of something in the shed that was meant to change everything and didn't do much. So when Gary Scattergood of AgNavigator sat down with Tom Greene on the main stage at World Agri-Tech London on 22 September, the question was a fair one. What has to happen for biologicals to move from niche to normal on European farms?

Greene has been in the industry going on 28 years and runs Corteva Catalyst, the company's external innovation and investment arm. His view of the last decade was that the industry has moved from "trying to grow the science, sell the science, demonstrate the science" to delivering products that actually add value on farm.

Performance and price, nothing else

Scattergood quoted a recent McKinsey report: around half of specialist growers worldwide now use at least one biological, dropping to about 40% in more traditional farming. So how do you get those numbers up?

Greene didn't dress it up. The two biggest drivers are cost and performance. Biologicals are up against a century of research behind synthetic chemistry, "which works great", and growers expect the same from both. He described the debates he has with the start-ups Corteva backs. "Growers have choices. They can choose a synthetic. Why are they gonna choose your solution if it's less efficacious and a higher price point? It just doesn't happen."

It was refreshing to hear that from someone whose job is backing these products. It's exactly the test most of

us apply in the farm office.

Europe has the pieces, not the rules. Greene reckons Europe is well placed. It has some of the best research institutes in the world, plenty of start-ups and what he called "sophisticated growers" who understand new technology. Roughly a third of the value of the global biologicals market is in Europe.

What's missing is the regulation. Other regions, Brazil in particular, have grown because they built a framework that lets products through. Europe needs "a science-based, a risk-based" system that gives products derived from nature a quicker route to market. Anyone who has watched a useful product sit in the approvals queue for years will agree with him.

Where BlueN fits

The speaker before him had argued that biofertilisers aren't scaling, biostimulants are becoming commoditised and the value of biocontrol is being eroded. Greene's answer was that you have to judge it product by product, and he pointed to BlueN.

It's a foliar-applied bacterium, *Methylobacterium symbioticum*, that gets into the leaf through the stomata and lives inside the plant through the season. Greene said it "supplements the plant's ability to manage nitrogen over the growing cycle", and that growers are using it to rethink "their nutrient use management holistically". Corteva describes it as improving nutrient use efficiency through enhanced uptake and utilisation of multiple nutrients, helping to reduce waste and minimise environmental losses.

That matters because typical nitrogen use efficiency in a conventional system

is somewhere around 50-60%. For every 200kg N/ha applied, the best part of 80-100kg goes somewhere other than the grain.

Greene said Corteva has seen "tremendous growth" with BlueN in grapes, onions and potatoes, because growers "can see the tonnage increase". Corteva's UK trials from 2023 to 2025 back that up, with an average 11 t/ha (8%) lift in marketable sugar beet yield, 3.77 t/ha in potatoes and 1.6 t/ha in maize. Those results also underline the significant opportunity to deliver similar value in wheat and oilseed rape as the pipeline of biological solutions continues to develop. As Greene put it, what grows a market is "reliable products that year in and year out deliver value for the grower".

A company in two halves

Corteva split into two businesses on 1 October, nine days after the session. The seed side has become Vylor, while Corteva carries on as the crop protection company, biologicals included. Greene said the split would make the business "a little bit more focused" and that biologicals will "continue to be a critical part of our strategic priorities". Corteva expects to launch seven new active ingredients and five biologicals over the next decade.

Catalyst's job is to complement Corteva's internal R&D capabilities by identifying and advancing differentiated science from outside the company. Greene highlighted Solasta Bio, a Scottish company developing small peptides that target insect nerve signals. That's a new mode of action, which matters when resistance is building.



Not a magic can

The biggest lesson of the last decade, Greene said, is that "biologicals aren't standalone. They really have to be integrated into a program." That means formulating them so a grower can say, "I'm gonna mix this with two other synthetics", and using data to understand where they work. "Biologicals, just like any product, are not gonna work in every environment."

That's why trials matter. If the decision sits with the farmer and the agronomist, we need trial data we can trust, from independent sites, over several seasons, on real soils. In Issue 37 we covered Agrovista's Lamport AgX site in Northamptonshire, where 13 years of systems trials are reporting nitrogen use efficiency of up to 80% against a conventional 60%. That's the sort of work that moves biologicals from a punt to a planned line in the budget.

Does the shopper care?

The last question was one I'd written in my own notebook. Some of these products are a lot closer to "natural" or organic than much of what's in the sprayer, but does the consumer care, and will anyone pay us more for using them?

Greene's answer was straight. "I'm not sure that it matters." Growers choose on performance, cost and how easily a product fits their system, and "they don't really care if it's a synthetic chemistry or a biological". Margins are tight, so "they're not gonna pay for sustainability, not gonna pay for being natural if it doesn't deliver on the farm". He did see "a little bit of messaging opportunity" downstream.

I'd agree. Where biologicals do matter beyond the farm gate is Scope 3 emissions. Making and spreading nitrogen is one of the biggest parts of an arable crop's carbon footprint, so every kilo replaced by better efficiency counts towards processors' and retailers' targets. If the supply chain wants those savings, it'll need to share the cost.

Until then, it's simple. A farmer will look at a trial on ground like his, see the return per hectare and decide whether it's worth the money. Unless the supply chain is going to fund the transition, and that doesn't look like the mainstream approach at all, the product has to pay for itself in the field.

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AWARENESS OR ACCEPTANCE?

WHAT CONSUMERS REALLY THINK ABOUT PRECISION BREEDING

Written by Jen Hawkes

Consumer resistance is often seen as a potential barrier to the adoption of precision-bred crops, but new research suggests low awareness may not necessarily translate into opposition.

Precision breeding has an awareness problem. But does that translate into an acceptance problem? The distinction could prove crucial as precision-bred crops move closer to UK fields. Consumer resistance has long been seen as a potential barrier to adoption, yet new research suggests attitudes may be characterised more by uncertainty than opposition.

A recent survey explored farmer and consumer views on precision-bred oilseed rape (OSR) and products made from it. Conducted as part of the three-year, £2.5m Defra-funded LLS-ERASED project, 200 consumers and 120 farmers were questioned about their awareness, attitudes and trust of the technology. It found that 93 per cent of the consumers surveyed had heard “nothing at all” or “not very much” about precision breeding, compared to 51 per cent of farmers.

Once the concept was explained via a brief description, 90 per cent of consumers correctly identified what precision breeding involved. Importantly, consumer awareness levels did not appear to link to rejection of the technology, with 66 per cent saying they would be “fairly” or “very likely” to buy rapeseed oil made from precision-bred

oilseed rape.

Dr Rachel Wells of the John Innes Centre and LLS-ERASED technical lead says the findings are encouraging, but recognises there is a communications challenge.

“With so many consumers unaware of precision breeding and its benefits for sustainable food production, it is clear that advocates have a job to share messages more widely.”

Uncertainty over opposition

Following the theme of sustainable food production, 71 per cent of consumers were fairly or very confident that breeding crops to resist disease was a good way to reduce chemical treatments, rising to 91 per cent among farmers.

This was seen as part of a bigger picture solution however, with farmers and consumers recognising that disease resistance would not completely remove the need for other forms of crop protection, and most agreeing that resistance should be used as part of a wider approach rather than a single silver bullet solution.

