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REVIEW

MARCH/APRIL 2024



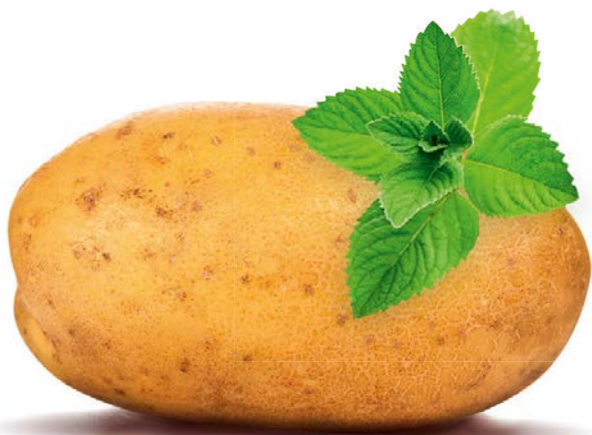
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Editor's letter

OUR armoury in the control of late blight is soon to lose another piece of weaponry with the withdrawal of the active substance mancozeb. The brief stay of execution the UK saw after the EU banned its use in January 2022 has now come to an end following a review by the UK's Health and Safety Executive (HSE).

With this in mind, we'll be keeping a sharp eye on future control methods and will be keen to hear what alternatives are proposed. CEO of GB Potatoes, Scott Walker, says it's more important than ever to take a consolidated approach on actives, which you can read about in the GBP column.

Protecting against early season diseases like *Rhizoctonia solani* is key to a strong start in crops so in we look at the options and why resistance management should be given more consideration in sustainable control.

Nutrition will be more important than ever this season after challenging conditions. We talked to three suppliers and learned what they've unearthed in most recent trials, as well as being given an insight into how higher yields were achieved with reduced fertiliser and biologicals in trials.

Andrew Goodinson, Agronomist and Potato Specialist at Hutchinsons also gives some early season tips to getting the most from potato crops.

Two authorities on PCN detail latest advancements in treatment, while grower Tim Rooke talks to us about the robust approach he is taking to control the pest and prevent population growth.

Across the seas, 18 European partners have joined forces to launch NEM-EMERGE, a major research and innovation project targeting PCN, which you can read about in our feature on page 42.

Other international news is shared on pages 46 to 48, and elsewhere we share some of the highlights from recent SACAPP and CUPGRA conferences, while Dr Michelle Lynn D'Souza, Research and Innovation Manager for Global Agriculture Sustainability at McCain, discusses how innovative new technology can help combat climate change.

Plenty of food for thought as we enter the spring season – and hopefully the near-end of all this pesky rain!



Stephanie Cornwall
Editor

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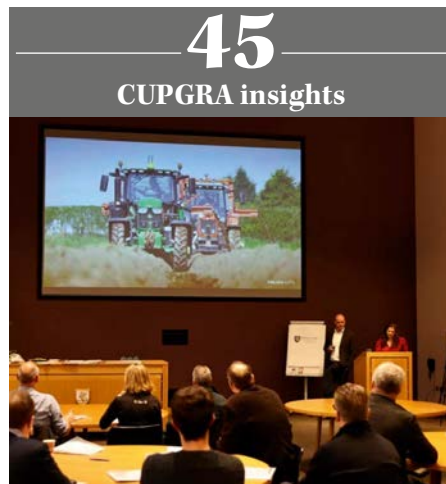
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HSE Proposal to withdraw approval of Mancozeb

THE Health and Safety Executive (HSE) has conducted a review of the approval of the active substance mancozeb and proposes to withdraw the approval of the active substance in Great Britain.

Mancozeb (MZ) is a broadly-used fungicide for the control of plant diseases, including late blight in potatoes caused by the oomycete *Phytophthora infestans* (Mont.) It was banned for agricultural use by the European Union from January 2022 because of perceived hazards to humans and the environment. But while it was withdrawn from use in the EU and Northern Ireland, it remained available in England, Scotland and Wales.

MZ has been found to cause human health problems, including hepatic, renal, genotoxic, and hematological disorders. One of the degradation products of MZ in the soil is ethylenethiourea (ETU), a group B2 carcinogen, which has been found to be a drinking water pollutant.

HSE has now reviewed the approval of mancozeb under Article 21 of retained Regulation (EC) 1107/2009, a process by which HSE may initiate a review of any aspect of the approval of a pesticide active substance at any point in light of new scientific information which indicates that it may no longer satisfy the criteria for approval.

This review considered the evidence for continuing approval of mancozeb, including supporting data submitted by fungicide manufacturers UPL Europe Ltd and Indofil Industries (Netherlands) BV (being the EU Mancozeb Task Force).

Approval of mancozeb was due to expire in England, Scotland and Wales on January 31st, but this will be extended. It is likely there will be an interim period of three months but this has yet to be confirmed. Similarly, withdrawal periods for approved products containing mancozeb are yet to be confirmed by HSE.

UPL Europe Ltd and Indofil Industries (Netherlands) BV have stated that they will advise their customers as soon as more information is available and help them transition to new modes of action.

"UPL Europe Ltd and Indofil Industries Netherlands BV fully appreciate the importance of mancozeb for the control of potato blight, in particular its multi-site activity for resistance management. We will therefore work closely with global and UK stakeholders and the UK authorities to evaluate what options are available to maintain the availability of mancozeb products in the UK," a combined company statement announced.



Awards runner-up renews potato education in 2024

KIDS Country, the 'Highly Commended' nominee for the British Potato Industry Awards' marketing category, is again looking for primary schools to get involved in its campaign which seeks to improve knowledge and understanding of the potato industry and food production generally.

With the start of the spring term across the East of England, Kids Country, the education programme run by the East of England Agricultural Society, are reminding primary schools across the region of the opportunity to get booked in to one of its themed workshops which are now all run exclusively on-site in schools.

Kids Country's Education Manager, Sandra Lauridsen, said: "Our Kids Country events bring hands-on learning experiences that help Key Stage 1 and 2 children (age 5-11) to understand things like where food comes from, the value of eating nutritional in-season produce



grown here in the UK, food miles, and keeping safe in the countryside.

"We are focused on bringing memorable experiences to schools in our community, which helps children to make more meaningful relationships with food and the countryside that surrounds us all. In the East of England we are lucky to never be very far from both nature and productive farmland,

and helping children to understand both is so important."

As well as the confirmed programme, Kids Country can also create bespoke workshops for schools.

Volunteer growers take time out of their busy day to bring tractors into playgrounds, give talks and arrange visits, and Sandra praised those who have pledged their support.

For more details contact slauridsen@eastofengland.org.uk.

SFI payment increase



Environment Secretary Steve Barclay.

PAYMENTS will be increased on average by 10% across the UK's Sustainable Farming Incentive (SFI).

Environment Secretary Steve Barclay announced updates for the government's Sustainable Farming Incentives, including the 10% funding uplift and a streamlined application process during a speech at the recent Oxford Farming Conference. He said the updated offer for 2024 has been designed using farmers' feedback.

British potato growers will be able to submit their applications for the 2024 offer from this summer.

New course to help British growers

BASIS, an independent British charity committed to raising professional standards across land management and food production, has launched an integrated pest management (IPM) course for growers

following the Upgrade of the Sustainable Farming Incentive (SFI).

The recent updates to the SFI for 2024 were disclosed at the recent Oxford Farming Conference and include an average of 10% increase in payments for farmers, the introduction of approximately 50 new actions, updates to 50 existing actions, and the implementation of 21 "premium payments" reserved for actions with the most significant environmental impact such as IPM1.

In tandem with the announcement, an online course entitled Creating an IPM Plan - A Practical Guide is being launched at the agricultural show, Lamma 2024, for agricultural professionals and those involved in sustainable farming practices. It is designed to align with the SFI Action IPM1 criteria, offering participants an opportunity to enhance their Integrated Pest Management (IPM) planning skills.

The curriculum will explore IPM planning tools, address risk assessment and develop customised plans tailored to meet the evolving demands of sustainable farming practices. Participants will gain insights into integrated control measures for pests, weeds, and diseases and there will be step-by-step guidance on crafting personalised IPM plans, supported by templates, interactive activities, and real-world case studies for immediate on-farm application.

The course is self-led and is expected to take approximately an hour to complete, although the actual duration may vary based on user engagement. In addition to this practical guide, further support is in development with three additional practical guides focusing on Pest and Beneficials, Weeds, and Diseases, all hyperlinked to relevant pages.



Integrated pest management (IPM) guidance will help growers following the Upgrade of the Sustainable Farming Incentive (SFI). Photo: Syngenta

Funding opportunity in East Anglia



THOSE looking to progress careers within the potato industry in East Anglia are being offered the chance to apply for a grant of up to £2,000, following the launch of the East of England Agricultural Society Scholars Programme.

The programme has three funding windows, the first of which closed on February 20th. Further windows will close in June and October, but applications are being welcomed all year round.

The East of England Agricultural Society launched the fund in September 2023, offering successful applicants the opportunity to develop their careers, whilst also building a network around the programme to help create future leaders in the industry.

Funding recipients will receive mentorship from committee members and past scholars, be invited to deliver talks, and have the opportunity to feed into the wider Society network.

Agricultural Events Manager Ruth Trollove said: "We are interested in viewing applications from anyone in the agricultural and horticultural sectors who thinks they could benefit from the programme. There are no limitations on age or background. This is a great opportunity to further your career whilst giving back to the community and to add to the network by encouraging future applicants."

Applicants can email scholars@eastofengland.org.uk or visit www.eastofengland.org.uk/scholars/ to receive more information.

Mixed responses to border procedures



Nigel Jenney



Richard Walker



Tom Bradshaw

BEGINNING in April, the UK's new border operating procedures will significantly alter the landscape for importing potatoes. Under these revised regulations, physical inspections at borders will become a standard practice.

The introduction of the Common User Charge (CUC) will play a pivotal role in this new framework and, come October, potatoes and other vegetables that are currently categorised as low risk, may be moved to the category of medium to high risk. Currently around 35% of fruit and vegetable products are imported to the UK from the EU.

The move has been met with varied responses from the British supply chain.

The Fresh Produce Consortium (FPC) estimates that the move will add around £200 million of extra costs, which equates to a £3m pounds value of fruit and veg. While the government claims that the cost passed on to consumers will be negligible, many fear the checks and delays will cost the industry dearly.

Chief Executive of the FPC, Nigel Jenney, described the cost as "a tax by the UK government to manage this process", and said the industry cannot absorb these costs.

He said: "The cost implication is basically a combination of different fees that the industry will have to pay to the UK government to manage the import process and subsequent inspections.

"There's a much more effective way of actually managing the controls, which are absolutely appropriate, and that allow controls at the point of destination. These have already been approved by the UK government."

But Deputy President of the National Farmers Union (NFU) Tom Bradshaw, believes the bio-checks are necessary. He said: "British farmers and growers are very proud of the standards we produce to and maintaining our biosecurity at the borders is absolutely essential. We need to stop the risk of any plant and animal diseases coming in."

At the retailer end of the spectrum, Iceland Chief, Richard Walker said: "The can has been kicked down the road for a very long time... but the reality is if you ask me exactly what's going to happen and how it's going to go, I don't know. We'll have to suck it and see. We'll see what the consequences are but you know it is more friction and it feels that it has been bungled by the government".

He said it's important that Britain gets back its sense of national pride and industry growth.

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'Public need to be aware that NGTs are safe'

RAISING awareness amongst industry and the general public about the safety and distinct nature of New Genomic Techniques (NGTs) compared to Genetically Modified Organisms (GMOs) is a key challenge to the potato industry, according to Vice-chair of the Europatat Technical and Regulatory Commission, Stijn De Pourcq.

Speaking following a vote by the European Parliament in favour of a proposed regulation on New Genomic Techniques (NGTs), he said: "Combating misinformation and clarifying the regulatory landscape will be crucial as we move towards a future with NGTs."

The European Potato Trade Association, Europatat, has welcomed the vote by the European Parliament, stating that the decision is an important step towards deregulating techniques that can be used to develop plants with enhanced yields, improved disease resistance, better food quality and greater resilience to climate change.

The Parliament's support for the Commission's proposal, which establishes two distinct categories for NGT plants with tailored regulatory frameworks, is particularly welcomed. This approach promises smoother authorisation for Category 1 NGTs considered equivalent to conventional breeding and stricter oversight for Category 2 NGTs similar to current GMO rules.

Chair of the Europatat Technical and Regulatory Commission, Florimond Desprez, said: "We should embrace innovation when it allows for a more efficient food production. These techniques will not solve all the challenges related to climate change and societal expectations our agriculture faces but they can certainly contribute

to accelerating its transition to a more sustainable model.

"Nevertheless, we must be aware that those techniques will have a positive impact only if their use is not restricted by patents on traits. The development of NGTs should not weaken the breeders' exemption."

Congress theme: 2030 trade and transition

THE next Europatat Congress will take place in Brussels on May 23rd and 24th. The annual Europatat event has become a key platform to assess the state of play of the potato sector.

Europatat organises its annual congress every other year in Brussels, the heart of the European Union. Under the theme 'European Potato Trade in 2030: A sector in transition', this year's event will focus on the main environmental, economic and social challenges for the potato sector and traders for the coming years, as well as solutions and opportunities that new tools and techniques can deliver.

Europatat members will review the different activities of the association during the meetings of its five commissions (consumption potatoes, seed potatoes, sustainability, technical and regulatory issues, and RUCIP). The Europatat General Assembly will take place, followed by a conference which will be open to the public.

On the eve of the European elections, the Europatat Congress will offer participants the possibility to discuss with European legislators and politicians, and other sectorial colleagues, how the sector should transition to the new decade.



White paper highlights benefits of 10% organic growing area

A NEW white paper published by Organic Farmers & Growers (OF&G) reveals how potato growers making the shift to greater organic land use will impact on the Government's environmental objectives.

'Growing organic – a multifunctional component of English land use policy' provides projections based on 'what if' scenarios for land use and crop types. One table indicates a total area of organic horticulture (including potatoes) of 38,114ha, demonstrating that if there was 10% organic land area in England, there would be around 8,000ha of organic potatoes.

The total horticulture crop output from this 10% English organic land area would be 666,316 tonnes and a conservative estimate of organic potato yields at 60% of conventional is highlighted.

The overall reduction in pesticide active ingredients from 10% English organic land would be 295,061 kg a.i. and the following savings in pesticides from organic potatoes are estimated:

- 70% reduction in fungicides, including copper
- 50% reduction in sulphur
- 100% reduction in herbicides
- 90% reduction in insecticides

OF&G's chief executive Roger Kerr said: "It's the same as removing 8,840 full lorry loads of fertiliser every year. If you parked the lorries bumper to bumper, they'd stretch from central London to Rugby."

By removing artificial inputs, the OF&G white paper also highlights biodiversity improvements. In organic systems, arable plant species were found to be up to 95% higher, field margin plant species up to 21% higher, farmland bird species increased by 35%, pollinators are up by 23% and earthworm species increased by 78%.

"Organic farming at its heart seeks to work with and enhance natural processes and ecosystems. Our report evidences organic farming's contribution to delivering necessary climate and biodiversity restoration goals while still producing nutritious food," says Mr Kerr.

OF&G believes the white paper demonstrates how supporting organic, as part of an integrated land use framework, is a crucial step towards a viable, productive, low carbon economy.



OF&G CE Roger Kerr.

"Continuing to feed people in the face of climate and biodiversity collapse is a complex problem and complex problems require versatile and multifaceted solutions like organic," he adds.

"Underwritten by clearly defined and auditable legal standards, organic is proven to provide significant improvements in public goods delivery and natural capital gains. We recognise there's no single 'right' way to produce food. To answer the critical challenges we face effectively, we must combine different approaches to ensure we reflect the land's topology, and climate, alongside the management experience of farmers.

"This is why we're calling for greater Government support for organic farming as it provides one simple, obvious and easily quantifiable route to take in addressing the multiple environmental challenges we currently face.

"Organic farming is a standard and practice that already operates within planetary boundaries. It's not a dream. There's clear scientific evidence gathered over many years of its positive impacts and so it represents a clear direction of travel towards a low carbon, and nature and people positive food production system," Jim said.

The 'Growing organic – a multifunctional component of English land use policy' white paper is available at www.ofgorganic.org/news/land-use-policy-increasing-organic-farming-and-growing.

Hospitality administrations

THE hospitality industry accounted for 12% of administrations in 2023 – the third highest sector in the UK – according to analysis by full-service law firm Shakespeare Martineau. Out of the 1,641 businesses who filed for administration last year, 190 were from the hospitality industry. The overall administrations total was a 22% increase compared to 2022 and 91% rise in comparison to 2021.

MAP-ping the future

AS wastage of fresh vegetables remains a global concern, modified atmosphere packaging solutions will be a game changer for the global fresh food market, which is projected to expand at a value compound annual growth rate (CAGR) of 6%–8% over 2022–27*, according to data and analytics company GlobalData.

Holding back the floods

GROWERS and machinery manufacturers have a part to play in controlling flooding in the future, it has been claimed.

Professor Jane Rickson, Professor of Soil Erosion and Conservation and an honorary Fellow of the Institution of Agricultural Engineers (IAGrE), says soil damage from harvesting and field operations when fields are too wet increases surface water runoff and risks of flooding.

She said more focus needs to be put on agricultural engineering to design, build and test better land management systems that control flooding at its source. This includes low-impact machinery, cover cropping, reduced tillage and controlled-traffic operations.

Field event

GERMAN Agricultural Society, DLG, is holding a 'Potato Days' open-air event in the UK in September at Nocton Farm in Lincolnshire on September 4th and 5th.

Children join half term slug hunt

FAMILIES were being recruited as ‘slug scouts’ during half term as scientists work to fight back against the field pest.

Children were provided with free kits to trap and collect slugs from dark, moist spots in their gardens or from farmers’ fields before posting them to researchers at the John Innes Centre (JIC) in Norwich.

