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MAY/JUNE 2024

# REVIEW



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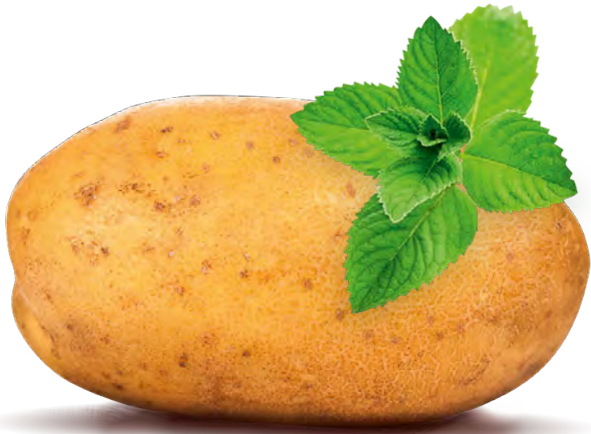
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# Editor's letter

As all growers are aware, carbon emissions from fertilisers urgently need to be reduced but this must be balanced against overall productivity. In the East Midlands, one grower has demonstrated that nitrogen and phosphorus applications can be optimised through the adoption of a Nitrogen Use Efficiency (NUE) programme and you can learn more about this in our fertilisation section.

In this issue, we also look at how two urea-inhibitors are holding up, the approach taken by two nitrogen 'fixing' agents, and a new biostimulant range being launched into the UK, as well as latest biostimulant trial results.

As temperatures begin to rise, so too does the risk of aphid-transmitted viruses which affect seed and ware crops. Agronomist Andrew Hutchinson gives some seasonal advice on aphids. The Seed Potato Organisation (SPO) also has its sights firmly trained on the pest and we learn more about that in its latest actions update. Elsewhere we share tips from growers and industry experts on pesticide application techniques.

In our blight section we consider fungicide resistance management and mixing strategies as well as sharing updates from the Fight Against Blight monitoring service.

As well as our international market updates, in this issue we shoot across the pond to learn from Dave Douches, Michigan State University's Potato Breeding and Genetics Program Director, about latest advances in diploid level breeding, and how another team at the university are looking to create healthier crisps by turning off a sugar-inducing enzyme.

On the lighter side of things, learn how two sets of jacket potato sellers have found international fame on social media.



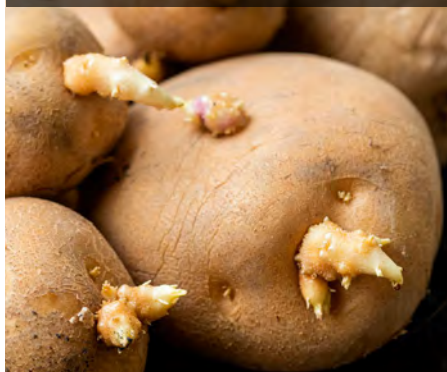
*Stephanie Cornwall*  
Editor

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# British POTATO REVIEW

March/April 2024

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## www.potatoreview.com

ISSN 0961-7655

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The publishers are not necessarily in agreement with opinions expressed in this journal. No responsibility can be accepted for statements made by contributors or advertisers.

POTATO REVIEW is published by:

Warners Group Publications,  
The Maltings, West Street, Bourne, PE10 9PH

Printed by Warners (Midlands) Plc  
Manor Lane, Bourne, Lincs. PE10 9PH



This publication is printed by Warners Midlands PLC  
Telephone: **01778 391000**



## CLA calls for flooding fund

IMMEDIATE support for flood-hit UK growers needs to be provided by the government, according to the Country Land and Business Association (CLA).

After storm Henk in early January the government announced that growers who had suffered uninsurable damage to their land would be able to apply for grants of up to £25,000 through the Farming Recovery Fund, but the fund is still not open and the CLA is calling for urgent action.

Following one of the wettest and stormiest winters in decades, thousands of land remain submerged or waterlogged. February was the fourth wettest since records began in 1871 in England, with a rainfall total of 130mm representing 225% of the 1961 to 1990 long-term average, and there have been 10 named storms in recent months.

CLA President Victoria Vyvan said the fund announcement was welcome but growers need it to open as soon as possible because the impact on their businesses had been 'profound', while a reduction in

domestic food production may lead to an increase in imports and prices.

"Farmers are dynamic and forward-thinking and are used to working with extreme weather, but the last few months have been especially difficult. The winter rainfall is pushing businesses to their limit and many fear for this entire cropping season," she said.

Landowners don't receive compensation when the Environment Agency effectively floods their fields to protect downstream houses and villages, despite the harm to their crops and the CLA is calling for more support to repair the damage.

Victoria said: "Years of poor management of watercourses and flood defences by the Environment Agency, often caused by lack of resources, means farmers are still unfairly shouldering the burden of flooding devastation. Farming businesses are willing to help protect homes and businesses from flooding by storing floodwater, but in turn there should be recognition of the added burdens on farmers with appropriate compensation."

## Scientists uncover secrets of blackgrass waterlogging

A NEW study has shown that blackgrass uses specific adaptations to flourish even when soil is totally saturated for up to three weeks.

Black-grass thrives on heavy land, particularly where drainage is poor and the findings reveal that when waterlogged, black-grass plants grow bigger than their well-drained counterparts.

Even though blackgrass doesn't pose as many issues for potato growers as for other crops, blackgrass plants can still seed in the potato crop, reducing attractiveness.

The research examined different populations of blackgrass and showed that the more herbicide resistant the population was, the more waterlogging tolerant it was too.

Other studies have shown that weed competition early in crop development has the greatest impact on yield. These findings suggest fields infested with herbicide resistant blackgrass are going to be badly affected by autumn waterlogging. The results also help to explain why black-grass tends to form patches in areas of the field where the soil is good at holding onto water.

Rothamsted's Dr Dana MacGregor, who led the research, said: "This is an important step forward in our understanding of what makes black-grass so resilient. We are getting closer to pinpointing the physical and genetic mechanisms."



She said blackgrass is incredibly resilient and will probably do pretty well even in the face of climate change. "If we want to future-proof our crops, studying how this weed survives today's challenges could help us to identify new or useful traits that could be used in tomorrow's crops."

The research was primarily funded under a Science Initiative Catalyst Award (SICA) supported by BBSRC, as part of the Growing Health Strategic Research Programme.

## On-site potato storage event

GB Potatoes, in partnership with Potato Storage Insight and SDF Agriculture, is continuing to run the Strategic Potato (SPot) storage project this year.

This aim of this season's project is to help refine potato storage practices using farm research and learning to fine tune practices. The partnership is running proactive demonstrations and activities to improve grower understanding of potato storage and help them maintain control of ever-increasing costs.

Following the launch event in December 2023, a further on-site meeting is to be held at Winters Lane Storage Ltd, Long Sutton, on May 14th, where various aspects of potato storage will be tested and monitored. This will be an opportunity for visitors to hear from Adrian Cunnington, of Potato Storage Insight and Simon Faulkner of SDF Agriculture talk

through areas of the work they have been conducting at Winters Lane and the nearby Gedney Dyke stores.

Topics being covered will include cold storage strategies for fresh potatoes, featuring maleic hydrazide uptake and storage regimes such as cold temperatures and ethylene as well as other products. Store design in terms of air flow and the evenness of temperatures throughout the store as well as insulation, respiration and dormancy will also feature. Additionally, there will be a look at varieties from a PCN trial and how they have stored under the different regimes.

After a hog roast lunch where the other 21 partners in the project will be exhibiting, the companies will be on hand to discuss their businesses and what they can offer growers. There will also be the chance to travel to the



nearby processing store at Gedney Dyke where two storage strategies have been used and to look at dormancy break. Respiration and weight loss information will be discussed as well as a look at fry colours from each storage regime.

Roger Stone from NFU Energy will be on hand to talk about energy use and saving and Richard Colgan will talk about the Produce Quality Centre pods that have been used to measure respiration.

For more details of times and address, and to book your place please visit the GB Potatoes website.

## Albert Bartlett looking to replace Maris Piper

FAMILY supplier Albert Bartlett has tasked its agronomy team with finding a more resilient variety to replace customer favourite Maris Piper, after seeing the variety's prices rise dramatically at the start of the year.

With floods and droughts plaguing British potato production over the past six years, and dwindling margins exacerbated by higher energy and fertiliser prices, it's become less financially viable to supply Maris Piper,



the group's Procurement Director, Paddy Graham-Jones, revealed in a recent interview with the Liverpool Echo. Furthermore, previously-unwashed sales have now been replaced with washed, leading to larger volumes of water being needed for skin cleaning prior to packing.

He said: "The financial loss of producing a crop of Maris Piper that does not make washed pre-pack grade, can be the difference between profit and loss for a grower."

It is now looking for an alternative variety better suited to the current climate.

Paddy told the Echo: "Our agronomy team is working with our retail customers to try and develop alternative varieties that still offer customers great taste, but are easier to grow, require less fertiliser and water, and cope better with the climatic extremes that occur on a more regular basis than they did 20 years ago."

The price of a Maris Piper 2kg bag at Sainsbury's is believed to have risen by around 22.2%, from £1.35 to £1.65, between January 8th and February 12th, based on analysis of Assosia data. Tesco also saw a rise of 21.3% in the same period while the price increased 10% on average across Lidl, Waitrose, Aldi, Tesco and Sainsbury's.

## Surplus potatoes supply meals for those in need

BRITISH potato supplier Albert Bartlett has supplied the equivalent of more than 11m meals to FareShare during its 14-year relationship with the UK charity which tackles food waste for social good.

Surplus potatoes from the company are redistributed nationwide throughout the year to a network of 8,500 charities and community groups. The network includes school groups, lunch clubs for older people, domestic abuse refuges, homelessness centres, and community centres.

Last Christmas, it included golden tickets worth £100 in its surplus potato bags which were used by five charities to buy essentials to support their communities. The tickets were found within the 62 tonnes of surplus potatoes redistributed throughout the UK by FareShare to 632 charities and the winning charities included: Laurence's Larder and Open Kitchen, The Food Chain, Kellands School, Dundee Survival Group, Faifley Community Council.

Brand and Marketing Director at Albert Bartlett, John Hicks, said: "We have a strong relationship with FareShare and we're dedicated to helping deliver its mission of tackling food waste and hunger."

Director of food at FareShare, Simon Millard: "We are enormously grateful to Albert Bartlett for its ongoing support for FareShare."

## First fully-recyclable crisp packet launched

A FULLY recyclable paper crisp packet, which the manufacturer claims is the first, has been launched by the British Crisp Company.



Eight billion crisp packets are thrown away each year in the UK, ending up in landfill or being incinerated. The new crisp packet can be disposed of in normal kerbside recycling bins alongside other paper recyclable items.

The paper packet has been developed in partnership with Evopak, a manufacturer of sustainable paper-based flexible packaging, using the polymer Hydropol instead of conventional plastic. A thin layer of vacuum-deposited aluminium keeps the crisps fresh but doesn't impact on the recyclability of the packets.

Hydropol can be recycled, re-pulped, composted and is compatible with anaerobic digestion. If unintentionally released into the natural environment, it is non-toxic and marine safe so will dissolve and subsequently biodegrade. It does not break down into microplastics and is already being used in products such as paper mailing bags.

The packets have been certified as recyclable in standard paper recycling mills by OPRL, the evidence-based on-pack recycling labelling scheme.

## Supermarket educates consumers on storage

SUPERMARKET giant Tesco is seeking to increase consumers' awareness on how to store potatoes effectively, for longer.

In a bid to cut down food wastage and help with the cost of living, the store has included the information for shoppers on its 'Real Food' website, where it shares recipes, tips for money-saving and seasonal information.

"Potatoes are one of the most versatile veggies. They can even have a great shelf life, lasting for months, if you know how to store potatoes properly," the website states, going on to say that it's possible to take steps at home to stop them from sprouting, going green and wrinkling.

It advises consumers to ensure potatoes have good air circulation, to remove them from plastic bags so they don't suffocate and to keep them in a cool dark place so they don't photosynthesise.

## All-time high price for whites

THE Mintec Benchmark price for English white potatoes hit an all-time high of £570/MT last month, marking a 90% year-on-year increase.

Market sources anticipate a continued upward price trend owing to tightening supply in coming months. Trade for Maris Piper remained minimal across the UK owing to limited availability. Market players speculate that the price of white potatoes may surpass Maris Piper price before the 2024 harvest.

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## New artisan crisp flavour launch

ESSEX-based artisan crisp producer Fairfield's Farm will expand its range by launching a new Prawn Cocktail flavour in May.

In 2022, Fairfield's Farm made the decision to make its entire crisp range 100% vegan-friendly and this new flavour is no exception. The brand has used a combination of carefully selected seasonings and spices, including vinegar and tomato to replicate the classic flavour.

Like the rest of the brand's popular range, the new flavour will be made using the farm's home-grown crisping potatoes which are hand-cooked.

The crisps will be launched in 40g and 150g packs. The flavour will be available to purchase from wholesalers and luxury retailer Selfridges as well as on the brand's website.



## Breeder sells fewer tons but increases higher non-EU yields

ROYAL HZPC Group sold significantly fewer tons from Europe than planned over the past year but expects to achieve a similar result for the financial year 2023/2024 (July - June) as the previous year.

In its annual report, the company stated that the 2023 crop year produced low yields per hectare of seed potatoes in seed sizes in Europe, especially in the Netherlands owing to a late and wet spring followed by warm and dry months.

Customers had also been buying top-of-seed sizes this year to use as seed potatoes, which partly compensated for the shortage of availability.

"In countries outside the EU, this usually requires government permission. An exception is rarely given, but this year these exceptions were made. Outside Europe, yields are in fact generally higher than average and Royal HZPC Group is growing solidly," the report states.

However, current CEO, Gerard Backx, said the tonnage grown under license by Royal HZPC Group licensees is growing by 25%, especially in the Americas and Asia.

"We expect the total tonnage that we sell and/or is sold by licensees to increase by 3%, despite the decline in direct sales from Europe of over 10%. This includes additional sales of top of seed sizes," he said.

He added that the changing ratio of direct sales to tons produced by licensees, combined with increased selling prices, means that turnover remains the same as last year: about €420 million.

The breeding company anticipates a constant gross margin of €71 million and constant normal operating costs. However, it expects higher total costs to result from debts owed by customers in politically unstable regions.

Royal HZPC Group's net result is estimated between €5 million and €7 million, excluding costs of the Connecting Growers program.



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*Keeping seed potatoes virus-free is a key focus as temperatures rise.*

# The seeds of change

*Potato Review* finds out some of the work SPO has been carrying out to target aphid infection, raise the profile of roguing and investigate new markets.

**T**HE Seed Potato Organisation (SPO) has its sights firmly trained on aphids currently as temperatures are beginning to rise in the UK.

Chairman Mike Wilson said: "The warmer temperatures give us more aphids thus a higher likelihood of virus spreading into our very clean, virus-free, crops. The continent has had

to deal with issues for decades now but slowly, with global warming, this problem is heading north. The SPO are investing in various tasks to try and combat this growing problem."

The organisation teamed up with SAC for a virus summit in December, where Dr Stuart Whale suggested future action points to reduce levels of virus in the country.

*Mike says it's important to train up 'tattie rogues' for the future as they play an important role in the seed industry.*



It is also advocating the use of an oil that, if applied frequently, helps prevent aphid infection in seed crops.

The oil is approved for use in the EU but is not currently permitted for use in the UK. SPO has applied for the emergency use of the oil on seed crops, pointing out the environmental benefits this would have by reducing pesticide usage. This application has been submitted to the Chemicals Regulation Division (CRD) and the SPO is now waiting to see if it has been successful.

The SPO is also investigating the use of colouring food dye to be sprayed on when the potatoes are just emerging.

"Trials have been conducted on carrots by Agrivista with excellent results with a big reduction on virus transmission and it is hoped, along with Scottish Agronomy, that trials in potatoes will be as equally successful," said Mike.

"The theory is that the potato plants are camouflaged, making it near impossible for the aphid to find them. Food colouring dye is very safe and, once again, will hopefully reduce the amounts of aphicides used on the crop."





*“We felt it was important to train up the Tattie roguers of the future.”*

Small teams walk the growing crops, removing any diseased plants to reduce spread. After completing a five-day course in June at Scotland’s Rural College campuses in Cupar and Aberdeen, roguers can start work identifying and rooting out problem seed potatoes. Annual refresher courses are also available.

“The course costs a lot to run and, with it being the only course in the UK, we felt it was important to train up the Tattie roguers of the future,” said Mike.

**Going rogue**

SPO, an independent co-operative representing the entire potato seed chain in the UK, is on a mission to encourage better engagement between SASA (formerly the Scottish Agricultural Science Agency), a division of the Scottish Government Agriculture and Rural Delivery Directorate, and growers.

“This has been greatly improved over the last months and hopefully with more interaction will continue to do so,” said Mike.

SPO is contributing to the Fight Against Blight scheme run by the James Hutton institute, which is monitoring blight samples all over Europe, looking at different strains and any resistance issues

**Going rogue**

The organisation is also sponsoring a potato roguing course run by SAC Consulting, part of Scotland’s Rural College (SRUC), and is keen to highlight the important role played by roguers.

Once tattie roguers have learned to identify different varieties, spot signs of key diseases or pests, and have received their certificate, they become a key component in the protection of the crop.

It is also keen to demonstrate that it is on the lookout for new markets. It has recently exhibited at Fruit Logistica, the international fruit and vegetable show, as well as the British Potato event and Potatoes In Practice.

“Our presence there was important to let the world know that we are focused on looking for new markets and we’ve had lots of interest from lots of countries so will hopefully have some more markets to supply going forward.”

Anyone interested in joining the Seed Potato Organisation (SPO), or sharing information with the co-operative is encouraged to contact Chairman Mike Wilson on 07808 066 673.

The organisation was formed in December 2022 following the demise of AHDB Potatoes to represent the seed sector of the potato industry and support its development. It aims to help fund research and innovations as well as seek out new markets. **PR**



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## Euro concerns on seed movement

THE European Potato Trade Association (Europatat) has been raising concerns about the draft report on Plant Reproductive Material (PRM) which was set for a vote in the European Parliament's Plenary at the time of going to press.

The report, prepared by the Parliament's Committee on Agriculture and Rural Development (AGRI Committee), includes amendments that the organisation says could have negative consequences on the EU PRM market.

The proposed amendments will allow for a substantial part of PRM material to move around the European Union without any oversight from the Competent Authorities and without proper plant health checks.

Chair of the Europatat Seed Potato Commission Peter Ton said: "There's a critical difference between various types of PRM. Seed potatoes and regular seeds have distinct characteristics and require different handling procedures. Seed potatoes carry a higher risk of spreading plant diseases, especially when transported over long distances.

"The Parliament's position needs to acknowledge these differences.

Uncontrolled movement of seed potatoes across the EU would be detrimental and have serious consequences."

To address these and other concerns, a broad coalition of stakeholders representing the PRM sector and its users in the EU, including Copa-Cogeca, Euroseeds, Europatat, Coceral, the European Beet Growers (CIBE), and CEPM Maiz'Europe, co-signed a joint statement which emphasises the importance of maintaining the balance achieved in the original proposal from the European Commission.

They argue that the AGRI Committee report compromises this balance by introducing exemptions that could allow unchecked PRM to reach the market without proper assurances or traceability.

"This, in all likelihood, would lead to the establishment of a parallel, uncontrolled market that undermines the efforts of plant breeders and farmers to increase sustainability while ensuring food security in Europe," the statement warns. "We urge the European Parliament's Plenary to reconsider the amendments and revert back to the Commission's original proposal to avoid future crisis," concluded Peter Ton, Chair of the Europatat Seed Potato Commission."

## Experts share blight insights

THREE experts in the research and practical fields were due to share their insights and the latest information on blight ahead of the season, at a webinar organised by crop protection and biological solutions company UPL.

The company opted to host the webinar ahead of a critical season for control with the spread of strains resistant to leading fungicides in Europe and Potato Review will carry a full report of the event in its July issue.

The expert panel who were due to speak at the time of our May issue going to press included Dr David Cooke, Research Leader at the James Hutton Institute, Eric Anderson, Senior Agronomist at Scottish Agronomy, and Dr Stephen Kildea, Research Officer at Teagasc. Geoff Hailstone, potato Technical Lead for UPL, was chairing the discussion.

## Growers urged to open their gates

BRITISH growers are being urged to take part in the annual Open Farm Sunday event to put the public in touch with growers and enable them learn more about what is involved in the supply chain and food production.

Managed by LEAF (Linking Environment And Farming), the event celebrates its 18th anniversary this year and takes place on June 9th.

The Open Farm Sunday team is holding a series of online Zoom sessions to provide additional support across a range of topics. Those interested can visit the OFS website to register.

## New crisp flavour with limited edition print

CRISP manufacturer Simply Roasted has launched a new flavour, sour cream and chive while teaming up with painter and print designer, Becky Boden, who has created a limited edition A3 print to tie in with the launch.

The new flavour follows the lead of others in the manufacturer's baked crisp range by containing 50% less fat than regular crisps, and less than 99 calories per serving.

Available in both single serve (21.5g) and sharing size (93g), the new Norfolk-made crisps are the only roasted potato crisps on the UK market.

## Making plans for breeders meeting

FOLLOWING on from the success of last year's event, plans are afoot for the next Caythorpe Open Days, where different breeders will come together to showcase their new varieties.

The 2024 event will take place on August 28th and 29th at Caythorpe near Grantham.

Breeders returning to exhibit at the annual event are likely to include HZPC, Meijer, Solana, IPM, Germicopa, Grampian Growers, Caledonia, Agrico, Stet, Cygnet PB and Cullen Allen.





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# Nitrogen Use Efficiency

Higher potato yields achieved with reduced fertiliser and biologicals in trials.

**D**ESPITE potatoes having the lowest global carbon footprints among foods produced, at 0.21kg per kg of food<sup>1</sup>, there is an increasing demand from some processors for on-farm carbon reductions through sustainable methods.

A Cambridge University study has quantified the life cycle emissions from fertiliser for the first time, showing manure and synthetic fertilisers emit the equivalent of 2.6 gigatonnes of carbon per year, more than global aviation and shipping combined.

But as all growers are aware, while carbon emissions from fertilisers urgently need to be reduced, this must be balanced against the need for global food security and without a loss of productivity.

In the East Midlands, a potato grower has demonstrated that nitrogen and phosphorus applications can be optimised through the adoption of a Nitrogen Use Efficiency (NUE) programme from biologicals producer, Unium Bioscience, which he said has led to increased crop yields in a recent trial.