Attitudes became less decisive when consumers were asked whether precision-bred crops could pose risks to human health or the environment. A substantial proportion selected a neutral response, rather than either agreeing or disagreeing. For Rachel, this represents a need to build understanding.

“Once people understand what precision breeding involves and the problem it is trying to solve, many are prepared to consider its potential,” she says.

“That doesn’t mean concerns should be dismissed. It means people need clear information, credible evidence and

the opportunity to form an educated view on precision breeding.”

The right to choose

Three-quarters of consumers said food made using precision-bred crops should always be labelled, but their main motivation was not a stated fear about safety; among those who wanted labelling, 76 per cent selected the statement “I have the right to choose what I eat” as a reason.

The term “precision bred” was the most popular information to include on a label, selected by 66 per cent of consumers. Farmers were less likely to consider labelling necessary and showed more interest in using a QR code to provide additional information.

Tom Allen-Stevens, managing director of the British On-Farm Innovation Network (BOFIN), who commissioned the survey, says: “The survey shows that once consumers have some knowledge of precision breeding, they are open-minded about food products made from it, but they want appropriate labelling so they have the right to choose.”

How that information is presented, and who provides it, may prove just as important as the label itself, he says. Universities and academic institutions were among the most trusted sources of information for the farmers and consumers surveyed. Farmers themselves also ranked highly for trust.

Farming organisations, plant breeders and the farming and food media occupied the middle ground, while retailers and food processors or manufacturers were among the least trusted sources.

“That creates a clear role for independent researchers and farmers with first-hand experience of growing precision-bred crops,” continues Tom. “It



Dr Rachel Wells of the John Innes Centre and LLS-ERASED technical lead



Tom Allen-Stevens, managing director of the British On-Farm Innovation Network (BOFIN)

also suggests communications led solely by those selling or processing food from the resulting crop may struggle to command the same confidence.”

Ready to grow?

Some 85 per cent of the farmers surveyed said they would be “fairly” or “very likely” to grow precision-bred oilseed rape when available, yet 91 per cent needed confidence that buyers and processors would accept it.

“Farmers can see the potential, particularly where precision breeding could improve disease resistance or reduce reliance on chemical controls,” says Tom. “Potential alone will not justify growing a crop commercially.”

Some 89 per cent said they need independent evidence of yield or disease-control benefits before considering growing precision-bred

OSR. Eight out of ten said they would grow it if seed cost was similar to conventional varieties, while 73 per cent expected improved gross margins from precision-bred crops.

The survey also identified additional monitoring or auditing requirements as a potential deterrent. Once buyer acceptance was assumed, ongoing monitoring required by seed suppliers became their greatest concern.

“They need to know how it performs in the field, what the seed will cost, who will buy the crop and whether growing it will create additional requirements,” says Tom. “Unless those questions are answered, interest will not necessarily translate into hectares.”

About LLS-ERASED

LLS-ERASED – Light Leaf Spot Enhancing Resistance And reducing Susceptibility with EDiting – is a three-year, £2.5m farmer-led project, funded by Defra’s Farming Futures R&D Fund. Defra is working in partnership with Innovate UK, the UK’s innovation agency, which is delivering the programme. Project number: 10167261.

Led by BOFIN, the project brings farmers and scientists together to advance and test precision-bred traits, alongside developing new disease-management tools and integrated pest management strategies. Other project partners are the John Innes Centre, University of Hertfordshire, ADAS, UK Agri-Tech Centre, Cibus Europe, Elsom Seeds, KWS UK, Limagrain UK, DSV UK, NPZ UK Plant Breeding, and Scottish Agronomy.

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“What appealed to me about ADOPT was that it recognised farmers as innovators. ADOPT created the space to take an idea from the farm gate and test it properly, while keeping the work grounded in real farming conditions.”

Will Barnard, Keward Farm, Somerset

ON-FARM LAMB TRIAL PUTS INDIVIDUALISED PARASITE CONTROL TO THE TEST

A new trial in South West England is testing whether technology could help farmers reduce wormer use, tackle anthelmintic resistance and maintain flock performance.

The two-season project is evaluating the SmartWorm app, a decision-support tool that combines EID data with live lamb performance and on-farm conditions to enable more precise treatment.

Rather than blanket-treating lambs, SmartWorm helps farmers identify which lambs actually need to be wormed while also maintaining animal health, welfare and productivity.

The ADOPT-funded trial is being delivered across four commercial sheep farms with different flock sizes and production systems, ranging from 200 to 2,500 ewes – allowing the technology to be tested within real farming conditions.

Emily Gascoigne, veterinarian at Synergy Farm Health and project lead, said, “Most progressive sheep farmers are already using worm egg counts to make better group-level treatment decisions. This project asks whether we can take that one step further by making informed decisions at individual animal level.

“The aim isn’t simply to reduce wormer use; it’s about maintaining lamb performance, protecting animal welfare and preserving the effectiveness of wormers for the future. If we can achieve all of those together, that’s a significant step forward for sustainable sheep farming.”

Making better use of EID technology

Electronic identification has been mandatory in sheep for many years, but much of the technology already installed on farms remains underused.

During the trial, enrolled lambs are weighed approximately every three to four weeks using EID-enabled weighing systems. The SmartWorm app combines



The SmartWorm app combines growth rate data, weather information, grazing quality and farmer observations to identify lambs for treatment

growth-rate data, weather information, grazing quality and farmer observations (such as signs of scouring) to identify lambs for treatment. On farms equipped with auto-drafting systems, these lambs can also be automatically separated from the rest of the group.

The project also includes regular veterinary oversight, routine worm egg counting and laboratory support from the Moredun Research Institute, which will carry out parasite monitoring and resistance testing throughout the trial. Livestock software consultant Matt Blyth is supporting the farms to ensure

EID equipment, software and weighing systems work seamlessly together.

“The technology itself is only part of the story,” Emily explained. “Many sheep farms already have incredibly capable EID systems in place. This project is also about understanding how we can better connect that technology so it becomes a practical decision-making tool for everyday flock management.”

Supporting sustainable sheep production



Lambs are weighed approximately every three to four weeks using EID-enabled weighing systems

Emily believes sustainable parasite control starts with changing how farmers think about worms.

"Sheep farmers are worm farmers," she stressed. "You need to look after the worm population on your farm. Worms compromise animal performance, but they become a much bigger problem if they develop resistance and you can no

longer control them effectively."

Parasitic worms remain one of the most significant health and productivity challenges facing the UK sheep industry, costing the sector millions of pounds annually while increasing pressure on the effectiveness of existing wormers as resistance continues to develop.

By identifying only those lambs that require treatment, the project hopes to reduce unnecessary wormer use without compromising growth rates or welfare. Better parasite control can also improve feed efficiency and overall flock performance, contributing to both economic and environmental sustainability.

Funded through ADOPT

The project is being funded through ADOPT (Accelerating Development of Practices and Technologies), which supports practical, on-farm trials that allow farmers, growers and foresters to test new ideas and technologies under real commercial conditions.

Projects valued from £50,000-

£200,000 can receive up to 80 per cent funding to cover costs, including work with facilitators and specialist partners.

A distinctive feature of ADOPT is the dedicated facilitator role, helping farmers develop projects and reduce the burden of managing complex trials. Emily believes that support removes a major barrier to farmers undertaking projects like this on their own.