The mission will help experts develop novel methods of pest control.

Schools have proved an enormous help in the past, with pupils teaming up to build special ‘slimeries’ where slugs gather and can be easily collected. More slugs are needed to continue the work, which is part of the UK Government-funded SLIMERS (Strategies Leading to Improved Management and Enhanced Resilience Against Slugs) project.

“We received a terrific response when we put out calls for help last year,” says Tom Allen-Stevens, the founder of the British On-Farm Innovation Network (BOFIN), which provides the kits.

“Our researchers now need more slugs and we’re looking for special skills from those who volunteer to help this worthy cause. What we need are grey field slugs (*Deroceras reticulatum*) – the ones that really give farmers a headache. So we’re calling on those who can identify the right ones to send them in.”

Those who sign up to become a slug scout receive a free pack containing, instructions, an identification guide, plastic containers, tweezers and postage-paid envelopes as well as a badge and pen.

Dr Jenna Ross OBE from Crop Health and Protection (CHAP)

said grey slugs, without adequate control, can cost potato growers dearly and alternative control measures are needed that are effective, sustainable, environmentally and societally acceptable, and economically viable.

“Researchers at CHAP and JIC are conducting vital research that will help us achieve this, but in order to succeed we need as many slugs as possible.”

For further information visit www.slimers.co.uk.



Families are being asked to collect the grey field slug pictured.











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Agricultural economist Professor Steven Thomson.



Professor Gerry Saddler, Chief Plant Health Officer for Scotland

‘Phenomenal success so far’

SACAPP conference delegates hear how PCN project is making great inroads, while there is a need to keep educating retail buyers on variety choice.

A NUMBER of measures that could be key to addressing the problem of Potato Cyst Nematode (PCN) in the future were outlined at the recent SAC Association of Potato Producers (SACAPP) conference in Dundee, which was attended by more than 150 of the UK’s leading potato producers and industry representatives.

Future production continues to be blighted by the pest and fears that it could bring an end to the country’s seed sector within the next 30 years is very real. Scottish seed accounts for 80% of the potatoes grown in GB.

Dr James Price from the James Hutton Institute, was one of the key speakers at the conference.

James has been leading a five-year project targeted at understanding PCN and bringing in a joint approach which could help tackle the problem. The project, which was initially backed by £2.3 million of Scottish Government funding, has been running for more than two years and has seen “phenomenal progress”, he told those gathered at the conference.

The measures taken have included assessing the economic value of the potato sector and the impact of PCN to determine the effectiveness of different PCN control options and to create an effective decision support system, he said.

“The development of markers for genetic resistance to PCN along with the introduction of new genes from wild potato varieties into pre-breeding programmes should help ensure the viability of long-term resistance, especially when used in conjunction with new accelerated breeding techniques,” he said.

One challenge is convincing retail buyers to accept newer, resistant, varieties, rather than the current, non-resistant, varieties that they favour, James said, adding that some new varieties, both resistant and tolerant, are starting to find favour.

Understanding the difference between resistance and tolerance is also something there needs to be more awareness of, he said.

“While resistant varieties can be fantastic at reducing the problem, this can sometimes be at the cost of yield,” said James.

Addressing groundkeepers and volunteer potatoes was another important issue, with non resistant varieties resulting in further multiplication of PCN numbers while resistant groundkeepers could see that resistance challenged.

The other speakers at the conference, which was chaired by SAC Consulting’s Senior Potato Consultant Dr Kyran Maloney, were Professor Ian Toth from the James Hutton Institute, Nuffield Scholar Tom Murray from O’Shea

Farms, and Dr Nigel Crump, General Manager of AuSPICA in Australia.

Agricultural economist, Professor Steven Thomson, also previewed a new piece of computer modelling which will allow growers to input their own production figures and assess the effects of different scenarios on costs and profitability levels.

Professor Gerry Saddler, Chief Plant Health Officer for Scotland and former Head of SASA, delivered his vision for the Scottish potato industry as a closing presentation.

He said: “The potato industry in Scotland has established a worldwide reputation for quality. Maintaining and growing this reputation is a continuing challenge, not least as pressures from pests and diseases wax and wane.

“A changing climate and disruption to long-established trading relationships adds further uncertainty. It is only by learning the lessons from the past, working together and nurturing innovation that we will be able to meet the challenges of the future.” **PR**

“While resistant varieties can be fantastic at reducing the problem, this can sometimes be at the cost of yield.”

Dr James Price, Project Leader, the James Hutton Institute

With potato planting just around the corner, many growers will be thinking about fungicide treatments to protect against seed- and soil-borne diseases like *Rhizoctonia solani*, silver scurf and black dot.
Photo: Agriphot



Use all options in fight against seed-borne disease

Protecting against early season diseases like *Rhizoctonia solani* is key to a strong start in potato crops. Here, we look at the options and why resistance management should be given more consideration in sustainable control.

RESISTANCE management isn't the first issue that springs to mind when thinking about pre-planting seed tuber fungicides targeted at seed- or soil-borne diseases.

SAC Consulting's Kyran Maloney believes growers should consider alternating the treatment options to avoid potential insensitivity problems developing.

With potato planting just around the corner, many growers will be thinking about fungicide treatments to protect against seed- and soil-borne diseases like *Rhizoctonia solani*, silver scurf and black dot.

The first opportunity for treatment is using a liquid fungicide applied to seed at source, or on farm soon after delivery where there is access to the right equipment, ideally a roller table.

Later at planting, growers can use one remaining powder seed treatment for seed-borne disease and two in-furrow liquid fungicides for soil-borne inoculum.

In other parts of the world, there is known insensitivity to dry rot-causing *Fusarium* species and silver scurf, and variable sensitivity to fungicides across anastomosis groups of *Rhizoctonia* has been observed.

Kyran Maloney says that because the market for potato seed treatments is relatively small, there is little time and money invested



SAC Consulting's Kyran Maloney believes there should be better monitoring of fungicide sensitivity in seed- and soil-borne potato pathogen populations in the UK.

in public monitoring pathogen populations here in the UK.

"It is a worry that no one is looking, or if they are, then the results are not easily accessible. The good news is that growers aren't talking about control failures or poor efficacy, which indicates the chemistry is holding up well, but we do need to update our understanding of these pathogens.

"Which ones are posing the biggest problems, and do they have any developing fungicide sensitivity shifts? It would be helpful to know.

"The selection pressure isn't as great as in other pathogens, like late blight where there

is a rapid lifecycle and much greater exposure to fungicides within the growing season, but it doesn't mean the risk isn't there," Kyran said.

Good stewardship

Until the industry gets that clarity and reassurance, he believes that good stewardship of all the tools available will help reduce this risk and ensure growers maintain control for the foreseeable future.

The first consideration is a storage treatment like Gavel (imazalil) and/or Storie Excel (thiabendazole) in seed potato stocks at high risk of dry rot, silver scurf, skin spot and gangrene as soon as possible post-harvest.

While the ship has sailed for early treatments going into store or at first grade, an application of Gavel is still permitted any time post-harvest and up to chitting if it hasn't already been applied.

Gavel applied to seed as it is brought out of long-term storage can reduce the development of silver scurf and skin spot on daughter tubers, as well as guarding against any further spread of dry rot and gangrene.

It also puts a different mode of action into the mix against these pathogens ahead of pre-planting treatments, according to Certis Belchim Potato Portfolio Manager Caroline Williams.



Caroline Williams says if seed is being treated with a fungicide, application through correctly set up and regularly calibrated equipment is vital to maximise product efficacy.

“We know that you get the best efficacy against dry rot when Gavel is applied soon after harvest, but there is still value in applying when stocks are taken out of store and graded, particularly for the blemish diseases. It’s cost effective and represents a very small percentage of overall seed costs,” she said.

Pre-planting treatments

When it comes to pre-planting seed treatments, which are largely targeted at *Rhizoctonia solani*, there are also some considerations that will help with product stewardship, according to Kyran.

He stresses the importance of risk assessment for diseases and urges the industry to make better use of testing to inform seed treatment decisions.

NIAB and SAC offer eye plug tuber tests to detect latent infection in seed, which isn’t always visible to the naked eye.

Combined with interpretation of a variety’s disease resistance scores, these could cut the need for a pre-planting treatment altogether.

“They should only be used where necessary, but if there is a concern about *Rhizoctonia* you will more often than not find you need a treatment. It can be a dangerous disease in terms of yield and quality loss, but I would like to see much more risk assessment by growers – not every stock needs a seed treatment,” said Kyran.

Finding any evidence of black scurf on a tuber justifies treatment and this is best done just prior to planting but before sprout development.

It’s also important to remember that *Rhizoctonia* hyphae can be present on tubers even in the absence of black scurf, so caution is needed.

Options for seed treatment at this time are liquid fungicides RhiNo (flutolanil), Maxim 100FS (fludioxanil) and new this year, Honesty (fluxapyroxad).

SAC Consulting has been running seed treatment trials with established and near market products for many years on behalf of its SACAPP members, producing data across differing seasons, particularly on the control of black scurf caused by *Rhizoctonia*.

Kyran says product ranking on black scurf control can vary in trials, depending on the season and pressure in the seed stock or soil.

An example of this was in SAC’s 2023 trials, where all products gave a significant reduction in black scurf on daughter tubers over the untreated, with RhiNo providing the best control (see figure 1).

“However, in other years Maxim and Honesty edge it. In my view, they are all good products that have a place in *Rhizoctonia* programmes, particularly with resistance management in mind,” said Kyran.

Skin finish

Over five years of trials, skin finish assessments after the three treatments are also comparable, all providing a significant improvement over untreated.

For stem canker, which can be sporadic and difficult to gather data on, Honesty has a slight edge over the other two, with RhiNo and Maxim 100FS level just behind. The trials look at other diseases and Honesty and Maxim 100FS have the edge over RhiNo for silver scurf, although all offer some reduction.

Honesty and Maxim 100FS have black dot on the label, but SAC has never been able to show a significant response to these treatments against the blemish disease, which can significantly impact marketability in the pre-pack market.

“We don’t think any of the treatments are effective against black dot in Scottish conditions and against the local pathogen population, but that doesn’t mean you won’t see an effect elsewhere. It may be that the inoculum from the soil is playing a part in our trials results.”

The trials have also looked for any efficacy against common scab, with Maxim 100FS working well in some seasons, but not others. This leads Kyran to conclude that more emphasis on correct irrigation scheduling is better than relying on a seed treatment for its management.

“Overall, I think all the liquid seed treatments are good products and have a place, depending on the situation growers are faced with.”

Caroline said that, in addition to the liquid treatments, flutolanil powder formulation RhiNo DSG offers flexibility for growers receiving seed on a just-in-time basis to treat on the planter.

“There has been a move to liquid treatments by some growers to ease pressure on the planter operator, but the powder remains popular,” she said. “It could be particularly useful this spring, as seed supplies are uncertain and there might be some last-minute deliveries that require a *Rhizoctonia* treatment at planting.”

Treatment decisions

So how do you decide which one to opt for? The key thing is not to use the same product all the way through the seed multiplication chain.

As Maxim 100FS is not approved for use on seed for seed multiplication, it lends itself to use on seed destined for ware producing farms.

While RhiNo and Honesty are both SDHI fungicides, they work in slightly different ways, so alternation would be wise in early field generations of seed and consideration should be paid to which in-furrow product is applied from the planter.

Using Allstar (fluxapyroxad) soil treatment in sequence with Honesty treated seed gives a double dose of fluxapyroxad.

For resistance management, it would be better to either sequence strobilurin fungicide azoxystrobin as a soil treatment with Honesty treated seed or Allstar soil treatment with RhiNo treated seed, says Kyran.

“I think it would be a big mistake if we use the same products or combination of products year after year and it is something the industry should consider moving forward.

“I think tuber diseases should be lower risk than other pathogens, but I would be a lot more confident if we had a good monitoring programme.”

Caroline agrees that resistance management principles are important and adds that whichever fungicide is being used, application through correctly set up and regularly calibrated equipment is vital to maximising product efficacy. **PR**



Where there is a concern about *Rhizoctonia* infection, a fungicide seed treatment is advised. Photo: Blackthorn Arable



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Andrew likes to see a strong canopy that closes quickly.

“As the crop needs a balanced supply of nutrients, it is not just about having the nutrients in the soil. The many interactions between these nutrients needs careful analysis as these can interfere with the uptake of other nutrients.”

Get to the root of the issue

Andrew Goodinson, Agronomist and Potato Specialist at Hutchinsons, gives some early season tips to getting the most from potato crops.

CREATING the best conditions for getting the crop established and the canopy to start photosynthesising as soon as possible is the most important aim when it comes to planting, says Andrew.

Ideally, he likes to see a strong canopy that closes quickly but says yield is not only driven by the canopy's ability to intercept light for photosynthesis. The root structure and architecture play a crucial role in facilitating water and nutrition uptake.

“It is important to look at the whole picture so you can develop a well-balanced, tailored diet for the particular crop in a particular field,

Based in Herefordshire, Agronomist and Potato Specialist Andrew Goodinson has been working for Hutchinsons for 17 years and looks after nearly 8000 ha of farmland, including the Welsh borders, south Shropshire and Worcester. Most of the potato crops he looks after are destined for the crisping or processing markets. This month he looks at ways to help this year's crop get the best start possible.



providing the right nutrients and conditions for optimum development,” he said.

Ensuring planting takes place in the best possible good soil conditions is also crucial, to help avoid smearing soils as they have decreased infiltration capacity, making it more difficult for the water to reach the root zone.

“Last season we saw a huge effect with the soils being so wet, and these conditions may well be repeated this year,” said Andrew.

Any imbalance caused by excess of a nutrient can be detrimental, he warns. For example, if a crop has too much nitrogen, it not only leads to soft growth that is more susceptible to pests

and diseases such as late blight, it also creates more green mass to defoliate.

As with all crops, root development and structure is crucial, and Andrew points out that, unlike combinable crops, the potato is not good at producing roots. For example, in perfect conditions, a potato plant can grow a root measuring 1m, but roots 60cm are more typically seen.

“If we look at this another way, in a potato field there are 3.8km/m² of roots in the topsoil, which sounds a lot until you realise that cereals produce 24km/m² and oilseed rape 19km/ha.” →

PLANTING

He recommends using a starter fertiliser in addition to applied organic manures at the time of planting, adding that base fertiliser can help the crop establish and provide a yield boost of between 5% and 15%.

Products such as Primary P, which contains 10% N, 40% P 2% Mg and 2% zinc, can be applied in a granular or liquid form, and cost between £50-£70/ha.

As for most crops, the main nutrients are nitrogen (N), potash (K) and phosphate (P), but micronutrients such as zinc (Zn) and calcium (Ca) are often underestimated, as are the interactions between the different elements.

“All nutrients, whether major or secondary, play an important role in growing good quality crops that yield well and, as found by German chemist Justus von Liebig, one of the founders of agricultural chemistry, there is a Law of Minimum which states that deficiency in just one of these can impact on yield and quality,” said Andrew. “For example, zinc is often considered as a secondary nutrient, but it plays an important role in the plant’s uptake of phosphate, N metabolism, auxin formation, cell division, and elongation.

“This is critical because elongation plays a role in tuber growth, but also because it has an effect on skin quality and helps the development of skin elasticity.”

However, it should not be applied at tuber initiation (TI) as it can affect tuber numbers and growth, he said.

Zinc deficiency can occur with high phosphate levels and although symptoms can include interveinal chlorosis and small leaves in the canopy, symptoms not necessarily visible in the field.



Nutrition starts with the soil, so the place to start is to invest in a good analysis to assess soil health.

“If your soil is very high in magnesium, there can be imbalances in potash uptake. To ameliorate this risk, it is often a good idea to apply foliar Mg during the season.”

Soils high in calcium can also result in phosphate being locked up. This can happen in the southwest. The phosphate is locked up because of high pH (a measure of hydrogen ions, the higher the hydrogen ions, the lower the pH). As a result, the higher the ratio of calcium to phosphate, the more locked up the phosphate is.

Potatoes do not need much N for the first four to five weeks after planting, with 60-70% being taken at tuber initiation (TI) and bulking.

While there is no benefit to applying more N either by foliar or top-dressed after bulking in periods of stress, high temperatures or drought, an application of seaweed can help reduce stress symptoms right up to the final stages of the crop’s development. Some bio-stimulants applied just prior to a stress event can also help maintain the rate of growth.

The critical time for P uptake is around 50 days after planting, which is around TI, and also the second half of bulking.

“While phosphate makes roots, potash makes shoots,” he says, noting that the plant needs K at the same time as N. “On its own, K affects dry matter and bruising susceptibility, while when it is together with N, it contributes to haulm longevity and therefore impact on yield.”

Nutrition starts with the soil, so the place to start is to invest in a good analysis to assess soil health and what nutrients will be available at the right time, he emphasises.

“As the crop needs a balanced supply of nutrients, it is not just about having the nutrients in the soil, the many interactions between these nutrients needs careful analysis as these can interfere with the uptake of other nutrients.”

P not only helps increase ground cover, which impacts on tuber numbers and marketable yield, but also when crops grow quickly, they tend to have fewer symptoms of stem canker and FLN damage.

Knowing the availability of P in the soil remains crucial, and there are alternative ways of measuring than Olsen P, as it only measures available P and does not give the full picture of any legacy in the soil.

“Potatoes only remove a small amount of phosphate, leaving it behind in the soil,” he said, adding that P is negatively charged and sticks to positively-charged soil particles and organic matter, making it less prone to leaching than positively-charged nutrients.

“For example, if P is Index 3, it only needs 50kg of fresh P to grow. What is important is that potatoes need access to the nutrient to be within 1mm of the roots, because phosphate is so immobile in the soil.”

“Zinc is often considered as a secondary nutrient, but it plays an important role in the plant’s uptake of phosphate, N metabolism, auxin formation, cell division, and elongation.”