J & J Burnett Ltd in Newark, Nottinghamshire was keen to understand the carbon footprint of its potato enterprise and to start to investigate potential approaches to reduce it. Given the extensive use of biological products routinely integrated into crops, and their positive impact on NUE, trialling them seemed like one practical option.

In 2023, the business conducted the trials with Unium Bioscience and Agrovista, which

compared different nutrition programmes. During the trials, yields were improved and nitrogen was successfully reduced by 20% and phosphorus by 75%.

Weighbridge yield results showed that the farm standard produced 69t/ha, the reduced farm standard plus the NUE Unium Bioscience programme delivered 72t/ha, digestate plus the NUE programme yielded 71t/ha, and the reduced farm standard plus the PUE treatment yielded 73t/ha.

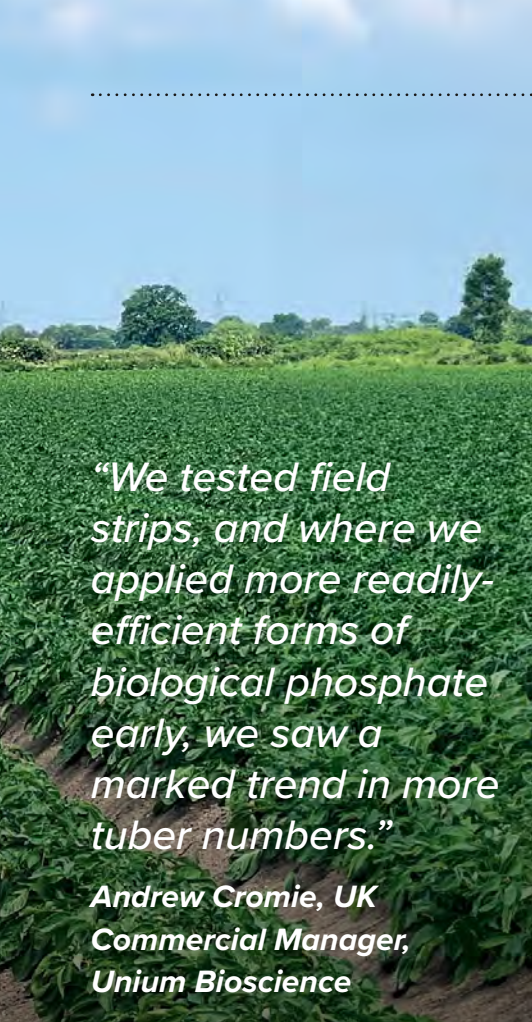
Farm Manager for J & J Burnett Ltd, Matthew Smith, said: “The initial results look very interesting. We are excited to progress the trial work further, the ability to produce more crop with less inputs makes sense both environmentally and financially.”

Andrew Cromie, UK Commercial Manager at Unium Bioscience, says that randomised independent digs and assessments were made on the crops throughout the trial to ensure verifiable results, which closely match the farm’s weighbridge yields.

“Field strips are a very good way of trialling products, and this trial showed all Unium Bioscience programmes were statistically rigorous and the results significant.”

*“The initial results look very interesting. We are excited to progress the trial work further.”*

**Matthew Smith, Farm Manager, J & J Burnett Ltd**



*“We tested field strips, and where we applied more readily-efficient forms of biological phosphate early, we saw a marked trend in more tuber numbers.”*

**Andrew Cromie, UK Commercial Manager, Unium Bioscience**

Andrew Cromie of Unium Bioscience.



**NUE programme**

Andrew added: “We tested field strips, and where we applied more readily-efficient forms of biological phosphate early, we saw a marked trend in more tuber numbers, which is an early indication of a strong yield potential.

“The NUE programme was initially designed to replace bagged chemical fertiliser with biological fixed sources of nutrients, and the programme plus the farm standard clearly made the potatoes bulk more with less artificial fertiliser.

“One litre of Unium’s newly developed Tarbis was applied at rosette stage. This is a foliar applied option developed with the same strains of nitrogen fixing endophytic bacteria as the industry leading seed treatment Tiros. Two applications of Twoxo were made at one litre per hectare, the first at tuber initiation and the second went on two weeks later.”

Twoxo is a unique signalling molecule designed to increase nitrogen assimilation and carbon sequestration. There are two enzymes that play an important role in nitrogen metabolism, glutamine synthetase (70% in non-pulse crops cereal crops) and asparagine synthetase (30% in non-pulse crops cereal crops).

“Twoxo works 100% on the glutamine pathway and what scientists proved with over 30 years of research was the link between carbon and nitrogen metabolism in this pathway,” said Andrew.

“The product has two modes of action, the first is when the plant photosynthesises and fixes carbon, the Twoxo signals to the plant to upregulate the N uptake to bond to the carbon. It can also upregulate photosynthesis to bond carbon to N.

“The carbon helps to keep the balance in the assimilation. We know that excess use of N causes lush floppy growth, making cells extend rather than divide, and carbon is central to optimising N use in the plant. Also, if excess N is exuded off the leaf it encourages pathogens and bugs.

“It’s not simply about cutting back N, it’s about managing it effectively.”

**PUE programme**

The PUE programme saw the reduction of phosphate by 75%, a big reduction in traditional chemical fertiliser applications.

“Two litres of Luxor were applied to the furrow at planting, then two litres of both Luxor and Calfite Extra were applied at tuber initiation. This programme encouraged the

plant to root and scavenge for the readily available phosphate more efficiently, and with P indices at 4 across the field, optimising PUE was crucial,” Andrew said.

“The most important aspect to consider with nutrients such as phosphorus, is availability. For phosphate, it exists in three pools in the soil but only the inorganic form dissolved in soil water is readily available to the plant.”

Andrew says that using the biostimulant Calife Extra acts as a ‘scavenging stimulant’ on the plant, designed to improve crop rooting and maximise nutrient uptake, whereas Luxor provides phosphate supply through maximising availability and reducing adsorption in the soil.

“The pidolic acid found in the biostimulant, Luxor helps a crop to make the most of this availability while increasing nitrogen assimilation. Combining this with the calcium phosphite found in Calfite Extra tricks the plant into thinking it’s phosphorus deficient, so it increases its uptake,” he said.

**Next steps**

Phil Warham, Agronomist at Agrovista, also worked on the trials and says they are looking to do bigger trials this year for J & J Burnetts.

“We’re looking at strip field trials this year and if we can show it works at field scale, we will move up to trials of between 10-20 hectares.

“The results are exciting for growers looking for an economical and environmental solution. Key for us is that yield, and quality is not compromised, and the trials clearly demonstrate this. Our growers want to do better with less, ideally,” said Phil.

He said the products are tank mixable which makes them easy to use. **PR**



Phil Warham, Agronomist, Agrovista

*“We’re looking at strip field trials this year and if we can show it works at field scale, we will move up to trials of between 10-20 hectares.”*

**Phil Warham, Agronomist, Agrovista**

# Fungicide resistance management firmly in the spotlight

A rapidly-evolving European late blight population has sparked much discussion in recent months. *Potato Review* gets some expert advice for the 2024 season

**P**OTATO growers need to learn to live with fungicide-resistant late blight strains that are now established across northern Europe, with good hygiene practices and mixing and alternating of different fungicide modes of action key to maintaining control, according to an agronomy specialist.

Shropshire-based specialist Denis Buckley has been warning for some time that the European industry practice of blocking fungicide applications is irresponsible and risks resistance development.

The use of blocking, whereby three or more consecutive sprays of the same fungicide are applied to a potato crop, has been widespread on the continent for many years, despite a couple of scares, one major, one minor.

The major scare came when the fluazinam-resistant EU\_37\_A2 genotype emerged a decade ago, with blocks of the active substance being used alone in late blight control programmes in countries like The Netherlands. This strain then spread to the UK, causing severe storage losses in many crops.

After a drop in fluazinam use, the genotype never came to dominate, but the practice of blocking other fungicides continued, and the consequences are now clear to see.

## European spread

The EU\_43\_A1 lineage was discovered in Denmark and has spread across Europe. Some 43\_A1 isolates are completely resistant to CAA inhibitor fungicides like mandipropamid, found in the product Revus.

In 2023, it was responsible for about 36% of late blight samples processed by the European-wide monitoring initiative Euroblight and some 43\_A1 isolates have also proven to be resistant to OSPBI fungicides like oxathiapiprolin.

In the same season, newly-reported genotype EU\_46\_A1 was responsible for 96 positive late blight samples and is also resistant to OSPBIs.

“The European industry has always been hostile to mixing and alternating, perhaps for practical simplicity, and it’s finally bitten them in the rear end.

“Having genotypes resistant to CAAs and OSPBIs is a major blow. If you take away these two important chemical groups, it puts a lot of pressure on all the others, apart from mancozeb, which is very low risk in terms of developing resistance,” said Denis.

The genotypes of concern have not yet been discovered in the UK, but Denis reminds growers that the distribution data of late blight genotypes relies on samples sent in by growers and agronomists.

Therefore, it is perfectly feasible that they are present in the UK somewhere but haven’t yet been picked up.

“Seed is a very important source and isolated outbreaks [of 43\_A1] in Brittany, Portugal and Ireland have almost certainly been seed related.

“I advised growers not to buy imported seed this year, but with availability a problem, there will inevitably be stocks coming in, which carries a real risk of importing fungicide resistant strains with it,” warns Denis.

Shropshire-based specialist Denis Buckley has been warning for some time that the European industry practice of blocking fungicide applications is irresponsible.



### Multi-site use

So, what does this mean for the upcoming season?

Controlling primary inoculum sources such as dumps or cull piles is a neglected practice, says Denis, and with the threat of new strains this should be the priority as new crops come through the ground this spring.

Keeping on top of volunteers, with the help of maleic hydrazide products like Crown MH applied in season, and solanaceous weeds in and around the farm is another key part of integrated pest management (IPM) strategies for potatoes.

Once the season is up and running, Denis believes “data is everything” and the work at James Hutton Institute in Dundee as part of the Fight Against Blight monitoring initiative will be more important than ever in 2024.

Scottish Government-funded work at JHI is looking to develop DNA-based tests that will generate rapid feedback on the resistance status of 43\_A1 isolates during the 2024 season.

This information will help agronomists and growers make more informed decisions during the season, but in the planning stages, mixing and alternating different modes of action through the programme should underpin thinking.

In crops grown from imported seed, Denis will be using CAA or OSPBI fungicides with caution early in the programme and will be mixing them with full rate of mancozeb.

Even where crops are grown from British seed, growers shouldn't take any undue risks and mancozeb should feature with every spray for at least the first half of the programme.

“It's the one fungicide with multi-site activity and no known resistance issues,” Denis said.

### Updated guidance

For Prime Agriculture Agronomist Alistair Neill, his programmes haven't relied heavily on

CAA-inhibitor fungicides in recent years, but he has maximised the use of OSPBI fungicide oxathiapiprolin in products like Zorvec Endavia.

He says its strong activity on late blight has seen it find favour at times of the year when growers have a heavy workload elsewhere, such as early on in cereal harvest, giving them peace of mind that crops are protected.

However, manufacturer Corteva has issued new stewardship advice for using its oxathiapiprolin products, including a reduction in post-Zorvec spray intervals, advice on mixing and alternation and a reduction in maximum number of applications.

He says this has prompted more thought about where it will be used, and he suspects that he will switch out an early Zorvec application at late rapid canopy stage for Privest (ametoctradin + potassium phosphonates).

“Its mobility in the plant is very good, so it ticks that box. You then have your Zorvec applications to use later in the programme when we know more about how the season will play out,” says Alistair.

### Early sprays

Technical Manager at Certis Belchim, James Cheesman, says there has been plenty of debate about how to start late blight programmes in 2024, particularly around fungicide groups affected by resistance.

With resistant strains potentially harboured on seed, ready to cause an outbreak when crops emerge, he agrees there needs to be caution, but as with 37\_A2 and fluazinam, active substances shouldn't be thrown by the wayside at the first sign of trouble.

“With 37\_A2 at very low levels, a Shirilan (fluazinam) + mancozeb mix is a very good option for the earliest sprays, as is Ranman Top (cyazofamid) + mancozeb, which starts to build in tuber blight control at the early stages of tuber initiation,” said James.

This is something Alistair agrees with, and fluazinam will be featuring early in his programmes, alongside multi-site mancozeb, as it will free up other useful chemistry for later in the season. →

*“The European industry has always been hostile to mixing and alternating, perhaps for practical simplicity, and it's finally bitten them in the rear end.”*

**Denis Buckley, Agronomist**

Technical Manager at Certis Belchim, James Cheesman, says there has been plenty of debate about how to start late blight programmes in 2024.



*“With 37\_A2 at very low levels, a Shirlan (fluazinam) + mancozeb mix is a very good option for the earliest sprays, as is Ranman Top (cyazofamid) + mancozeb.”*

**James Cheesman, Technical Manager, Certis Belchim**

There was also hope that falling levels of phenylamide-resistant genotype 13\_A2 would lead to active substance metalaxyl-M being reintegrated into programmes to help with resistance management.

However, Denis points out that incidence of 13\_A2 rose in 2023 FAB monitoring data, so will strike a blow to any plans to use the fungicide more often, other than in specific situations.

“It’s useful early in the programme for its activity on pink rot, caused by *Phytophthora erythroseptica*, where you have a known susceptible variety, or in fields where there is a history of the disease,” he adds.

### Protecting cyazofamid

Denis believes a key consideration when planning late blight fungicide programmes is protecting the efficacy of cyazofamid.

Apart from fluazinam, potato growers are reliant on just two other fungicide groups for controlling zoospores, which are washed into the soil and cause tuber blight that can lead to huge losses later during storage.

The fungicides offering activity on zoospores include fluopicolide, one of two actives in Infinito, and Qii fungicides cyazofamid and amisulbrom.

Ranman Top is a protectant fungicide used early in the programme during the rapid

canopy phase, as it has some local systemic activity, then later in the programme to build in tuber blight control.

“We are very dependent on the continued activity of cyazofamid. I can’t overemphasise the importance of protecting it,” says Denis.

“I think Certis Belchim should beef up its advice on resistance management and reduce the number of consecutive applications on the label from three to two. They should also recommend always mixing it with a fungicide with a different mode of action.”

James says that blocking three applications of Ranman Top is not something he is aware of British growers doing, and it is certainly not a strategy the company would recommend.

Two consecutive applications of Ranman Top are more common at the end of the season, as it works well in combination with desiccants like Gozai (pyraflufen-ethyl) to provide tuber blight protection late in the season.

However, growers often use Ranman Top + Gozai in the first desiccant spray and follow that with another desiccant mixed with Infinito as a final application.

### FRAC Guidance

James says in a year when late blight pressure is normal and 12-14 sprays are required in a maincrop storage variety, there shouldn’t be any need to block or apply consecutive applications.

“We have always said to follow FRAC (Fungicide Resistance Action Committee) guidance and to mix and alternate any product, including Ranman Top.

“It’s a tried and trusted formulation and following that advice will help protect its long-term efficacy. Good programme planning ahead of the season is an important part of the process too, ensuring that its foundations are built on good resistance management,” he adds.

Suitable mixing partners for Ranman Top include Shirlan, or where pressure is higher, a three-way mix adding Shirlan and Cymbal (cymoxanil). This will offer control of all known resistant blight strains and add some kick-back activity from the cymoxanil component.

“For a belt and braces approach when you’re really up against it, mixing Ranman Top with a product like SIMPRO (cymoxanil + propamocarb hydrochloride) could be a good choice.

“You are getting the antispore activity of propamocarb, along with some kick-back from cymoxanil, plus the strong protection provided by cyazofamid,” James said.

This is particularly pertinent as the GB dominant strain, EU\_36\_A2, has a sporulation capacity of 818,000 spores per week at a temperature of 18C, putting it ahead of 43\_A1 at 693,000.



## Table of late blight fungicide groups for mixing and alternation

Group	FRAC code	Actives	Example Products
Benzamides (pyridinylmethyl-benzamides)	43	Fluopicolide	Infinito
Benzamides (toluamides)	22	Zoxamide	Presidium
CAA-fungicides	40	Mandipropamid Dimethomorph Benthiavalicarb	Revus Morph Zorvec Endavia
Carbamates	28	Propamocarb hydrochloride	Infinito Proxanil Simpro
Cyanoacetemide-oxime	27	Cymoxanil	Cymbal 45 Drum
Dithiocarbamates	M03	Mancozeb	Manzate 75 WG
Phenylamides	4	Metalaxyl-M	Fubol Gold WG
Qil (Quinone inside inhibitors)	21	Cyazofamid Amisulbrom	Ranman Top Shinkon/ Gachinko
Qol (Quinone outside inhibitors)	11	Famoxadone	Tanos
QoS1 (Quinone outside inhibitor, stigmatellin binding type)	45	Ametoctradin	Enervin SC
Uncouplers of oxidative phosphorylation	29	Fluazinam	Shirlan
OSBPI (oxysterol binding protein homologue inhibition)	49	Oxathiapiprolin	Zorvec Enicade Zorvec Endavia Zorvec Entecta

*“I advised growers not to buy imported seed this year, but with availability a problem, there will inevitably be stocks coming in, which carries a real risk of importing fungicide resistant strains with it.”*

**Denis Buckley, Agronomist**

It's also almost double that of EU\_6\_A1 and EU\_13\_A2 according to Certis Belchim research at its Belgian research station at Londerzeel.

### Application

The final piece of the puzzle when managing late blight risk is getting the appropriate programme applied at the right time and in the right way.

Denis points out that larger growers with more ground to cover are normally spraying on planned seven day intervals, reducing the risk of things falling apart if pressure suddenly changes.

He warns against stretching intervals any further than that if sprayer capacity is on the edge, but in a hot and dry season and where growers are managing a smaller area of potatoes, there could be a case for longer intervals.

“They can whip out with the sprayer in very short order and cover the ground [if conditions change], so there is some flexibility there,” says Denis.

Sprayer setup, nozzle choice and water rates are crucial in ensuring spray coverage is optimised.

Any GPS auto shut off systems should be set up correctly to avoid any misses when coming in and out of work, and angled nozzles have been shown to give best results at both early growth stages and on a stable canopy.

“Water rates should be a minimum of 200L/ha, which will give the best balance between efficiency and coverage of the target,” concludes James. **PR**

*Prime Agriculture agronomist Alistair Neill, has maximised the use of OSPBI fungicide oxathiapiprolin.*



# ‘No current resistance issues – but don’t become complacent’

Experts warn to be alert for resistant blight strains this season.

**W**ITH the rise of strains resistant to vital chemistry on the continent, potato blight control could face a challenging season ahead, but ongoing testing has so far showed the UK has not been affected by the resistant strain.

However, changes to chemical regulations will increase future challenges.

EU\_43\_A1 (EU43) remains undetected in the UK, although it has now been found in Ireland. This strain and an additional related strain, EU\_46\_A1 (EU46), account for almost 40% of the samples analysed across Europe by EuroBlight, a consortium of organisations studying late blight across Europe.

In 2022, EU43 primarily concerned Danish growers, but it has spread to become the dominant strain in the Netherlands (52%), Germany (52%), and Belgium (36%) in 2023.

Fortunately, the frequency of EU43 in Denmark fell from 64% in 2022 to 24% in 2023, indicating a potential fitness penalty and that the sensible use of carboxylic acid amide (CAA) fungicides can reduce the selection pressure for this strain.

Research leader at the James Hutton Institute, Dr David Cooke, said: “We analysed 946 samples last year, and there is still no EU43, which is good news.”

He and Dr Alison Lees lead the team running the Fight Against Blight monitoring service, which is enabled by industry sponsors and is still seeking funding to run this season’s service.

“In the UK, we mostly have EU\_36\_A2. This doesn’t mean blight is easy to manage, but at least we don’t have resistance issues,” said David. “All the fungicide testing has shown

that the UK isolates are sensitive to all the main actives, apart from the known fluazinam issue with EU\_37\_A2.”

The learnings from the continent continue to resonate, he added. There, mandipropamid and oxathiapiprolin resistance exists and is widespread in the case of mandipropamid.

It is still debated whether the level of resistance amongst the CAA fungicides varies. Regardless, experts caution that CAA-containing fungicides should be used judiciously and that the FRAC CAA working group guidelines are rigorously followed.

“If we do find EU43 (in the UK), the first thing we will need to do is test what variant of the lineage it is and whether it has the resistance or not. There are variants of EU43 which are sensitive to mandipropamid and oxathiapiprolin, and some which are resistant to both,” said David.

The James Hutton Institute has been developing genetic markers for mandipropamid and oxathiapiprolin resistance as part of Scottish government funding. David anticipates that they will be able to use these to determine whether any field samples of EU43 in the 2024 season have the mutations associated with fungicide resistance.

“The EU43 found in Ireland is a concern because of the prevailing wind. Our view is once it has been found, there must be others. They just haven’t been sampled. Early potato crops in Pembrokeshire and Cornwall will be of interest and should be monitored closely,” he said.

Agronomist Denis Buckley of Highfield Lodge Agronomy is principally concerned about imported seed potatoes bringing EU43 and EU46 into the UK.

*“Whatever programme I go with, mancozeb will be a large part of it. You need to be applying mancozeb, certainly in the first half of the season, with every spray. You don’t know what will turn up on your farm, and the last thing you want is blight.”*

Research leader at the James Hutton Institute, Dr David Cooke.



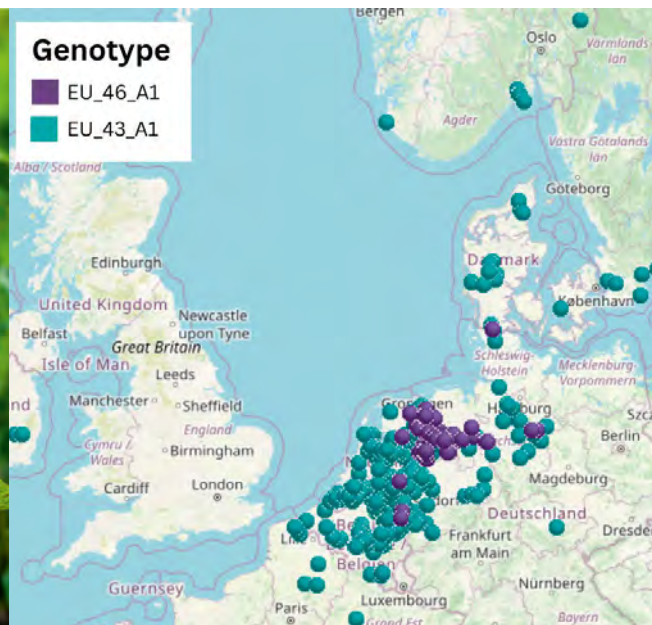
Geoff Hailstone, Potato Technical Lead for UPL in the UK.