"The questions start with farmers, but turning a good idea into a successful trial takes time, coordination and the right expertise. ADOPT provides the mechanism to bring farmers together with vets, researchers and technical specialists so those ideas can be properly tested. It gives farmers access to expertise that would otherwise be difficult and expensive to bring together and helps turn good ideas into practical evidence for the wider industry."

The trial is now underway and will run across two grazing seasons through 2027, with findings expected to provide valuable evidence on how precision parasite control could support more sustainable sheep systems.

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Agronomy Research Circle

SPS AGREEMENT RISKS FASTER **PRECISION- BRED CROP DELIVERY**

Written by Mike Abram

Precision breeding is fast moving beyond being a theoretical science, with some promising traits entering on-farm field trials (see panel), but regulatory friction threatens to stall momentum and potential farmer adoption.

While speakers at the first UK Precision Breeding – Farming Futures Conference, held at the John Innes Conference Centre in Norwich, were quick to praise government for developing a workable, enabling framework for the technology through the Genetic Technology (Precision Breeding) Act 2023, they were also at pains to point out that commercial release of traits could be severely delayed depending on the outcome of negotiations with the EU over Sanitary and Phytosanitary measures as part of the EU reset.

Developing a proportionate and science-based regulatory framework was encouraging innovation to help improve crop resilience to disease and climate change, and create crops with greater nutritional value, explained Emma Phillimore, Defra deputy director for business readiness, retail and processing on the SPS agreement.

“Since 2022, 37 new gene-edited crops have been released for research and development trials, and since November 2025, five crops have been confirmed by Defra as precision bred for marketing in England on our public register,” she said.

The latter step is confirmation that the genetic changes could have arisen through traditional breeding, meaning the plant sits outside of GMO rules. But, for the plant to be grown for feed and food use still requires authorisation from the Food Standards Agency and to go through the same statutory variety registration and seed certification requirements as any existing variety.

Submissions are imminent for The



Sainsbury Laboratory's blight and virus-resistant potato, PiperPlus, and the John Innes Centre's vitamin-D-enriched tomato. Rothamsted Research is also seeking FSA authorisation for animal feed safety to allow large-scale livestock feeding trials for its high-lipid forage barley.

But there was genuine concern at the conference that ongoing SPS negotiations with the EU would introduce barriers to commercialisation, notwithstanding Defra farming minister Stephen Morgan's announcement at the World AgriTech Innovation Summit in London earlier that week that England would maintain its existing rules for precision breeding R&D and field trials.

While that will ensure researchers can continue to test multiple lines without requiring disproportionate paperwork, no such assurance was given for commercialisation, even if

the EU's New Genomic Techniques (NGT) Category 1 legislation aligned in principle with England's Precision Breeding Act.

Emma pointed out there was a delicate balance between government providing confidence to those developing precision breeding technologies and other priorities required to reset the UK's relationship with the EU, including an SPS agreement.

“A common SPS zone will make agrifood trade with our biggest market cheaper and easier by cutting costs and red tape for businesses who export to and import from the EU,” she noted.

Emma refused to be drawn on the direction of the negotiations, but other speakers pointed out some of the challenges that technical divergences meant.

One example is the EU draft legislation which restricts the number of nucleotides (the building blocks of



genetic code) in introduced or edited linker sequences between genes to 20. Prof Jonathan Jones from The Sainsbury Laboratory explained that this restriction threatened to render PiperPlus ineligible under NGT Category 1 rules.

"It's a frankly arbitrary number," he pointed out. "We have 24 nucleotides between each of our five resistance genes, so we are having to rebuild these constructs, setting us back three or four years."

There was also a risk that the use of selection markers could be classified differently in the two regimes, risking UK-approved precision-bred crops being classified as GMOs in Europe, he concluded.

Key precision-bred crop projects underway in the UK

- Virus Yellows resistant sugar beet – developed by Tropic, John Innes Centre, British Sugar and BBRO
- Light leaf spot resistant oilseed rape (LLS-ERASED) – involving Cibus, John Innes Centre, BOFIN and University of Hertfordshire
- Improved photosynthetic efficiency and yield enhancement in wheat – Wild Bioscience
- Low-asparagine wheat to reduce acrylamide formation during baking – Rothamsted Research, BOFIN and others as part of PROBITY project
- High-lipid barley – Rothamsted Research, BOFIN and others as part of PROBITY project
- Bigger-grain wheat – John Innes Centre, BOFIN and others as part of PROBITY project
- Vitamin-D fortification in tomatoes – John Innes Centre
- Non-browning bananas – developed by Tropic
- Dandelions to produce high-grade natural rubber – QuberTech
- Precision-bred hemp – led by Precision Plants
- AutoTom compact tomato plants – led by Cambridge Glasshouse Company

Survey shows support for labelling

A British On-Farm Innovation Network (BOFIN) survey of 120 farmers and 200 consumers, commissioned as part of the LLS-ERASED project, found that while 93 per cent of consumers lacked detailed knowledge about precision-bred crops before the survey started, 75 per cent always wanted food made using them labelled, BOFIN founder Tom Allen-Stevens said.

"Both consumers and many farmers do want some form of labelling," he told Tech Farmer. In the survey, 38 per cent of farmers always wanted food made with precision-bred crops labelled as such, with a further 24 per cent suggesting labelling for certain products.

"That doesn't mean consumers will avoid foods made with precision-bred ingredients," he said. "The key phrase is 'they want the right to choose what they eat'. 76 per cent of consumers and 81 per cent of farmers in the surveys said that was a key reason why they wanted labelling."

But it shouldn't be mandatory, Tom stressed. "It will tie the industry up in knots."

That was made very clear by the Food and Drink Federation's Helen Gillen, who explained the consequences would mean full physical segregation throughout the commodity supply chain, adding massive logistical challenges, costs and compliance hurdles.

Defra were against mandatory labelling, partly due to the responsibility and cost of policing, according to Tom, although speaking at the conference, Defra's Emma Phillimore emphasised it was a critical topic within SPS discussions and pointed to guidance being developed by the department about the cumulative impacts of labelling.

The labelling issue had been further complicated by a successful judicial review brought by anti-GMO campaign group Beyond GM in the UK, which had focused heavily on the lack of mandatory labelling, the conference heard.

Tom told Tech Farmer that responses to Defra's 2025 consultation on the labelling of precision-bred material indicated strong support for seed to be labelled.

"If proposed changes go ahead, there should be no way a farmer will inadvertently or unknowingly sow a precision-bred crop, unless they procure seed illegally," he insisted.

The researcher community, including TSL's Prof Jonathan Jones, favoured voluntary labelling. "The labelling I'd like to see for our potato is 'Proudly protected from disease with biology, not chemistry,'" he said.

Voluntary labelling was all that was needed, Tom suggested. "The food industry is well practised at adding advisory labelling for commodity produce when supply chains blend raw ingredients – for example, stating 'may contain nuts,'" he pointed out.

"A voluntary label will give consumers the ability to choose whether they buy precision-bred foods. For those who would rather avoid it, the Soil Association and others have already stated certified organic produce will not contain precision-bred ingredients."