However if granular fertiliser is placed too close to the seed tuber, it can cause scorching of the developing roots owing to chloride in muriate of potash (MOP).

“If you are replacing your planter, it is worthwhile having a liquid/solid fertiliser applicator fitted on the new one.”

Calcium (Ca) is another crucial nutrient for potatoes, says Andrew, noting that it reduces incidence of rust spot and other disorders. “However, this needs to be applied to the soil as it is only taken up by the roots, and trying

Knowing the availability of P in the soil remains crucial according to Andrew Goodinson.



to remedy a shortfall by the application of foliar Ca will only lead to inconsistent results at reducing deficiency symptoms. If your soils are low in Ca, an application of gypsum is useful because it contains Calcium and sulphur but does not increase pH levels.”

Some soils, including many of those in Herefordshire, have a high magnesium to calcium ratio, which affects the workability and friability and Andrew finds that gypsum helps redress the balance.

“Sulphur affects chlorophyll production, and

deficiency results in upward leaf curving and light green or yellowish leaves, which affects photosynthetic efficiency.”

Another benefit of gypsum is that it also contains sulphur, which is sometimes considered as ‘oil for the soil’, observes Andrew, adding that the combination of sulphur and calcium is beneficial for the soils, as together they help prevent ridges from slumping, capping and then cracking open.

Remedying the amount of Ca available in the ground can be done with chicken manure

but as it is also very high in N and P, and this can upset the nutrient balance, said Andrew.

Foliar-applied nutrients have won an important place in nutrition strategies, and timing is crucial to get the best possible efficacy, with applications made at the rosette stage, TI and the onset of tuber bulking.

“Prior to potential foliar applications, it is a good idea to do some leaf sap petiole testing so you know the what is going on in the crop and what it needs,” he says, adding that tissue tests are best done in the morning.

Nonetheless, he reflects, it is important to tailor fertiliser according to need, and avoid older practices that may have applied 1000kg/ha of a 14:14:21 blend of N, P, K to cover all bases.

“If you have grown a cover crop before potatoes, there may be some residual P in the roots, but any N captured will be used by the soil microbes, leaving only a little residual N for the following crop.”

Timing of weed control crucial to effective management

Effective weed control in the early stages of crop development is vital for achieving a high yield, says Andrew. Anything that affects early crop growth can threaten quality and yield. Herbicide applications too close to emergence can also damage crops, particularly varieties that are not metribuzin-tolerant.

Crops were affected more than usual last year because of the poor seedbed conditions which resulted in plants struggling to develop roots and were unable to bounce back from damage.

“Ideally you would apply a residual two weeks after planting then return closer to emergence with a contact herbicide (Gozai), or apply a residual and the contacts together prior to emergence.”

Whatever strategy is chosen, it needs to be followed through effectively, said Andrew. “Cleavers and bindweed can smother the canopy, while others, such as oilseed rape volunteers, fat hen, and thistles compete with the crop for nutrients, water and light, affecting yields and also making harvesting more difficult.

“Further problems can be caused by those in the same crop family. For example black nightshade (*Solanum nigrum*), can also host some of the same pests that affect potatoes such as *Rhizoctonia*.”

Herbicide costs have gone up, but ensuring the right fit to the on-farm conditions and soils is still important. “The aim should be not to use post emergence broad leaf herbicides, as there is a risk of affecting foliage and crop growth. →

“Soil type should be an important driver of your herbicide choice too. Herbicides move more quickly through sandy soils, so their persistence is shorter. Choice of herbicide is limited, and Bentazone (which is post-emergence) is effective with cleavers and other broad-leaved weeds is under review because of the risks of it entering water courses. This will limit the already depleted toolbox even further, and there is nothing new in the wings,” said Andrew.

“Managing grass weeds with a contact herbicide is increasingly difficult, and there are occasions when we resort to an application of glyphosate as a pre-em within 10 days of planting. This can still do a reasonable job, but timing is critical because glyphosate is very mobile and can damage shoots below the surface of the ridge.”

He said some mechanical weeding is now being done with potatoes grown in the regenerative agriculture system.

“The seed beds are cultivated and then re-ridged, which is a useful activity because it helps to mineralise nutrients. After planting there is often heavy rainfall and the ridge caps and by re-ridging this avoids the problem at the same time as removing the weeds,” he said.

“Although the activity could encourage other weeds to germinate, as the potato is already planted and getting ahead, these should soon be smothered by the canopy.”

Avoid false economies to minimise rhizoctonia

Skimping on rhizoctonia risk assessments may put the crop at risk, warns Andrew. Also known as black scurf, the fungus causes stem canker, which reduces sprout development and causes stolon pruning, affecting the number of daughter tubers. Cold, wet soils make the crop more vulnerable to infection.

He recommends washing and examining the seed potatoes when they arrive on-farm and treating them with a fungicidal seed dressing if necessary. Home-saved seed can help growers save money on the costs of seed, but seed health remains key and proper testing should still be done.

“There are varietal differences in the number of tubers produced, so if you are growing a variety such as Shepody, which does not produce many tubers, compared to Maris Peer which produces a lot of tubers, seed size and plant spacing become important.”

Where treatment is necessary, the sector is moving away from on-planter powder dressings, and towards liquid applications, which must be applied on a roller table on a grading line and this can be done at the seed source or on arrival at the farm, he says.

Rhizoctonia is not always possible to see and there can be sub-clinical infections, said



Maxi Rooter, an overwinter cover crop, used before potatoes, may leave some residual P, but any N captured will be used by the soil microbes, says Andrew.

“It is not just about having the nutrients in the soil. The many interactions between these nutrients needs careful analysis.”

Andrew. Sometimes the runner hyphae can be invisible as well as typical symptoms of growth cracks, a crazy paving-type skin blemish or symptoms that look like black ash on the tuber surface. As a result, growers need to think of the bigger picture and how that might affect the risk of the pathogen affecting crops.

For example, knowledge of field history is useful when making decisions on whether to apply an in-furrow treatment for soil-borne rhizoctonia, particularly when the previous potato crop had been harvested more than four weeks after defoliation.

“Last year’s cold wet soils in spring saw more of the disease than in other recent seasons, but there were other factors coming in to play, such as physiological age and plant establishment, which made the plants more susceptible to stolon pruning,” said Andrew.

Symptoms on emerging crops can be confused with free living nematode (FLN) damage, and he notes that some agronomists consider that FLN feed on roots infected by rhizoctonia, making an accurate diagnosis more difficult.

“Testing for FLN pre-planting would help clarify the situation, but this cannot be done at the same time as PCN testing. Common-sense practical routines together with appropriate fungicide applications on the seed tubers or in-furrow can help reduce the threat of seed and soil-borne pest rhizoctonia.

“Seed treatments can also delay emergence, although not establishment, as they prevent infections of other pathogens black dot and silver scurf. Using all the information available is key to making informed decisions on what is right in a particular season to help get the most from your crop.” **PR**

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Leading the charge against industry threats



CEO of GB Potatoes, **Scott Walker**, describes why a consolidated approach on actives is needed rather than examining each individually.

WEATHER remains one of numerous challenges confronting potato growers, but while we're unable to control the weather, there are other threats to our industry that demand our proactive attention.

The continual loss of essential active ingredients, crucial for managing diseases, pests, and weeds, poses a persistent problem. The recent announcement of mancozeb withdrawal in the UK following its withdrawal in Europe adds to the mounting list of active ingredients under threat.

We must abandon the notion of examining each active ingredient in isolation. Such an approach is incompatible with the workings of our environment and not the best recipe for building resistance.

In collaboration with others, GB Potatoes is looking at whether a case can be presented to the HSE's Chemicals Regulatory Division CRD for reconsideration of its decision. This entails consolidating inputs from all relevant stakeholders to deliver a unified response. This exemplifies GB Potatoes' core mission: To serve as the industry's voice and the primary liaison with governments and regulatory bodies. If we fail to act, who will?

Potato Cyst Nematode (PCN) presents a significant threat across Great Britain, which will only exacerbate unless action is taken.

While research efforts are underway in England and Scotland, there has been no mechanism for aligning these endeavours to combat PCN comprehensively across all potato production areas.

In partnership with CUPGRA, GB Potatoes has established the GB PCN Forum, uniting all stakeholders involved in combating PCN to leverage the wealth of information, research, and knowledge available nationwide.

The loss of active ingredients and PCN represent just two examples of the major challenges we face. I'm certain that, like me, you could reel of a list of threats that space doesn't permit me to include here. However, these are battles we must engage in.

Adopting the mindset that others will fight these battles for us is not an option. Without an industry body like GB Potatoes, we lack the means to mobilise the industry in a concerted effort against diseases, pests, and regulatory decisions. However, all this requires both time and financial resources.

GB Potatoes will require increased funding to develop and sustain critical projects. But above all, we'll need more members to amplify our collective voice going forward. So if you haven't already joined or are sitting on the fence, it is time to jump off that fence and join us. **PR**



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Dr Michelle Lynn D'Souza says reimagining a more sustainable way to grow potatoes is a pivotal aspect of producing more planet-friendly food.

Can soil DNA help save the planet?

Dr Michelle Lynn D'Souza, Research and Innovation Manager for Global Agriculture Sustainability at McCain, discusses how innovative new technology can help combat climate change.

CLIMATE change is an ever-looming global threat, with the agriculture industry being a significant contributor to rising greenhouse gas emissions.

The intensifying climate crisis, coupled with a complex geopolitical landscape, has caused an array of food, energy, and cost-of-living crises, revealing the fragility of our food systems. As the urgency to address more extreme and irreversible climate effects becomes increasingly apparent, there is also a growing need to make our food systems more sustainable and resilient to these changes.

The Importance of Soil Health

Soils consist of a vibrant diversity of life forms which are key to sustaining our food systems and nurturing the environment. Comprising approximately 60% of the species on our planet, soil is the single most biodiverse habitat.

Importantly, soil acts as a significant carbon sink, with an estimated 85% of terrestrial carbon stored in soil. That is three times more than the

amount stored in the atmosphere and 4.5 times that stored in living plants and animals.

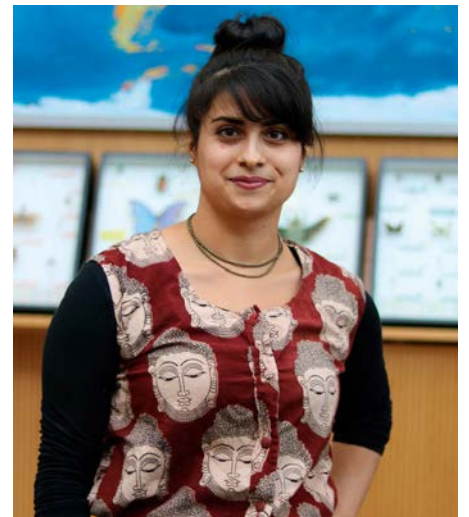
Healthy soils are crucial, not only to decrease the amount of carbon from the atmosphere, but also to produce crops that are more resilient to changing weather conditions and diseases, ensuring the long-term sustainability of farming.

The role of regenerative growing

Conventional agriculture, reliant on pesticides and synthetic fertilisers, often neglects soil biodiversity, harming organisms within the soil. However, regenerative agriculture aims to mimic nature rather than control it.

Adopting a holistic perspective, challenges like diminishing fertility, runoff, and persistent pest infestations signal a disconnect between farmers and the land, and a broader systemic misalignment within the agricultural industry.

Practically, regenerative agriculture encompasses diverse practices focused on revitalising soil, water, and biodiversity. It



embraces the use of cover crops and perennial plants to ensure soil is never left bare, restores natural water cycles, supports surrounding pollinator habitats, and implements animal grazing practices that mirror the behaviour of natural herds.

Understood in this way, regenerative growing is much more than a shift in farming practices. It signifies a paradigm shift, fundamentally altering our relationship with nature, with soil biodiversity and health, and, ultimately, with our foods.

Barcode SOILS and Farms of the Future

Despite the vital role that soil biodiversity plays in sustainable farming, there is a global knowledge gap in this area of agriculture. Traditionally, decisions regarding soil health have been based on the physical and chemical properties of the soil.

McCain Foods is actively addressing this gap through its Farms of the Future, a series of specialist farms that advance regenerative farming practices and explore how the latest agricultural innovations can be implemented at scale.

One project, Barcode SOILS, uses high-throughput DNA sequencing platforms to decode a large amount of DNA, from various soil organisms, all at once, an innovative technology called DNA metabarcoding.

By targeting specific short DNA fragments from different species, known as their barcodes, it uncovers the soil's unique genetic signature. This initiative seeks to deepen our understanding of the effects of regenerative agriculture techniques on soil biodiversity and resilient cropping systems.

DNA uncovers effects of farm practices

The Barcode SOILS project has produced some insightful findings so far. With more than 500 soil samples collected between 2020 and 2022, efforts have detected around 500 million sequences representing a complex diversity of bacteria, fungi, and animals.

When we look a little closer, we observe distinct soil communities across specific management practices. For instance, a higher cropping diversity yesterday (six vs three species over six years) is linked to a more diverse soil ecosystem today. →

Report highlights past year's sustainability achievements

FRENCH fries producer McCain Foods has given a detailed month-by-month look into life on a sustainable farm and highlighted how it is supporting growers in Africa and Canada in its recently-released annual Global Sustainability Report.

The manufacturer has completed its first season at its Farm of the Future Africa and third season at Farm of the Future Canada, improving water-use efficiency in water-stressed regions by 9.4%, delivering more than 23,500 hours of training to farmers and reaching its target of having 21.9% of the potatoes grown for McCain being water stress-tolerant varieties.

McCain currently partners with 3,500 growers around the world and seeks to provide technical and educational assistance, as well as developing financing solutions to offset costs associated with making changes in growing practices and adopting new technologies.

The report details a typical year in the regenerative agriculture cycle at Farm of the Future Canada which parallels learnings with those in the Southern hemisphere at Farm of the Future Africa, trialling, testing, and learning from the outcomes of implementing regenerative agriculture practices.

Last year the company also launched new global policies for clean ingredients and nutrition. In addition, McCain employees have provided more than 17,000 volunteer hours through the 'McCain Chips In' initiative, reaching 2,716 new beneficiaries with development programs and partnerships and donated the equivalent of 11.9 million meals.

The report states that McCain is well on the way to achieving its milestone of

implementing regenerative agriculture practices across 100% of the global acreage that grows potatoes for McCain products by the end of the decade.

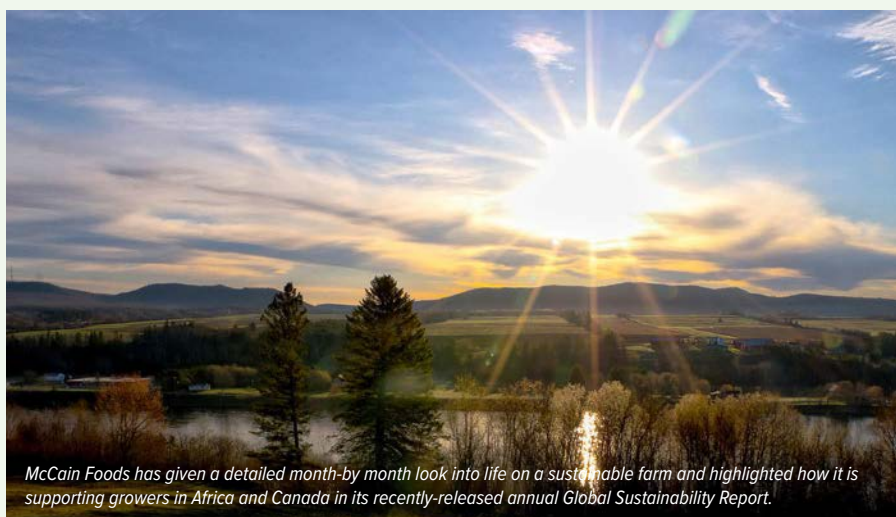
President and CEO of McCain Foods, Max Koeune, said: "While we are proud of how far we have progressed towards our goals, we recognise there is more to be done. But we know this is not something we can do alone. Partnership and knowledge are crucial to move forward. We will continue to look to stakeholders – from our farmers, to government, to financial institutions, NGOs, suppliers, customers and other players in the food system – to collaborate on this journey towards planet-friendly food."

In addition to its direct work with growers, the report highlights how McCain has adapted its own operations to become more resource efficient and the policies it has adopted towards clean ingredients and nutrition.

More than 21% of the electrical energy used by McCain was from renewable sources and absolute carbon emissions reduced by 9.8% from 2017, the report states, while the manufacturer has also achieved a 16.3% improvement in water-use efficiency in priority plants. Additionally, 98.5% of McCain's paper packaging and 87.8% of its plastic packaging are designed for recycling.

It highlights the manufacturer's 100% Global Food Safety Initiative (GFSI) certification at all McCain-owned facilities and 96% GFSI certification of all Tier 1 ingredient supplier facilities. The report also states that sodium was reduced by 6.6% in McCain-branded appetiser products and the company has continued to remove artificial ingredients from key products.

Max Koeune said: "As one of the most vulnerable sectors impacted by climate change, the food system is one of the most important levers to help drive a sustainable and resilient future."



McCain Foods has given a detailed month-by-month look into life on a sustainable farm and highlighted how it is supporting growers in Africa and Canada in its recently-released annual Global Sustainability Report.

FARM OF THE FUTURE

In animals, for example, we observed more species of worms and other key arthropods, such as collembola, insects, and mites—all organisms important in creating organic matter. In the low diversity cropping system, some key groups are missing entirely, such as centipedes.

While far more complex, similar patterns emerge among groups of bacteria and fungi, their role in key functions like carbon sequestration being explored. These findings demonstrate the potential of regenerative agriculture to drastically change soil communities. They enhance our understanding of the practises that foster biodiversity and support soil health.

The industry and soil health

Reimagining a more sustainable way to grow potatoes is a pivotal aspect of producing more planet-friendly food. Early efforts from the Farms of the Future are demonstrating that regenerative agricultural practices that foster biodiversity need not compromise crop yields.