A 7% reduction in the Northern Europe seed area in 2023, coupled with losses from downgrading and poor yield, means there will be a critical shortage of potato seed this season. There is a danger that supply problems could see seed potatoes from crops infected with EU43 or EU46 imported into the UK.

“Imported seed is more of a potential issue than anything else,” says Denis. “I have been advising my clients not to buy it, but the problem is that many are already committed and can’t source it from anywhere else.”



EuroBlight is studying late blight across Europe

Recorded EU43 and EU46 outbreaks in 2023.  
Source: www.euroblight.net

David agrees this is a risk and cites infected seed as the most likely cause of EU37 arriving in the UK because it was first detected in a distinctive node in the Midlands.

“I can’t remember the uncertainty surrounding blight control being this great,” said Denis. “The resistance that has appeared is in very important chemistry. This puts more resistance pressure on the other active ingredients that are still available. Then there is then a risk that they fall over too.”

Denis is still figuring out a robust programme of systemic fungicides for the season.

“Whatever programme I go with, mancozeb will be a large part of it. You need to be applying mancozeb, certainly in the first half of the season, with every spray. You don’t know what will turn up on your farm, and the last thing you want is blight.

“Mancozeb is the only potato blight fungicide we have access to with true multisite activity, meaning selection for resistance is highly unlikely,” adds Denis.

### The regulatory outlook for mancozeb

At present, the proposed withdrawal timelines would mean the sale and supply of any plant protection product containing mancozeb ends on October 31st this year, says Geoff Hailstone, Potato Technical Lead for UPL in the UK.

An additional year would be allowed for the storage, disposal and use of any product containing mancozeb. This means that growers should plan their purchases and usage accordingly to avoid any disruptions to their planned blight programmes.

The industry continues to lobby for the maintenance of mancozeb, citing its critical role in resistance management and disease control.

### Key considerations for blight control this season:

- EU43 and EU46 are now the dominant strains in Northern Europe, accounting for almost 40% of samples analysed by EuroBlight in 2023.
- Variants of EU43 and EU46 are resistant to mandipropamid and oxathiapiprolin.
- EU43 or EU46 remain undetected in the UK
- Try to avoid imported seed grown in infected areas and monitor those crops closely where this is not possible.
- Send samples to the Fight Against Blight to aid monitoring efforts.
- Follow FRAC and CAA working group guidance when building fungicide programmes.
- Mancozeb should be included in tank mixes to manage resistance and boost control.
- Products like Proxanil (cymoxanil + propamocarb) should also be considered. The two actives in Proxanil have no reported resistance issues; they are both from different chemistry groups and are the only members of those groups.

Geoff believes the loss of mancozeb in mainland Europe has been an important contributory factor in the increase in resistant strains, which has resulted in serious blight outbreaks, leading to yield and quality losses.

UPL plans to have Nautile DG (cymoxanil + mancozeb) and Manzate 75 WG (mancozeb) available this year.

“We are planning our production for mancozeb based on it being approved for sale this season,” said Geoff. “The UPL team is busy asking the market how much mancozeb they are likely to need and whether this is more or less than last year.

“The industry is coming off the back of a high-pressure year in 2023 and increasing concerns over resistance pressure. It is difficult to ascertain what a typical season is. I would encourage growers and advisors to speak with their suppliers to let them know what they expect to need. This information greatly helps with our production planning.”

He advises potato growers to continue to adhere to the general FRAC guidance:

Always mix products with different modes of action in the same application and alternate mixes in the programme.

“Without mancozeb, products like Proxanil (cymoxanil + propamocarb) would become even more important. The two actives in Proxanil have no reported resistance issues. They are both from different chemistry groups and are the only members of those groups.

“Cymoxanil is known to be one of the few actives with kickback activity and has a very low risk of developing resistance. Propamocarb has strong anti-sporulant activity, good movement in the plant and is only active in the carbamate resistance group.

“When tank-mixed with a protectant fungicide such as cyazofamid, Proxanil strengthens the activity and gives excellent resistance management.” **PR**

# Mix it up to max it up

Good fungicide mixing strategies will be the most effective way of managing blight this season, says expert.

**E**FFECTIVE fungicide mixing strategies are the key to managing the increasing incidence of blight resistance in potato crops according to Syngenta Technical Manager, Andy Cunningham.

Andy says growers can still retain the benefits of utilising the most potent chemistry to protect crops.

Speaking at the Potato Science Live events this spring, he highlighted how the mandipropamid mixing strategy enabled growers and agronomists in Denmark to dramatically reduce the outbreaks of CAA-compromised blight strain EU 43 from more than 70% of recorded cases in 2022, to less than 20% of outbreaks last season.

As a result, the recommendations for the use of the Syngenta product Revus in Denmark have increased by more than 60% for this season, from two applications per crop to five, with a range of fungicide mixes.

“UK growers are in a far more fortunate position, given that the EU 43 strain has never been sampled in blight monitoring programmes, and they have many more options available for mix partners that will enable them to reliably use Revus in this season’s programmes,” he said.

Andy said the product has been a potent blight fungicide for protection through the most important early and mid-canopy phase, outside of OXTP – with news that this too has now been compromised with resistance in the European blight population.

“There has been an emergence of a new blight genotype, EU\_46, in the Netherlands. We still need to understand what impact it will have. However, owing to our understanding of the resistance mechanism to CAA chemistry, there is a very good chance this new strain will be sensitive to Revus, meaning mandipropamid becomes the solution to the issue,” he said.

To ensure Revus retains its full efficacy, and to avoid selecting for any resistant strains, should they arrive in the UK, Andy advocates using it in mix with a complementary blight fungicide with an alternative mode of action. Furthermore, the partner must be used at a rate that will give protection equal in duration to Revus in the blight programme schedule.

He cited suitable partners in the UK for the 2024 season as being mancozeb, fluazinam, propamocarb and cyazofamid, as well as amisulbrom.

“There is potentially a role for cymoxanil to give kick-back activity, in the event of a weather-delayed application, but in our Eurofins blight trials, there was indication that it may not give the desired duration of protection – so intervals would have to be tightened,” he said.

Andy reported the robust resistance breaking strategy of fungicide mixing had been proven in the Eurofins trial, even in an inoculated and infection cultivated trial with the fluazinam resistant EU 37 strain, a season-long programme of fluazinam – mixed with a range of partners, maintained full or high levels of control.



Andy Cunningham, Technical Manager, Syngenta, said UK growers are in a favourable position as they have many more options available for mix partners.

“The experience of the research at Eurofins, along with R&D in Europe, has given confidence that with appropriate mixing strategies we can both minimise the risk of resistant blight strains established in the UK, and still get beneficial effects from compromised chemistry should it occur.

“Potato growers and agronomists need to take a responsible approach to planning this season’s blight strategy, and still take full advantage of the benefits of Revus for highly effective foliar blight control and, by keeping the crop clean, minimising the risk of tuber blight spread.”

The combination of mandipropamid and amisulbrom could prove especially valuable, targeted at the reduction of tuber blight risks, Andy said. **PR**

Recommended treatment applications for potato crops in Denmark have been increased this season.



# Applicators investment changes the landscape for Cambs growers



**A**CCURATE nematicide application has become more critical than ever for Cambridgeshire grower Ollie Dennis as UK potato production faces up to new and diverse challenges.

“In the 80 years since my great grandfather first established the business, I’d certainly argue that the past 10 years have seen as much change as the previous 70,” said Ollie. “However, as farmers, we often have to remind ourselves that external factors such as unpredictable weather, Brexit, inflation and larger geopolitical events such as the war in Ukraine are out of our control.

“It’s therefore all about focusing on the elements we can control, and that obviously includes keeping on-farm production costs as low as possible to ensure the business remains profitable.

“A key early spring task is nematicide application, but given that the cost of nematicide has increased by over 50% during the last 10 years, accurate application to maximise the efficacy of the product and minimise wastage is as important as it’s ever been.”

Ollie, of Dennis (Haddenham) Limited, runs a 700ha arable farm that includes 400ha of potatoes grown annually for the crisping,

chipping, packing and processing markets. He manages the family business alongside his father Jonathan and uncle William Dennis.

Ten years ago, they took the decision to replace their applicator with a Maxicast from Technat Engineering and have since invested in two more of the machines. The decision to replace the old chain-driven Horstine applicator was made after encountering calibration and maintenance problems, said Ollie, and the investment has made a huge difference to production, while keeping running costs low.

“Applying the nematicide is safe, accurate and straightforward with a closed transfer filling system and the machine’s 12 fishtail outlets, spaced at 450mm intervals along the full width of a 5.4m boom, deliver the product precisely where it needs to be within our three-bed system,” he said.

This season, the business will also be investing in an ISOBUS controller for better variable rate control and adding an auto-shut off system for more accurate headland control.

The large 400l hopper means they have to stop to refill less often, and an all-weather cover to protect the machine has been a god-send during the recent erratic weather, Ollie said.

Having recently decided to minimise ploughing, they will also be using the applicators to plant a cover crop mix to improve soil structure.

## Wet conditions increase potato soil pest threats

**H**IGH soil moisture has been identified as a precursor for pest activity, with wet areas and flood plains increasing pressure levels, and with that in mind Syngenta has been carrying out further trials on wireworm and PCN control.

Technical Manager Andy Cunningham said: “Wireworm is an increasing issue in cereal rotations, particularly where there’s grass weeds in stubble or left as cover - be that with stewardship scheme compliance or limited chance for cultivations in the autumn that disrupt the pest. Weather conditions have severely curtailed growers’ opportunities for Integrated Pest Management (IPM) cultural controls of wireworm.”

Trials in Lincolnshire last year showed Nemathorin incorporated at the wireworm rate of 15 kg/ha at the time of planting reduced the proportion of wireworm damaged tubers to 2% of the harvest, compared to 9% in untreated areas. The severity of damage was also reduced, with no tubers in treated areas showing more than five holes, and significantly fewer with one to five holes. More than 2.5% of the untreated crop had an unacceptable three or more wireworm holes.

Applying at a higher rate of 30 kg/ha in a high-pressure field situation had halved the number of tubers seriously affected by wireworm. Its application at 30 kg/ha is permitted where PCN or free-living nematodes are being targeted.



In an average of eight recent trials where PCN was present, Nemathorin delivered an average yield increase of more than 17 t/ha over untreated.

# The backed-up and the backers



**Mark Taylor**, Chair of GB Potato, outlines some of the actions being taken to support growers and suppliers in recent months, while looking to raise government awareness on current challenges.

**A**T the time of writing this, I was sitting looking out of the office window on a sunny warm day with an improving forecast.

It's about time!

I can't help but reflect on the contrast to the wet and mild winter we just experienced.

Regardless of where you stand on the climate change debate, it's hard to ignore the increasing frequency of extreme weather events, and it is significantly increasing the risks encountered in growing our potato crops. Spring workload is "backed up" and there's much to be done.

While demand for potatoes remains strong with rapid clearance from store to satisfy supply chain needs and injecting much-needed cash back to the farm, it is important to remember that while this situation benefits some growers, not all are reaping the rewards.

There is currently a lot of media interest in prospects for the months ahead, from both a supply side and especially regarding crop planting. With little crop planted in comparison with previous seasons, we are desperate for favourable weather in May.

Following record-low production volumes in 2023 and delayed planting, coupled with robust sales, we're likely to depend heavily on imports to meet market demands. Yet, much of our fate in the months ahead hinges on the unpredictable weather.

While our industry possesses the experience and agility to adapt to such challenges, it's imperative to think beyond short-term fixes. Addressing the cumulative factors bearing down on us requires a longer-term plan.

The pages of this magazine consistently emphasise the importance of recognising these cumulative challenges. As someone deeply aware of the current pressures, I make it a point to communicate our industry's challenges to anyone who will listen.

I was presented with the opportunity to voice these concerns directly with Mark Spencer, the Minister of State at the Department for Environment, Food and Rural Affairs and, at the time of writing this column, felt confident in presenting our industry's case. However, the real test lies in whether Government is truly listening.

It's crucial to return to discussing and developing a longer-term strategy. Simply lurching from one season to the next is not a viable business plan, nor is it something we can present to our bank managers. Longer-term thinking and commitments breed confidence and pave the way for reinvestment in operations.

Despite the wet winter and spring, it's inevitable that we'll require irrigation throughout the growing season. Advocating for responsible water usage through initiatives like Water For Food, of which I am the Chair, will shape future policies on water allocation.

As abstraction licences come under review, now more than ever, it is vital that the industry is recognised for its judicious and careful use of water to produce food. GB Potatoes is a key collaborator in Water For Food and represents the interests of the whole GB potato industry.

Similarly, the retention of Plant Protection Products (PPPs) is back in sharp focus as we contemplate the evaluation of mancozeb. Scanning the horizon for the future at-risk substances is vital if we are to build a case to help retain the products that the industry will struggle to manage without and GB Potatoes is hot on the case.

Of course it is vital that we recognise that any PPPs that we use are not associated with any health risks and are as environmentally friendly as possible, so picking our fights will be an important part of our approach, including informing regulators of the needs for these products and demonstrating responsible usage. Having that single voice to communicate the industry's ethical credentials to those that make the decisions is what GB Potatoes is all about.

Seed production in Great Britain also faces significant challenges, with implications for supply. Despite boasting a seed industry globally renowned for producing top-quality and healthy seed, all parts of the industry must collaborate to preserve this. As with all agricultural sectors, fostering strong relationships is pivotal for success, and now is the time to build these relationships with your seed suppliers.

The era of cheap seed is a relic of the past, and understanding the quality of your planting material can significantly impact your business.



The synergy between the seed and ware industries is undeniable. They are inter-dependent.

Working together is the only way forward. Seed shouldn't merely be viewed as a commodity. It serves as the foundation of a successful crop. Strengthening and broadening the relationships between these two sectors is imperative to ensure a robust supply of top quality seed for 2025 and beyond.

I trust these illustrations have provided insight into the significance of having a dedicated industry organisation. GB Potatoes serves as that crucial entity, established for the reasons outlined above and numerous others. But to effectively advocate on your behalf, we require your support.

We seize every opportunity to articulate the challenges confronting our sector to policymakers, regulators, and the government and we will continue to champion our sector's longer term needs.

GB Potatoes is looking to shape the future of the potato industry and ensure its resilience and prosperity through a collective voice. If you are interested in making a difference to the potato industry please get in touch to become a member or for further information: [info@gb-potatoes.co.uk](mailto:info@gb-potatoes.co.uk) / [www.gb-potatoes.co.uk](http://www.gb-potatoes.co.uk)





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# Keeping on top of virus, pest and disease

This month **Andrew Goodinson** looks at some of the viruses and pathogens affecting potato crops, offering key insights into how to achieve the best control possible.

**P**RAGMATIC strategies are needed for keeping on top of early blight this season, with the future loss of the only multi-site active blight control active looming large.

But while the loss of mancozeb is a cause for concern, there is no need for blind panic, according to Andrew.

The dates for withdrawal and use-up are yet to be officially announced. It can still be used for this season at least, but as soon as the death sentence has been given, processors may decide to remove it from their preferred product list for 2025, he said.

“Mancozeb has been on the market for 60 years, and as there are now concerns over its effects on humans as well as its environmental profile, we should anticipate its loss, so we need to move on.”

The impact of *Alternaria* on a field relies on a number of criteria such as varietal susceptibility, plant stress and weather conditions, and isolates may be more virulent owing to different weather and/or climate conditions, he suggests, cautioning that this needs scientific confirmation.

“Extended weather conditions can create more plant stress, and therefore higher stress levels, so we need to think about how we can best manage that stress. We know that the pathogen grows better at higher temperatures, thus the link with climate change has been suggested.

“More research is being done on the performance of potential replacement actives as well as integrated crop management solutions, but because last year’s weather was surprisingly not conducive to *A. Alternata*, results were often inconclusive.”

At the time of writing, soils were very wet, and 2024 may have a difficult planting season subjecting potato crops to stress, owing to soil conditions restricting root growth and nutrient utilisation. This will make them more susceptible to pathogens such as *Alternaria*.

If the weather later in the year becomes hot and dry (often in early July) creating heat stress for the crop, later-planted crops which have not achieved full canopy, appear to suffer first.

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.



*“PLRV has a latent period of 24 hours, and one of the challenges in seed potatoes is that it can be difficult to see symptoms. There is some upward leaf rolling and some purple edges of leaves.”*

Of the two species affecting potato crops, *A. solani* and *A. alternata*, *A. solani* comes in earlier, is more aggressive and tends to affect the newer leaves which then become covered by the canopy as the plant grows.

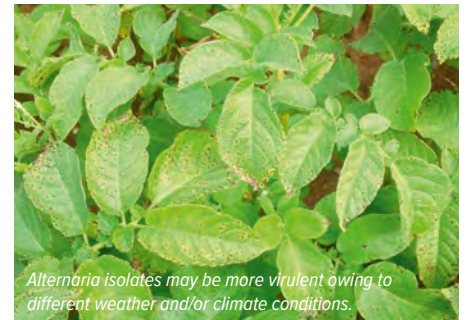
“*A. alternata* needs more help from factors such as plant stress for it to infect the plant, and the six to eight-day latent period between infection and symptoms appear. However, once it has become established, it is more difficult to control.”

Andrew recommends targeted applications of *Alternaria*-active fungicides before flowering to high-risk crops, to protect the crop before the disease can get established.

The lesions caused by *A. solani* are larger, more random, and angular, and the pathogen is more aggressive, and affects the new leaves, it is easier to control.

He warns that there is increasing concern about *Alternaria* spp isolates showing reduced sensitivity to fungicides belonging to the Quinone outside Inhibitor (QoI) group of fungicides, and both species are also less sensitive to strobilurins and older SDHIs.

“This implies we need to incorporate IPM methods and treatments which help reduce stress and infection, as they are likely to play a key role in preventing disease development. Ensuring plant nutrient levels and soil moisture are adequate for the crop is key, and if it is irrigated, ensure the strategy is suited to the environmental conditions during the first six weeks of crop growth.”



*Alternaria isolates may be more virulent owing to different weather and/or climate conditions.*

He often recommends strategic use of biostimulants to help reduce crop stress (it’s a bit like ensuring lambs and calves have colostrum soon after birth) and this year is going to look at potential benefits of Scyon as a means to reduce *Alternaria* susceptibility. It is currently used in cereals at T0 as a biostimulant.

“These strategies are particularly relevant if you are growing susceptible varieties such as Markies, Melody or King Edward,” said Andrew.

He also points out that *Alternaria* can be confused with magnesium deficiency, which can easily be clarified by nutrition tests. *Botrytis* can also have symptoms at flowering time.

But the news is not all bad, he emphasises, noting that products such as Caligula (fluopyram and prothioconazole) have raised standards above those of difenoconazole.

“When used together as part of a well thought-out IPM strategy, growers should be able to keep on top of this pathogen.” →

### Aphid control key to keeping virus infections to a minimum

There has been a lot of discussion about aphids and the devastating effects they can have when they transmit viruses or damage plants by direct feeding damage.

Both seed and ware sectors are affected. Aphid-transmitted viruses are a major reason for crops failing seed certification and in ware crops they cause damage to haulm and tubers affecting yield and quality.

Key factors to of virus management remain location choice for seed, the correct timing of chemistry applications combined with cultural controls, Andrew said. This includes removing volunteers from elsewhere in the rotation and in neighbouring crops as well as other virus host plants such as black nightshade

Aphid control has become much more challenging, particularly in ware crops, because of a lack of effective chemistry.

Andrew said this is partly because historical over-reliance on pyrethroids led to resistance developing in the peach potato aphid (*Myzus persicae*) and the grain aphid (*Sitobion avenae*) and also because the available actives, flonicamid (Teppeki) and acetamiprid (Insyst) have label restrictions for ware.

“Insyst can be used once on ware, but the window for use is very narrow, between tuber initiation and July 31,” he said. “The majority suppliers and/or processors do not accept ware crops treated with Teppeki. As a result, many growers still apply pyrethroids, despite warnings to avoid them because of resistance issues.

“Monitoring and managing aphid populations is really important because they vector persistent and non-persistent viruses to potato plants as they feed on them.”

He draws attention to complementary ways of reducing the number of aphids landing in the crop, as a means of reducing the virus load. This includes research evaluating regenerative methods of growing potatoes using straw mulch. These methods are being used in seed growing areas.

“Aphids are attracted by the colour difference between the brown soil and the green crop, so by creating a lower visual contrast of plants we may be able to reduce the attraction of the crop to in-coming aphids.

“This method could prove to be effective in the growth period from emergence until canopy closure in seed crops. In addition, mineral oils can be applied in seed crops in the early stages of crop growth because they can block up the aphid’s stylet and reduce virus transmission.”

Andrew goes on to point out that not all aphids landing on the crop are colonising and non-colonising aphids can also create challenges for growers.

“This is because these aphids briefly settle on crops and may introduce virus into the plant before moving on to other crops.”

He explains that persistent viruses are only acquired from infected plants by aphids.

“The aphid picks a persistent virus only after feeding on an infected plant for several hours and it takes several hours more to go through its digestive system before it can then transmit the virus.

“However, after this stage the aphid is infected for life and has the capability of infecting potato plants it subsequently feeds on.”

Persistent viruses include Potato Leaf Roll Virus (PLRV) and Potato VirusX.

“PLRV has a latent period of 24 hours, and one of the challenges in seed potatoes is that it can be difficult to see symptoms. There is some upward leaf rolling and some purple edges of leaves.”

Last year, seed-borne PLRV was misdiagnosed in a few ware crops as being aphid feeding damage, reports Andrew.

“Infection was random, sometimes affecting a few plants in a field to, occasionally, whole areas. This was down to variation in the seed lot because the virus can be passed into daughter tubers, causing stunted plants, and, owing to high starch accumulation, older leaves become rolled and tough, reducing their ability to photosynthesise.”

As a result, yield losses can be around 5%, depending on the varietal susceptibility. Daughter tubers can develop tuber necrosis, which affects fry quality and tuber shape.

Andrew points out that aphids that do not colonise potato crops but can still cause problems by transmitting non-persistent viruses. These include potyviruses (PVY, PVA), also known as mosaic viruses.

“The aphid picks up a non-persistent virus with its stylet when it probes a host plant, and holds the virus in the mouthpart, passing the virus between the plants it subsequently lands on,” said Andrew.