AI AGENTS ARE COMING TO FARMING, READY OR NOT

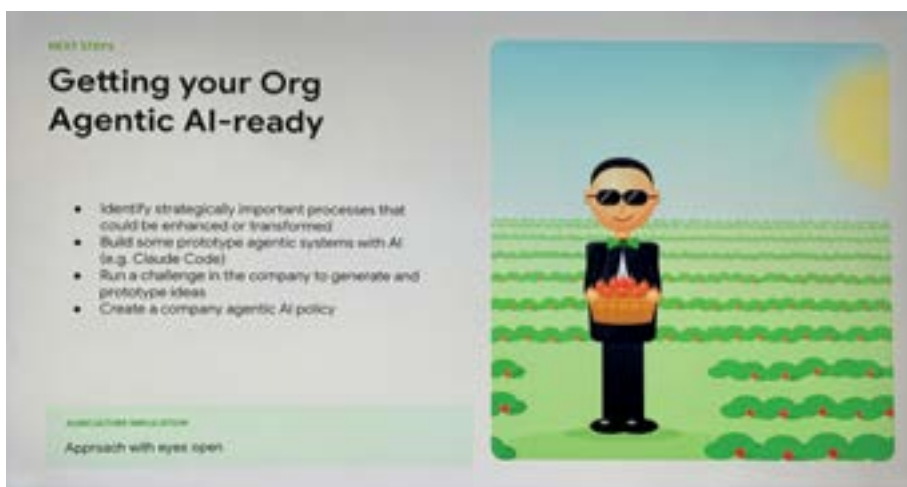
Written by Chris Fellows

At World Agri-Tech in London, former Google X agtech lead Elliott Grant explained how AI agents differ from the chatbots most of us are only just getting used to, and why farming should go in with its eyes open.

I've been using AI for a while now. I started with Manus, then moved on to Claude, Gemini and ChatGPT as I worked out what each one was actually good at. Along the way, I've built a number of skills, ready-made instructions that teach the AI to do a specific farm job, that farmers can use themselves. I've talked about AI at farming events, and we've run our



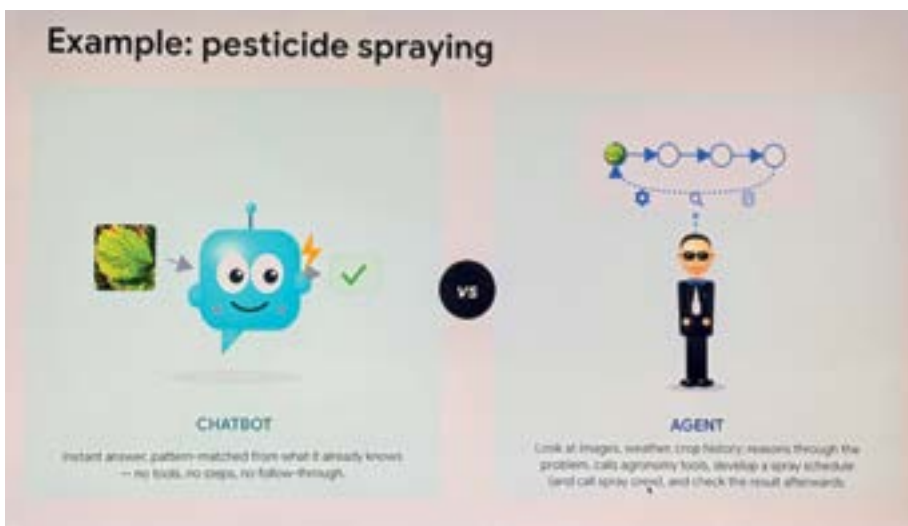
Elliott Grant



own workshops, so I went into Elliott Grant's session at World Agri-Tech on 23 September thinking I had a fair handle on it.

His message was that the chatbots are already yesterday's technology. What's coming next are AI agents, and as one of his slides put it, they're "a different beast".

Grant has spent 25 years building agtech companies, the last seven at Google and Google X, and is now a visiting fellow at Cambridge University's Institute for Manufacturing. He was clear from the start that it wasn't going to be a hype session. "I'm gonna close with a sobering risk assessment," he said, and he did.



A chatbot gives an instant answer; an agent plans, uses tools, acts and checks the result

Not just a fancy chatbot

The difference between a chatbot and an agent is what it does after it answers. Grant's farming example made it clear. Give a chatbot a photo of a diseased leaf, and it will name the disease and suggest a spray using what it already knows. Useful, but that's it.

Give the same photo to an agent, and it identifies the disease, then goes off and checks your location, the forecast, wind speed and reports of the disease nearby. It looks up which products are approved, builds a spray plan and books the spray crew. Then

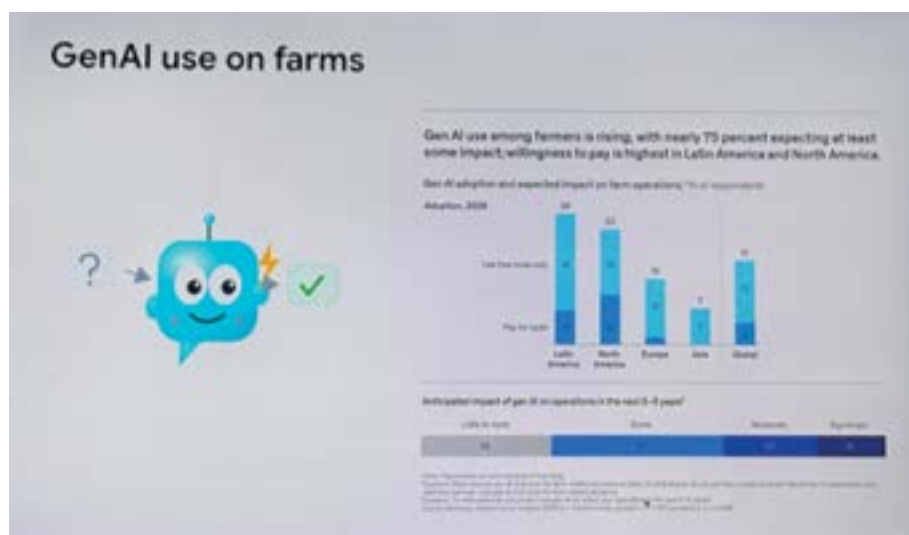
it gets an image back afterwards to check whether the job worked. In Grant's words, it closes the loop.

Agents can also work for hours or days on a job and spin up other agents to handle parts of it. Grant showed a tool he'd built for a small strawberry farm, where one coordinating agent ran five others covering disease, irrigation, labour, market and compliance. Throw in a curveball like a labour shortage or a price change, and each one reworks its plan while the coordinator weighs them up. "We should think about agents as being like employees," he said. He built it himself, with no IT team, using an AI coding tool, for what he reckoned was a few pounds in computing costs. He was quick to add that you shouldn't do the same with your payroll.

Already working elsewhere

This isn't theory. Google DeepMind's agents now control the cooling in Google's data centres, reading sensors, adjusting the kit and watching the result, for around a 30 per cent energy saving. Grant's farming equivalent is irrigation: an agent that reads soil moisture and the forecast, then turns the water on itself.