Indeed, they're intertwined. Improved yields, biodiversity, and soil health can be achieved with modest investments, creating a more dynamic system requiring fewer inputs.

Moreover, such a system can sequester more carbon and release fewer harmful chemicals into the environment, helping combat climate change.

The diverse stakeholders actively collaborating on the Farm will bring this

knowledge to bear in the coming year, three years since the farm was launched in 2021 and the minimum time needed for any progress to be robustly supported by on-farm data.

As we continue our journey of regenerative agriculture, innovative technologies like those used in Barcode SOILS are highlighting the potential for transformative change within the sector, leveraging biological insights gained by DNA metabarcoding for informed decision-making in sustainable agriculture.

The efforts in studying and implementing regenerative practices lay the foundations for a holistic approach to address the intertwined issues of climate change, food security, and sustainable agriculture. **PR**





Next-generation green bioinsecticides

A NEW form of green bioinsecticide that will be effective against aphid pests of potatoes is set to be commercialised within the next three to four years, after successful field trials were carried out recently.

Solasta Bio's unique micro-peptide Insect Control Agents (ICAs), based on insect 'neuropeptides', demonstrated efficacy on par or better than commercial standards across 20 field trials on multiple crops in Europe, the UK and US during the 2023 trials season.

As well as demonstrating a high degree of efficacy, the trials also showed that beneficial insects continued to thrive in crops treated with the producer's pollinator-safe products and no adverse effects on crop health were observed.

Founded in 2020, UK-based SOLASTA Bio has developed a technology platform for creating neuropeptide-based ICAs that are nature-inspired. The company is on course to bring its first ICAs to market in 2027/2028. The technology is patent protected with further patent protection currently under submission.

Co-founder and CEO Shireen Davies said: "We're really excited by these findings which bring us one step closer to delivering safe, effective micro-peptide ICAs to market. These outstanding trial results demonstrate our ICAs consistently perform on par or better than commercial standards."



The new green bioinsecticide will be effective against aphid pests of potatoes according to its start-up manufacturer.

Sales data available to spud suppliers

A NEW point-of-sale data service that can help sellers of fresh and frozen potato products make strategic decisions when supplying supermarkets has been relaunched to enable access to images and information that can only be discovered in UK stores.

British Growers Insights is a fresh and frozen produce point of sale data service for organisations within the fresh and frozen produce sector, offering insights on stock keeping units (SKUs), both online and in store, including how products look on shelves, and what customers see.

Users can access up-to-date customer perspectives, on demand.

Lisa Eagles, Managing Director at British Growers Association, the not-for-profit organisation behind British Growers Insights, said: "British Growers Insights offers users access to timely retail data that's updated by our team each week, and all of which has been collected by barcode scanners to reduce the risk of human error. Our team goes into stores, so our clients don't have to."

She added: "The data provides over 25 product features, some of which can only be discovered in store, including pricing, promotions, pack size, variety, retailer, availability, and country of origin."

Lisa said the information can help potato businesses make strategic and tactical decisions.

British Growers Insights is available on a 14-day free trial from sales@bginsights.org or 01507 353796. Visit bginsights.org to learn more.

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Make a good start

Nutrition will be more important than ever this season after challenging conditions. We talk to three suppliers and learn what they've unearthed in most recent trials.

FEEDING crops with targeted and appropriate foliar nutrition early in the season is going to have a huge impact on gross margins this season, particularly as growers throughout the UK have experienced some of the most challenging establishment conditions on record.

Rain has been relentless since early autumn and the impact on crops that were planted and those that have still to be planted cannot have gone unnoticed. In these sub-optimal growing conditions nutritional agronomy is critical according to OMEX's National Agronomy Manager, Scott Baker.

"With spring just around the corner, the importance of getting crops off to the best start is clear," he said. "Rooting is a vital stage in crop development with strong roots creating the basis for healthy plants that are able to withstand the stresses of the growth cycle.

"However, during a season where many crops were not drilled in the autumn, it's critical those planted in spring flourish and deliver a high return on investment. However, wet soils with poor structure can create stressed crops and these will need to



OMEX's National Agronomy Manager, Scott Baker says wet soils with poor structure can create stressed crops.



The Crop Smith's Technical Director Sam Brown said implementing a biostimulants program involves strategic application.



Vita-Rhize Director Nick Read says microorganisms play significant roles in the the growth of potato plants and impact of pests and diseases.

be given nutrition to help them deal with challenging growing conditions."

To achieve strong healthy roots, Scott recommends the application of phosphite formulated with nitrogen and potassium in the form of Kickstart.

"It also aids the uptake and systemic movement of co-applied nutrient cations within the plant, creating an overall healthier crop."

Recent trials conducted at Nottingham University showed an average increase in root mass of 38% when applied at three true leaves compared to the untreated plants.

Randomised replicated plot trials at the end of the growing season showed a 0.5t/ha yield response, proving the value of boosting early establishment in cereals.

"Significant root mass allows a plant to maximise yield potential by foraging for nutrition and water in the soil," he said.

He said routinely monitoring crops is vital to understand how a crop is performing nutritionally so he recommends growers use SAP analysis, to help guide agronomic decisions on foliar nutrition options and to seek advice from a qualified FACTS advisor. →

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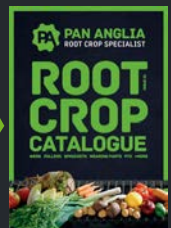
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FERTILISATION

Biostimulant trials

The use of biostimulants to enhance potato growth and yield continues to gain attention, with recent studies showing that a well-designed program can increase tuber number and yield as well as improve the uniformity of tubers.

Made from substances or microorganisms that are applied to the soil or directly to plants with the aim of enhancing nutrient uptake, stress tolerance, and overall plant vigour, biostimulants differ from traditional fertilisers which primarily provide essential nutrients. Instead they work to improve the plant's physiological processes, leading to increased growth and yield.

The Crop Smith, a supplier of seaweed-extract biostimulants, carried out recent trials with a specific focus on improving tuber initiation and formation and subsequent uniformity.

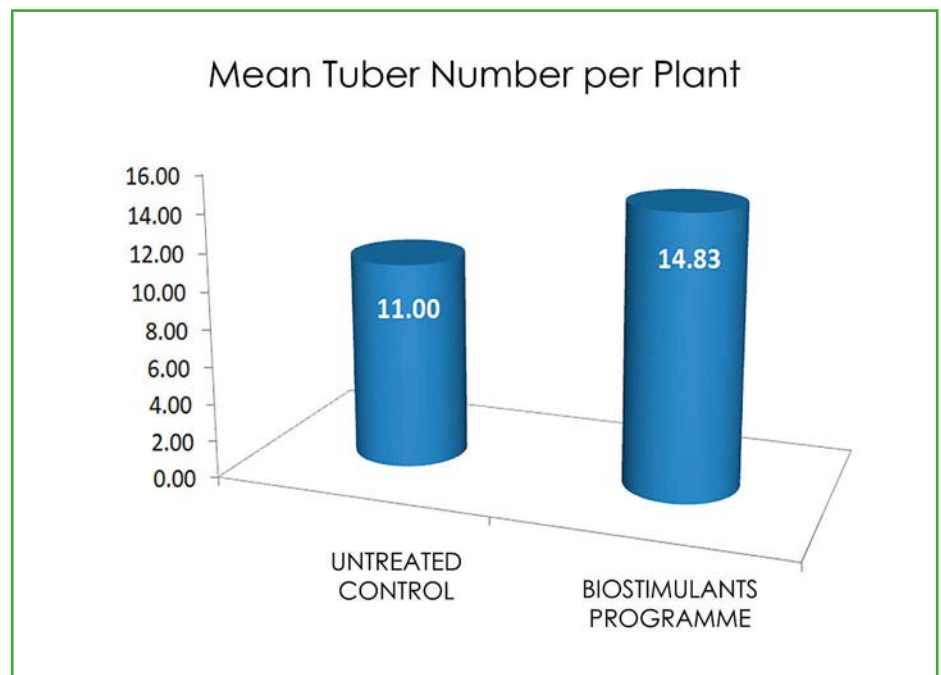
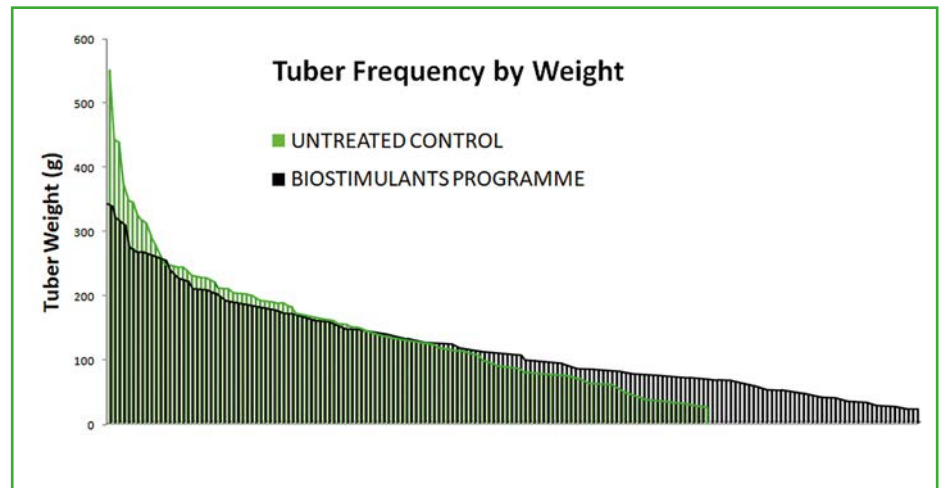
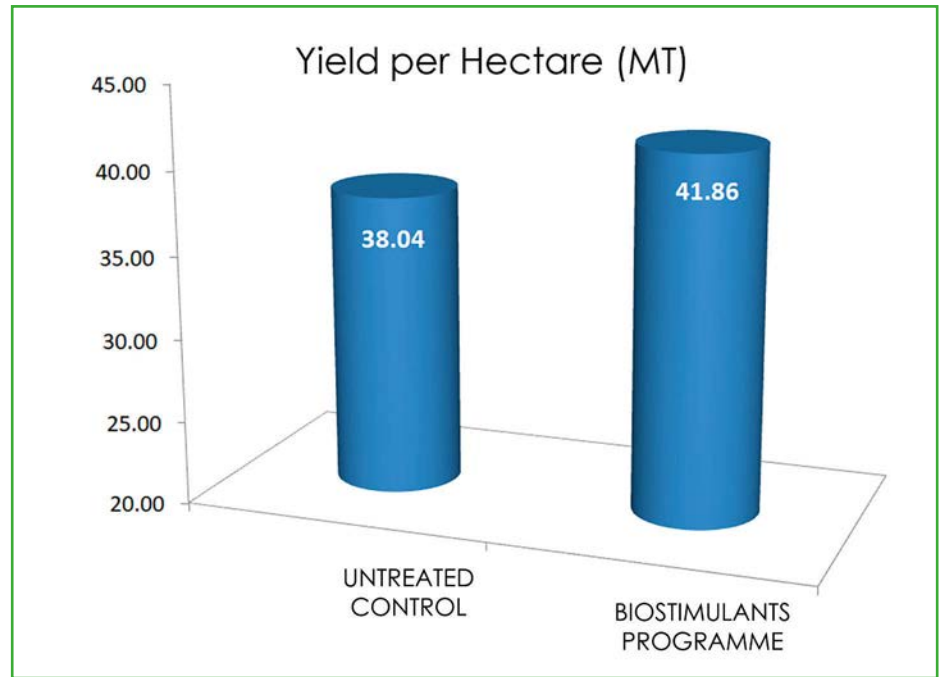
Technical Director Sam Brown said: "Implementing a biostimulants program involves the strategic application of these substances throughout the potato growing season. In our 2023 field studies we implemented a programme of microbial soil treatments combined with foliar sprays of a high-quality seaweed extract, with the objective of creating a synergistic effect that positively influences the potato plants' development."

She said the science behind this approach is well established: The correct soil microbes contribute to improved nutrient uptake and absorption and seaweed extracts stimulate hormonal activity within the plant, promoting the initiation of additional tubers. →




Bacteria and other microorganisms provide a 'natural' approach to fertilisation according to Hexham-based supplier, Vita-Rhize.

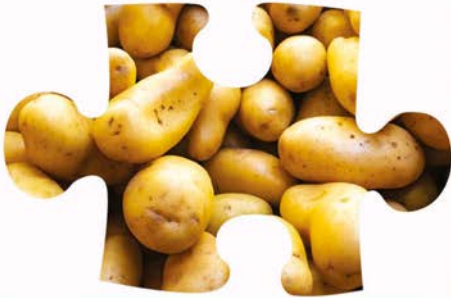
Biostimulant trials results



Results of The Crop Smith's recent trials

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“In addition, seaweed extracts protect the crop from various environmental stresses throughout the growing season. Heat stress and drought can seriously impact tuber development and yield. Improved stress resilience contributes to more robust tuber development, even in challenging growing environments,” she said.

The biostimulants programme supported the development of a greater number of tubers and delivered 3.83 extra tubers per plant. In field, with a population of 24,000 plants per hectare, that represents an additional 92,000 tubers per hectare.

“Potato specialists, especially those involved in seed potato production, prioritise uniformity as a key element in achieving a successful and productive potato cultivation because it promotes consistent planting, emergence, and growth, simplifies crop management, enhances harvest efficiency, improves quality and marketability, facilitates storage, and ultimately contributes to optimized yields,” said Sam.

“During the biostimulants trial in 2023 we observed a higher proportion of mid-range tubers.”

The right balance

Bacteria and other microorganisms provide a ‘natural’ approach to fertilisation according to Hexham-based supplier, Vita-Rhize. Company director Nick Read believes the trials it has conducted over the past two years clearly indicate that a different approach could help to lessen the current cash crisis growers are experiencing and help offset the decline in soil health.

A relative newcomer to the industry, the company was founded in 2022. Nick said microorganisms play significant roles in the productivity of the soil, the growth of potato plants and the impact of pests and diseases.

Vita-Rhize relies on the complex interactions between the complete microbial community and the plant. “It is the balance of the microbial community composition that is important for healthy host-microbe relationships and the resulting impacts on plant health. Both the enrichment and disruption of microbiota abundance serve as important mechanisms of disease incidence in plants,” said Nick.

In UK trials in 2022 and 2023, Vita-Rhize performed best with the complete replacement of industrial NPK applications.

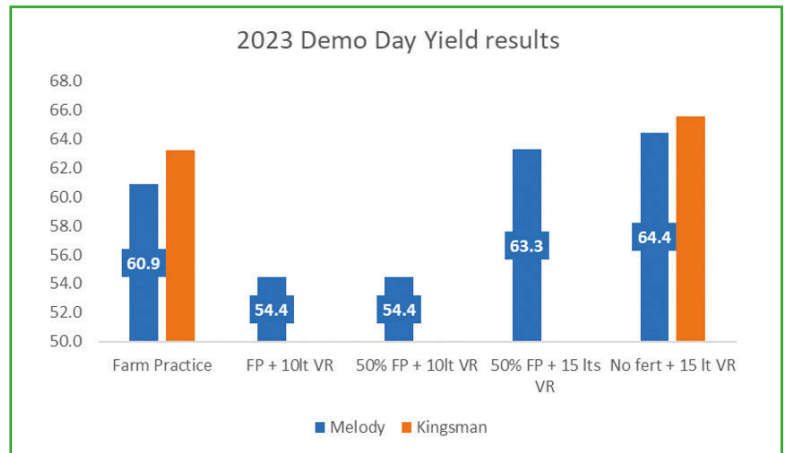
“Improved stress resilience contributes to more robust tuber development.”

Sam Brown, Technical Director, The Crop Smith



In UK trials in 2022 and 2023, Vita-Rhize performed best with the complete replacement of industrial NPK applications.

Vita-Rhize's 2023 demonstration day results.



“Yields were shown to increase by 7% and 6% respectively, producing bigger tubers at earlier maturity, lowering input costs by GBP 100 per hectare, increasing overall yield by 7% and 6% respectively,” said Nick, adding that, based on potato pricing at harvest 2023, improved profitability of £ 1,350 per hectare for Melody and £760 per hectare for Kingsman would have been achievable.

The ‘good’ nematode

Bacteria break down easy to-use organic material, and retain the nutrients, like N, P and S in the soil. About 60% of the carbon in those organic materials are respired as carbon dioxide, but 40% of that carbon is retained as bacterial biomass.

Fungi break down the more recalcitrant, or difficult-to-decompose, organic matter, and retain those nutrients in the soil as fungal

biomass. Just like bacteria, fungal waste products become soil organic matter, and these waste materials are used by other organisms.

“Protozoa are one-celled, highly mobile organisms that feed on bacteria and on each other. Because protozoa require five to 10-fold less nitrogen than bacteria, N is released when a protozoan eats a bacterium. That released N is then available for plants to take up. Between 40 and 80% of the N in plants can come from the predator-prey interaction of protozoa with bacteria,” said Nick.

With growers continually engaged in battles with PCN and FLN, there’s one key fact that is often overlooked, or indeed not even know – not all nematodes are bad!

Beneficial nematodes eat bacteria, fungi, and other nematodes. Nematodes need even less nitrogen than protozoa, between 10 and 100 times less than a bacterium contains,

IN one cubic centimetre of soil, you will find:

- 100 million or so individual bacteria
- 50-150 meters of fungal threads
- 10,000 – 100,000 protozoa
- 5 to 500 beneficial nematodes

FERTILISATION

or between five and 50 times less than a fungal hyphae contains. Thus when bacterial- or fungal-feeding nematodes eat bacteria or fungi, nitrogen is released, making that N available for plant growth.

These beneficial nematodes are unfortunately also controlled by chemicals used for the control of parasitic nematodes, significantly disrupting the soil microbiome, Nick said.