“Potato VirusY, which is non-persistent, is acquired in seconds when vectored and has no latent period, is spread mainly by the peach potato aphid, with other aphids also able to transmit virus.

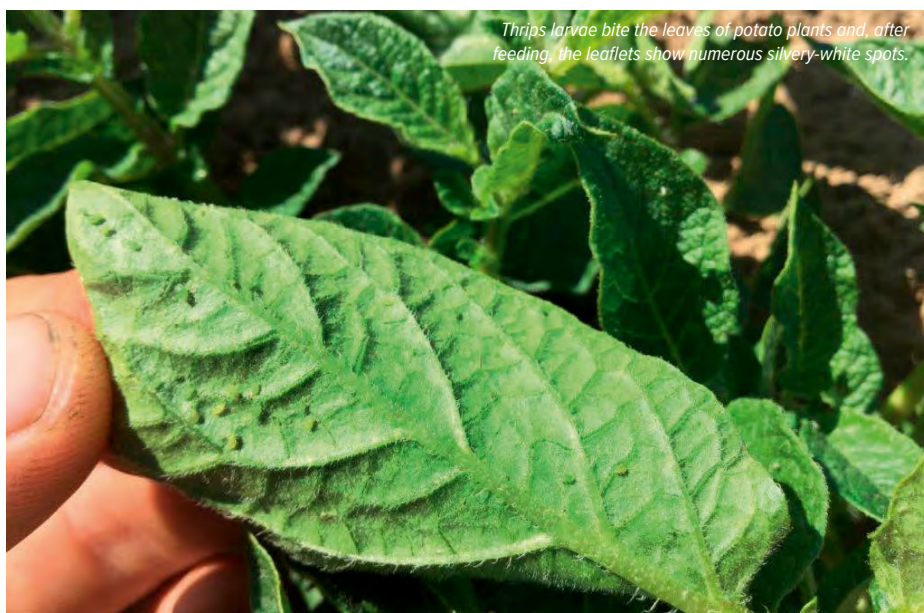
“Symptoms of these mosaic viruses can be similar, showing lack of plant vigour, smaller leaves, leaf distortion and mottling, and cracking on the tuber surface.

“As a company, Hutchinsons nationally monitor aphids, using the forecasting tools and water traps to help predict numbers and timing for their entry into crops. This is a real challenge for growers to deal with, as transmission to a potato crop is really fast and often the aphid has transmitted the virus before the insecticide kills it.”

Planting certified seed will help reduce the risk of virus inoculum being present in the daughter tubers, emphasises Andrew.

“When presented for certification, tolerances to virus have been reduced over the past ten years, so the risk of seed-borne virus is higher, resulting in a greater risk of infection and spread.”

*“Aphids are attracted by the colour difference between the brown soil and the green crop, so by creating a lower visual contrast of plants we may be able to reduce the attraction of the crop to in-coming aphids.”*



*Thrips larvae bite the leaves of potato plants and, after feeding, the leaflets show numerous silvery-white spots.*

*“If you suspect you have FLN, it is important to test to see if they are carrying tobacco rattle virus, which can cause internal defects, gappy, patchy, stunted crops.”*

### Potato mop top virus (PMTV)

Carried by the powdery scab fungus *Spongospora subterranea*, PMTV can remain in the soil for many years, infecting potato crops when conditions become favourable, such as wet soils.

“It is often spread from seed tubers with powdery scab and infects roots and tubers, and part of the challenge is that if the mother tuber has symptoms, PMTV does not show until the second generation,” said Andrew.

The virus causes spraing and is often associated with internal blemishing leading to rejections.

“It is a virus we rarely see in the west but ensuring that volunteers and potato relatives such as nightshade are promptly removed will help reduce risk of infection, as will ensuring that seed potatoes are clean.”

### Looking behind Verticillium wilt in potato crops

The pathogen appears to be soil-borne, so when it is already present in the soil, anything causing crop stress is likely to make the plant more susceptible, says Andrew.

“It is a fungal disease of the vascular tissue of the potato and is often seen in small patches.

It can affect one side of the stem and can be identified by cutting the stem at an angle and seeing some vascular browning.

“Once *Verticillium* has infected the plant, it damages the stem, affecting nutrient uptake, and therefore results in stunting and causes premature plant senescence, creating a yield hit.”

He notes that there are many different sub-species, but in general the fungus occurs in wet, low-lying areas.

“Control is best done by choosing the right location to grow the crop, ensuring all seed is clean and avoiding areas with high nematode populations that can damage the roots.”

### Sclerotinia

*Sclerotinia* is another soil-borne pathogen with a wide host range, which allows it to survive from season to season, warns Andrew.

Tending to occur where oilseed rape is in the rotation, it can infect potato crops post-flowering.

“It is often confused with black-leg because the stems go soggy, but as the crop dies off you can see the sclerotia,” he says. “Effective control can be achieved with the use of fluazinam, which can be applied twice at full canopy as part of the blight control strategy making sure you add in another blight controlling active.”

### Nematodes update

Planting crops too early before conditions are ideal, can increase the risks of damage from both PCN and free-living nematodes (FLN), warns Andrew.

This is because in poorer planting conditions root systems are reduced leaving less ability for the plant to compensate for any soil pest attacks.

He recommends testing soils for FLN at the same time as PCN, based on previous history.

“If you suspect you have FLN, it is important to test to see if they are carrying tobacco rattle virus, which can cause internal defects, gappy, patchy, stunted crops. Such symptoms are often incorrectly attributed to soil-borne rhizoctonia as the pathogenic FLN species damage roots, opening them to infection.” **PR**



Andrew and his team nationally monitor aphids, using the forecasting tools and water traps to help predict numbers and timing for their entry into crops.



Seed tubers with powdery scab are responsible for spreading potato mop top virus (PMTV).



Last year's weather was surprisingly not conducive to *A. Alternata*.



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## HERBICIDES

### ‘Glyphosate ban would lead to difficult trade-offs’

New modelling shows reduced yields if widely-used herbicide is withdrawn.

A UK ban on glyphosate, a herbicide used by many potato growers, could lead to an increase in weed abundance and a decrease in crop, according to a new modelling study. Rothamsted’s Dr Helen Metcalfe led the study. She said: “Glyphosate, the most widely used herbicide, is linked with environmental harm and possible human health issues, but its use is central to no-till farming approaches. Public pressure is now building for it to be replaced in agricultural systems. We wanted to find out what the implications of a ban might be.”

Approval for glyphosate use in the EU expired in December 2023, following an extension to the renewal assessment process in 2022. In the UK, the current expiry date is set to be December 2025, following a three-year extension as the UK’s post-Brexit pesticides regulatory regime was developed.

Glyphosate is applied to the leaves of potato plants to kill both broadleaf and grass weeds.

The treatment is widely used in potato farming, but in regenerative systems focussed on improving soil health in particular, glyphosate is important for weed control in no-till stubbles and the management of cover crops and leys. The environmental and health issues associated with glyphosate may trade-off against some of the benefits of moving to more sustainable systems that reduce tillage and integrate cover crops, the study found.

The study team modelled the impacts of discontinuing glyphosate use and replacing it with alternative control methods.

“Integrated Weed Management with more use of cultural control methods offers the potential to reduce chemical use but is sensitive to seasonal variability and can also have some negative environmental and economic impacts,” said Helen. “The uncertainty associated with the non-chemical approaches we tested supports the view that adoption of IWM requires multiple options adapted to the local environment. This will however require careful consideration and a strong grounding in the principles of weed ecology and biology.”

In the study, introducing more grass leys or spring cereals into the crop rotation inevitably led to a decrease in food production owing to the replacement of high-yielding crops with less productive alternatives. Overall, the study team hope that the modelling exercise will encourage more growers to experiment with alternative weed control strategies. “Simulation studies like this one can help to carefully assess any management changes, as it is not always possible to predict outcomes when so many variables - including the weather - are playing a key role,” said Helen. **PR**

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Harley and Jake Nelson run a jacket potato business in Preston from an old tram carriage.

# SPUD CELEBRITIES!

Baked potato vendors in Preston and Tamworth have found fame thanks to social media and are convincing international travellers to come sample their British jackets ...

**S**PUD Brothers' Harley and Jake Nelson, who run a jacket potato business in Preston from an old tram carriage, have become social media celebrities after their videos attracted more than 17 million likes on TikTok.

The business, which they took over three years ago, is based at Preston Flag Market. The team also 'go on the road' in the tram, taking bookings to serve at events such as birthday parties, weddings, and corporate parties.

Jake, 28, and Harley, 21, took over the business at the start of the year and renamed it Spud Brothers. It was formerly called 'The Hot Potato Tram' and had been serving up hot potatoes and parched peas to customers in Preston since 1955, when it was set up by Ernie Rhoades.

Ernie kept the business in his family, handing over to his nephew Keith in 1978. Following his death in 2020, his friend Tony Nelson, a chef and food industry consultant, took over and ran it before handing over to Harley and Jake three years later.

The two livestream on TikTok from their hot potato tram and the videos they've posted have attracted many new customers, including international visitors.

They film videos about working on the van, how to keep customers happy and sometimes give away free food. One of their most popular videos attracted 20 million views.

"As social media is such a big thing we decided to also put out a Spud Brothers TikTok

to get more of a word out there," Jake said in a recent interview with the *Lancashire Post*.

"When we started doing it, we got a few videos that went viral and we have currently reached 16,500 in 12 weeks but in total across all our social media platforms we are now up to 900,000."

Jake added: "Our most popular spud is cheese and beans with garlic butter, but a new contender which seems to be taking over is Tony's Tram Chilli which is made by Tony."

## Spudman helps kidney research

Tamworth town centre has been well and truly put on the map by a social media celebrity known as Spudman.

Spudman, aka Ben Newman, is the son of a potato merchant who has been selling jacket potatoes for more than 20 years. But it's when he started posting videos on social media platform Tiktok around three years ago that he became an overnight sensation.

His son introduced him to the platform as a way of attracting new customers post-Covid. A father of nine, Ben also felt that starting his own TikTok page would be a way to watch what his children were doing on the video-sharing site.

He's since amassed more than 2.5 million followers and accrued more than 44m 'likes' through posting daily videos and live streams of life in his van, where he frequently offers customers a free potato and records their reactions.

People have travelled from all over the

Ben Newman's Go Fund Me web page raised more than £10K for kidney research.

## Spudman Free day for Kidney Reseach



Ben Newman is organizing this fundraiser to benefit Kidney Research UK.

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Hey, I'm Spudman! But I am also known as Ben and I have been a renal dialysis patient since 2010. I have had three transplants but sadly they didn't work due to my aggressive illness therefore, I have a life in dialysis. I initially started this at hospital but now do it at home, dialysing 4 or 5 times a week.



With trademark pink Mohican hair-style and a beard, Ben is a cheery figure as he works out of a trailer in Tamworth town centre. Photo: *tiktok@spudarmy*

world to try his food – jacket potatoes with classic toppings such as butter, cheese and beans – and he's been interviewed on TV and by many national newspapers.

Ben is a renal dialysis patient who has weekly procedures at home and raises money for kidney research through his "free days", where he asks customers to donate to an online fund-raiser instead of paying for their potatoes. Having had three transplants himself, which sadly didn't work, he has since raised thousands of pounds for Kidney Research UK.

"I wish to raise some money to help find a cure, to help raise awareness of this silent disease, to help fund better treatment, to help with mental health aspect of this life changing illness," he said on his Just Giving page.

With trademark pink Mohican hair-style and a beard, Ben is a cheery figure as he works out of a trailer in Tamworth town centre, where people have queued for hours to sample his lunchtime offerings.

His toppings include chicken curry, minced beef, BBQ pulled pork, tuna mayo and chilli con carne

He took over his now-famous pitch after the previous owners retired. **PR**

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GROWING TOGETHER

# The holistic approach

In this issue we look at how two urea-inhibitors are holding up, the approach taken by two nitrogen 'fixing' agents, and a new biostimulant range being launched into the UK by a Finland manufacturer.

**S**INCE the beginning of April, under the new policy 'option 4', the majority of England's urea applications are now having to be applied with an inhibitor to reduce ammonia emissions.

Good integrated nutrition management is key to the approach and an inhibitor can capitalise on the carbon footprint and economic benefits of urea fertiliser, whilst mitigating the issues associated with volatilisation and ammonia emissions, according to Nick Anderson, Technical Director of farm management and advisory service Velcourt.

The contribution of one urease inhibitor, Limus, manufactured by BASF, has recently been explored in trials while a second, NitroShield, has been granted EU approval.

Nick said: "Fertiliser is our arable farms' largest direct cost and a major part of their carbon footprint. Average nitrogen use efficiency (NUE) in Velcourt crops in 2023 was 55% but there was a range of 44% between the highest and lowest. There's both an economic and environmental imperative to do better."

The company's independent trials team has been testing a range of technologies and inputs including forms of nitrogen, endophytes, photocatalysts, urease inhibitors and remote sensing.

In 2021, in conjunction with COFCO – distributor of Limus-treated urea, Velcourt



*Nick Anderson, Technical Director, Velcourt, has been testing a range of technologies and inputs.*



*Syngenta Biologicals Market Development Manager, Neil Procter, says plants' energy could be better utilised in driving growth if the N is supplied in a more readily-useable form.*



*BASF Business Development Manager, Jared Bonner, said the inhibitor NitroShield combines the efficacy of two active ingredients – NBPT and NPPT – which bind to the active centres of different urease enzymes.*



*Syngenta UK Technical Manager and biologicals specialist, Andy Cunningham, recommends that to get the optimum performance with Vixeran, crops should be actively growing at the time of application.*

started trials. Four trials conducted over two years showed that Limus-treated urea is performing at least as well as ammonium nitrate (AN) and better than untreated urea.

"Within an integrated nutrition strategy, Limus-treated urea has the potential to reduce our externalities and improve our financial performance," said Nick. "In comparison with untreated urea, it reduces ammonia emissions and air pollution. While in comparison with ammonium nitrate, Limus-treated urea lowers the carbon footprint of the crops we're producing and is cheaper per kg of nutrient."

BASF Business Development Manager, Jared Bonner, said the inhibitor combines the efficacy of two active ingredients – NBPT and

NPPT – which bind to the active centres of different urease enzymes.

"This binding reduces a reaction that takes place between the urease enzymes and urea - unwanted when urea is on the soil surface as it results in ammonia emissions through volatilisation. This also means more urea enters the soil where it is converted into plant-available ammonium, resulting in higher levels of nitrogen available for the plant to use," he said.

BASF is in partnership with four suppliers of Limus in the UK: Thomas Bell, COFCO International and Bartholomews for solid urea fertiliser products, and through Frontier Agriculture as Limus Perform for liquid fertiliser treatment. →



*The Vixeran bacterial strain, CECT 9690, has a triple mode of action, working as a foliar and root endophyte inside the plant.*

# FERTILISATION

Field Technical Manager for Corteva Agriscience, Iuliia Kovalova, says it takes one week for BlueN to colonise the entire plant.



BlueN is intended for foliar application when at least 50% of the ground is covered by the crop.



## EU approval

OMEX Agriculture's urea inhibitor, NitroShield, was recently granted EU approval.

Trials carried by OMEX's research and development team has ensured the correct amount of NitroShield is used according to the conditions at time of use. Inclusion of NitroShield with OMEX's Nitroflo range or any other liquid fertiliser containing nitrogen designed for uptake through the roots, will reduce ammonia emissions, improve nitrogen use efficiency (NUE), and consequently improve yield or provide the option of applying less nitrogen.

OMEX Technical Director David Booty said: "OMEX trials show ammonia emissions from Nitroflo alone are less than a third of that from urea – and similar to emissions from protected urea. The addition of NitroShield produces an average emissions reduction of 70% compared with Nitroflo without the inhibitor. In lab conditions, less than 4% of applied N was lost to the atmosphere when NitroShield was included."

The impact of NitroShield's approval will be particularly significant for growers in Ireland according to OMEX's speciality products director, Edward Dickinson.

He said: "Ireland's twin challenges of nitrate leaching from CAN in the east, and ammonia emissions from urea use in the west, can be significantly reduced by using Nitroflo and NitroShield together.

"The combined benefits of accurate application through a sprayer, no waste outside of the cropped

area, no yield loss on field margins from the liquid, and environmental benefits of less leaching and very effective protection against ammonia loss, make this combination a really viable alternative to protected urea."

He said growers using Nitroflo and NitroShield together will be able to declare their inhibitor use under the new DAFM regulations introduced in September 2023.

## Nitrogen-fixing

Making better use of nitrogen throughout a potato plant's cycle can reap dividends in more ways than one, and two nitrogen-fixing products, Vixeran and BlueN, have been brought to our attention this season.

Syngenta Biologicals Market Development Manager, Neil Procter says nitrogen-fixing Vixeran could provide crops with an equivalent of 30-40 kg/ha conventional N fertiliser this spring, while helping crops to cope with the increasingly-challenging seasonal conditions.

The endophytic bacteria in Vixeran convert atmospheric nitrogen into a form that is readily accessible to all crop plants, he said.

Speaking at a technical webinar in February, Neil pointed out drivers for change in nitrogen use include societal and legislative demands, the cost of fertilisers, climate change requiring reduced energy consumption and the potential for crops to perform better in improved soil microbial conditions with regenerative farming practices, including minimum tillage and cover crops.

"Creating conventional N consumes a huge amount of energy in its production. Crop plants then expend further energy to convert nitrates taken up through the root into ammonium – and then into amino acids and proteins to build biomass," said Neil. "That energy that could be better utilised in driving growth if the N is supplied in a more readily useable form."

He further believes the continuous supply of N within the plant can help to mitigate the physical constraints of conventional fertiliser application timing and weather conditions for utilisation – be that too dry for uptake or too wet and leached away.

*“Average nitrogen use efficiency (NUE) in Velcourt crops in 2023 was 55% but there was a range of 44% between the highest and lowest.”*

**Nick Anderson, Technical Director, Velcourt**



“Vixeran gives the opportunity to make better use of the resource, for more efficient and sustainable crop production,” he said.

Reporting the development of the Vixeran bacterial strain, Mónica Perdices Hoyo, Technical Director at Ceres Biotics, said that while many bacteria have the capability to fix atmospheric N - including healthy soil microbial activity - there is huge variability in the efficiency with which they can achieve it.

“The potential of *Azotobacter salinestris* species has long been recognised, but it was only through huge investment in R&D time and technology that the specific CECT 9690 strain in Syngenta’s Vixeran has been identified and optimised.

“What sets the Vixeran bacterial strain apart - and makes it so applicable for field applications - is the speed at which it gets to work and its resilience to climatic conditions, which means it will provide reliable results more consistently, in a wider range of crops,” she added.

The Vixeran bacterial strain, CECT 9690, has a triple mode of action, working as a foliar and root endophyte inside the plant, as well



*Emerald Research’s Simon Fox says the last two seasons have seen prolonged dry periods during the peak nitrogen and phosphate requirement time.*



*Naturally-occurring bacteria, *Methylobacterium Symbioticum*, which fixes nitrogen from the air and converts it into ammonium, so the plant has a steady supply throughout the season.*

*“More urea enters the soil where it is converted into plant-available ammonium, resulting in higher levels of nitrogen available for the plant to use.”*

**Jared Bonner, Business Development Manager, BASF**

as in the soil rhizosphere. The N is supplied exactly where required and not subject to any losses, she said.

Trials have revealed yield benefits in potato crops averaging more than 10%, as well as quality benefits.

Syngenta UK Technical Manager and biologicals specialist, Andy Cunningham, recommends that to get the optimum performance with Vixeran, crops should be actively growing at the time of application, ideally with temperatures reaching 10-12°C on the day of treatment to ensure rapid colonisation of the bacteria.

He suggested most growers and agronomists are likely to utilise Vixeran alongside existing nutrition inputs and to benefit from an uplift in yield from its use.

“However, it is acknowledged that there is potential in a nitrogen reduction regime to compensate with Vixeran, typically up to 30 kgN/ha and still retain the same yields as a full fertiliser programme, although trials across the UK and Europe have shown that it could compensate more.”

He added that an application of Vixeran could also be especially useful this season, to help crops that were slow to establish in the autumn, or where soil conditions have compromised root structures.

**Naturally-occurring bacteria content**

Corteva Agriscience brought the BlueN product to the market last year and the company’s Biologicals Field Technical Manager for Corteva Agriscience, Iuliia Kovalova, says, with proper timing and input, it can now make potato crops less dependent on soil nutrient uptake.

BlueN is a nutrient efficiency biostimulant that provides potatoes with an additional source of nitrogen which is available throughout the plant’s lifecycle.

Growers are advised to apply it to actively-growing plants because actively-growing plants unaffected by stress produce more methanol than stressed plants.

On average, BlueN delivers the equivalent of 30kg/ha of nitrogen. It contains a naturally-occurring bacteria, *Methylobacterium Symbioticum*, which fixes nitrogen from the air and converts it into ammonium, so the plant has a steady supply throughout the season.

By providing a sustainable, supplemental source of nitrogen, it reduces dependency of nitrogen uptake from the soil and is approved for restricted organic use.

“It is fully supplied to the plant. The optimal timing for application with potatoes is between growth stages BBCH 25 to 33, immediately before rapid canopy expansion, up to ro closure/tuber initiation,” said Iuliia.

“Where large tubers are preferred, apply between BBCH 30 and 33, when plants meet in the row or slightly later. Aim for 70% to 80% ground cover and increase phosphorous by 10% to 20%.”

She said BlueN should be applied when stomata are open, either in the early to mid morning, or late afternoon or evening. The crop must be actively growing at the time of application and it takes one week for BlueN to colonise the entire plant, she added.

The plant’s resilience is increased thanks to the season-long nutrient supply.

In trials conducted in Bavaria, Germany, BlueN produced higher yields in potato crops, with a 6% increase revealed compared to an untreated crop.

BlueN is intended for foliar application when at least 50% of the ground is covered by the crop. →



The new UPM Solargo™ range aids plant growth by improving the quality of soil microbiome and by increasing water retention.

### The margin game

The use of micronutrients, microbials and biostimulants is a working example of the definition of marginal gains – the theory that small yet significant improvements can lead to monumental results, according to Simon Fox of Emerald Research Limited (ERL) supplier of OptiYield biostimulants.

By compensating for broad soil deficiencies and ensuring access to the optimum nutrient growing mix until maturity, growers can look to maximise marketable yield and build resilience in what is likely to be an unpredictable season, he said.

“Optimised nutritional programmes have been developed from 10 years’ laboratory, glasshouse, strip and field research as well as commercial on-farm trials into the nutritional needs and responses of potatoes by growth stage, in a range of weather extremes and varying levels of disease prevalence,” he said.