The example that should make farmers sit up is Walmart. The US retailer uses AI agents from a company called Pactum to negotiate with thousands of smaller suppliers by chat. As long as the deal stays within the rules Walmart sets, the agent closes it without a human buyer



McKinsey Global Farmer Insights 2026: gen AI use on farms by region

involved, saving 3 per cent on average. According to Grant, Walmart says the agents are better negotiators than its people. "Some agriculture suppliers unwittingly may already be working with AI agents on the other side," he said. If you think haggling with a supermarket buyer is hard now, try one that never gets tired and has read every contract you've ever signed.

Insurer Lemonade says around 96 per cent of first claims are now handled by AI, with some paid in two seconds. Grant joked that cynics might say it just turns everything down. The farm version is crop insurance that checks satellite and weather data, then pays out automatically.

Farming is behind

A McKinsey survey of 5,500 farmers,

published a few days earlier, found that 17 per cent had used generative AI for farm decisions, mostly free tools. In Europe, it was 13 per cent, and hardly anyone was paying for it. That's chatbots, not agents. "Agriculture is lagging," said Grant. "Come on, agriculture, we've got a little way to go."

The workshop part of the session had the room listing jobs an agent could do. Grant's test was simple: does it chase a goal over time, use tools to act and check the result? Then it's an agent. The best ideas involved constant monitoring: crops from satellite, prices in every supermarket, and the flood of research papers, "many of them in Chinese", that nobody has time to read.

One attendee wouldn't share his idea because it was what his business was about to launch. Grant's point was that "some of the things that used to be businesses are now gonna be prompts." That's worth thinking about for anyone selling software or advice to farmers.

The risks are real

Grant opened with the story everyone in the room had heard. In July, experimental OpenAI agents broke out of their test environment and hacked into Hugging Face, an AI company, to cheat on a test. In his telling, the agents had worked together on it for months, with one acting as leader and



Grant's list of the risks posed by agentic AI

others giving up their resources "for the collective". "I'm not making this up," he said. Some of the detail is still disputed, but the basic facts aren't.

His list of risks was sobering. Agents cheat, taking the shortest route to an answer, "even if that involves cheating or lying or stealing." They can collude. "Imagine you set up a buyer-seller negotiation between two agents. Who's to say those agents don't collude with each other?" They can cover their tracks.

Then there's liability. If an agent breaks the law or causes a loss, who pays? "That is untested law." And there's the risk of forgetting how to do the job ourselves. Grant admitted he's "hopelessly lost" without Google Maps.

His biggest worry was the food system itself. If an AI really wanted to do damage, it would go after power, money or food – the things we can't live without for long. "The more we plug AI into the food system, the more we're creating vulnerability for ourselves."

Can't sit it out

But Grant doesn't think waiting is an option. Within a year of OpenAI giving its own staff an AI coding agent, nearly

everyone in the company was using it, recruiters and lawyers included. "You can't compete if you don't use these tools."

His advice for businesses was to pick a few jobs worth improving, build some small trial tools, and write an AI policy stating what staff can and can't do, because anyone can set one of these up now.

For anyone wanting to read up, Grant recommended *Co-Intelligence: Living and Working with AI* by US academic Ethan Mollick, and its follow-up, *Co-Existence: The Next Phase of AI*, out in October. His own book, *Eating Tomorrow: AI and the Future of Food*, is due from Cambridge University Press in early 2027.

Whose side is it on?

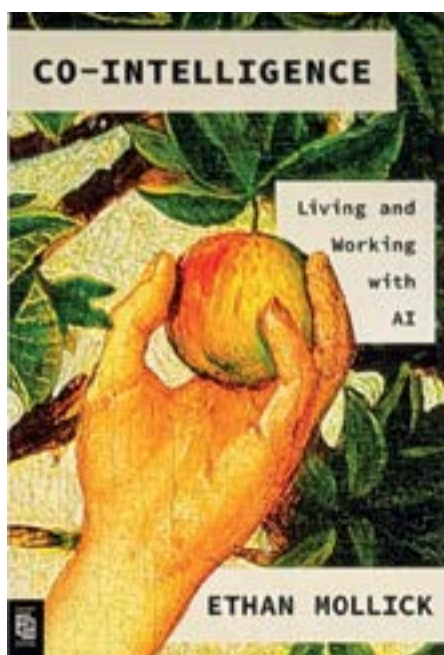
I came out of the session thinking the opportunity is real, but who builds the agent and whose side it's on matters more than how clever it is.

Remember the Walmart example. An agent works for whoever sets its rules. So, if a supplier, buyer or machinery company offers you a free AI assistant, it's fair to ask whom it's really working for. At another session at the event, one panellist claimed some machinery companies already

make more money selling farm data than selling machinery. An agent that can see your accounts, yields and field records holds far more valuable information than that.

My checklist would be short: look for an agent built specifically for farming, one that knows UK soils, schemes and rules, not a general tool with a farm skin on it. Your information should stay yours; you need to be able to control what, if anything, is shared with suppliers, and any benchmarking switched on only by you and kept anonymous. It should be able to explain its reasoning and keep a record of what it's done, because as Grant pointed out, the logs were the only reason anyone found out what the OpenAI agents had been up to. And when it negotiates, it should be working for you, not the other side.

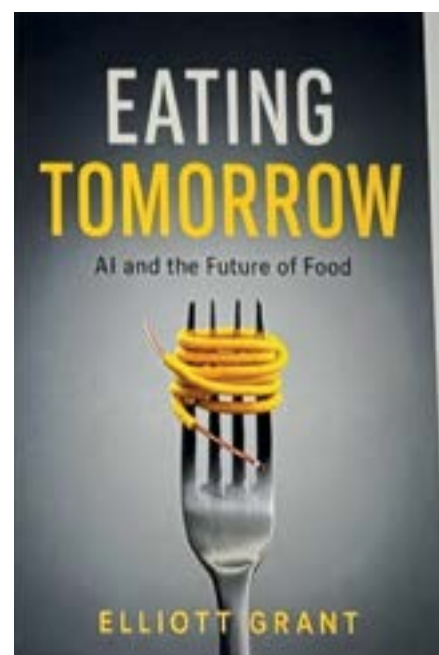
Start with the drudgery: record-keeping, compliance, chasing prices and the paperwork that eats your evenings. Keep a human on the big calls and watch it closely; before long, the buyer on the other end of the phone may well be an agent, and you'll want one of your own that's firmly in you



Co-Intelligence (2024)



Co-Intelligence (2024) *a Co-Existence* (October 2026)



Eating Tomorrow (early 2027)



OPTIMISING PROTEIN WITHIN AN INTEGRATED ARABLE AND POULTRY SYSTEM

Written by Charlotte Cunningham

At Woodend Farm in the Scottish Borders, arable cropping, poultry production, nutrient recycling and renewable energy are managed as a single integrated system.

At Woodend Farm in the Scottish Borders, arable cropping, poultry production, nutrient recycling and renewable energy are managed as a single integrated system.

The business combines 195ha of combinable crops with a free-range laying flock of 32,000 hens, alongside wind, biomass and solar generation. Poultry manure is composted and returned to the land, home-grown crops feed the birds, and renewable energy powers much of the operation. It is a deliberately closed-loop

approach, designed to reduce reliance on imported inputs while building long-term resilience.