Unlike other species-specific biological products for specific functions, Vita-Rhize relies on the complex interactions between the complete microbial community and the plant. It is the balance of the microbial community composition that is important for healthy host-microbe relationships and the resulting impacts on plant health. Both the enrichment and disruption of microbiota abundance serve as important mechanisms of disease incidence in plants.

“Over time, improving the fertility of the soil and the diversity of the microbiome will further decrease expenditure on nutritional and crop protection chemicals and improve the quality and quantities you harvest,” Nick said. **PR**

“Over time, improving the fertility of the soil and the diversity of the microbiome will further decrease expenditure on nutritional and crop protection chemicals.”

Nick Read, Director, Vita-Rhize

MICROORGANISMS play significant roles in the productivity of the soil, the growth of plants and the impact of pests and diseases.

- They convert detritus into useful soil products like humus
- They bring nutrients into the ecosystem from the atmosphere and mineral reserves locked up in the soil
- They form symbiotic relationships with plants to help roots take up nutrients
- They increase the length and mass of root systems enabling the plant to absorb nutrients better, they also convert nutrients in to a form easier for plants to use and absorb. Since the root mass and size has been increased moisture can be absorbed from a much larger area giving greater drought resistance
- They protect roots from pathogens. When foliar applied, they colonize the leaf surface and leaf cells to perform the same functions
- Several types attack and destroy parasitic nematodes
- CO₂ produced by their respiration provides a much higher level in the air just above the soil for photosynthesis
- They produce chemicals that are toxic to some pests and diseases

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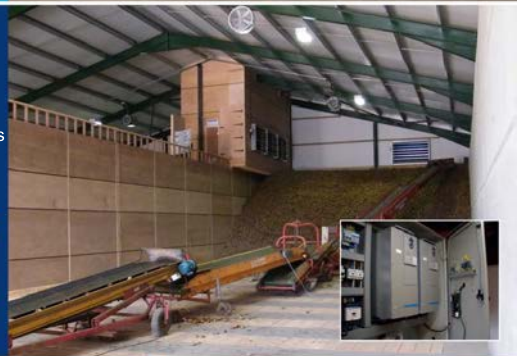
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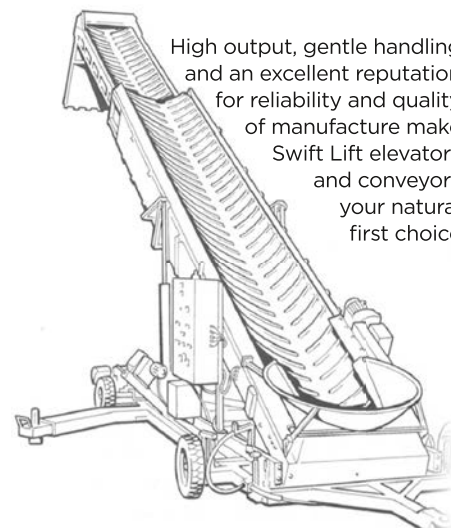


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Currently, potato cultivation is a heavy process, with significant volumes of soil being moved to bury stones and clods to establish a friable seed bed.



Leaving no stone unturned

As the Potato-LITE project prepared for its spring trials, we caught up with **Adam Johnson**, Potato Specialist at GRIMME UK and part of the project's team, to learn more about what the project could contribute to the evolution of cultivation machinery.

THE four-year Potato-LITE project being delivered by a consortium of businesses, researchers and growers, is almost at the end of its first year and those involved have been organising their spring trials.

Led by PepsiCo in partnership with McCain Foods GB Ltd, GRIMME UK Ltd, Harper Adams University, Crop Health and Protection (CHAP), Cranfield University, and growers from Strawson Limited, JRO Griffiths Ltd, JM Bubb & Son and H Sutton & Son, the project received DEFRA funding in 2023. Its focus is to develop machinery and cultivation practices for the future which will enable UK potato growers to minimise tillage intensity, improve soil health and lower greenhouse gas (GHG) emissions.

The project received £4.6 million funding given from the £10m Defra pot. Nothing on this scale has ever been done before.

The Harper Adams University team began soil sampling and measuring GHG at two Shropshire sites before the first potatoes were planted last April, using a range of low intensity tillage approaches developed by the consortium.

We recently caught up with Adam Johnson, Potato Specialist at machinery manufacturer GRIMME UK, to get a better understanding of the project, its progression, and what it could mean in terms of future machinery use in cultivation.

Adam said: "We were very excited to start the Potato-LITE project as it is vital to help set the direction of potato production techniques for the future. Innovative equipment and processes are needed for us to move forwards, as UK production has reached a plateau. We hope it will help us to bring new solutions that will deliver commercial and environmental benefits through reducing the intensity of cultivations."

Cultivation processes

Currently, potato cultivation is a heavy process, with significant volumes of soil being moved to bury stones and clods to establish a friable seed bed. The project is looking at the processes within potato production - deep ridging, de-stoning and bed tilling - to study the effects of each and determine whether it will move a problem further down the road.



Adam Johnson believes leading the journey is better than waiting for consumers to dictate growing practices.

"If you drive past a potato field, you can always see where the stone rows have been. What we're asking is how quickly that soil will recover back to full health, full drainage, how we get to that in the shortest possible time and which one of these different levels of intensity cultivation methods is best suited for that, while not impacting the yield or store ability," said Adam.

Potato Lite is running repeated, highly scientific trials focussing on these issues, as well as the carbon dioxide impact.

"If you look at the goals set by government, companies like McCain and PepsiCo have released their global strategies and want all their growers to be doing this. They haven't prescribed how they have to achieve this but they have said 'here's the target you need to get to'.

“We’re basically looking at how we can take these wishes, and government wishes, and apply it in ways that come with positive recommendations for growers,” said Adam.

While the project’s ultimate goal is to understand the differences between different treatments, taking into account the economic and environmental aspects, it is essential to ensure future practices are viable for growers, he stressed.

“You need a huge amount of data sent to be able to do this. We said, as a consortium, that the project was going to go ahead one way or another - the government money just made it slightly easier. Having the universities on board, validating things, is a real plus,” said Adam.

Stone island

Around 70% of the potato growing area in the UK has stone in it in one form or another, which presents British growers with a challenge that is less of a concern for European growers.

“Europe does not have the stone challenges we have. We have this lovely beautiful island we call home, but with this huge stone content,” said Adam.

“The Norfolk, Cambridgeshire and Lincolnshire areas were originally the potato growing areas. Now it’s everywhere. In the 1960s there were hardly any potato growers in Yorkshire, now there are 16,000-17,000 hectares of potato there.”

The rise in designated potato-growing land came about following the introduction of

destoning machinery in the 1970s and opened up many opportunities for growers.

“Rotation used to be one in three. We can now deal with stone and go for longer rotations but to achieve that we have to move further afield,” said Adam.

“The industry has driven potatoes to be planted in areas where potatoes probably wouldn’t normally be planted. Over the years, growers have come to us and asked us to develop solutions to be able to do these processes in ground that probably is not good for potatoes. Now we’re looking at how we can reduce that impact on soil structure, carbon emission and so on.”

No ‘one cap fits all’

Adam said that within potato growing, there is a ‘one cap fits all’ perception which he said is the wrong approach, especially when it comes to cultivation.

Even with high stone content, a different approach will still be needed in different parts of the country, owing to the types of stone found there and the damage they can inflict. There is a need to look at things on a field-by-field basis, he stressed.

“For example, Grade 3 land in Norfolk land would never have had potato growing but can now accommodate it because of destoning and irrigation. Sharp flint is found in Norfolk and Suffolk which can cut the tubers.”

“In areas like Yorkshire there will be rounder pebbles that are less of a problem during harvest because of their smooth edges, but if they fall on the potatoes and hit them, they can cause bruising.

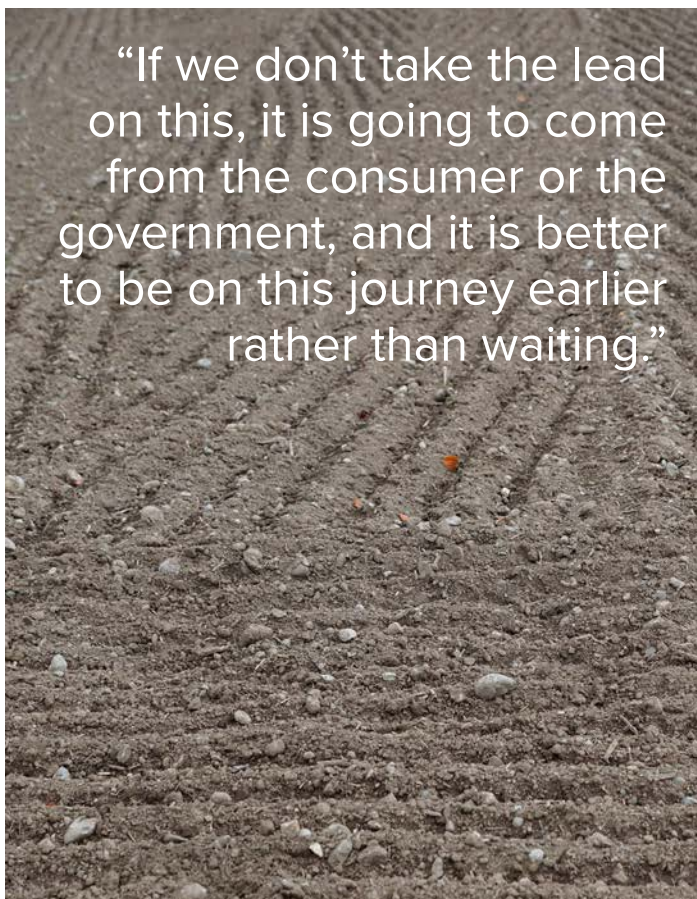
“If you’re growing potatoes for the supermarket bag, that is where your problems are going to be. A lot of European potato production – around 60 or 70% - is for the processing sector. But in the UK, that figure is below 40%. A lot end up in chip shops and you would not accept a bruise in your chip or on your plate with your Sunday roast,” said Adam.

“With this high stone content, when you harvest, you run this risk and we want to stop that happening.”

So how can we take that destoning idea and mix it up?

“Larger stones may cause damage while smaller ones don’t always have an impact, so one of the focus points is splitting the stones into size factions. If we look at this in terms of the soil, we probably won’t need to move as much soil,” said Adam.

In addition to this, there is another challenge – stone moves! “If you could put a GPS on a stone in the ground, it will be in a different location in five years’ time,” said Adam. “Sometimes you’ll hit a stone at harvest and think – that definitely wasn’t there in the spring!” →



Around 70% of the potato growing area in the UK has stone in it in one form or another, which presents British growers with a challenge that is less of a concern for European growers.

Machinery adaptations

Machinery development and adaptations will be made based on project findings.

Grange machinery, a contractor based in Holderness, East Yorkshire which provides low disturbance subsoilers and parts, is working alongside Grimme within the project, looking at how existing machines can be adapted to achieve the same results but with lower disturbance.

“We can then make a machine that can integrate and make that our single path operation,” said Adam.

He added: “We have to look at measurability. We are scoring different types of cultivation. For example, destoning might score 100, ridging might score 50. If we can make that number smaller by doing less cultivation or less intense cultivations, that’s the whole idea. The quantifying benchmark is the impact of the cultivation.”

Grimme is taking existing machines into the trials and seeing what can be achieved by making small changes in year one and two, running field trials with machinery at planting and harvesting.

“The one that excites me most is how we are going to reinvent destoning to open up the system,” said Adam. “We treat stone by placing in slightly different places, looking at whether we can work shallower, faster, wider. Obviously in potatoes everything has to fit the track width of the tractor.”

Trials and testing

Preliminary testing was carried out in the autumn and spring trials are due to be carried out based on that. “We’ll have another set of replicates across the field that we can look at and, if it is working well, look at the environmental impact,” said Adam. “Growers think about three things: Time, effort and money. We need to create processes that tick all or some of those boxes. We’ll then look at grower days, conferences, and other ways of getting the message out there.

Feedback to the initial trials had been a pleasant surprise, said Adam.

“Yield from the low input cultivation was actually very good. However, those are the

plots where we still have stone to deal with so we have to look at whether we achieved those yields with less fuel etc, but moved a problem to somewhere else.

“That’s where the data and measuring come in – on everything from planting day to emergence data, canopy cover, drone flights – a huge amount of data is being collected. Greenhouse gases are being collected by Harper Adams, soil analysis by Harper and Cranfield. There’s a lot of base data.”

The hectareage involved is relatively small. “You can learn as much from a small trial as you can from a large,” said Adam. “Every four trial sites is being replicated six times. It’s more about replicates and getting that law of averages.”

Practical implications this year had been with the length of the trial plots, and next year the team will work with eight row widths instead of four.

“We want to show that we can transition in a simple way so it can be implemented in different size and shape fields.”

“We hope to provide concrete evidence that a saving can be achieved without just shifting a problem from spring to harvest.”



The future for growers

Balancing consumer demands and holistic expectations is going to be a fine-tuning exercise, but the key to the project is resilience, according to Adam. Rather than waiting for these to drive the future of potato cultivation, the key is to develop something now that growers are happy with, then the dissemination of that information.

“If we don’t take the lead on this, it is going to come from the consumer or the government, and it is better to be on this journey earlier rather than waiting.

“At the end of the day, as one grower once said, you can be achieving everything in terms of environmental terms, but if you’re yielding less what’s the point of doing it at all? We’d need to find more land to make up for the shortfall, and where are we going to find that because we also have PCN issues, we have renting issues, and it’s still going to take the same amount of time to harvest these crops.

“So if we’ve got to do the same with more work in less time how can we justify this

holistic approach? Hopefully, we’ll be able to give growers the options and information so they can make that decision for themselves and provide concrete evidence that a saving can be achieved without just shifting a problem from spring to harvest.”

Adam added that the growers GRIMME works with have always been very enthusiastic and keen to drive change. Four growers are involved in the project – two who supply McCain and two who supply Pepsico. The varieties used are for crisp or frying, if not storage. **PR**



Bruising caused by stones is unacceptable for consumers buying table potatoes.



The industry has driven potatoes to be planted in areas where potatoes probably wouldn't normally be planted.

Winning the war against PCN

Two authorities on PCN detail how latest advancements are combating a pest that causes up to £31m in damage and lost output annually.

OVER the past three decades, there has been significant progress in our understanding of the biology and management of potato cyst nematode (PCN), yet it is still regarded as one of the main threats to potatoes.

Dr Matthew Back, reader in nematology at Harper Adams University and a renowned authority on PCN management, said the prevalence of the pest is concerning, especially in previously-untouched seed land in Scotland.

“The James Hutton Institute has warned that at the current rate of spread, there could be in the region of five potato seed crops left that aren’t impacted by the pest,” he said.

He said the species, *Globodera pallida*, has become the most prevalent of the two species infecting potato crops in the UK, with the latest research showing occurrence at 95% of sites that have PCN present (Dybal, 2018).

“The dominance of *G. pallida* has been driven by the trend of cultivating varieties with the H1 gene; a major gene which has resistance to *G. rostochiensis*,” said Matthew. “For example, Maris Piper has the H1 gene and continues to be the most widely grown variety of potato in the UK.”

PCN tolerant varieties

Matthew explained that, compared to 25 years ago, there are many more resistant varieties, such as Elland, Innovator, and Lanorma. These varieties are mainly used for processing and few options exist for fresh prepack markets.

However, while varietal resistance offers a solution to lowering PCN populations, Matthew explains it does not protect the tuber yield of infected plants. This is where PCN tolerance is important.

“Varieties with PCN tolerance have extensive root systems that compensate for PCN root parasitism, meaning that they continue to produce acceptable yields. Essentially tolerance needs to be used alongside resistance to avoid unwanted PCN multiplication,” he said.

Agrii Agronomist and member of The Potato Partnership steering group, Nick Winnill, explained how The Potato Partnership has been investigating IPM control of PCN through resistant and tolerant varieties.

The Potato Partnership is an industry collaboration initiated by Agrii and founded on the model provided by the former AHDB Potatoes SPot Farms. Other partners include

Dr Matthew Back, reader in nematology, Harper Adams University, warns that biofumigation should not be practised on acidic soils.



plant breeders, growers, manufacturers, and a wide range of agronomists.

“Within the Potato Partnership, there is a recognition that we urgently need practical solutions to the pest and disease challenges facing the sector. For PCN, our trials have sought to evaluate the resistance and tolerance of a range of potato varieties grown under commercial conditions in the presence of *G. pallida*,” said Nick.

The 2023 trial was located on a sandy loam site at Sutton, Suffolk. The field was sampled and tested for PCN on a one-hectare grid basis, with the trial finally located within a 1 ha block with a population average of 9.56 eggs/g soil.



NSP Chairman Patrick Mitton stressed the importance of growers and operators following the NSP Protocol.

“The trial found that certain varieties were better at coping with the PCN burden,” said Nick. “The maincrop variety Buster gave the lowest mean rate of multiplication of PCN, followed by the white maincrop Lanorma, then the early maincrop Cinderella, which is resistant to both PCN species.

“Iodea, also resistant to both species, and a salad/ baby type variety, performed well followed by two recent introductions, Lady Luce and Bruar, both of which offer dual resistance to PCN.

“The partial resistant varieties Sensation and Decibel increased the level of PCN but to a lower level than the non-resistant variety Maris Peer. In contrast, the other non-resistant maincrop variety, Markies, had the highest rate of multiplication reflecting its low resistance rating to *G. pallida*.”

Nick said the results suggest that breeders are introducing a range of varieties with good levels of both tolerance and resistance to *G. pallida*.

“This offers the prospect, subject to market acceptability, of helping in a strategic approach to managing PCN. The uncertain regulatory future facing granular nematicides and the high PCN infestation levels seen across much of the growing area, make it clear that varieties exhibiting both resistance and tolerance to *G. pallida* represent the most effective and sustainable means of managing populations for the long term,” he said.