“Through this extensive research, it has been possible to formulate a range of optimised growth programmes for seed, earlies and maincrop potatoes that deliver increased marketable yields on farm of 10-25%.”

‘Getting away well’ at planting is the first step, with results continually demonstrating that germinating potatoes whose roots have

*“Creating conventional N consumes a huge amount of energy in its production. Crop plants then expend further energy to convert nitrates taken up through the root into ammonium.”*

**Neil Procter, Biologicals Market Development Manager, Syngenta**

easy access to phosphates, manganese, sulphate and iron have an improved rooting efficiency, higher germination rates and produce stronger, healthier plants that are more resilient to environmental stress brought on by cold snaps or prolonged April showers, he said.

A snapshot of results from a recent east Yorkshire field trial on the crisping variety Brooke resulted in a 16.7% increase in marketable yield, valued at £1,423/ha net increase in yield value and out of specification losses cut by £400/ha

When it comes to stimulating growth and bulking, from rosette stage to late bulking, trial research also supports a holistic approach of using biostimulant formulation to sustain the crop through its most heavy nutrient demand phase and aiding nutrient optimisation within the plant, Simon said.

During trials, a mixture of bioactive compounds and minerals principally from renewable and sustainable natural resources that together aid uptake and redistribution of nutrients within the plant have shown improved resistance to heat, cold and drought stresses as well as improved photosynthetic performance.

They also revealed an increase in photosynthetic area and leaf and shoot

growth. Slowed disease ingress and progression meant the plants were stronger, while sugar content and plant carbohydrate production were intensified.

“Biostimulants that contain an ionic form of phosphorous together with zinc and copper ions, combine to reinforce plant health and crop vigour, significantly increasing the ability to naturally resist a wide range of stresses that commonly occur during vital growth stages,” said Simon.

The role played by phosphate and nitrogen in the growth and bulking stages is not in question, but rather the method of application and the last two seasons have seen prolonged dry periods during the peak nitrogen and phosphate requirement, coupled with broadcast applications sitting on the soil’s surface waiting for rain, often missing the time-critical optimum growth window.

Once there is a large enough canopy, the use of foliar-applied nitrogen and phosphate decreases the time lag between application and plant utilisation, from hours/days to minutes, ensuring nutrient availability at the point of need, said Simon.

Direct foliar application will allow growers to reduce their nitrogen and phosphate volume by up to 50% without a decline in yield.



Research supports a holistic approach of using biostimulant formulation to sustain the crop through its most heavy nutrient demand phase and aiding nutrient optimisation within the plant.

“Research keeps demonstrating that taking a holistic approach to crop nutrition produces crops that are resilient to unseasonal or unexpected cold, drought and heat as well as being healthy enough to withstand common pathogens,” Simon said.

“By going beyond macronutrient applications and paying equal attention to the benefits of micronutrients, microbials and biostimulants, it is possible to reduce macronutrient inputs.”

### New biostimulants range launched

A NEW range of bio-based stimulants has been launched by UPM Biochemicals.

The new range, UPM SolargoTM, aids plant growth by improving the quality of soil microbiome and by increasing water retention.

They do not directly provide nutrients to the plant. Instead, they increase nutrient absorption, utilisation efficiency and stress tolerance of the plant and the Finland-based manufacturer states that, in long term testing, the products have been shown to increase crop yield and quality, reducing the need for nitrogen, phosphorus and potassium (NPK).

“The launch of UPM SolargoTM marks the successful end of many years of research and development,” said Christian Hübsch, Director Sales & Marketing Biochemicals at UPM.

He added: “The reduction of CO2 emissions across industries can only work if we scale the replacement of materials and chemicals which are based on fossil raw materials – across sectors. The agricultural sector is particularly important in that respect, as the effect of bio-based, sustainable products such as UPM SolargoTM goes beyond climate change mitigation. It also supports increasingly important sustainability goals for the agricultural sector by improving soil health, soil productivity and biodiversity.”

UPM SolargoTM biostimulants contain plant-based polyphenols from renewable sources. They are derived from lignin, a bio-based, non-toxic raw material.

These have been trialled in Europe and will be available in the UK. [PR](#)



Mónica Perdices Hoyo, Technical Director at Ceres Biotics, said that while many bacteria have the capability to fix atmospheric N - including healthy soil microbial activity - there is huge variability in the efficiency with which they can achieve it.

*“Biostimulants that contain an ionic form of phosphorous together with zinc and copper ions, combine to reinforce plant health and crop vigour.”*

**Simon Fox, Founder, Emerald Research Limited**

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## BIOLOGICALS

# Seeds planted alongside potatoes can help crops and pollinators

**G**ROWERS can now take advantage of environmental seed mixture offers for the 2024 season which have been shown to provide soil structure protection, as well as increasing pollinator species, when planted alongside potatoes.

Syngenta's range of seed mixes have been selected to be easy to establish and manage, as well as meeting objectives of new environmental scheme payments. Sustainable Farming Manager, Belinda Bailey said many of the mixes create additional ecological and agronomic benefits.



# New biological foliar treatment to boost nutrient use efficiency



*Habitat creation alongside productive cropping.*



The Green Headland Mix fits within multiple aspects of SFI/ Countryside Stewardship, but when planted alongside potato and vegetable crops creates essential protection of soil structure and retention of nutrient and soil in the field.

The mix also includes floristic species selected to provide pollen and nectar sources for pollinating insects and to encourage beneficial predators that reduce pest risks to the growing crop.

The Operation Pollinator Bees 'n Seeds mix meets all the requirements for winter bird food provision, along with an earlier flowering component that provides a late-season pollen and nectar source to boost pollinating insect populations.

Last year, detailed studies on five farms revealed more than 200 species among 11,000 invertebrates identified in ecological areas sown with the seed mixtures alongside commercial potato and vegetable crops. That included 67 pollinator species and 60 species known to be predators or parasitoids of crop pests.

Independent monitoring of the Green Headland Mix over five seasons had identified more than 140 species of pest predators and 99 UK species that aid pollination. It has also highlighted 118 species of food sources for game and farmland birds, as well as 32 species recognised as rare or notable on conservation lists.

Belinda advised the Green Headland Mix has the flexibility to plant from the end of April right through to mid-September, in most seasons. That makes it an ideal option for uncropped areas surrounding root and vegetable crops, as well as a summer catch crop and companion cropping with IPM strategies.



*Detailed studies have revealed more than 200 species among 11,000 invertebrates identified where the seed mixtures were sown alongside commercial potato and vegetable crops.*

“It can also be used as a SFI winter cover crop. Farmers and agronomists have had great success when sown after winter barley, with a rapid accumulation of biomass that research has shown retains and enhances nutrient recycling for following crops, as well as improving soil structure.” A non-brassica version of the mix is available for farms where a brassica component could interfere with crop rotation.

Belinda also highlighted the Syngenta Bees 'n Seeds has been specifically selected with no monocot wildflower species in the mix, which increases the flexibility for herbicide use where required in the farm's agronomy strategy.

“It fully meets the requirements for AHL2/AB9 winter bird food provision, but also delivers so much more interest and ecological value, with autumn food source and habitat for pollinating insects.”

The Syngenta environmental seed mix range also includes an annual flower mix picked to produce a quick and reliable early flush of colour and food source for pollinating insects in the early summer. The rapid build-up of insect populations can be a valuable part of an Integrated Pest Management strategy, said Belinda.

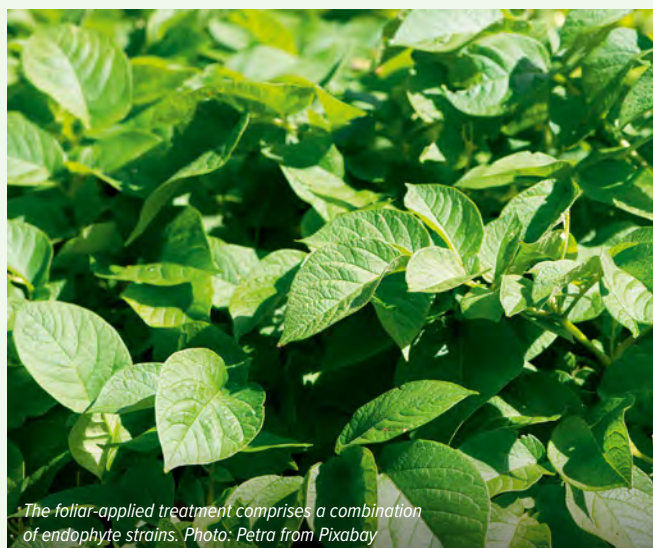
**A** NEW biological foliar treatment, proven to enhance nutrient use efficiency, boost crop yields, and decrease reliance on artificial fertilisers, is being launched this spring.

Based on seed treatment TIROS, TARBIS is a foliar-applied treatment suitable for potato crops, comprising a combination of endophyte strains that enable seedlings and mature plants to fix nitrogen, sequester phosphorus, potassium, and zinc, and better withstand drought stress.

It is being launched to the market by biologicals specialist, Unium Bioscience.

Director John Haywood said it can increase yield by maximising biological nutrient availability and use efficiency, building more robust crops which to handle abiotic stress.

“The technology has undergone peer review at the University of Washington and NASA Ames Research Park, and it has been tested in trials on the International Space Station. Subsequently, independently conducted trials in the UK have consistently shown that treated crops require less artificial fertiliser,” he said. **PR**



*The foliar-applied treatment comprises a combination of endophyte strains. Photo: Petra from Pixabay*

# Early approach reduces stress

Over the past three years, independent experiments in Lincolnshire and Cambridgeshire have been examining the effects of biostimulants' applications to work out where the best results are achieved. *Potato Review* shares the findings.

**T**HREE years of independent replicated experiments carried out by Dyson Farming Research (DFR) have concluded that a consistent reduction in stress impacts can be achieved through early applications of a biostimulant.

Ilex EnviroScience's PK Maxx +, a biostimulant used in the experiments, contains phosphorous in both the phosphate and phosphite forms, which are recognised to reduce stress, boost root development and stimulate healthy growth at critical growth periods. It also includes beneficial levels of magnesium, and sulphur together with essential trace elements manganese, zinc, copper, boron, iron and molybdenum.

The experiments started in 2021, investigating the influence of products containing (phosphite), Simplex (seaweed extract), and a new product called Advocate (containing calcium). In each experiment, sequential sampling was performed throughout the season and data from individual harvests were assessed by analysis of variance. Rates of tuber bulking were analysed by linear regression and rates were compared statistically.

In the 2021 experiment, heat stress interrupted tuber bulking in the middle of the season. After the stress period, bulking continued at a reduced rate which was lower in untreated than treated plots, with the difference being significant for Advocate, showing that this reduced the effects of stress (Graph 1).

In the 2022 experiment, the stress occurred later in development and treatments did not influence the initial rate of tuber bulking but final yield was significantly higher in plots treated with Advocate or Stimplex than in untreated plots, indicating protection of yield at the end of the season (Graph 2).

The experiment in 2023 aimed to continue this research and provide further data on the influence of PK Maxx + and Advocate on potato crop performance. The experiment included a wider range of timings, so that effects could be related to the timing of any stress events.

## Phased application timings

The experiment was performed within a commercial potato crop, planted in Lincolnshire,



*PK Maxx + has been shown to enhance rooting when applied alongside a standard fertiliser programme, according to one grower.*

and comprising seven treatments with three replicates in a complete randomised block design.

Phased application timings of PK Maxx + and Advocate were provided in early, mid and late season.

DFR researcher Christine Jones said: "As in the previous experiments, the crops experienced heat stress periods, this time occurring mainly pre-bulking and at the end of tuber bulking. In this experiment, there were no significant differences between the products. Timing of product application was important, with some timings giving significant yield increases compared with untreated plots.

"Yields were 16% higher following early application, 12% higher following mid application, and not significantly different following late application (see Graph 3).

Treatments did not influence the initial rate of tuber bulking but provided amelioration of stress effects, enabling greater late season bulking in treated than untreated plots.

"The 2023 experiment supported results from previous experiments, showing that in a season where stress occurred an application of PK Maxx + or Advocate provided some protection/amelioration, and the pattern of response was similar to that in the previous two seasons, in that there was no evidence of treatments influencing the initial rate of tuber bulking."

She said scientific literature shows that potatoes can suffer from heat stress as

temperatures increase above 25 degC and that stress is exacerbated if conditions are also dry. In 2021 the main heat stress period occurred in mid-bulking, after which rates of tuber bulking were reduced but less in treated than in untreated plots, showing clearly the protectant effects of the biostimulants.

"It is particularly interesting that despite the late season stress, the most effective application timings were the early ones. Both PK Maxx + and Advocate have different constituents and thus the potential to have different benefits to potatoes. PK Maxx + contains phosphite, which in related formulations or products such as phosphonate, phosphonic acid or phosphorus acid (H<sub>3</sub>PO<sub>3</sub>) has long been shown to have the potential to provide some protection against late blight," she said.

Other research has shown that at least part of the effect of phosphite may be down to induced resistance and that resistance to abiotic stress may also be enhanced.

"An application of Advocate might therefore be a suitable choice for growers concerned about both heat/drought stress and calcium nutrition, while PK Maxx + might be of interest to those concerned about stress and plant health," said Christine. "The phased treatment timings in the 2023 experiment provided an excellent design to study effects of the products in providing protection from stress events, which could occur at any time."



DFR researcher Christine Jones said phased treatment timings in the 2023 experiment provided an excellent design to study.



Ilex EnviroScience's Managing Director Murray Smedley says biostimulants on the whole have a significant role to play in maximising a crop's potential when used alongside the more traditional inputs of nutrition and pesticides, without replacing them.



George Munns of L and AE Munns of Westmoor Farm near Chatteris grows predominantly for customers around East Anglia.



James Fountain of Delavals Farm, Whittlesey grows 50ha of potatoes for the pre-pack market.

## Crucial finding for tuber bulking period

Ilex EnviroSciences Managing Director Murray Smedley says that this is a crucial finding because growers targeting an early harvest should look to biostimulants to help reduce the impact of stress at this critical growth period and ultimately minimise the yield penalty from a shortened bulking period.

"For commercial crops, maintaining as high a rate of tuber bulking as possible is essential," he said. "In the trial, at final harvest, the majority of yield was within the 50-60mm and 60-70mm size grades, with a significantly higher yield in the 50-60mm grade for plots treated with PK Maxx Plus, compared with untreated plots."

## Access to early market

Biostimulants applied to potatoes at the pre tuber initiation stage have enabled Cambridgeshire grower George Munns to tap into the early market that supplies fish and chip shops.

Having access to the early potato market has paid dividends for L and AE Munns of Westmoor Farm near Chatteris. The 40ha grown predominantly for customers around East Anglia, command a healthy premium over the same crop lifted only two weeks later.

The grade one fen soils support a rotation based on wheat, sugar beet, barley and potatoes. Potatoes are sold directly off the field. There is no cold or ambient storage. Harvest starts at the end of August and is finished by the end of September.

On a good day, George can lift up to 70t graded and weighed off the field, with a Grimme Allrounder bought in 1989 and pulled by a MF 6180. The potatoes are graded and packed into 25kg bags and transported in 8t lots by trailer to the field edge or back to the yard. Seed grade is also graded out into a hopper. A sample is sent to NIAB and if it is suitable quality, he will store it in a local cold store for the following season.

Early saleable crop yields regularly exceed 15t/ha with a price tag often more than £250/t, compared to perhaps only £150t/ha for the same crop only two weeks later.

"Targeting the early potato market is the key and concentrating on getting the crop off to a good start is critical if margins are to be maximised. Providing the correct nutrition and applying it at the pre-tuber initiation phase is critical," said George.

Maximising yields and achieving high quality is mostly about nutrition, he says. Feeding the crop with a quality product is something he takes very seriously. Standard nutritional packages will give his potatoes a good start but the attention to detail helps to produce a uniform and quality crop.

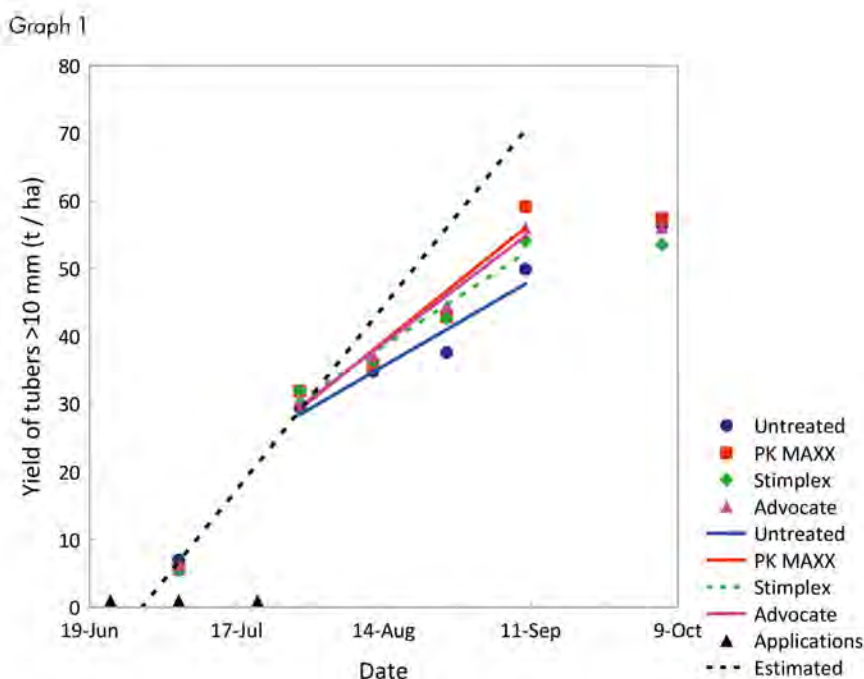
For nearly a decade Mr Munns has been fine-tuning his fertiliser inputs and has incorporated biostimulants and foliar nutrition into his

nutritional armoury. PK Maxx + has featured strongly and is now applied routinely, which has made a significant impact on yield and quality.

A key benefit of this product is to enhance root development, which helps the crop forage for essential nutrients and minerals. It is also claimed that uptake of this essential nutrient is quicker than when it is applied in a phosphate form.

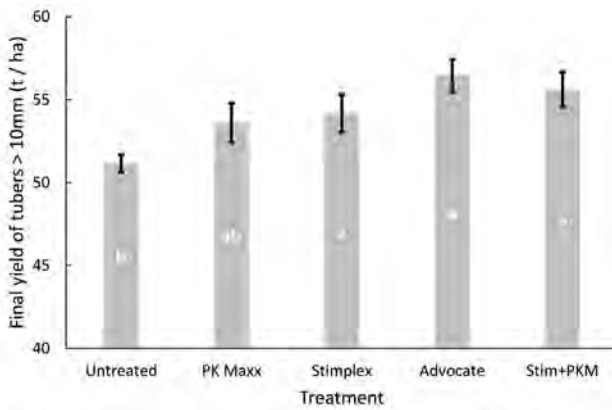
Adding a phosphite source early definitely brings the harvest date forward without putting the crop under stress, George said. A stressed crop stops growing so the early application of phosphite helps maximise yields at the start of the lifting season.

Grading in the field only, George's aim is to produce a regular sample of 50mm + tubers as early as possible in the season. Small tubers are graded out and can be retained for seed for the following year. →



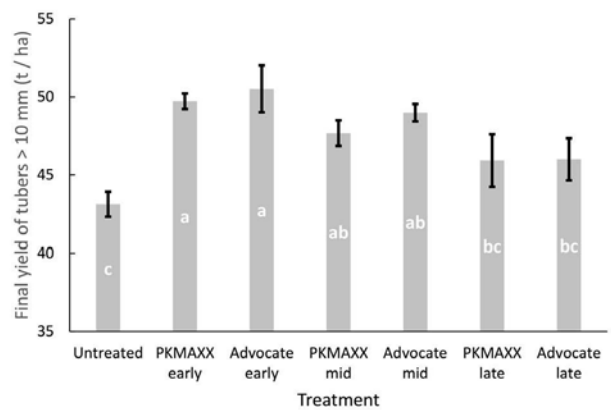
Results of 2021 experiment. Broken line shows the estimated rate of tuber bulking which would have been expected in the absence of stress. Significant difference in post-stress bulking rate between Advocate and Untreated ( $P = 0.042$ ).

Graph 2



Results of 2022 experiment: mean yield ( $\pm$  S.E.) at the final harvest. Columns without a common letter differ significantly (Fisher's LSD,  $P = 0.008$ ).

Graph 3



Results of 2023 experiment: mean yield ( $\pm$  S.E.) at the final harvest. Columns without a common letter differ significantly (Fisher's LSD,  $P = 0.001$ ).

"Planting early brings the sample forward, but this can stress the crop, which makes the correct nutrition at this time essential as well as making available plenty of water through irrigation," he said.

"The minute we have a good sample we start harvesting. PK Maxx + has definitely enhanced the rooting. The key is to apply it alongside our standard fertiliser programme."

The product is applied at a rate of 1l/ha during the pre-tuber initiation stage, which is when the plant is weaning off the mother tuber, followed by a second application of 2l/ha at tuber initiation. Thereafter, each blight spray up until flowering will include a further 1l/ha of this phosphite source.

"Potatoes inherently have poor root systems, but we have definitely found that the product improves root fibres. We have also found that when the product is applied at 1l/ha alongside each blight spray, when there is a target leaf area, we think it supports a better blight control," said George.

The business only grows Sagitta, which is popular with the fish and chip trade because of its attractive bright skin, uniform shape and consistent high frying quality. For growers, it is a multi-purpose, reliable yielder, and an early maturing variety, although it can suffer from poor rooting, especially on the more peaty soils in the area. Early applications (pre-tuberisation) definitely increase the root mass, according to George.

### Early timing is key

Early lifting impacts canopy density and although George says that in a good year he gets canopy closure, it is more the exception than the rule. It is therefore important to get the foliar phosphite on as early as possible, ideally before tuber initiation, to maximise rapid growth and early development of the crop.

"On our black fen soils we always get a manganese deficiency too, so the PK Maxx + goes on at the same time as the manganese foliar spray. Manganese deficiency causes a paling of the leaf

*"Biostimulants are a low-risk option, having excellent tank mix compatibility with pesticides, so we can apply them at the same time rather than in a separate pass."*

**James Fountain, Grower, Cambridgeshire**

and it normally occurs in patches across a field. Visually the condition should not be mistaken for nitrogen deficiency," George said. "The inclusion of PK Maxx + in the tank mix definitely helps get the manganese into the crop more efficiently.