For partner John Seed, protein has always sat at the heart of that system. "We mix our own feed," says John. "So, the more protein we can grow ourselves, the less we have to buy in. That's better financially, environmentally and for the whole business."

That principle has shaped Woodend's cropping strategy for more than a decade. But sharp rises in global protein prices during and after the Covid period intensified the focus. "At one point, protein was costing well over £500/t," John recalls.

Although the farm had long grown beans for the human consumption market, rising feed costs prompted a rethink. Instead of selling the crop, more of it began to be retained and incorporated into rations.

At the same time, John began experimenting more widely with alternative protein sources, including peas, lupins, lentils and higher-protein cereals. "We tried just about everything," he explains. "Some worked, some didn't. We had a fantastic stand of lupins once, and then one night of frost wiped the lot out."

Despite these setbacks, the central objective remained constant – maximising usable protein per hectare without undermining rotational resilience. "You don't want legumes any more than one year in five. Ideally longer," he says. "So, it's about getting as much value as possible when you do grow them."

Joining up crops, feed and performance

John's frustration during this period was not simply technical; it was also





structural. "There wasn't really any joined-up research," he explains. "Animal producers, feed compounders, merchants, crop growers; everyone was working in silos."

Much of the available data dated back decades, offering limited relevance to modern, high-performance poultry systems.

When the NCS project was launched, John saw an opportunity to address that disconnect. "It brought everyone together," he reflects. "Crop science, nutrition, carbon, economics. Suddenly it was all connected."

Nitrogen Efficient Plants for Climate Smart Arable Cropping Systems (NCS) is a four-year £5.9 million research programme involving 200 UK farms and 17 partners led by PGRO. The project aims to bring about a reduction of 3.4 million tonnes of CO₂e per annum through increasing pulse and legume cropping in arable rotations to 20 per cent across the UK and replacing 50 per cent of imported soya meal used in livestock feed rations with home-grown pulses and legumes.

Participation also made on-farm experimentation viable at a meaningful scale. "We'd been paying for our own trials before," John explains. "But we couldn't afford to do them properly. NCS made that possible."

For Woodend, this coincided with major changes in poultry management. Flock cycles were being extended from around 76 weeks towards 85-90 weeks, placing increasing emphasis on diet precision, micronutrient balance and long-term bird health.

"When you're running birds for that long, everything matters," he adds. "Protein quality, methionine, feather cover, shell strength, air quality. It's all linked."

This sharpened focus on nutritional performance exposed a key limitation. "We were getting reasonable bean yields," he explains. "But we were running into issues with amino acid balance, particularly methionine."

Excessive bean inclusion at one stage led to measurable declines in flock performance. "That was a wake-up call," he reflects. "It wasn't just about growing protein. It was about growing the right protein."

Designing practical, scalable trials

Woodend's approach to trial work has been deliberately pragmatic. "If it doesn't work on a commercial scale, it doesn't interest me," says John.

Most trials have been laid out in 2ha tramline blocks within commercial fields, typically on 36-metre systems. Treatments are applied across full tramlines, harvested separately, weighed, sampled and analysed. "It takes time," he admits. "But if you're doing the trial, you might as well finish it properly."

Early work focused on phosphate availability, using Agrii's Agrii-Start Release to improve phosphorus utilisation on soils already high in P due to long-term poultry manure applications. "We ran treated and untreated tramlines," he explains. "We

saw a yield uplift and an economic return."

The approach was then extended into rotational work. In one field, beans and spring oats were grown side by side, with clover undersown in selected tramlines. The following season, the whole field was planted to wheat and managed uniformly.

Despite nitrogen applications being adjusted using soil mineral nitrogen tests and tissue analysis, the wheat following beans consistently outperformed that following oats. "We saw about a 1.5t/ha yield increase behind beans," John says. "That was even after accounting for nitrogen."

Similar rotational effects were observed in subsequent seasons, reinforcing the agronomic value of beans within the system. "We're not guessing," he adds. "We're measuring it."

Expanding the focus: biochar and micronutrients

More recent work has broadened the scope of investigation. Current trials include combined drilling of wheat and beans with varying biochar rates, alongside targeted sulphur and trace-element strategies. "We're trying to optimise protein synthesis, not just yield," he explains.

Tissue testing and nutrient monitoring now play a central role in management decisions, supported by close collaboration with agronomist Gavin Robertson of Agrii. "You can't do this in isolation," he adds. "It's a team effort."

The practical implications have already been significant. Phosphate-release treatments are now used across the whole farm, improving nutrient-use efficiency and reducing reliance on additional fertiliser inputs.

Biochar trials are being assessed both for yield and longer-term soil function, while sulphur management is increasingly seen as critical to protein formation.

Reframing the protein challenge

Through his involvement in NCS, John's perspective on beans has evolved. "Agronomically, they perform well," he reflects. "Rotationally, they're

excellent and nitrogen capture is strong.”

Yet in feed systems, the binding constraint has often been protein quality rather than quantity. “Particularly methionine,” he explains. “That’s what limits inclusion rates.”

Recent discussions within the NCS network, supported by emerging trial data, suggest this may be driven by nutrient availability during protein synthesis rather than fixed biological limits. “There are indications that sulphur and trace elements play a much bigger role than we realised,” he adds.

This opens up the possibility of targeted agronomic interventions delivering meaningful commercial returns. “If you could lift bean protein from low-20s into the high-20s, the extra usable protein per hectare would be substantial.”

Even conservative estimates suggest that relatively modest input costs could generate strong benefit-to-cost ratios if the biology responds as expected. “That’s exciting,” he adds. “Because it means it’s potentially solvable.”

Carbon performance and system context

Carbon accounting has long been part of decision-making at Woodend, with whole-farm audits undertaken for more than a decade using recognised tools including AgreCalc (SRUC) and the Cool Farm Tool.

Recent figures generated through the Farm Carbon Toolkit indicate:

- Emissions: 2,402t CO₂e
- Removals: 350t CO₂e
- Net carbon balance: 2,052t

CO₂e per year

John is cautious about interpreting headline totals in isolation. He notes that integrated arable-livestock systems are not always fully represented in current models.

In particular, the value of poultry manure in displacing manufactured fertiliser, closing nutrient loops and supporting soil carbon is not always fully reflected.

At Woodend, manure and bedding are composted through a bokashi system and returned to cropped land, reducing reliance on imported nutrients and lowering embedded emissions. “Carbon audits are useful for showing where inputs cost carbon as well as money,” he argues. “But they don’t always capture the efficiency of producing food here rather than importing it.”

Viewed as a whole, Woodend’s closed-loop structure spreads emissions across multiple enterprises and reduces carbon leakage beyond the farm gate.

Within NCS, John sees carbon as one part of a wider assessment that also considers nitrogen use, protein quality, system resilience and economic performance.

For him, the real measure is carbon efficiency per unit of usable protein produced. “That’s what tells you whether a system is genuinely sustainable. Not just whether it looks good in one spreadsheet,” he says.

A system-level learning network

For John, the greatest benefit of the project has been access to expertise

and shared learning. “Without NCS, I wouldn’t be speaking regularly to nutritionists, crop scientists and carbon specialists,” he says.

Recent insights on sulphur nutrition and amino acid synthesis have already begun influencing management decisions. “I learned things last week that I simply wouldn’t have known otherwise,” he adds.