“It’s reassuring that breeders and seed houses have recognised this reality and are introducing varieties with these genetic traits, but also with the potential to deliver commercially competitive yields.

“If breeders are to find the confidence needed to increase seed production, the industry first needs to convince consumers that these varieties are as good as the current market leaders such as Maris Piper, Maris Peer and Markies.”

Granular nematicides

Granular nematicides, applied to the seedbed, help protect the yield of potatoes by preventing infective PCN juveniles from reaching the roots, limiting penetration and feeding damage.

Matthew said: “Granular options have dwindled in the past five years with Mocap 15G* (a.s. ethoprophos) and Vydate 10G* (a.s. oxamyl) being withdrawn in 2019 and 2020, respectively.

“Current granular options include Nemathorin* 10G (a.s. fosthiazate), which is widely regarded as the most effective nematicide and is currently registered until July 2029,” he said.

Chair of the Nematicide Stewardship Group (NSP), Patrick Mitton, said that when using Nemathorin it is important that growers and operators follow the NSP Protocol to support the product’s future.

“Granular nematicides are an essential tool in any integrated management strategy to reduce yield losses, and it is safe and responsible use which will help retain them for the future,” he said.

“The NSP best practice steps bring together practical advice on how to use granular nematicides safely and forms part of the Red Tractor Standard for growers.

“The protocol consists of six easy steps to protect operators, the environment, and consumers. These include: Gaining the necessary qualifications for application, ensuring machinery is correctly calibrated, applying in a single pass, ensuring shut-off

before the end of the row, making sure any spillages are buried immediately, and carrying out field checks 12-24 hours after application.

“If you are using granular nematicides this season, make sure you are up to date with the protocol. More information and helpful videos can be found on the NSP website.”

Biofumigants

As well as established IPM methods, such as extended rotations and volunteer management, Matthew said populations can be lowered further by the inclusion of biofumigant brassica cover crops.

“Performed correctly, these measures have the potential to reduce populations to manageable levels and shorten rotations. Brassica biofumigants, such as Indian mustard, are grown during the summer months, typically behind crops such as winter barley, vining peas or carrots.

“Their activity on PCN comes from volatile and toxic compounds, mainly isothiocyanates, produced from chopped stems and leaves of plants that have reached early flowering,” he said.

“The aim here is to grow maximum biomass and to accomplish this I recommend achieving optimal sowing (date and method) and adequate supply of nitrogen (typically 80-100 kg N/ha). Glucosinolates can be maximised by appropriate supply of sulphur (25 kg S/ha) and correct date of chopping (green bud to early flowering).” →

“Trap crops and biofumigants can reduce the PCN challenge, while allowing growers greater flexibility with rotations.”

**Dr Matthew Back, reader in nematology,
Harper Adams University**



Cysts on roots of a potato plant.

NEMATODE CONTROL / BIOFUMIGANTS

He adds that work undertaken by William Watts showed that chopping using a rotary flail and incorporation via a rotavator or spader gave better results in terms of PCN suppression.

“Water is also vital for the conversion of glucosinolates to volatile compounds (hydrolysis), so soil moisture at 60-80% of field capacity is ideal,” he said.

Matthew warns that biofumigation should not be practised on acidic soils (pH lower than 5.5) as this influences the effectiveness of the process. Low pH leads to lower concentrations of isothiocyanates.

“An area receiving greater interest is partial biofumigation,” he said. “This type of biofumigation is associated with isothiocyanate production from growing crops and is related to the secretion of glucosinolates from brassica roots.

“Glucosinolates released into the soil can be broken down into toxic isothiocyanates by microorganisms (fungi and bacteria) that produce myrosinase, the enzyme used by brassica plants to convert glucosinolates into isothiocyanates. The breakdown of root secreted glucosinolates results in continuous release

of isothiocyanates, albeit at a much lower concentration than traditional biofumigation.

“Partial biofumigation doesn’t cause as much suppression as traditional or complete biofumigation but provides greater flexibility to growers in rotations as there is no requirement for chopping and incorporation, meaning that cover crops can be sown later or even overwintered.

“Additionally, partial biofumigation can be achieved with other brassica species such as oilseed radish (*Raphanus sativus*),” he said.

There is extensive work on biofumigation, and researchers around the world have recorded suppression against a range of pests, weeds and diseases.

“In potatoes, there’s evidence that brassica biofumigants can lower soil-borne pathogens such as *Rhizoctonia solani* (the cause of stem canker and black scurf), *Spongopora subterranea* (powdery scab) and common scab (*Streptomyces* spp.),” he said.

“A number of UK studies have focused on biofumigant activity against PCN and have shown reductions of the pest typically ranging from 35-70%.”



Trap crops, typically native to South America, are close relatives to potatoes, which stimulate PCN hatch.

African nightshade (*Solanum scabrum*) could provide a tool in the UK for reducing PCN and root knot nematodes (RKN).

“Granular nematicides are an essential tool in any integrated management strategy to reduce yield losses.”

Patrick Mitton, Chairman, the Nematicide Stewardship Group (NSP)



◀ Prickly nightshade (*Solanum sisymbriifolium*) is the most well-known trap crop and was used more commonly in the mid-2000s.

▼ In the past 10 years, there's been greater interest in other solanum species such as tall/velvet nightshade (*S. chenopodioides*).



Matthew said the key to success with this approach is growing the right species and variety, performing the practice at the right time – typically when the temperatures are higher and daylength is longer – and using the correct agronomy.

Trap crops

Solanaceous trap crops offer another tool for lowering PCN populations in potato rotations.

Prickly nightshade (*Solanum sisymbriifolium*) is the most well-known trap crop and was used more commonly in the mid-2000s.

Trap crops, typically native to South America, are close relatives to potatoes, which stimulate PCN hatch by producing hatching factors such as the glycoalkaloids alpha-solanine and alpha-chaconine.

Infective PCN juveniles can penetrate the roots of these plants but not fully complete their lifecycles, due to the plants' defence responses.

The trapping activity of these 'dead end plants' leads to reductions in PCN populations as high as 85%.

"In the last 10 years, there's been greater interest in other solanum species such as African nightshade (*S. scabrum*) and tall/velvet nightshade (*S. chenopodioides*)," said Matthew.

"Work in Kenya highlighted that African nightshade could provide a tool in the UK for reducing PCN and root knot nematodes (RKN). However, the challenge of growing trap crops is achieving consistent results with establishment and plant development.

"The key to overcoming these inconsistencies appears to be around ensuring seed is sown at a shallow depth of 0.5-1cm, with sufficient moisture to enable seed-to-soil contact."

Research conducted on the Innovate UK project, DeCyst - Factors affecting trap crop success against PCN (Produce Solutions, CHAP, Harper Adams University, VCS Potatoes and Curious Raven), has indicated that standard or precision drilling are likely to provide better results with plant ground cover and biomass than broadcasting.

Matthew believes there is a good opportunity for trap crops and biofumigants to be used within integrated control programmes for the management of potato cyst nematodes.

"Trap crops and biofumigants can reduce the PCN challenge, while allowing growers greater flexibility with rotations. Embedding these crops and biofumigants within environmental stewardship schemes, would be a further step forward and would help incentive their usage," he said. PR



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The persistence of PCN in the soil means it is easily spread without realising.

The strategic use of nematicides in potato farming

Tim Rooke is a third-generation farmer who grows 600-650 acres of processing and crisping potatoes in Ryedale, North Yorkshire.



British Potato Review hears from grower and NFU potato policy group member, **Tim Rooke**, on how he controls potato cyst nematode (PCN) on his North Yorkshire Farm.

THE persistent threat of Potato Cyst Nematode (PCN) is one of the major challenges faced by the potato industry, and Tim Rooke's farm is no exception.

As the chair of the NFU potato policy group and a potato grower himself, Tim emphasises the importance of addressing PCN and explains how safe and responsible use of nematicides is incorporated into a business.

Tim farms in partnership with his brother and son and has a mixture of tenanted and owned land spanning 1,800 acres. He is a third-generation grower who grows 600-650 acres of processing and crisping potatoes in Ryedale, North Yorkshire. In addition to potatoes, they grow winter wheat, winter and spring oats and oilseed rape (OSR).

PCN is such a significant pest for potato crops because of its ability to cause substantial yield losses and persistence in the soil, meaning it is easily spread without realising. Tim says careful management is of paramount importance.

"We have PCN present on the land, so we test to understand the population we're dealing with. This informs our control and planting strategy ahead of each season," he said.

When testing for PCN, he said they try to understand the distribution of the pest to inform whether the land is suitable for potato production and what, if any, control methods need to be used.

"At least half of the 600 acres we grow on, will show some signs of PCN, which is obviously a huge problem for us. If the land is free of PCN, we can use any variety and no control is needed. However, if there's a population, we may select a variety with resistance or higher tolerance to PCN, and it also determines how we control it," said Tim.

Tim explains that they take a robust approach to control, to prevent population growth.

"If the potato land is infected with PCN, we know we cannot reverse that situation. Equally, if it's at a low level, it's hard to predict the full impact of the pest until harvest and caution is needed in this situation owing to the easy spread of the pest," he said.

Managing PCN

PCN management is not just about maintaining crop health but is vital for the economic viability of the farm, said Tim, pointing out that even though the chemicals they use to fight PCN are expensive, they're really important.

"Without granular nematicides, such as Nemathorin, PCN can cause even more damage which can cost a lot more, so using these is key to keeping our potato farm financially healthy," he said. "Yet responsible use of these products is crucial, balancing the need for effective pest control with environmental stewardship."

"There's huge importance in using available products judiciously and the need for building

on research and development of resistant varieties, which could offer a more sustainable solution to the PCN problem in the future."

Safe nematicide use

With nematicides being a key part of PCN control, Tim explained how they have integrated the safe use of granular nematicides into the farm business.

"We are very keen on training, all our team are PA1 qualified and our operators have a PA4 qualification as well," he said. "We also use the expertise in our wider team to make decisions and determine farm practices and our operators are fully trained and registered as NROSO members."

"This means we have plenty of people who can contribute to making sure we are always following best practice when using any chemical, including nematicides."

Calibration and cleanliness

Calibration of machinery to ensure a correct and steady flow rate is imperative. Tim explains that each year, the application equipment is assessed and calibrated by an external, independent assessor.

"This is part of Red Tractor requirements, and it is beneficial in that they are able to look for more subtle challenges and maintenance than we would do with our farm team," he said.

In addition, the operator calibrates the applicator every day during use, to ensure the correct rate of application.

As PCN can also multiply from relatively small numbers to damaging levels within one potato crop, making sure you pay attention to machine cleanliness at harvest time, is essential, he said.

“When we move from field to field with machinery, we make sure to clean off equipment to minimise the amount of contaminated soil transfer. As much soil and debris is removed from the harvester as possible in the field before it’s moved and tractors and trailers are also checked for excess debris and soil.”

Safe application

Tim explains that the way granular nematicides are applied should be carefully controlled to achieve accurate application, and incorporated to remove the risk of effects to wildlife.

“If high levels of PCN are present, we manage this by applying a granular nematicide in a very targeted way,” he said. “We recognise the need to maintain availability of granular nematicides to potato growers long-term and therefore we take stewardship extremely seriously.

“In order to do this, we apply nematicides in a single pass and headlands are cultivated. We also ensure we check fields between 12 and 24 hours after application, looking for adverse effects to wildlife, which is part of the NSP Protocol and Red Tractor standards.”

So far, no impacts on wildlife have been observed on his farm, he said.

Careful approach

Tim reiterates the importance of having a trained team who can be trusted to work together and consult each other when needed.

“Thankfully we’ve never had any, but if a spillage were to occur, we would be sure to involve one of our agronomists to ensure we respond effectively,” he said.

“A small spillage would be buried, but for larger spillages, we would put on appropriate PPE and place the spillage into a plastic tub, followed by speaking to our chemical distributor to arrange safe disposal.

“If we factor in the pressure to grow the best varieties for chips, rather than the PCN-resistant varieties, this highlights how crucial nematicides are for potato production in the UK.”

Farm facts

- Farm 1,800 acres in total
- Location: Ryedale, North Yorkshire
- 600-650 acres for potato production – chipping and crisping
- Also produces winter wheat, winter and spring oats, oilseed rape (OSR)

Nematicide Stewardship

The Nematicide Stewardship Programme (NSP) promotes the correct use of granular nematicides. The NSP best practice steps, which are part of the Red Tractor standards for potato growers, gives guidance on how to achieve safe and responsible application. **PR**



GRANULAR NEMATICIDE BEST PRACTICE STEPS



1. QUALIFY

- PA4G or PA4 certificate
- Artis e-learning certificate
- NR050 membership



2. CALIBRATE

Machinery must be professionally calibrated every two years



3. SINGLE PASS

Apply and fully incorporate nematicides within a single pass



4. SHUT OFF

Applicators must have the facility to shut off granule flow before the row end



5. SPILLAGES

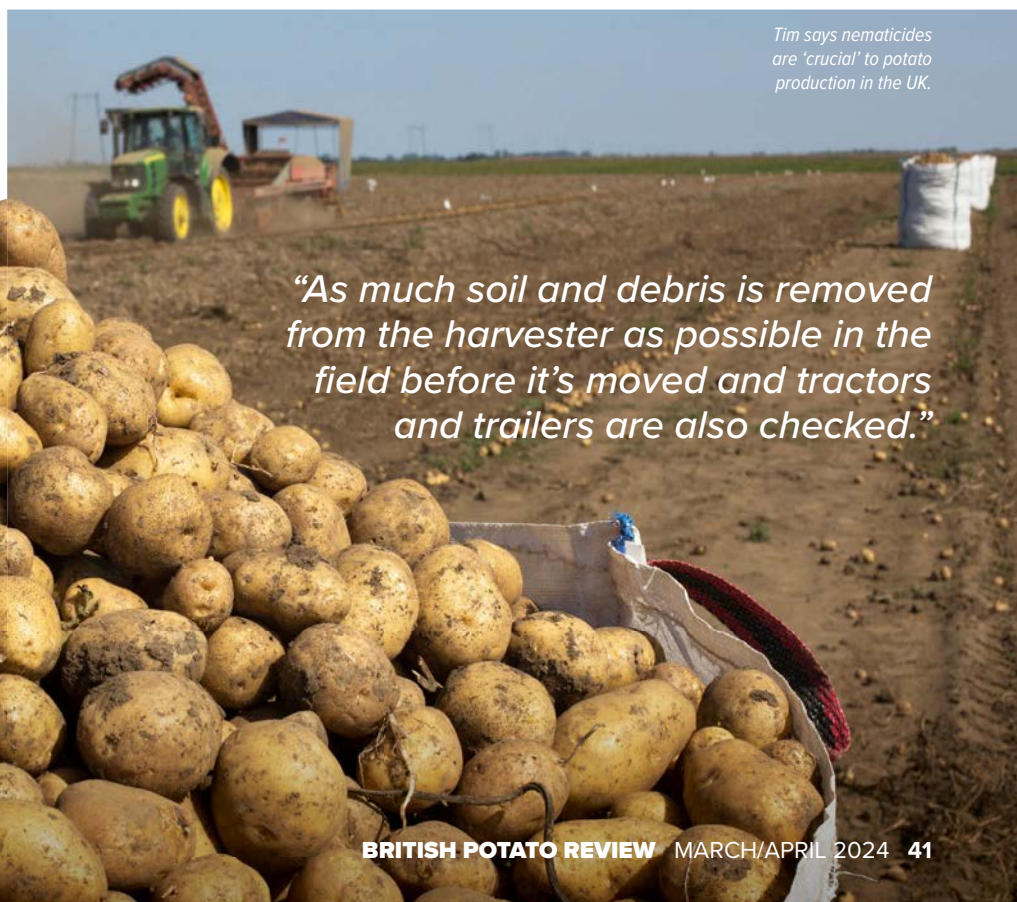
Bury small spillages immediately



6. CHECK

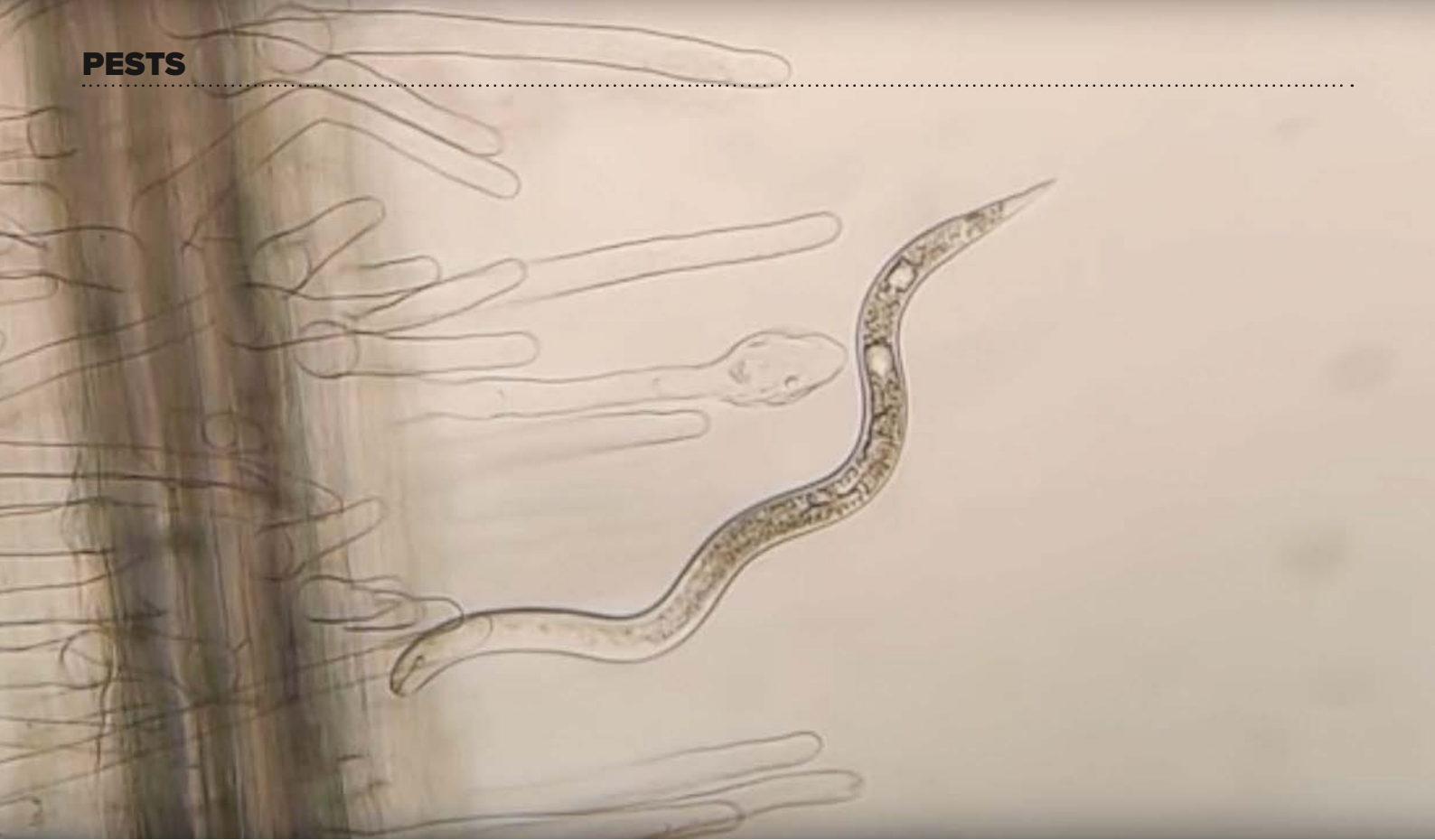
Check treated fields 12-24 hours after application for adverse effects to wildlife

FOR MORE INFORMATION VISIT: WWW.NSPSTEWARDSHIP.CO.UK



Tim says nematicides are ‘crucial’ to potato production in the UK.