"Interestingly, often at the point of lifting, the price we get per acre is the same as the price we get later in the season when the yields increase and the price drops. This is a simple supply and demand equation, but it demonstrates that the key to maximising profitability is to get the crop off early and to have a regular sample as soon as possible."

With potato prices normally dropping as the supply increases, the period of time that he harvests is where he makes the biggest gain. "We work to be finished lifting before everyone else starts," said George.

### Root development improvement in Cambridgeshire

Cambridgeshire grower James Fountain of Delavals Farm, Whittlesey grows 50ha of potatoes for the pre-pack market. Like so many farms of its type, the potato enterprise relies on a quality skin finish and high yields (average 45t/ha). Main varieties include Orchestra, Melody, Mozart and Fandango.

James carried out his own replicated trials using PK Maxx + on potatoes and biostimulants now feature in his nutrient product armoury.

"In the trial, applying PK Maxx + early to the crop helped it establish well ahead of drought-like conditions. The phosphate and phosphite forms in the product provide rapid and efficient delivery of phosphorus

at critical growth periods, boosting root development and stimulating healthy growth, helping build tuber numbers and produce more saleable yield," he said.

"On close visual inspection soon after application root development noticeably improved. We think this enhanced the plants own ability to hunt for soil-held nutrients and moisture, effectively building a level of natural drought tolerance."

James applies Stimplex at the early rosette stage for reducing stress and building yield followed by an application two to three weeks later of PK Maxx +.

Potatoes are planted after cereals (normally spring barley) with stubbles sub-soiled in September. Ploughing follows in early October and fields are then left to over winter.

Controlled traffic wheelings at 24m are put in during February and March. Bed tillering and planting starts in April and re-ridging is carried out where necessary.

Lifting starts around September 10th and finishes by early October. Up to a third of the crop goes into an ambient store for November delivery, whilst the majority goes into cold storage for March/April delivery.

"We are growing for the supermarket pre-pack market predominantly, so good skin finish is critical," says James. "We see biostimulants now as a key component in our input armoury and these are considered a major part of the yield and quality building block process. They are a low-risk option, having excellent tank mix compatibility with pesticides, so we can apply them at the same time rather than in a separate pass." **PR**



# Practice makes perfect



Mark Taylor

A reminder on how proper nematicide protocol needs to be followed during application.

**T**HE Nematicide Stewardship Programme (NSP) is reminding growers to follow the best practice granular nematicide protocol this spring to ensure products are used safely and are protected for the future.

Mark Taylor, Chair of GB Potatoes, the platform enabling collaboration between businesses in the potato supply chain, is a working group member of the NSP. He said: "PCN represents the most significant and widespread challenge in the potato industry. Our access to quality land is diminishing, making the responsible use of nematicides, within an integrated approach, paramount to managing this issue effectively."

The NSP's best practice principles focus on raising awareness and knowledge about nematicides such as fosthiazate, outlining the responsibilities and obligations towards environmental care and operator safety.

"The stewardship programme, as it has evolved, embraces these aspects and reinforces the importance of training and resource availability for growers," Mark said.

He emphasised the six key areas of the protocol:

- **Qualify:** All operators must have a PA4 or PA4G certification and must have completed the ARTIS Nematicide Stewardship e-learning course to apply granular nematicides. They must also be members of NRoSO.
- **Calibrate:** Applicators must be checked daily for damage or wear, to ensure all pipework is correctly fitted. The applicator must be inspected and certified as fit for use by a qualified National Sprayer Testing Scheme (NSTS) engineer at least every two years. The amount of product used should be calculated according to the area treated to make sure the correct volume per hectare is applied. For advice on how to calibrate your machinery, visit the calibration page on NSP's website.
- **Single pass:** The product should be incorporated within a single pass,

immediately prior to planting with no granules left on the surface of the soil.

- **Shut off:** All applicators must be fitted with a device in the cab that allows operators to shut off granule flow at least 3 metres from the end of each row. The shut off time allows for all piping to run out before the machine is lifted out of the ground.
- **Spillages:** Use the same filling point in the field to allow any spillages to be identified quickly. Bury small spillages immediately to ensure no granules are left on the surface. If the spillage is large, remove it to an empty nematicide container, clearly label it and return it to the manufacturer, burying any remnants immediately.
- **Check:** Check treated fields 12 to 24 hours after application for adverse effects to wildlife. Check field edges and areas where application equipment is turned on and off, but also inside headlands and breaks in the middle of the field.



The Nematicide Stewardship Programme (NSP) was formed in May 2015, to promote the correct use of nematicides. The programme includes all stakeholders involved in the supply, distribution and use of these products, along with those who purchase crops, including representatives from NFU, PPA, Syngenta UK Ltd, Red Tractor Assurance, FPSA, NIAB and Agrii. [PR](#)

For more information, or to update your knowledge on best practice application of granular nematicides visit [www.nspstewardship.co.uk](http://www.nspstewardship.co.uk).

## NSP GRANULAR NEMATICIDE BEST PRACTICE STEPS



### 1. QUALIFY

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



### 3. SINGLE PASS

Apply and fully incorporate nematicides within a single pass



### 5. SPILLAGES

Bury small spillages immediately



### 2. CALIBRATE

Machinery must be professionally calibrated every two years



### 4. SHUT OFF

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



### 6. CHECK

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

FOR MORE INFORMATION VISIT: [WWW.NSPSTEWARDSHIP.CO.UK](http://WWW.NSPSTEWARDSHIP.CO.UK)

# Driving the diploid direction

Dave Douches, a Professor at the US's Michigan State University, has spent a decade studying how to breed potatoes at diploid level.

**A**ROUND 10 years ago, Dave Douches, a professor in Michigan State University's Department of Plant, Soil and Microbial Sciences and Director of MSU's Potato Breeding and Genetics Program, led the Solanaceae Coordinated Agricultural Project (SolCAP).

The project, funded by the US Department of Agriculture's National Institute of Food and Agriculture (USDA NIFA) to advance potato and tomato crops, gave rise to a new potato-breeding venture Dave has been exploring ever since.

Most potatoes grown in the world are tetraploids, meaning they have four sets of chromosomes. This makes breeding potatoes relatively difficult owing to the high level of genes that must be crossed.

During his time as Director of SolCAP, Dave recognised the need for finding the genetic material needed to cultivate a diploid potato, one that has just two sets of chromosomes. Both tetraploid and diploid potatoes originated from South America centuries ago, but it ultimately was the tetraploid potato that reached the global market and is what consumers typically buy today.

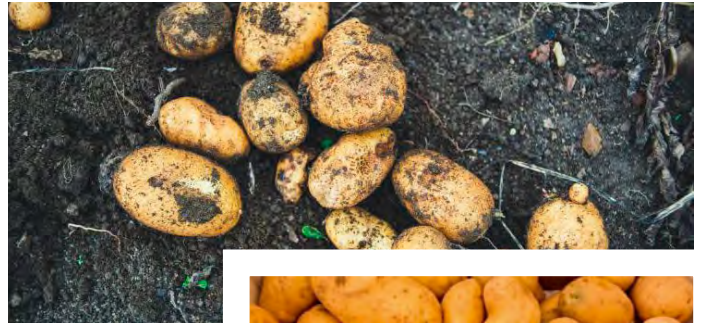
"It was in that project I realised we needed to think of a new way of breeding the potato at the diploid level and to capture the advantage and simplicity of using diploid genetics," said Dave

Diploid breeding allows for genetic advances to happen quickly. At the diploid level, scientists can edit genes with a greater probability of achieving desired traits than they can at the tetraploid level.

To help launch this research, Dave applied for and received Project GREEN funding in 2018. Project GREEN, Michigan's plant agriculture initiative that's housed at MSU and includes plant-based commodity groups and businesses, MSU AgBioResearch, MSU Extension and the Michigan Department of Agriculture and Rural Development, has been critical in pursuing a diploid potato germplasm — the genetic material of reproductive cells used for breeding, conservation and research.

"Since 2018, Project GREEN has helped us jumpstart this work," Dave said. "It's really been crucial work because we've been taking advantage of modern technology and gene editing to impart self-compatibility in diploid potatoes."

Self-compatibility refers to the process of a plant being able to pollinate itself from its own seeds and fruits. Self-compatibility is a rare trait within diploid potatoes but could become a viable option that opens the door for numerous varieties of diploid potatoes to be easily and quickly developed, Dave said.



Prior to studying potatoes at the diploid level, there was little progress made in finding the gene that would protect potatoes against Colorado potato beetle but that has also now changed. At diploid level, they've been able to tackle this and have identified the resistance gene in a germplasm that Dave said had been "hovering around for 30 years".

"Now we're integrating the gene into our diploid germplasm through a simpler breeding system."

However, complacency isn't an option since insects and pathogens can adapt over time to overcome potato resistance, he stressed.

"With breeding, you can't say 'I've found this resistance gene — I'm all set now,'" Dave said. "Insects evolve. Pathogens evolve. You really need to continue feeding the system to develop broader resistance." **PR**

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Persistently-transmitted potato leaf roll virus incidence has increased sharply in Scottish seed in recent seasons following extreme aphid pressure, particularly in 2022.

Photo: Eric Anderson/Scottish Agronomy

*“There’s too much focus on individual measures and there is a real job to do in getting across what an effective integrated control programme looks like.”*

*Kyran Maloney, Potato Specialist, SAC Consulting*

# IPM confidence boost needed to turn virus tide

Incidents of certified seed being downgraded or failed for presence of virus have increased across Europe in recent seasons and a recent survey suggests a lack of confidence in integrated control strategies could be to blame.

**G**REATER confidence needs to be instilled in the components of integrated pest management (IPM) for the industry to get on top of rising virus levels in seed, according to recent research.

Data from the 2023 Seed Potato Classification Scheme (SPCS) in Scotland shows an upturn in crops downgraded or failed owing to virus. From 6.2% downgraded and 0.3% failed in 2022, the data jumped to 15.4% downgraded and 1.8% failed in 2023.

Until recently, variants of the non-persistent potato virus Y (PVY) have been the main culprit and while they continue to be problematic, the incidence of persistent potato leaf roll virus (PLRV) has rocketed.

For SAC Consulting Potato Specialist Kyran Maloney, this is a warning that coordinated action needs to be taken across the potato industry to turn the tide.

Speaking from a Scottish perspective, he says seed growing there has historically been protected from aphid virus vector pressure by the country’s cool and wet climate. But the 2022 season, when aphid and virus pressure was extreme in Scotland, illustrates that protection may no longer be guaranteed.

“As the climate changes, the problem is only going to increase. It’s something that the industry needs to come together and deal with,” said Kyran.

## Effective communication

The Scottish Aphid-Borne Virus Working Group has promoted best practice guidance through its Six Steps for Effective Virus Management in Seed Potato Crops (see box).

Kyran endorses these action points as the best practical way of getting on top of the issue, but points to evidence that they need to be communicated more effectively.

This comes through in a recent piece of research work funded by Scotland’s Plant Health Centre and carried out by SRUC, which surveyed seed growers on their attitudes to virus control.

There were some positives, with respondents seeing groundkeeper control, clean input stocks and the proximity of seed to infection sources like ware crops as very important. Early haulm destruction was also recognised as a key IPM tool for battling virus and there is faith in insecticides, albeit with some concerns about resistance in aphid populations.

However, there were differences of opinion on measures such as encouraging natural enemies,



*Kyran Maloney, Potato Specialist, SAC Consulting*

establishing purge strips around seed crops, straw mulches, and the use of mineral oils.

Kyran says two reasons behind this ambivalence are a perceived lack of evidence and a feeling that they can increase risk.

“There is plenty of evidence that the same IPM measures can be an important part of the solution to rising virus levels, in both UK and overseas potato crops. Our view at SAC is that there’s too much focus on individual measures and there is a real job to do in getting across what an effective integrated control programme looks like,” he said. →

## Mineral oils

One measure the research singles out as attracting scepticism is the use of mineral oils early in spray programmes. These are proven to help stifle transmission of non-persistent viruses like PVY variants, of which PVYN is dominant in the UK.

There are several hypotheses on how mineral oils help control PVY, but put simply, the coating of oil on plant leaves disrupts the acquisition and transmission of virus by the aphid's stylet (mouth parts).

Concerns amongst seed growers related to mineral oil use, aside from doubts about efficacy, include phytotoxic effects which can mask virus or cause misdiagnosis by rogues and seed crop inspectors.

There is also a theory that extending leaf wetness with mineral oil applications can increase the risk of late blight infection.

Certis Belchim's Netherlands-based technical specialist Fokke Smit has been working on the development of paraffinic mineral oil product Olie-H since 2007 and it has been a key part of Dutch IPM programmes ever since.

In Dutch seed producing areas, concentrated in the northern coastal regions and a pocket in the southwest, growers heed advice to begin mineral oil applications at 30% emergence, subject to aphid pressure and/or variety.

This is because products like Olie-H have demonstrated 60-80% reductions in PVY when used from an early stage.

"About 10-15 years ago, we would advise 80% emergence, but we adjusted because of climate change. We increasingly have no winter here and aphid pressure early in the season is very high.

"When the winged aphids get into young potato crops, you only need one infected plant, and the virus can quickly spread. There was some opposition, because you are spraying a lot of bare ground at 30% emergence, but it's clear that the worst non-persistent virus transmission happens early, so this approach is more effective," said Fokke.

## Application conditions

To some of the concerns voiced by growers and agronomists, Fokke says there are practical tips from experience of using mineral oils in The Netherlands which can help avoid phytotoxicity.

These include avoiding spraying when conditions are warm and sunny – evening spraying is advised instead – and not mixing oils with certain late blight fungicides, including fluazinam and zoxamide.

"When it's sunny and warm, it's also advised not to mix oils with certain fertilisers, particularly those that contain nitrogen. I always advise to spray on a dry crop as well.

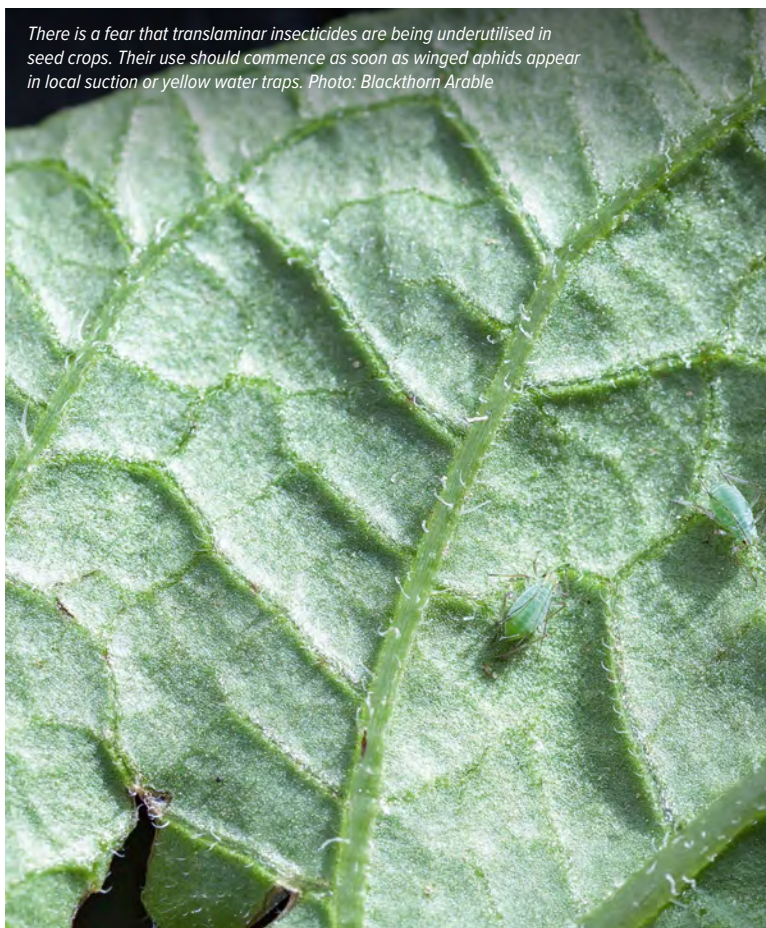
Sometimes if you apply to damp or wet leaves, if you get a bright day afterwards, you can see some phytotoxic effects," said Fokke.

He adds that increased late blight infection risk should not be a concern if the right fungicide programme is being applied and adding the mineral or paraffinic oil improves efficacy of some products.

VCS Potatoes Specialist Graham Tomalin advises on commercial and home-saved seed crops across Norfolk, Suffolk and Cambridgeshire where the biggest virus issue is variants of PVY, with early willow-carrot aphid migration central to its transmission.

Peach-potato aphid is ever present and also a key vector of PVY, but thus far, he hasn't seen the uptick in PLRV experienced in other production areas.

Integral to his virus management strategy is bringing in low field generation input stocks, crop isolation – although that is tricky on rented land in an intensive potato growing area – and the use of adjuvant mineral oils added to blight sprays to improve their performance.



*There is a fear that translaminar insecticides are being underutilised in seed crops. Their use should commence as soon as winged aphids appear in local suction or yellow water traps. Photo: Blackthorn Arable*



*Infection of seed with variants of non-persistent virus PVY can cause necrotic symptoms in daughter progeny. Using mineral oils as adjuvants early in seed crop spray programmes can help suppress its transmission.*

*"I'm not against straw mulches, as there is some good data to suggest they work, but on mostly rented land I'm not sure landlords will want to risk importing blackgrass."*

**Graham Tomalin,  
Potatoes Specialist, VCS**

Graham Tomalin, Potatoes Specialist, VCS



“In our trials, it’s not been a complete cure, but we have seen a good reduction in transmission of PVY applying oils from early emergence to tuber initiation, as per current product labels,” said Graham.

Any phytotoxicity he’s experienced in commercial situations has been marginal, as he has followed the mantra of avoiding applications in the heat of the day to drought stressed crops.

“We are also careful with the late blight products we’re mixing the oils with,” he said.

### Insecticide use

Using SASA Pesticide Usage Survey data, Kyran has looked into the volume of insecticide active substances Scottish seed producers apply and it suggests there is an overreliance on pyrethroids.

This is a concern because the willow-carrot aphid and the grain aphid – migratory species central to non-persistent virus transmission – are resistant to pyrethroids. The data also suggests that growers aren’t utilising the full quota of translaminar insecticides to control peach-potato aphid and other colonising species which transmit PLRV.

Kyran emphasises that programmes need to be designed to control non-persistent and persistent viruses in seed crops, in a way that complies with product labels and end user protocols. This is particularly challenging in dual purpose crops he says, where growers take a proportion of progeny tubers for seed and sell the oversized as ware, meaning they often grow on for longer than a dedicated seed crop.

“Many advisers are discouraging growers from producing dual purpose crops, as it’s not felt to be a sustainable option, but we accept the economics and structure of the industry are against growers. The key thing is to follow advice from the Scottish Aphid-Borne Virus Working Group advice and use oils as adjuvants from 30% emergence up to tuber initiation, along with pyrethroids for PVY control.

“Then commence with translaminar insecticides once colonising aphids arrive,” he said.

James Cheesman, Technical Manager, Certis Belchim.



### Decision support

Certis Belchim UK’s Technical Manager James Cheesman says decision support systems are key to getting insecticide choice and timings right. These include the suction trap network run by Rothamsted Research and SASA, which reports on winged aphid migration, alongside the in-field yellow water trap subscription service run by FERA.

Yellow water traps catch aphids as they move into fields and subscribers send catches into FERA’s laboratories in York for analysis and online reporting of results.

He adds that planning a programme to cover your expected crop duration, which for most specialist seed crops is about 12 weeks, is a good first step, then growers can use the decision support data to flex throughout the season.

“Mineral or paraffinic oils are key early on and pyrethroids can be effective too, but they should only be added to the tank when susceptible species are present, as they do knock back beneficial predators,” said James.

Graham says translaminar insecticide options are a key part of his virus control plans beginning just before aphids enter crops and continuing to utilise the available products at 14-day intervals.

“When you see first catches of colonising species like Myzus in suction traps, you need to get the translaminar products into the programme. Don’t delay until you see aphids in the crop.”

Graham adds that growers need to be mindful of product labels and restrictions, with the latest InSyst (acetamiprid) label stipulating that neither of its two applications to seed can be applied before tuber initiation (BBCH 40) or after July 31st.

A minimum interval of 21 days must also be observed between the two permitted applications of InSyst to seed potato crops. The same applies to Teppeki (flonicamid) but in practice this is not an issue as the two products are typically used in alternation at 14–21-day intervals to protect crops for two months.

Movento (spirotetramat) must only be applied to crops that flower once flowering has finished (BBCH69).

“Because of the flowering restriction on Movento, if we do use it, it’s late on if the season dictate,” said Graham.

Considering some of the other IPM options, Graham says growers in East Anglia may struggle with widespread use of straw mulches because of the potential grassweed seed contamination risk.

“I’m not against straw mulches, as there is some good data to suggest they work, but on mostly rented land I’m not sure landlords will want to risk importing blackgrass.”

However, he has been involved in trials which suggest cereal companion crops – which have proven to be effective in sugar beet – offered some promising reductions in PVY transmission in 2023. The cereals are then taken out with a graminicide.

“The companion cropping is a work in progress, and we will keep looking at it this year. If we get another repeat result, I think growers may start taking it up,” he said.

Finally, timely haulm destruction is key, and Graham advises his growers to burn crops off as soon as they reach seed size and to get the job done quickly, limiting any late virus transmission. This is one of several reasons why his growers do not grow dual purpose crops in the area, with virus pressure so high.

Ensuring there is no regrowth up until harvest is important too and this is an aspect which novel spraying technology should soon be able to contribute to.

Already using spot applicators with camera recognition technology to take out weeds in onions, VCS will be trialling it for spot spraying green areas in potato seed crops, which could save blanket applications of desiccants.

“Growers are often unnecessarily treating whole fields with Spotlight Plus (carfentrazone-ethyl) or Gozai (pyraflufen-ethyl) late in the season, so it would be a massive step forward for regrowth,” he said. **PR**

*“Mineral or paraffinic oils are key early on and pyrethroids can be effective too, but they should only be added to the tank when susceptible species are present, as they do knock back beneficial predators.”*

**James Cheesman, Technical Manager, Certis Belchim**



## Mark appointed AEA President

MARK Earles is the newly-appointed President of the Agricultural Engineers Association (AEA).

Mark began his career as an apprentice aircraft engineer and joined Makita 29 years ago. His current role within the global power tools giant is market surveillance and business development, with responsibilities in Europe, where he chairs and vice chairs market-based and technical committees at the European Garden Machinery Federation (EGMF).