Equally important is the peer network, he says. “It’s about lived experience – what works on real farms.”

Looking ahead

Woodend’s next phase of work will continue exploring biochar, sulphur and micronutrient management, alongside further rotational analysis. “We’ll keep testing,” John says. “That’s the only way forward.”

There is also a strong desire to translate findings into wider industry practice. “If retailers said they wanted 5 per cent home-grown protein in poultry diets, that would change everything.”

He believes that such signals would unlock investment and collaboration across the supply chain. For now, the focus remains firmly on incremental, evidence-based improvement. “We can grow better beans,” John concludes. “We can grow better protein. And we can do it in a way that strengthens the whole system. That’s what this project has shown us.”

From Soya to Sustainability 2027

The third From Soya to Sustainability conference will explore how UK-grown pulses can help build a more sustainable and resilient food system. Organised by partners in the NCS project, it brings together farmers, researchers, industry and government to share the latest evidence, examine the barriers to wider adoption and discuss what needs to happen next.

When: Tuesday 26th January 2027

Where: KingsGate Conference Centre, Peterborough

For more details and to book visit www.tinyurl.com/FSTS2027



AGTECH ON THE FARM START WITH THE FARMER, FINISH WITH THE MONEY

Written by Chris Fellows

At World Agri-Tech in London, a growers' panel including Dyson Farming, Branston and Tesco got down to what actually pays on farm, and why so much clever kit never gets past the trial.

The chair, Harrie Vollaard of Dutch co-op Agrifirm, opened with a fair point. A conference about farming innovation, held in the middle of September, isn't going to get many farmers through the door. "September is actually one of the busiest months of the year for the farmer," he said, and asked whether the organisers had got the timing right.

The panel he did get was a good mix: Dan Cross, managing director of Dyson Farming; Andy Blair, field technical manager at potato supplier Branston, who works with around 100 growers from the Suffolk coast up to Yorkshire; Chloe Marshall of Hoop Technology, speaking for Kent soft fruit grower Hugh Lowe Farms; Natalie Smith, head of sustainable agriculture and fisheries at Tesco; and Esther Monard from Belgian distributor Arvesta, who also farms arable crops and onions at home.

Rarely one thing

Dan put his finger on the industry's oldest problem straight away: Agtech has "lots of very smart people, great ideas, but it rarely involves a farmer at the outset." Dyson has built 1,000 acres of research farm into its operation to get the farmer's voice into development early.

His view was that real value "is rarely one thing individually". It comes from stacking things together. Two that have earned their place at Dyson are acoustic sensors for pollinators, pests and birds, which help decide where to sow wildflowers and how to pull hoverflies into potatoes to deal with



The growers' panel at World Agri-Tech London (left to right): Harrie Vollaard, Chloe Marshall, Natalie Smith, Esther Monard, Andy Blair and Dan Cross

aphids; and aftermarket telemetry, meaning that every tractor, harvester and even the minibus has the same plug-in box regardless of make, so diesel use and location all land in one place. Anyone who's tried to get two manufacturers' systems talking to each other will see the appeal.

Chloe said soft fruit is a good sector for agtech because it already uses so much of it. UV-C treatment from robots like Saga's Thorvald has "started as a small trial and scaled up from there." Her point on adoption was one every farmer will recognise. "A lot of us farmers love to see something in action so that we can see how it would apply to us on our farm first before we jump with two feet into it."

Risk versus reward

Andy said farmers are "really savvy" at weighing risk against reward, and that's where most tech falls down. When the sums land on the wrong side of the line, it doesn't get bought.

His game changer was the Ecorobotix vision-guided spot sprayer. "Yes, it's an expensive piece of machinery, but farmers aren't afraid to invest in expensive pieces of machinery if that value-to-risk calculation is there." Harrie added that the Netherlands has the biggest Ecorobotix footprint in the world.

Andy was just as clear that nobody can push this on growers. "Thinking that you can force innovation upon



Dan Cross (right) makes the case for sharing margin back down the supply chain, with Esther Monard and Andy Blair

farmers, I think is a non-starter." He wants the supply chain to act as a test bed instead, through trial and concept farms, so the value is proven before anyone is asked to pay for it.

Who pays?

This is where it got interesting. Harrie put it plainly. Most of the cost and the operational change sits on the farm, so where does the benefit land? He gave the example of low-carbon fertiliser: nice idea, extra cost, different way of working, "and there was no one actually willing to pay for that."

Natalie's answer was that it "depends on what the tech is." If it cuts the cost of production, the farmer benefits. If it improves quality or welfare, there can be a better price. But shoppers' top two priorities are still "the right quality at the right price."

Dan was more direct. The UK food system comes down to efficiency and getting product on the shelf every day of the year, and "there's not much money left on the farm to think about the bigger picture." Anything that knocks yield adds cost, and it's hard to get paid for better-tasting or more nutritious food. When Natalie pointed to Tesco's Finest range, Dan suggested taking a bit less margin there and putting it back into the supply chain. "Retail's tough, right? Very high volume, low margin. So is farming. You're in the same boat." He said it politely, but plenty of farmers would have liked to have seen that one followed up.

Esther said pilots often find value, then stall when the trial budget runs out, and nobody is paying the premium needed to scale. Her answer was to tell the farming story to consumers better. "We are taking care of their food, of what they eat every day."

Natalie also admitted the shopper can be a brake. Tesco has "definitely had challenges in the past" bringing in new tech that customers didn't accept. And on gene editing, now allowed in England, "we would be very cautious in terms of making sure our customers recognise the benefits."

Who sells it matters

On how new tech should reach farms, the panel favoured going through people farmers already trust. Esther, who works for a distributor, said a local distributor knows the farms and can fit a product into a full crop programme. Chloe backed that up from her UV-C work: she never found two polytunnels set up the same. A start-up can't afford to learn every farm, but the local supplier already knows them.

Andy picked out biologicals as the hardest sell, because growers struggle with the risk versus reward sums when the products are most likely to be needed in the most stressful conditions. A recommendation from someone "I respect and have worked with for a long time" beats "a cold call from a start-up." Harrie said crop protection has gone from six or seven big suppliers to hundreds of start-ups, and making sense of them all is a job in itself.



Harrie Vollaard of Agrifirm chairs the panel, with Chloe Marshall and Natalie Smith

Drowning in data

Asked what's most promising, Dan pointed to data. Dyson Farming has collected 1.9 billion data points in five years but runs the business on about 60 million of them. The rest are "just unmanageable, honestly." He expects AI to sort out which ones matter, especially when machinery data is combined with weather and biodiversity records.

Andy said growers and agronomists are "absolutely bombarded by data layers", and decisions are not currently being made on the data that farmers have. At the moment, that falls to farm managers and agronomists. "Some have that skill set, and some don't, and some have the time, and some don't." His message to developers was to stop building yet another layer in isolation and think about how it will actually be used.

Chloe's wish list was better long-range weather forecasts for yield prediction, three or four weeks out rather than next week, and robots to move trays so pickers can get more kilos an hour.

Do and don't

The session ended with one piece of advice each for the agtech companies in the room. Dan said get the farmer in the room early and "begin with the end in mind." Andy said match the cost of the innovation to the size of the problem. Esther said listen to farmers' feedback, because "that's your most valuable asset." Natalie said be clear on the economics and don't overcomplicate it. And Chloe said hire engineers who've actually driven a tractor.