“As much soil and debris is removed from the harvester as possible in the field before it’s moved and tractors and trailers are also checked.”



NEM-EMERGE COLLABORATION

With plant-parasitic nematodes on the rise, *British Potato Review* brings news of a major European research project.

TO get a clear picture of the proliferation of novel nematode species and populations and to find appropriate and sustainable solutions to these problems, WUR is launching a major research and innovation project with 17 European partners called NEM-EMERGE.

Climate change and genetic selection have brought root-knot nematodes further north in Europe and made cyst nematodes more difficult to control. These emerging parasites pose a huge threat to potato crops.

The WUR project has been accepted as a Horizon Europe Project, resulting in 7 million euros in funding.

Researcher Hans Helder said: “They drain energy from the plant, causing a plant condition referred to as ‘fatigue’. As a result, the crop barely grows and is severely weakened, leading to crop loss and hence economic damage.

“Annually, root-knot nematodes alone cause yield losses of several billion euros. Next to crop rotation and resistant varieties, growers currently

use broad-spectrum chemicals to control these nematodes which have unwanted negative side-effects on nature and the environment.”

Both root-knot nematodes and cyst nematodes are on the rise. According to Helder, climate change is a major cause of this. “Our winters are becoming milder. As a result, ‘tropical’ root-knot nematodes are moving further north. Whereas they used to be found only in North Africa and southern Europe, in recent years they have also been observed in central France and halfway across the Balkans.

“In addition, climate change is affecting soil temperatures. At temperatures of 28 degrees or higher, some important resistance genes of crops no longer work. This line of defence that protects plants against parasites is thereby lost. Besides climate change, genetic selection is another driver that plays a role in the emergence of nematodes. Frequent use of a limited number of resistant crop varieties resulted in the rise of nematodes that are less sensitive to these resistance genes.”

Mapping the scope of the problem

Hans said the team is going to investigate the current distribution of root-knot nematodes to find exactly where they currently occur.

“From southern Turkey and Spain to northern Germany, we are going to take soil samples about every two to three hundred kilometres to investigate the presence of plant-parasitic nematodes. Based on the resulting picture, modellers can predict where we can expect them in five or 15 years.”

His colleague Aska Goverse aims to tackle the instability of resistance genes in plants under higher temperatures in one of the other work packages.

“We have been working on the molecular mechanisms that underly the (mis) functioning of resistance genes for several years,” said Aska. “We have a pretty good view of the factors determining their function for some diseases, but not yet for these plant-parasitic nematodes.

The researchers will work on solutions in close cooperation with end-users. As the use of pesticides is increasingly restricted within the EU, farmers seek alternative methods.

Aska said: "Growers require knowledge and practical tools to make a transition towards sustainable agriculture. The EU is steering towards integrated crop management, but what tools are needed to reach that goal? How can we, for instance, boost the soil's disease-suppressive potential? At the same time, researchers want to know the demands and the conditions for innovation from an end-user's perspective. The ultimate goal is to develop solutions that can be put into practice."

There is no single silver bullet solution, Hans warned. "We cannot afford to focus exclusively on, for example, new resistant varieties because it is only a matter of time before a new population of nematodes emerges that can break this resistance. We must really focus on a wide range of measures, from plant resistances to more hygienic working practices to the stimulation of natural enemies."

He emphasised the importance of collaboration between research groups. "It is already there, but only sparingly. The breadth of the consortium, from growers to universities, gives this project an extra dimension. We hope that this project can be the oil that will greatly boost cooperation between European research centres."



NEM-EMERGE is a collaboration between 18 European partners. These include knowledge institutions from Spain, France, Scotland, Turkey and Slovenia, among others, as well as organisations and companies specialising in biological control, plant health and breeding. Besides the official project partners, NEM-EMERGE also involves local stakeholders. **PR**





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BOOK





Disruptive solutions discussed

Genome editing, supply chain challenges, disease control, diets, and pest management discussed by delegates.

THE theme of the recent CUPGRA conference was 'Looking forward to disruptive solutions' which provided panellists and attendees with the scope to debate a number of pressing issues and take part in workshops.

A stellar line-up of speakers included those involved in various research sectors, suppliers, advisors and consumer trend specialists, who gave rounded viewpoints and updates on topics including genome editing, supply chain challenges, disease control, diets, and pest management.

Insights and experiences from overseas were provided by Marleen Riemens, Erwan Allain and Craig Richael. Marleen heads up a scientific research team focussing on IPM (Integrated Pest Management) in arable production systems at Wageningen University (WUR) in the Netherlands while Erwan is an agronomist from Brittany and the former Deputy Director of Bretagne Plants, which controls seed potato production in Brittany.

Craig, of Simplot Plant Sciences, discussed the market release of GM and gene-edited potatoes in the USA. He provided an in-depth look at genetically modified and gene-edited potato products, discussing how his research team has created potato products which have improved quality traits, higher yield, and robust disease resistance. He said advances in genome editing and marker-assisted breeding to complement genetic modification of potato and other crops remains a priority of his work

Also looking at how genetic engineering is put into practice and how it will work for potatoes, Cathie Martin, compared to editing the vitamin content in tomato and outlined what can we learn from this that can be used in potato breeding.

The science of 'smelling a rot' was outlined by Barbara Correia of B-hive Innovations, while Tom Storr of Dyson farming spoke about reduced cultivation trials during a joint session on potato growth.

Barbara currently leads the TuberSense project, looking at early detection of potato diseases through volatile sensing to reduce food waste in the supply chain, after being awarded a UKRI Future Leaders Fellowship in 2021, while Research Agronomist Tom specialises in soils, cover crops and potatoes.

Professor Jim Monaghan of Harper Adams University discussed how we should nurture future talent for growing potatoes

PCN updates were given by James Price of PCN Action Scotland and Peter Craven of NIAB.

Looking at industry collaboration, Mark Taylor represented GB Potatoes and James Harrison gave an update on CUPGRA's work. **PR**

Interviews and videos of the CUPGRA event can be found by visiting <https://bit.ly/49h8wCn>



Tackling crop waste



THE UK's Aston University is looking to tackle international crop waste by developing a mobile and sustainable refrigeration system for Malawi.

The university has received a grant of £241,075 from Innovate UK as well as other funding for the CoolRun project in Malawi, in southern Africa.

The researchers are to develop a mobile refrigerated box cooled by a phase-change material which can release or absorb sufficient energy to keep vegetables cool.

In most of Malawi, the electricity supply is unreliable, and the increasing cost of fossil fuels makes it expensive to operate internal combustion-driven generators and compressors.

Agriculture is the country's key industry but up to 50% of crops harvested are left to rot because of lack of a reliable cold supply chain for potatoes and other vegetables.

The project will involve the creation of a cool air blaster which will lower the temperature of the crops at a central location using a solar-powered refrigeration unit that also cools the phase-change panels. The food is then transferred to mobile CoolRun pods which can have their location and temperature monitored by both the supplier and the customer via a cloud database.

Aston University will be working in conjunction with its partners Hubl Logistics, Enterprise Projects Ventures Limited (EPVL), Malawi Fruits and Engineeronics Ltd in the UK and Modern Farming Technology (MFT) in Malawi.

The project will last two years. The Aston University team is led by Dr Muhammad Imran, Senior Lecturer in engineering and technology.

New distribution agreement



SEED potatoes from the Dutch breeder Agrico are being exported to small-scale farmers in Tanzania, following the signing of a distribution agreement with Fraxen Consult Ltd, based in the country.

In Tanzania, Agrico registered three potato varieties: Arizona, Markies and Manitou. Because of the market preference, in Tanzania Agrico is starting up with the varieties Manitou and Markies.

The country has 3.7 million small-scale growers with an average low potato yield of around two to three tons per acre. It is hoped the new varieties will help them to improve these yields.



Sector hits \$1 billion milestone



THE Australian potato industry has seen a 24% increase in value in the past fiscal year, exceeding a production value of \$1 billion, according to the latest Australian Horticulture Statistics Handbook.

Potato Australia's Acting Chair Nigel Crump has attributed the growth to substantial investment in automation and innovation, with considerable infrastructure enhancements by major processing companies and the fresh sector alike have seen considerable infrastructure enhancements.

The top potato-producing state is Tasmania, followed by South Australia and Victoria.

Australia has successfully exported more than 40,000 tonnes of potatoes, primarily to South Korea and the Philippines.

Supply unaffected by floods



CYPRUS potato supply remains steady, despite recent floods.

Flooding in Larnaca and the free Famagusta province have failed to impact on the crop, according to the Potato Producers and the Agricultural Association.

Despite concerns the winter potato crop would suffer from diseases and reduced production, assurances have been given that there will be no market shortages.

Medal of Honor awarded



THE German Potato Trade Association (DKHV) awarded its Honorary President Dieter Tepel the Medal of Honor of the German Potato Trade for outstanding achievements and tireless commitment to the potato industry at its annual International Berlin Potato Evening on February 6th.

Processing solution to be unveiled



TNA solutions announced that, for the first time, it would exhibit a range of solutions for french fries and savoury snacks at Anuga FoodTec in Germany, including a potato processing solution.

Pre-pack quality tightens



THE availability of pre-pack quality stock in Ireland is tightening and prices reported are reflective of this, according to IFE, Ireland's largest farming representative organisation.

The viability of overwintered crop is questionable according to the organisation. Some growers have up to 50 acres remaining to be harvested because of poor weather conditions.

Appeal to local growers



THE Namibian Agronomic Board (NAB) is urging local growers to increase potato production, in a bid to reduce the country's N\$138 million annual bill for potato imports.

Currently, Namibia only produces 35% of its potato needs, leading to a reliance on imports for the remaining 65%. There is a consistent national demand for the crop and the border remains open for potato imports all year round.

The National Association of Horticultural Producers has started a program to train small-scale growers in potato cultivation.

Using data science in search of stronger potato plants



A DUTCH research project entitled CropXR, which is focusing on the faster development of extra resilient (eXtra Resilient) crops, has received 43 million euros of government investment through the National Growth Fund (Nationaal Groeifonds).

The project is focusing on data science and the use of artificial intelligence (AI) and additional funding has also been contributed by Utrecht University, the University of Amsterdam, Wageningen University & Research and Delft University of Technology.

Project leader Guido van den Ackerveken said CropXR functions as a virtual institute that houses and facilitates research.

The programme will examine what makes plants resilient to environmental stress, how to properly map this out and how to use this knowledge within breeding.

“We’ll combine this fundamental research programme with technological development. The focal point of the first half of the 10 year process is the methodology: How do you get the most meaningful information from measurement data in order to improve our understanding of plant resilience?” said Guido.

“We can collect a lot of measurement data, but the bottleneck is converting this data into knowledge. The use of AI should provide a major breakthrough here, in smart ways that make much better use of that data. Subsequently, the developed methodology will be translated to the various crops that play a role within CropXR. Besides the potato, we also work on a number of vegetable crops such as tomatoes, lettuce, cabbages and onions, and in floriculture we’ll work on the chrysanthemum.”

Guido said CropXR has developed crop-specific satellite programmes. “We’re not going to work intensively on most crops until the second five years, but with the potato we’ll already be starting up seriously in the first year,” he said.

Two large field trials will be set up in the next growing season, with resilience characteristics, such as how plants cope with stress factors, being mapped out. For another experiment, related to the microbiome of the potato, a group of researchers from Utrecht University will sample the roots of potato plants at various locations

in the Netherlands. They’ll be mapping microbiomes, and then looking at their effect on potato growth and resilience in an experimental setting.

“Robust crops are extremely important, but they don’t always get enough attention in breeding at the moment,” Guido said.

A consortium called HIP (Holland Innovative Potato) consisting of public and private-sector key players in the potato value chain, is the industrial partner for potato projects within CropXR.

“Because HIP wants to start with their potato research already in the first phase, they cannot yet use the new technology and methodology that we’re developing at the same time. They’ll therefore approach the research from a different angle, for example with field trials. Ultimately, those two approaches will come together. That’s an interesting set-up that could turn out very well”, said Guido.

By the end of the first five years, the project is expected to have mapped out certain properties that could be used in breeding.

“If you know which properties you need to bring together in a variety, you can take very targeted breeding steps. Bringing different properties together does make the breeding process more complex. We have to find the right balance in this. But when it comes to very important resilience properties, it’s worth spending time on them. Ultimately, each breeding company will decide for itself what knowledge it takes on board and which parts will be used in their breeding processes,” Guido said.



Seed decline and historic high prices



SEED potato production has declined for the third consecutive year according to a buyer and seller of seed potatoes in the Netherlands.

Wouter Mutsaers, who buys and sells seed potatoes at Q-potato Holland, said in a recent interview with Fresh Plaza that the production is now less than 40,000 hectares in the Netherlands, while acreage is also shrinking in Germany and France, presenting many challenges for ware production.

He said there is also increasing pressure from disease, while poor tuber setting, large seed potatoes, and difficult harvesting as a result of heavy rain, have reduced starting material for next year.

“It’s been a generally dismal seed potato harvest,” he said.

He foresees a move toward using virus-resistant varieties but said, as yet, the Dutch variety package doesn’t yet contain many kinds of low-virus-vulnerable potatoes.

‘Prices hindering sales’



PRICE levels in the Netherlands are hindering smooth sales, according to one supplier.

Kees Schouten of Altena Potatoes says both local sales and exports are being affected, with the market described as ‘sluggish’.

Few potatoes are being shipped to Africa and the focus is mainly on exporting Agria potatoes to Spain and France, as well as the domestic market, he added.

“For many countries, our prices are too high. You can’t find quality potatoes for under €0.35, and Agria prices even top €0.40,” he said. “As long as prices remain at this level, I don’t foresee significant sales volumes. We’re priced a few cents above French potatoes, so our Eastern European customers turn there first.

“However, finding good quality is challenging. Fry potato sales seem to be doing fairly well, but the industry isn’t buying much either. They, too, are hesitant, given these prices. Even the waxy potatoes are too expensive for export. We’re gearing up for the new import season. Potatoes are growing quite well in Malta, and that season should start in March. Plus, more Moroccan potatoes will probably begin arriving next week.”

East Coast deficit

THE East Coast has had a deficit of potatoes, according to Ken Gad of Cambridge Farms Inc.

Bad weather meant Maine growers were unable to store the same quality of volume of crop they normally would, with reds, yellows and whites being impacted more than Russets.



Collaboration to boost growing



IN a bid to bolster potato farming in Kenya, Jomo Kenyatta University of Agriculture and Technology (JKUAT) has teamed up with Fujita Corporation of Japan.

This collaboration is set to revamp the potato value chain, aiming at increased yields, improved nutritional value, and enhanced resilience against challenges such as pests and diseases.

Prof Daniel Sila, a Principal Researcher at JKUAT, highlighted the shared goal of leveraging research and industry expertise to benefit farmers and the agricultural sector. The initiative, starting in Nyandarua County, focuses on soil analysis, pest and disease management, and the introduction of tissue culture to improve seed quality. Moreover, the project has ventured into mechanisation, introducing three innovative prototypes to streamline potato farming processes.

Additionally, the collaboration will support four postgraduate students and has already led to the establishment of a cold storage facility in Kinangop, marking a significant advancement in post-harvest management.

Northwest region potato stocks



POTATO stocks in Idaho on February 1st, 2024 totaled 82.0 million cwt. Disappearance of the Idaho crop to date was 63.0 million cwt. February 1st potato stocks in Oregon totalled 15.0 million cwt. Disappearance to date was 12.5 million cwt. In Washington, February 1st potato stocks totalled 44.5 million cwt. Disappearance to date totalled 55.2 million cwt.

Nationally, the 13 major potato States held 216 million cwt of potatoes in storage February 1st, 2024. Potatoes in storage accounted for 49% of the 2024 States' production, up 1% from a year earlier. The indicated season to date disappearance, at 225 million cwt, was up 7% from the same period last year.