## Simon joins Timac team

CROP nutrition and soil health specialist, Timac Agro UK, has recruited Simon Gillett to lead its South Central regional team.

Based in Salisbury, Simon has an extensive technical background in fertiliser manufacturing and 10 years' experience developing distributor relations.

He said: "It's been a challenging winter for growers, with crops under water for weeks on end. It'll be critical these next few months to get land and revenue back on track and I strongly believe there's still hope with the correct nutrient management plan in place."



## Appointments and moves by crisp producer

UK crisp producer, Fairfield's Farm, has appointed David Nairn as the company's new Non-Executive Director, while promoting Tash Jones to Commercial Director, after seeing its business grow by more than 50% in recent years.

Having formerly served as Managing Director of Burts Snacks, David has a wealth of knowledge in the industry and will be supporting the executive team.

Fairfield's Farm saw business turnover grow by 56% between 2022 and 2023.

David Nairn says: "I have been working in the snack category for a long time and certainly admired Fairfield's Farm from afar. It's a good, solid business with an exciting strategy and strong core values, so I feel extremely privileged to be joining the team. I very much look forward to helping the business reach new heights."

Tash Jones is joining the board having been promoted from Head of Marketing & NPd. In her new role, Tash will oversee the sales and marketing strategy.

With previous experience at Kettle Chips, Tash first joined the Fairfield's Farm team in

April 2021. "I'm so proud of how far the brand has come and look forward to helping drive Fairfield's Farm forward," she said.

Co-founder Robert Strathern said: "I'd like to welcome David to the team, and I'm confident that his considerable experience and expertise in the fast-growing snacks business will help us to achieve our growth goals here at Fairfield's Farm. I equally would like to congratulate Tash on her new appointment as Commercial Director. The board has big upcoming ideas and plans, and Tash has already proven herself to be an asset. She will certainly play a key role in helping us to develop the business, particularly at a time when we are accelerating at such a rapid pace."

Fairfield's Farm is situated in Wormingford, near Colchester. The families of co-founders Laura and Robert Strathern have been growing potatoes for three generations and set out to launch their own hand-cooked, farm-fresh crisps in 2006. These are now available in eight different flavours, stocked in East of England Co-op and Chelmsford Star stores, as well as numerous independent retailers, farm shops, pubs, cafés and attractions across the country.



## Mark comes out of retirement to help SPO

FORMER Grampian Growers Managing Director Mark Clark has joined the team at the Seed Potato Organisation (SPO) and will be working part-time to help with various tasks.

In his role with Grampian Growers, which he held from 2002 to 2023, Mark helped to develop and expand the co-operative's range of seed potato varieties, as well as explore new export markets.

Prior to that, he was Commercial Director with Dundee-based CSC Crop Protection (now Agrii) from 1988 to 2002.

He announced his retirement five months ago but has agreed to work part-time to help SPO, which was formed in 2021 by a group of Scottish growers to support and develop the seed potato industry. Seed growers form the bulk of the membership while associate members also include ware growers, potato trade and supply chain companies.

SPO's Chairman Mike Wilson said Mark's input will be invaluable.



## New CEO for breeding company

GERARD BackX is stepping down as CEO of potato breeding company Royal HZPC Group this year, having held the role since 2001.

Hans Huistra will take over the role in September.

Hans is currently COO of Meatable and has more than 30 years' leadership experience at Unilever, Friesland Campina, Hero and Fonterra, among others.

For the past seven years he has also been a member of Cosun's Supervisory Board. He has extensive experience in the agricultural and food sectors in Europe, Asia, America and Africa, in which interaction with farmers has always been of a key part of his roles.

Following Hans Huistra's nomination in September, Gerard will continue to work for Royal HZPC Group for as long as desired.

## Agtech firm appoints new director

UK agricultural technology company PheroSyn has appointed Dr David Lawrence to its board of directors.

David was formerly a non-executive director and Head of Research & Development at Syngenta and has also held scientific and management roles at ICI and Zeneca.

CEO of PheroSyn Dr Mary Ellis said: "His extensive knowledge and impressive track record will ensure



the company continues to drive innovation, expand its portfolio of products and gain market share."

David said: "Feeding the world is a massive challenge, not least in a time of climatic change and the drive for more climate- and environment-preserving production methods. I am proud to be

able to help PheroSyn become a significant contributor to overcoming this challenge."



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# Cracking the code to healthier crisps

A team of researchers at Michigan State University are making head-roads into how to switch off sugar-inducing enzyme.

**S**WITCHING off the potato vacuolar invertase gene (VInv), one of the key enzymes in sugar metabolism, can result in healthier, more aesthetically-pleasing crisps and could help the wider snack industry, according to Michigan State University researchers.

The team of scientists led by Michigan State University professors Jiming Jiang and David Douches discovered a key mechanism behind the darkening and potential health concerns associated with cold-stored potatoes.

With snack producers needing a constant supply of fresh potatoes to meet their demands, preserving potatoes in cold storage ensures producers have what they need, but low temperatures also trigger cold-induced sweetening (CIS) which converts starches to sugars. During processing, this results in darkened chips and crisps.

It also generates acrylamide, a carcinogenic compound formed during high-temperature processing, which has been linked to health concerns, including an increased risk of cancer.

As techniques to reduce sugars in cold-stored tubers can add to costs and affect the flavour of final products, Jiming and his colleagues have focused on the root of the problem to work toward potatoes that aren't affected by CIS to begin with.

"We've identified the specific gene responsible for CIS and, more importantly, we've uncovered the regulatory element that switches it on under cold temperatures," explained Jiang, an Michigan State University (MSU) Research Foundation Professor in the departments of Plant Biology and Horticulture in the US.

"By studying how this gene turns on and off, we open up the possibility of developing potatoes that are naturally resistant to CIS and, therefore, will not produce toxic compounds."

Jiming, a potato researcher for more than 20 years, has dedicated his career to solving this puzzle.

To overcome one of the most pressing issues in the potato industry, Jiang started his work to minimise acrylamide in potato chips and fries at the University of Wisconsin-Madison.

*"By studying how this gene turns on and off, we open up the possibility of developing potatoes that are naturally resistant to CIS and, therefore, will not produce toxic compounds."*

## Jiming Jiang

There, he and his team published a paper in 2010 identifying a key gene responsible for potato CIS. Moving to MSU in 2017, Jiming and his team have worked to pinpoint which elements of that gene could be modified to stop the process of cold-induced sweetening.

His research team, which includes collaborators across MSU's campus as well as at other research universities, used a combination of gene expression analysis, protein identification and enhancer mapping to pinpoint the regulatory element controlling the CIS gene.

A potato breeding program led by Dave Douches has been used for this research and the next steps involve using this knowledge to create CIS-resistant potato lines through gene editing or other breeding techniques in his greenhouses.

Dave said. "With our collaboration, we were able to produce a finding that paves the way for targeted genetic modification approaches to create cold-resistant potato varieties."



Michigan State University professors Jiming Jiang and David Douches are leading the project.

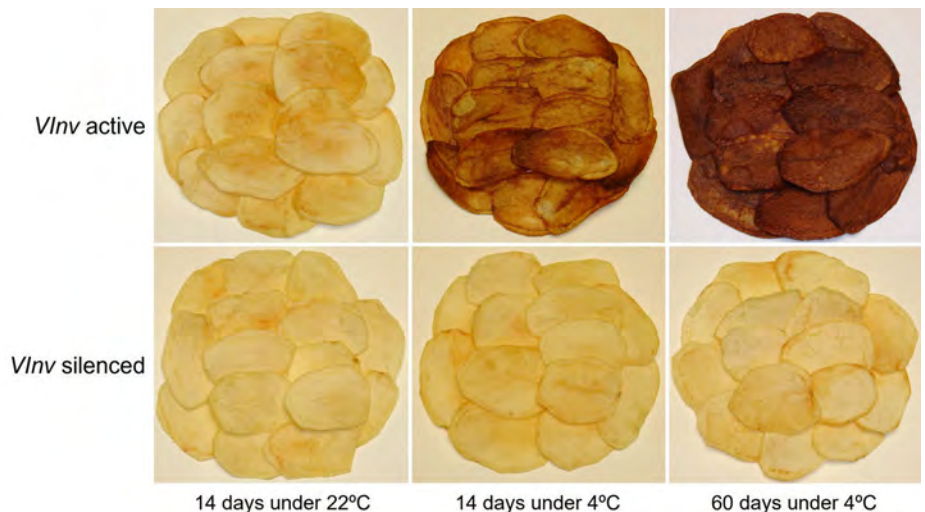
The potential benefits of this research extend beyond improved snack food quality. Reducing acrylamide formation in potatoes could have implications for other processed starchy foods. Additionally, cold-resistant potatoes could offer greater flexibility in storage and transportation, potentially reducing food waste and costs.

New CIS-resistant potatoes could be commercially available in the near future, Jiming said.

"This discovery represents a significant advancement in our understanding of potato development and its implications for food quality and health," Jiming said. **PR**

*"We were able to produce a finding that paves the way for targeted genetic modification approaches to create cold-resistant potato varieties."*

## David Douches







## UK Agri-Tech Centre opens

THE new UK Agri-Tech Centre has been formally opened by Innovate UK CEO, Indro Mukerjee.

This follows last September's announcement that three agri-tech centres – Agri-EPI, CHAP and CIEL – were joining forces to create a new integrated facility.

The centre, which receives its core funding from Innovate UK, is led by CEO Phil Bicknell and a newly-appointed executive leadership team. It will address challenges, identify new opportunities, and accelerate the adoption of agritech solutions for growers throughout the UK.

It is based at the Midlands Agri-Tech Innovation Hub located at Harper Adams University, in Newport.

## 200-plus children join 'grow your own' potato project

MORE than 200 children from across greater Peterborough have planted their own potatoes and lettuce plants this Spring with Kids Country, the East of England Agricultural Society's educational programme.

The project is to help them better connect with how their food is grown, as well as learn about the nutritional benefits of fresh, local and seasonally grown food in the East of England.

Kids Country visited four schools: Warmington School, William Law C of E

Primary School, Orton Wistow Primary School and Kirkstone House School.

The team of volunteers was supported by local producer Burgess Farms, which donated the seed potatoes, Albert Bartlett which supplied fresh potatoes for the children to taste and explore different varieties and types of packaging, and Evergreen, which supplied the compost. G's Fresh also supported the popular annual education event with the planting of lettuce plug plants.

## Support for growers/workers affected by cancer

THE Farming Community Network (FCN) has launched a new UK-wide partnership with Macmillan Cancer Support which will enable growers and farm workers affected to access cancer services and support.

FCN will work closely with Macmillan Cancer Support, including raising awareness in rural communities of the signs and symptoms of cancer and building referral bridges to and from Macmillan's services.



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## Highest-ever Dutch prices as availability tightens



THE demand for free-buy supplies of potatoes in the EU remains robust, but the supply is tightening, according to analysts at Mintec, provider of global commodity price data, forecasts and market intelligence for food chains.

Last year's wet harvest is the culprit, with many growers no longer having sufficient stocks to offer on the free-buy market because of quality issues that compromised storability.

To top up contracted supplies, buyers must increase their prices to incentivise growers to sell. At the end of February 2024, the Mintec Benchmark Price (MBP) for Dutch processing potatoes reached €37.5/100kg, the highest price for February since the price series began in 2014. According to market sources, limited supply was expected to continue to support prices as the market year progressed.

In the Netherlands, signs of the shortage are becoming apparent in the processing industry. VAVI, the processing organisation in the Netherlands, processed 321.6 thousand tonnes of potatoes in January 2024, a decrease of 10.8% compared to the previous year. There has been a shortage of processing potatoes due to the challenges in obtaining them from suppliers. Dutch processing is becoming more reliant on supply from neighboring countries. In January 2024, 33.2% of the total supply was imported, compared to 21.4% of imports in January 2023.

A significant amount of potatoes were left in saturated ground for an extended period of time. The NEPG (North-Western European Potato Growers) has estimated that 650 thousand tonnes were lost during harvesting or left in the ground and did not reach the market.

The potatoes which were harvested during the wet conditions were no longer suitable for long-term storage. As a result, the availability of uncontracted supplies is very tight and processors have been competing with each other for the limited stocks, which has continued to push up prices.



Photo: Agrico

## Co-operative expands acreage



POTATO co-operative Agrico is looking to expand its acreage by acquiring the seed potato activities of The Potato Company (TPC), which is based in Emmeloord, Netherlands.

CEO Mark Zuidhof said: "This acquisition contributes to Agrico's growth objective in Western Europe's shrinking seed potato market. This allows us to focus even more strongly on the sales and development of monopoly varieties. TPC's distribution network to more than 60 countries is also an excellent addition to our sales channels."

TPC was established almost 20 years ago and has more than 450 hectares of seed potatoes, grown on a pool contract basis. It is also very active in free trade. Its distribution network covers monopoly varieties and free trade varieties. TPC is accomplished at developing potato varieties with broad potato cyst nematode resistance.

TPC will become part of Agrico as a wholly-owned subsidiary.

Owner Gaby Stet said: "I am proud that we have brought the company so far over a period of almost 20 years, and I look forward to further growth and professionalisation along with Agrico. TPC, as a second sales channel within the Agrico group, will also be able to further evolve its international activities. Along with Agrico, we will be able to continue to guarantee the return for our growers and, in terms of sales, we will remain visible under the identity of TPC."

## New supply welcome, but unlikely to meet demand



A LEBANESE supplier says the arrival of Spanish new potatoes is set to enrich a market that, for months, has been supplied with imported storage potatoes from France, as well as fresh potatoes from Egypt, whose off-season exports to Spain have been rapidly gaining ground.

However, supply won't meet demand until mid May according to Kiko Navarro, a sales representative in Spain for Askar Go Fresh, which trades between Spain and the Middle East, therefore prices are likely to rise.

"It all depends on the weather. Last year, for example, it rained during part of May and June, so potatoes were imported until July," he said in a recent interview with *Fresh Plaza*.

He added: "This year, the measures implemented to prevent the entry of the bacterium *Ralstonia solanacearum* at customs are causing delays and hold-ups, which are leading to an increase in the price of potatoes, as such costs must be reflected in the final price."



## Collaboration for greater range



THREE Spanish producers have joined forces, enabling them to offer a wider range of potato products while expanding their geographical reach.

Leonese company Patatas Hijolusa, Vitorian Natuber and Alicante-based Agrícola Villena have now created Somos Hijolusa.

Established family business Patatas Hijolusa is recognised as the leader in Spain's quality fresh potato market in terms of kilos marketed and turnover, having been operating for more than 50 years, while Natuber (Transformados de Patata de Álava), founded in 1997, offers fresh potatoes already washed, peeled, cut and packaged. They have joined up with Agrícola Villena which is a leader in the cultivation, processing and marketing of carrots, leeks, celery, parsnip, cabbage, turnip, swede, stew packages and carrot sticks.

## Shortage of seedlings and price rises seen



FRENCH potato grower and trader Top’Pom says there has been a significant rise in fresh potatoes in his country since the start of the year, caused by lack of supply and perpetual demand.

Despite an active month with exports in January, this slowed down in February. However volumes sold are ‘clearly higher’ than this time last year, according to Director Antoine Geysels.

In September 2023, Italy, which suffered a significant drop in production, and Spain were already absorbing large volumes of French potatoes and this dynamic continues today, he said.

“The demand from Italy was still strong at the beginning of the year, leading to a considerable increase in volumes exported to this country compared to previous years. Spain, on the other hand, remains by far the leading importer of French potato imports, with an acceleration in shipments at the start of the year.”

Another factor to be taken into account by French operators over the coming weeks is the arrival of new potatoes from Egypt and Israel.

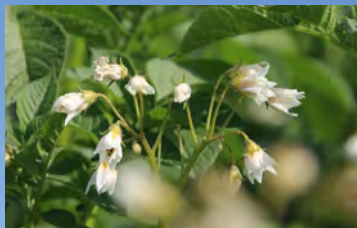
Antoine said he still hoped to be able to cover the demand for the next season.

“The shortage of seedlings for the next season makes us all aware of the importance of this segment for the balance of our sector,” he said.

FEDEPOM announced in November 2023 that production of certified seedlings in France has fallen by almost 11% this year (- 60,000 tons). This decline can only be partly attributed to weather hazards.

French and European seedling producers are also faced with technical difficulties regarding possible solutions to treat aphids, the main pest responsible for the potential deterioration in seedling quality.

“Insufficient supplies of seedlings can also weaken farms, which may find themselves unable to produce all or part of their projected acreage for the coming season. But European packers and manufacturers are also concerned, as they will need sufficient raw material to supply and amortise their production facilities. We therefore hope that the final acreage cuts will not be too drastic, and will enable us to cover the demand for the next season,” said Antoine.



## Link to UK and Old World



THE Canaries were among the first places in the Old World to grow potatoes, which arrived on the islands from the Americas 500 years ago. They are every bit as popular today and are evidence of a close and long-standing link between these islands and the UK.

Local farmers have imported seed potatoes from the UK for decades, and varieties such as the King Edward and Arran Banner even have their own local versions (Quinegua and Arambana).

In the days when the Canaries were the only source of ripe winter tomatoes in Europe, boats would often head to the UK with cargos of tomatoes and return laden with potatoes.

In Spain, potatoes are usually boiled, fried, or roasted (it is rare to find jacket potatoes). Size and age are important. Canarian wrinkled potatoes are smaller, and often younger than the other varieties on offer. Early maincrop potatoes are valued for general use, and this means most potatoes will have a reasonably high level of dry matter, meaning that they are floury rather than waxy.

Labels and varieties regularly seen in Lanzarote include:

- Para Freir (For Frying) – Diva strain, ideal for chips and roast potatoes with a fluffy, floury texture.
- Para Cocer (For Boiling) – Kingsman strain. A decent all-round potato with white flesh.
- Para Arrugar (For Wrinkling) – Smaller, newish potatoes. We spotted the Maris Peer strain and the famous King Edward, a long-standing favourite on the Canaries. Both offer great flavour and firm white flesh.
- A Granel (Loose) – Many varieties are sold loose, generally all-purpose varieties. The Spunta variety, often imported from Cyprus, is a popular choice.

Fresh Canarian potatoes are more likely to be found in smaller grocers or markets. These can be more expensive than imported potatoes, reflecting the size of the small farms that produce them. The small, dark-coloured papas bonitas have a unique taste.

The papas arrugadas (wrinkly potatoes) served with many Canarian meals are a favourite with many diners and are cooked by placing in a saucepan covered with water with plenty of coarse local sea salt added – at least 75g for each 500 g of potatoes (sea water is not usually used because it’s a hassle and doesn’t meet restaurant hygiene regulations).

They are boiled for 15 minutes, until potatoes are cooked through (test with a fork).

## Potato Variety Registration Guidebook launched



TANZANIA Official Seed Certification Institute (TOSCI) in partnership with the Embassy of the Netherlands, has launched a guidebook for registering potato seed varieties.

It has been linked to the Potato Seed Platform, an initiative aiming to improve local potato farming and ensuring food security through strengthening the potato seed sector.

Over the past decade, the partnership between Tanzania and the Netherlands has attracted Dutch potato farmers to register their varieties in Tanzania.



Photos: Top’Pom

## Europatat invites registrations

REGISTRATIONS have opened for Europatat, annual gathering of the European potato community.

Under the theme 'European Potato Trade in 2030: A sector in transition', the 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 offered by new tools and techniques.

The annual congress will take place in Brussels on May 23rd and 24th. Rik Vera will give a keynote speech during Friday's public session on the Thursday.

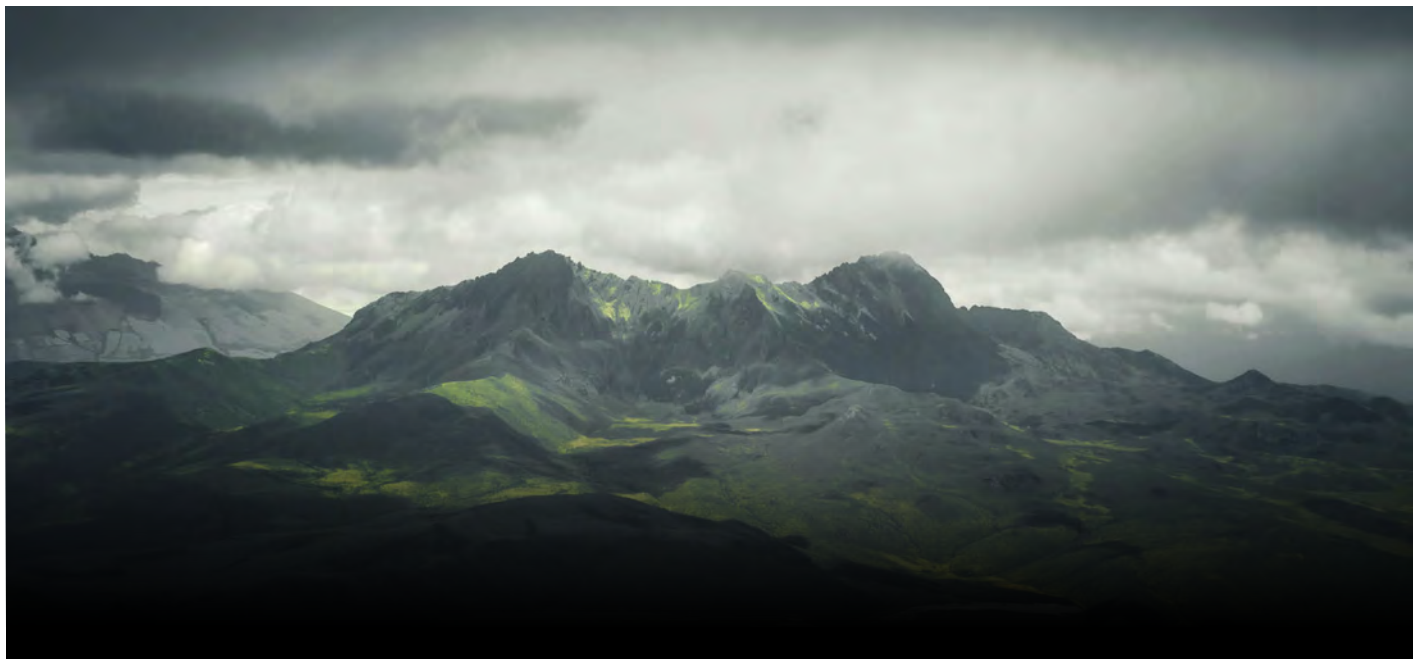
Rik Vera has more than 18K followers on social media and has delivered more than 1.500 keynotes in 60-plus countries. He writes and talks about

business models, entrepreneurship, leadership, marketing, extreme customer centricity, sales and digital innovation.