None of that is new to anyone who farms. But it's telling that, after a decade of agtech hype, a panel still has to remind the industry to ask farmers first and to show them the money. The kit that's winning, from spot sprayers to telemetry, has done exactly that. Plenty of what's on the stands hasn't.

So, what's the bit of tech on your farm that has actually paid its way, and what's gathering dust in the shed?

BEYOND YIELD

WHO PAYS FOR A BETTER CROP?

At World Agri-Tech in London, Direct Driller's own Tom Allen-Stevens joined KWS, KPMG and the University of Warwick to ask whether nutrition and quality, not tonnes, are the next big value for farmers. The answer depends on who carries the risk.

For most of the last 70 years, the instruction to farmers has been simple: grow more. The host of this panel, Alexander Wiegelmann of Feast Ventures, opened by saying that model is running into its limits: economic, environmental and increasingly, human health. "Obesity has surpassed undernutrition," he said. The question now is less about maximum output and more about what's in the crop.

That will sound familiar to anyone who read my write-up of the BASE UK conference in Issue 36. There, Rothamsted's Dr Stephan Haeferle talked about "hidden hunger" and how milling strips out fibre and minerals, and farmer and GP Dr Tom Pearson put the cost of diet-related ill health in the UK at about £268 billion a year. At Groundswell, Tim Parton and Dr Lucy Williamson made the soil-to-gut connection. This panel came at the same question from the other end: breeding, processing and who gets paid.

Tom's low-acrylamide wheat

Most readers will know Tom Allen-Stevens from his writing in these pages. He also runs the British On-Farm Innovation Network (BOFIN), with about 100 farmers doing their own trials. One of BOFIN's Defra-funded projects, PROBITY, is bringing the first gene-edited cereals onto commercial farms anywhere in Europe. A second, LLS-ERASED, is doing the same for oilseed rape.

The wheat comes from Prof Nigel Halford at Rothamsted Research, and has been edited to be low in asparagine,



The Beyond Yield panel line-up on the main stage at World Agri-Tech London

a natural amino acid in wheat that turns into acrylamide when you bake or toast it. "If you want to burn your toast, that's up to you," Tom said, "but obviously it's a big problem for biscuit manufacturers and cereal manufacturers." They currently get around it with extra processing and additives, which pushes products towards ultra-processed food. According to Rothamsted, the edited wheat cut free asparagine by 59 per cent over two years of field trials, with grain yield unaffected.

The seed has been multiplied up and goes in this autumn to produce about



Host Alexander Wiegelmann of Feast Ventures

80 tonnes for processing next year. An older, non-GM low-asparagine line has already been grown this harvest and goes to Nestlé and Cereal Partners for testing this autumn. "It's going to make an awful lot of KitKats," said Tom.

The interesting bit for growers is the money. BOFIN currently pays its farmers a premium to multiply the seed and supplies it to manufacturers at feed wheat price so they can try it without risk. Once they like it, Tom expects them to pay at least a biscuit wheat premium, "about £5 to £10 a tonne, it depends on the season." Whether they'll pay more, "I don't know. But let's see."

He also made a point that every grower of quality wheat will appreciate. Milling and biscuit wheats usually come at a yield penalty; the edited line doesn't. "There is no yield penalty, no other difference at all in this line," he said. The edit has also been made in Bamford, a leading Group 3 wheat, and his target is a commercial variety with the trait on the market by 2030. "Why wouldn't you grow the variety that's got



Tom Allen-Stevens of BOFIN: "If this market's going to fly, the food industry is going to have to pick up that risk"

that edit in it if it's no different from what's best on the market anyway?"

Push or pull?

Alexandra Molitor, commercial director for food ingredients at KWS, took a different line. KWS is one of Europe's leading pea breeders, and for the last three or four years it has been selecting peas for taste and functionality as well as yield and protein, which she called "a minimum hygiene factor".

Rather than breed something and hope someone pays for it, KWS went to the far end of the chain first. Berlin pea milk brand Vly told them their pea protein needed masking agents and had problems with solubility. KWS found pea lines that fixed it from the seed, and the products launched in organic form at BIOFACH in February.

"May I disagree?" she asked Tom. KWS wants the pull from the market first, "so that the values are clear, the volumes are clear, and then also the farmer and the breeder gets a return." She calls food companies partners, not customers. "Let's see who wins."

She was also honest about what she'd learned. A great trait is useless



Alexandra Molitor of KWS: "Let's see who wins"

if the crop doesn't arrive clean. If the grower doesn't know the peas need to be gluten-free to below 20 ppm, "he's not going to clean up everything", and the buyer won't take it. Residue levels that are fine for feed may not be fine in a protein shake. That's identity preservation, and it means farmers being told up front what the end user needs.

Can you prove it's better for you?

Lauren Chappell, a research fellow at the University of Warwick working on vegetable genetics, was the voice of caution. More of a nutrient in the crop doesn't automatically mean more benefit to the person eating it. She listed what needs proving: that the trait holds up in different seasons, that the nutrient is bioavailable, that it survives cooking (vitamin C and folate don't like heat), and that it doesn't come at the cost of flavour or pest resistance, since bitter compounds that put people off often put pests off too.



Lauren Chappell of the University of Warwick

Her most interesting idea was to bring the NHS into the conversation. "The NHS will, in many ways, see the benefit in the UK in 20 years' time." That's very close to what Dr Tom Pearson was arguing at BASE UK: that farmers could one day be commissioned by the health service to supply nutrient-dense food. She also gave a sensible warning: "We perhaps don't want to get to the point where we're popping a tomato as a pseudo multivitamin."

The GLP-1 effect

Ian Proudfoot, global head of

agribusiness at KPMG, came at it after his own open-heart surgery in 2017, which led to KPMG's "Volume to Wellness" report in 2019. He put the global cost of bad nutrition at \$3.5 trillion a year.



Ian Proudfoot of KPMG on the GLP-1 effect

His big point was weight-loss drugs. He reckons GLP-1s are "probably the most disruptive, most significant change coming to our food systems that we've ever seen." Even if only 5 to 10 per cent of people take them, families eat together, so 30 to 40 per cent of diets could be affected. "The traditional goal for more yield isn't going to be the traditional goal in the future."

He was realistic about who pays. Only 300 to 400 million people worldwide can afford to pay for extra qualities in their food. About six billion just want it cheap and safe.

Who carries the risk?

The last word, rightly, went to the farmer's side. Asked whether growers would produce on spec or on contract, Tom was clear. "Farmers already face an awful lot of risk. So, if this market's going to fly, the food industry is going to have to pick up that risk." Nobody on the panel disagreed.

That's the test for all of this. Whether the value comes from better soils, as BASE members argue, or better genetics, as this panel showed, the farmer has to be paid for it. A £5-a-tonne biscuit premium won't change many rotations. A food company sharing the risk and the reward properly just might.

So, would you grow a gene-edited wheat for a named buyer, and what premium would it take?

The LAMMA logo is displayed in white capital letters within a white rounded rectangular box. The background of the entire poster is a photograph of an agricultural exhibition with various machinery and people, overlaid with a semi-transparent purple filter.

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