Processors in Idaho used 39.1 million cwt of potatoes for the season, up 1% from 2023. In Oregon, 20.2 million cwt of potatoes had been used by processors for the season, down 6% from the previous year.

Processors in Malheur County used 5.02 million cwt, down 3% from the previous year, and 15.1 million cwt had been used in other counties, down 6% from the previous year. In Washington, 34.4 million cwt of potatoes had been used by processors for the season, up 1% from the 2023. Processors in the eight States used 115 million cwt of potatoes for the season, up 3% from February 2023.

New bag unveiled



TASTEFUL Selections, a potato brand from RPE LLC, has announced its new bag in the potato category – a three-pound, mesh pillow pack.

The packaging is designed to showcase premium Honey Gold, Ruby Sensation and Sunburst Blend potato varieties.



Expanded conference



THE 2024 Ontario Potato Conference is set to take place in Guelph on February 29th.

The conference has expanded to include 10 additional exhibitors in the Potato Hub room and will also offer Continuing Education Units (CEUs) for crop advisors and professional agronomists.

Import volume for chipping potatoes to be doubled



THE Philippines has made a significant move to double the import volume of chipping potatoes to 60,000 tons under the Minimum Access Volume (MAV) scheme, aiming to bolster the local snack manufacturing sector with a reduced tariff.

The adjustment is in response to the escalating demand for high-quality raw materials necessary for producing potato chips and french fries.

This was highlighted by the MAV Management Committee, which stressed the importance of aligning import requirements with the competitive edge of local potato chip producers.

Key beneficiaries include Universal Robina, Liwayway Marketing and Leslie Food, which are allocated to import chipping potatoes at a 3% tariff, compared to the standard 40% for imports. The move addresses the absence of locally-produced chipping potatoes suitable for snack manufacturing, compelling producers to rely heavily on imports.

Smugglers disguise onions as potatoes



FOLLOWING India's export ban on onions, smugglers are falsely labeling them as potatoes to exploit the global price spike.

The December embargo was imposed to control domestic costs and has fuelled a black market. Customs officers have been ordered to clamp down on the illegal activity. Sri Lanka and Malaysia are the main recipients of the smuggled produce.

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‘Carbon marketplace’ created

TECH company Trimble has launched a ‘carbon marketplace’ which it claims will connect and aggregate verified data across the potato supply chain and help meet net zero commitments.

Trimble’s Connected Climate Exchange creates a streamlined process for aggregating data across farm organisations and verifying this data for emissions reductions and removals buyers in one place.

Director Darren Howie said: “Farmers have long struggled to comprehensively report and tell their sustainability story in quantifiable and verifiable terms. They need a technology solution that brings greater value and helps bring structure to disconnected data.”

While many carbon programs work by identifying a specific practice to implement and search for farms, Trimble is partnering with agronomy-focused, enterprise agriculture companies to optimise interventions at the farm level, he said.

The Trimble Connected Climate Exchange works with the company’s Ag Software and other third-party farm management tools to centrally manage sustainability projects and customers, perform calculations to report on carbon emissions, reductions and removals, provide reporting and visualization to sustainability impacts, calculate payments where applicable and generate cross-sector supply chain insights.

New study reveals soil health benefits of regenerative agriculture

A STUDY being conducted at the University of Leeds Farm is shedding light on the benefits of regenerative cultivation techniques.

The study compares soil health, crop production, greenhouse gas emissions, and profit of different farming systems across seven 12m x 40m plots.

Some of the plots were ploughed and power harrowed, while others underwent minimal cultivation using non-inversion, shallow cultivation.

Cover cropping, living mulches, manures, livestock integration, and herbal leys have also been utilised as part of the trial.

Data was collected by state-of-the-art soil stations created by Estonian ag-tech company Paul-Tech, which take real-time readings of nutrient availability, soil water levels and soil temperature at depths of 8cm and 20cm.

Each plot received three treatments of nitrogen throughout the trial, with nutrient and water availability measured at both depths after each application.

The stations revealed that the trial plots which had minimal cultivation held more nutrients and water around the root zone for longer than plots that had been ploughed.

As a result, the minimal cultivated plots recorded a significantly larger nutrient release after fertilisation and higher nutrient availability at the 8cm mark compared to the ploughed plots, and nutrients were held around the rootzone for longer.

By contrast, water quickly drained through the ploughed soil, leading to a significantly smaller nutrient release at fertilisation and considerably less nutrients available to the plants at 8cm.

Soil temperature was also impacted by the cultivation method, with the ploughed soil experiencing much larger temperature changes over the course of the trial.

The ploughed soil froze when air temperatures dipped below zero, whereas those sown under a minimal cultivation

system maintained a much more stable temperature throughout and did not freeze.

The study is ongoing and will look at the impacts of other regenerative techniques on soil health over a longer period.

Paul-Tech Chief Executive Mikk Plakk said: “The data from our soil stations clearly shows soil nutrient availability and temperature differences between plots with different cultivation methods. For example, the soil in the conventional ploughed plot froze at root level and showed significant temperature differences while the minimal cultivated plots didn’t freeze and temperatures were relatively consistent in the root zone.

“Also, in the minimal cultivated plots, the soil was much more effective at holding water, which meant far more nutrients were available at 8cm than was the case in the ploughed plots.

The findings have a significant bearing on how farmers should be treating soil. They strongly suggest cultivation methods have the potential to significantly improve soil and plant health while reducing the amount of inputs they need to apply.”

Paul Tech’s soil station combines real-time proprietary sensor data with weather and satellite data to produce agronomic recommendations for farmers and growers, which are reported via an online dashboard.

The trial is being led by Dr Ruth Wade, Research Fellow at the University of Leeds. She said: “The results coming from this regenerative agriculture plot trial will provide important data on the impacts of different farming systems both on the environment but also for the farm business.”



Multiple weather station updates

GROWERS using Agrovista's weather station services can now access a suite of new and updated on-screen features to help optimise crop management, following an extensive overhaul of the company's data platform.

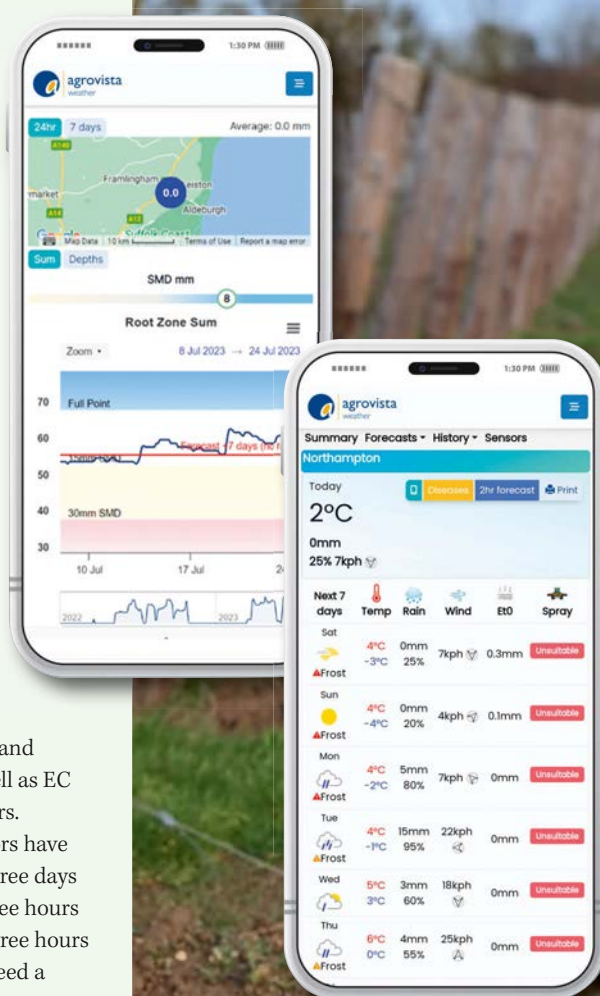
The weather stations measure a range of parameters including rainfall, air temperature, soil temperature, soil moisture, relative humidity, leaf wetness, solar radiation and wind speed, depending on which option growers choose.

A new dashboard design presents a wide range of data in a cleaner, more accessible format via an app that works across different devices.

Potato growers will also find weather and disease forecasting, as well as a forecast for spraying conditions, are now included on the same platform. Previously these were on a separate system.

The update also includes an irrigation probe dashboard with a soil forecast, indicating where moisture might be after seven days without rain. The dashboard also shows rain amounts, soil moisture levels and temperature measurements, as well as EC measurements for soft fruit growers.

New crop development indicators have also been introduced: growing degree days for all types of crops, growing degree hours for soft fruit crops and cooling degree hours for crops like blackcurrants that need a certain amount of chill over the winter.



Sensor to analyse plant health

AFRENCH sensor manufacturer has created a 3D multispectral sensor capable of analysing plant health and soil humidity levels remotely in real-time.

The 3D Multispectral LiDAR (Light Detection and Ranging) sensor aims to improve crop yields and resource management by optimising irrigation, water and pesticides consumption. It enables remote measurement, allowing outdoor usage in all types of weather or lighting conditions. Its 3D imagery also makes it possible to monitor plant growth.

The manufacturer says growers will be able to optimise water and pesticides supply, monitoring plant growth and health.

The sensor is currently being trialled in Brazil, being used to identify dead or weak plants, and the manufacturer is on the lookout for partners to deploy the technology to collect data to improve its AI. Anyone interested can get in touch at contact@iridesense.tech

Large-scale production of the device is foreseen later this year, with commercialisation to follow in 2025. The product is currently available all over the world, including the UK, but in limited quantity.



Diamond celebration for mobile grader

HAITH Group, a designer and manufacturer of vegetable handling equipment is celebrating the diamond anniversary of its mobile grader.

Introduced in December 1963, the mobile grader has become one of the company's best-selling machines, with more than 300 produced in the past six decades.

The technology found in today's graders has progressed significantly since the 1960s, featuring a heavy-duty hopper, auto crop flow control, a choice of cleaning systems, touchscreen HMI control and shaft-mounted drives. Haith also provides optional features such as soil extractors, optical sorter integration and stainless or mild steel construction.

The latest mobile grader to leave Haith's South Yorkshire factory was bought by BH Savidge & Son, which opted for the PRO SF 2400s model.

Ben Savidge said this had been custom built to the company's requirements and had replaced its previous high-capacity grader could not be moved and required very high power to run.

"We've known for a few years that we needed a mobile grader. This year, we needed to grade 2,000 tonnes more than last year and knew we would be working at our main base and another farm. As we wanted to invest in one machine to work at both sites and futureproof ourselves, the Haith mobile grader made perfect sense," he said.

Haith's Managing Director Duane Hill said there has been a recent resurgence in interest in mobile machinery for grading and sorting amongst growers and packers.

"The ability to move their machinery around is very popular now. We have a very healthy order book at the moment. Hopefully, when we come to celebrate the mobile grader's Blue Sapphire anniversary in five years, we will be marking the 350th mobile grader leaving the factory," he said.

Innovation recognition for efficiency boosting sprayer

An efficiency boosting sprayer system devised by Knight Farm Machinery has been named as overall winner in the LAMMA Innovation Awards.

The MAXImizer PRO system is now used across the company's range of mounted, trailed and self-propelled sprayers. MAXImizer PRO enables the sprayer's low volume plumbing to be primed before spraying begins, for full circulation, automatic agitation and instant nozzle response/switching. The system also means clean water line purging is similarly instant.

Introduced in the autumn, the MAXImizer Pro is an update of the established Knight MAXImizer circulation technology, with its live induction hopper, booms fed at multiple points to ensure even spray-line pressure, and continuous circulation of fluid through the complete plumbing of the machine. The MAXImizer Pro development sees boom pipework reduced by 21% for further enhancements to efficient spray-line circulation.

As an example, on a trailed Knight TB5200 sprayer with 36m boom, the development reduces sprayer retained volume by 7.5 litres.



New pellet frying and distribution equipment for crisps manufacturer

CALBEE, global manufacturer of potato snacks including the Seabrook Crisps brand, has invested in new frying, seasoning and distribution machinery for its Deeside plant in the UK.



The investment has seen Calbee installing a variety of state-of-the-art frying technology, including an indirect heating system, which has been designed, built and installed by industry specialists, Fabcon Food Systems.

The company's new line can produce fried snacks from pellets or extruded products, with fried products being integrated into an existing seasoning and distribution system which has now been extended, adding further stations.

Platform extensions have also been added to accommodate the new Fabcon-designed horizontal motion and electromagnetic vibratory conveyors.

Founded in 2015, Fabcon Food Systems manufactures, supplies and installs handling and processing equipment for the food industry. Designed and built at the company's Norwich factory in the UK, Fabcon's team of 25 supply systems and machinery to customers in the UK, mainland Europe, the Middle East, Australia and Africa.

New version of rotary tiller

STANDEN has launched a new version of its popular rotary tiller the Powavator.



For the 2024 season, the company has launched a new triple bed model, the HS400. The HS400, which has

seen three seasons of field testing, sees several key upgrades to the previous model to enable easier maintenance, reduce wear and tear as well as fuel consumption and increase speed.

It features narrower side drives, a deeper hull design, a new main gearbox design rated to 400hp and above, faster rotor speed of 330rpm from 266rpm, 10 or 12mm 'L' or speed blades and an optional wider point for convex body or square body option.

It is available with Shearbolt or Auto-Reset legs and a rear hood option for planting systems that don't require a destoner.

The Powavator is available in single bed, two bed folding, two bed straddle and triple bed options, giving you the ability to create a 1,2 or 3 bed machine which is designed and engineered to suit your precise requirements and soil type. Within each range is the choice of a number of different working widths from 1.8m up to 6.0m, to suit 72" / 1.8m wheelings and 80" / 2.0m wheelings as well as different bed forming body/rear wheel configurations. Rear rollers or depth wheels can be supplied.

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OMEX forms dedicated sustainability team

LIQUID fertiliser and crop nutrition provider, OMEX Agriculture, has formed a dedicated sustainability team comprising members of its procurement, research and development, operations, agronomy and service departments.

Newly-appointed sustainability lead Ian Silcox-Crowe said: "OMEX has already completed a substantial amount of research aimed at helping growers produce crops more responsibly, with a particular emphasis on the environment, especially soil health, water management and product procurement while offering full traceability."

Omex's current offering includes inhibitors aimed at reducing greenhouse gasses and emissions from soils.



New director of Breeders Trust

A NEW General Director took over at Breeders Trust Ltd on January 1st.

Corné van Beers has taken on the role at the Brussels-located organisation, succeeding Geert Staring, who now retired.

Breeders Trust was founded in 2008 and currently consists of 12 leading European seed potato breeding companies. Detecting unlawful copying of varieties protected by plant breeders' rights, illegal cultivation and trade are a key focus of Breeders Trust, which ensures that unauthorized cultivation and trade in protected varieties is tackled, plant breeders' rights are respected and that attention is paid to the fight against illegal practices with seed potatoes.

Corné van Beers has been working for Breeders Trust as a project manager since January 1st, 2012.



Zach joins Scottish Agronomy

FARM consultant Zach Reilly has joined Scottish agronomy advisory service and farmer-owned cooperative, Scottish Agronomy.

Zach was formerly with SAC Consulting's Forfar office, assessing whole farming businesses and supporting from agronomy to business management. He has also been a lead on Farming for a Better Climate's Regenerative Soil Group, exploring sustainability practices and their practical impact and integration on farm.

Zach said: "The way in which Scottish Agronomy uses the evidence from trials and shared experience to work first and foremost for its membership has always appealed to me, and I'm looking forward to getting fully involved and out on members' farms."

CEO for new Agri-Tech Centres announced

IN THE autumn of 2023 three Agri-Tech Centres – Agri-EPI, CHAP and CIEL – formally announced their intention to merge in April 2024 to form an integrated business spanning the entire agri innovation ecosystem.

This position was supported by Innovate UK, who, recognising the importance of the agri industries sector, invited the Centres to develop plans to become an Agri-Tech Catapult. This work is said to be progressing well, and the Chief Executive Officer for the new business has now been appointed.

Dr Peter Quinn, Chair of the Transition Board responsible for the merger and the future Agri-Tech Centres and current Chair of CHAP, said: "I am delighted to announce that Phil Bicknell will be the CEO for the new Agri-Tech Centres business from April 1st. We conducted a comprehensive recruitment process, internally and externally, to identify the best candidate to lead the business. Phil clearly demonstrated his vision for the future, along with the experience, skills and energy he will bring to the role.

"This appointment represents an important step in our process, as we move into the final weeks before the merger.

There remains a lot to do, in collaboration with our partners, but our talented teams are looking forward to the opportunity to make a real impact in the future through innovative agri-tech."

Phil Bicknell described the transition to a single agri-tech business as "a pivotal move to accelerate innovation for our sector".

"By combining the centres' UK-wide capabilities, with their world-class research facilities, investment and innovation expertise and extensive networks, the new business will be a hub for UK agri-tech to thrive," he said. "This merger will simplify the landscape, be completely inclusive and make it easier to navigate. That applies to everyone we engage with, here in the UK and internationally, meaning we all work smarter and more efficiently, removing sector and technology silos. It is the catalyst to think about the bigger picture, to challenge our food and farming systems and to think further forward.

He said the move will enable agri industries to form a strategic partnership with government, putting food and farming on the same level as sectors like digital, energy and



satellite applications, which benefit from a long-term and joined-up focus.

"We'll have critical mass and a single voice. There will be no excuses for us not being on the government's radar and vice versa," he said.

Each of the Agri-Tech Centres were established in 2015/16 as separate, independent, not-for-profit businesses.

Phil joined CIEL in 2021 and was made Director in June 2023, at which time he joined the Transition Board for the merger. Prior to CIEL he had a varied career across food and farming. He led the 50-strong market intelligence team at the Agricultural and Horticultural Development Board (AHDB) and was Chief Economist at the National Farmers Union (NFU).

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