On the Friday, there will be a panel discussion with speakers from European institutions and other potato stakeholders.

The Europatat Congress will also offer different social events such as the traditional Gala Dinner on the Thursday and farewell drinks on the Friday to reinforce the networking and contact among the European potato community.

Europatat is the European Potato Trade Association, comprising national associations and individual companies involved in the trade of seed, ware and early potatoes throughout Europe. Its members include traders, breeders, distributors, storers, packers, importers and exporters.



## Genetic potato abundance high in the Andes

HIGH in the Andes Mountains in Peru, at the heart of the origins of the potato, hundreds of farming families preserve traditional landraces and, with these, nature's biodiversity.

Important work, for which they have received very little recognition or compensation for a very long time. Change has finally come. Since 2014, HZPC and the International Potato Centre (CIP) have been working directly with these farmers through the AGUAPAN Association. The goal is to preserve this genetic abundance and to improve the well-being of these farmers.

In 1992, world leaders met for the first 'Earth Summit'. There, they signed the Convention on Biological Diversity. In it, they agreed to preserve biological diversity, to make sustainable use of this diversity, and to share the costs and benefits of biodiversity equitably amongst countries. Before 1992, gene banks were permitted to freely collect material. The Convention put an end to that. It was also agreed that the people from which the crops originate should be compensated. This includes the Peruvian farmers.

Stef de Haan, researcher at the CIP for the Andean region, explains: "In a special convention for agricultural crops, a "Farmers' Rights" clause was added in 2001. From that time on, farmers would receive financial compensation for the conservation of biodiversity. The

intentions of these international politics were good, but, in practice, the compensation did not reach the farmers directly. The distance between the farms and farmers was literally and figuratively too great. The Indian farmers from the Andes often do not even know that such a thing as "Farmers' Rights" exists."

For his research, Stef works extensively with local communities in the Andes. Acting as 'guardians', farmer families preserve as many as 50 to 300 old potato varieties each. Their living conditions are often substandard. There is a great deal of poverty, and they have only limited access to education and health care.

Stef said: "In 2014, at a meeting of the Stichting Hoogland Indianen (SHI) [Highland Indians Foundation], I tried to bridge the gap between the private sector in the Netherlands and these farmers in the highlands of Peru. So that money from the sector would go directly to them. At that time, HZPC was the only company that wanted to participate.' With initial funding from HZPC, Stef was able to hire an anthropologist who speaks Quechua, the local language. She went to visit the farming families to see if they were actually growing these landraces. They managed, through these contacts, to organise a meeting to which they invited approximately 50 farmers. There, AGUAPAN was established, and an initial board was elected.



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## Grain or vegetable?

US Senators from both the Republican and Democratic parties have urged officials of the US Department of Agriculture to throw out a controversial proposal to reclassify potato as a grain.

A joint advisory committee, tasked with providing recommendations to USDA and HHS secretaries to help inform their development of the Dietary Guidelines for Americans (DGA), is considering the interchangeability of starchy vegetables and grains.

This contentious issue would see the potato's classification change from vegetable in the upcoming DGAs for the years 2025-2030.

A group of 14 senators has written to Agriculture Secretary Tom Vilsack and Health and Human Services Secretary Xavier Becerra, stating: "The scientific basis for claiming potatoes are not vegetables is as thin as a potato chip. Potatoes offer real nutritional value, and we vehemently oppose their reclassification as a grain under the DGAs."

The potato has been classified as a vegetable since the inception of the US Department of Agriculture (USDA). The letter refers to potatoes as "powerhouses of potassium, calcium, vitamin C, vitamin B6, and fibre", adding that a new classification would confuse consumers and throw the entire supply chain into chaos.

The Senators also cited a 2013 National Library of Medicine study entitled 'White Potatoes, Human Health, and Dietary Guidance' which championed the potato's cause and says it should be in the vegetable group because it contributes critical nutrients.

The Senators highlighted that the reclassification would deprive consumers of vital nutrients.

Their letter states: "Our federal nutrition programs rely on the DGAs to ensure that program beneficiaries are receiving well-balanced, nutritious food. Such a change could also come at a cost to our nation's schools. Under the National School Breakfast and National School Lunch Programs, schools already struggle to meet vegetable consumption recommendations at a reasonable cost, and potatoes are often the most affordable vegetable."



## 'Speciality categories are growing'



THE organic and specialty potato categories are continuing to grow in the US and Canada, according to supplier EarthFresh Farms.

Within the organic segment, demand for organic baby potatoes and organic yellows is up as a result of advancements in better tasting varieties as well as health-conscious consumers continuing to spend time cooking at home. Additionally, retailers are also merchandising organics in better locations throughout their stores.

Andrew George with EarthFresh said: "The surplus of potatoes in the Western US has put downward pressure on the overall potato market in North America. Coupled with a weaker economy in both Canada and the US, the change from last year's short supply situation has been quite extreme."

EarthFresh is embarking on a new crop organic coloured potato program in May. The new crop organic program will be packed in both the company's Atlanta facility as well as in Burlington, Ontario.

Photos: EarthFresh



## President denounces 'Shrinkflation' in crisps bags

THE US President has hit out at crisps companies he's accused of practising 'shrinkflation'.

During his State of the Union address, President Joe Biden said many corporations raise prices to "pad the profits" while providing less actual product.

"The snack companies think you won't notice if they change the size of the bag and put a hell of a lot fewer chips in the same size bag."

Snacks get downsized more than other products, according to the 2023 report by the US Bureau of Labor Statistics. The agency tracks shrinkflation as part of its research on consumer prices.

Overall, shrinkflation affects a small portion of products, government experts found, and manufacturers are downsizing less frequently than they did a decade ago, although the changes can be dramatic.

Frito-Lay, which manufactures Lay's, Doritos, Cheetos, Fritos, Ruffles, Tostitos, SunChips, Stacey's chips and chip-adjacent Funyuns and is owned by PepsiCo was questioned about whether — or when — the company planned to add more crisps to each bag, but declined to comment.



## Levies to continue



AUSVEG, the industry body which represents the Australian potato and vegetable industries, has announced that Emergency Plant Pest Response (EPPR) levies are to continue.

The decision to keep the fresh potato and vegetable EPPR levies active is to ensure industry preparedness to fund future biosecurity responses as required.

The levies were introduced in October 2018 to pay back a debt to the Commonwealth Government for underwriting the vegetable and potato industry's share of the tomato potato psyllid (TPP) national response costs. It has since been used to help fund a biosecurity response to Varroa mite.



## Prices surge during harvest season



POTATO prices have surged in Dhaka, the capital of Bangladesh, where there has been a Tk15-20 increase per kilogram.

Inflation and supply chain disruptions are responsible for the increase, according to analysts. Compared to the previous year, the cost of potatoe production has doubled, with adverse weather, increased seed potato, and fertiliser prices each having an impact.

Currently, potatoes are selling for up to Tk65 a kilogram, compared to Tk28-30 last year. The Consumers Association of Bangladesh is blaming the price hike on market manipulation and inflation, exacerbated by the government's delayed response.

Fresh Plaza recently reported that, despite an increase in potato cultivation area, premature harvesting and adverse weather have led to a projected 30% shortfall in production, according to the Bangladesh Cold Storage Association. This is expected to keep prices elevated throughout the year. Contrary to the Department of Agricultural Extension's optimistic production forecast, industry experts predict lower yields due to unfavorable weather and rising costs for seeds and fertilisers.



## Proper crisps resume after cyclone's impact



FOLLOWING a temporary shift to Australian-grown sweet potatoes owing to Cyclone Gabrielle and subsequent weather events severely impacting local crops, Nelson's Proper Crisps has resumed using New Zealand kūmara.

The cyclone, part of a series of weather challenges including torrential rain and the Auckland Anniversary Day floods, destroyed 99% of the region's kūmara crops, according to Ant Blundell of Kaipara Kūmara, a supplier to Proper Crisps for over a decade. Ant described the past year's weather as unprecedented in his 50 years of kūmara harvesting.

With the industry experiencing a 70% downturn OWING to the cyclone, Proper Crisps had temporarily introduced a sweet potato variant using Australian produce. However, with the recovery of local kūmara crops, the company has placed an order for 700 tonnes of New Zealand-grown kūmara for its Lightly Salted Hand Cooked Kūmara Crisps, dedicated to the New Zealand market.



## Production decline in India



INDIA'S Department of Agriculture and Farmers Welfare, in its First Advance Estimates, anticipates a decline in potato production for the 2023-24 period.

Production in India is expected to slightly decrease by 2%, with an estimate of 58.99 million tons, down from 60.14 million tons, with West Bengal experiencing a notable shortfall.



## New feature in soil management platform

**Y**ORKSHIRE tech company, Soil Benchmark, gave growers and agronomists access to a new feature within its Digital Soil Management Platform last month to help them demonstrate how to comply with soil rules.

The new module automatically generates maps which can help farmers comply with Nitrogen Vulnerable Zone (NVZ) regulations and the Farming Rules for Water (FRfW).

The software start-up was founded in 2022 by Tom Scrope NSch and ex-James Hutton Institute soil scientist Dr Ben Buttler.

The platform offers growers tailored soil management plans, providing insights and compliance with the SAM1 action of DEFRA's Sustainable Farming Incentive (SFI) scheme. The Soil Sage package unlocks field-by-field Soil Management Plans for any sized farm, and when combined with a Manure Spreading Map,

helps farms comply with NVZ rules, Farming Rules for Water, and the SAM1 action of SF123.

Ben said Soil Benchmark's mission is to improve soil health at scale, and allow agronomists and growers to easily define risks.

"The user is free to fine-tune each field using their expertise and local knowledge, creating maps and plans that clearly and accurately define where risks are, and ultimately having impact on the ground," he said.



## The TRUTH about their soils

**E**XPERTS in soil and root health and sensor technology are working together on a new three-year project called TRUTH (Thriving Roots Underpinning Total soil Health), which has received £1M Defra funding.

They will work alongside growers who conduct trials on their own farms with the goal of identifying the tools they need to assess their crop roots and quantify the impact of their farming system.

A key part of this will be developing a novel sensor, developed by PES Technologies, capable of 'smelling' a soil's biological signature.

Cutting-edge UK ag-tech tools are coming together with research and development expertise to help growers discover more about the role roots play in maintaining healthy soils.

Soil degradation currently costs England and Wales £1.2 billion every year, but few tools have been developed to measure soil and root health and how they interact.

Tom Allen-Stevens of BOFIN (British On-Farm Innovation Network), which is leading on farmer engagement for the project, said:

"Healthy soils play an important role in food production, climate change mitigation, and maintaining biodiversity. However, what goes unrecognised is the role of the roots that weave their way through them, drawing nutrients, transferring carbon, providing life to the complex microbiome that lies unseen beneath our feet.

"What we've brought together with TRUTH is some really exciting, cutting-edge technology that can open a window on this unexplored world.

"In addition, there are many desirable traits that rely on the interactions between crop and soil, such as drought tolerance, performance in marginal situations, nitrate modulation, and soil carbon sequestration. Through TRUTH, we will get a better understanding of the interactions that would enable breeders to identify the genes responsible. These can then be brought into breeding lines and help identify bioproducts that consistently enhance performance."

TRUTH is funded by the Farming Futures R&D fund, part of Defra's Farming Innovation Programme, and Innovate UK is delivering the programme.

The three-year, £1 million project will build on work already carried out by PES Technologies to develop its soil health sensor to enable it to measure microbial diversity and fungal:bacterial ratio.

Working closely with leading scientists at University of Nottingham and John Innes Centre, it will create the 'Root Rangers



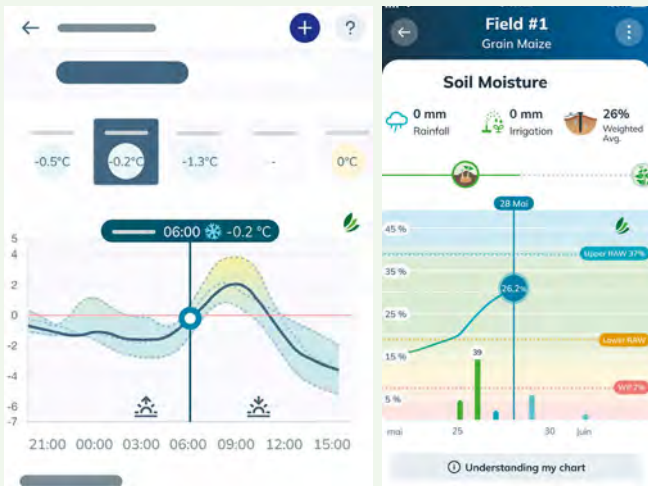
Tom Allen-Stevens of BOFIN

Platform', an online space offering on-farm soil/root health testing tools validated during the project by the farmers taking part.

"The project outcomes will deliver farmers the tools they need to assess their crop roots and quantify the impact of their farming system on soil health," said Tom.

TRUTH will be led by BOFIN alongside PES Technologies, CHAP Agri-Tech Centre, John Innes Centre and University of Nottingham.





## New sensors introduced for crop monitoring

**T**WO new environment monitoring sensors, Soilcrop and Thermocrop, have been introduced by Sencrop. Water stress is an increasing concern owing to the changing climate, and the new Soilcrop sensor takes real-time measurements of soil moisture and temperature at depths of up to 60cm. This enables irrigation to be triggered at the right time and turned off when soil moisture reaches the required level. In addition, it can be used to identify the most suitable time for other weather-dependent field work, including sowing and fertiliser application.

UK Account Executive at Sencrop, Mark Herriman, said: "Soilcrop takes measurements every 15 minutes at depths of 10cm, 20cm, 40cm and 60cm, giving an accurate picture of soil moisture content and temperature throughout the profile. If used in conjunction with Raincrop, a sensor that measures rain, temperature and air humidity, the app can show in a user-friendly graph the forecast soil moisture, using real-time data and forecasts. Producers can therefore be even more precise when it comes to crop management decisions."

The second feature, the new Thermocrop sensor, offers an entry-level monitor to help predict frost damage up to four days in advance. It measures air temperature and humidity every five minutes and is integrated with Sencrop's other weather management software to create predefined or personalised frost alerts within the app.

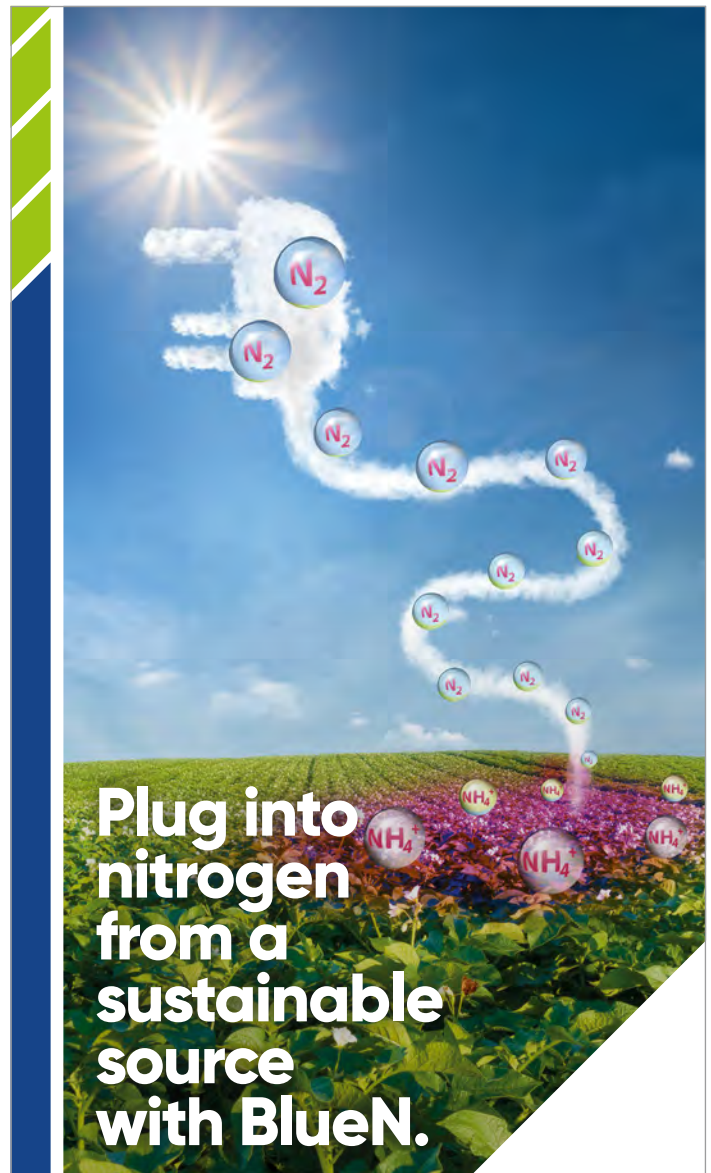
Thermocrop is a low-budget alternative to its big brother Leafcrop, which was launched in 2019. Whereas Leafcrop is a connected sensor placed on the plant itself to obtain accurate temperature, humidity and moisture measurements, Thermocrop is placed in the middle of the field for more general measurement.

## Grant aid for probe purchase

**S**ENCROP's soil probe, the Soilcrop, is eligible for a 43% grant of £477.60.

Soilcrop is the Sencrop's 60cm capacitive probe which measures soil temperature and humidity at four different depths (10, 20, 40 and 60cm).

The Farming Equipment and Technology Fund (FETF) grant was introduced by the Government earlier for to buy items that improve productivity within growing. For more details, visit the gov.uk website.



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# ‘Market contraction drives shift to sustainability and tech integration’

A 40% reduction in the agri-tech market in 2023 signals an influx of robust M&A activity in 2024, according to an investment banker.

Venture capital investment experienced a significant contraction in 2023, as global business underwent a period of turbulence. According to PitchBook data, the agri-tech sector followed this pattern, with investments decreasing from \$11.8 billion in 2022 to \$7.1 billion last year, a reduction of 40%.

Vice President at DAI Magister, Ali Al Suhail, said the early signs show that the market contraction has ‘sown the seeds’ for robust M&A activity in 2024. Start-ups have been forced to create more sustainable business models and more agtech companies are entering the market, enticed by the critical role of data in agriculture and the need to transform the industry in response to growing environmental concerns.

Ali said venture-backed and early-stage startups will continue to suffer in 2024 and should shift their focus to seeking new partnerships or attracting acquisitions.

“Precision farming firms, for example, could emphasise technological synergies to attract tech buyers,” he said.

He said that ultimately agri-tech is intrinsically linked to farmers’ economics and the regulatory environment, as well as being impacted by climate. “If there are supply shortages or volatile changes to commodity prices, market confidence can vary hugely. To bring in new investment, it’s therefore a question of educating the wider market about the challenges of the sector and how new and innovative solutions will drive the industry forward.

“In the first quarter of this year, we’ve seen some interesting new acquirers entering the market. Where historically farmers’ limited adoption of agri-tech solutions had dampened their ROI and data standardisation, a recent shift has signalled a broader embrace of tech applications driven by a regulatory focus on climate and farmer efforts to optimise yield.”

A strong example of a new entrant is tech giant Microsoft, which partnered with Bayer to create data solutions for the agriculture industry. Google also recently launched



Mineral.ai, a tool that utilises AI and machine learning to unlock sustainable methods of growing, while AWS partnered with Leaf, making Leaf’s Unified Farm Data API available on the AWS Marketplace.

“These launches and partnerships signal a period of transformation for agri-tech, with new market entrants driving tech adoption,” said Ali.

“The entry of tech giants may help break the agri-tech M&A valuation ceiling, which has seen only a dozen companies surpass the \$250 million mark over the last decade. This could unlock fund-raising opportunities for growth-stage players in the sector, who have faced doubts from investors on their ability to cross the \$250 million valuation mark.”

# Agritech specialist: ‘Supply chain needs to address future water shortage’

An agritech specialist is calling on everyone in the potato supply chain to play their part in conserving water resources for the future.

Against the current backdrop of excess rainfall and flooding, it’s a call that many may see is ill-placed but Peter Blezard of UK-based Engage Crop Solutions has spent the past decade working to find a solution to the agricultural water crisis globally.

He says leaders, manufacturers and growers must all fight to find new solutions that will enable us to feed a growing population against a backdrop of shrinking freshwater reserves and while agtech will play a major part in this, it can only work if all those in the supply chain get on board.

“We must work to find smarter solutions that enable us to reduce the amount of water needed to grow crops. This will reduce agricultural demand and help us to unlock more land to meet the food production demands of the future,” he said. “There are a range of new technologies coming through that can be part of the solution, but we need everyone in the food supply chain, from national leaders and major manufacturers,

through to the growers on the ground, to work together to tackle this crisis.”

Over the past 25 years, working with potatoes and other vegetable crops, Peter has helped to develop a range of technologies to enhance crop yields and food quality. He founded and floated Plant Impact PLC on the market and was also CEO and Founder of Azotic Technologies, another sustainable ag business, before securing a six-figure funding package for his current business, Engage Crop Solutions.

Engage Crop Solutions currently supplies a range of crop input technologies for the



potato sector, including Sentinel, Fortify and Bio-Chel along with Aqualatus. The latter, its flagship product, is geared towards halving agricultural water use while improving plant health and crop yields.



Image by WikimediaImages from Pixabay

# New generation of haulm toppers

Range now available for various working widths with redesigned housing and other new features.

**A** NEW generation of haulm toppers in various working widths has been introduced by GRIMME. The new TOPPA series features different models that enable haulm topping of two, four, six or eight rows in front and rear mounting or in a front-rear machine-combination.

The TOPPA 200 and TOPPA 400 are two-row and four-row haulm toppers, respectively, and are suitable for both front and rear attachment.

By optimising the gearbox position, the angle of the PTO shaft to the tractor has been flattened. The manufacturer states that this significantly reduces wear on the PTO shafts, especially when lifting the haulm topper at the headland.

Another new feature is, that the four-row machine, with a row width of 90cm, is now also equipped with a continuous flail shaft, without any bearing and missing flails in the middle of the shaft. Large maintenance flaps across the entire width of the housing make it easier to clean and change the flails.

The six-row front-rear combination consists of the TOPPA 200 in the front attachment of the tractor and a TOPPA 600 Combi in the rear. The TOPPA 600 Combi is folded hydraulically so that two rows are folded on either side of the tractor. The machine can be hydraulically folded to a transport width of 3m for a fast change from field to field.

For an eight-row front-rear combination, the TOPPA 400 in the front is combined with a TOPPA 800 Combi in the rear. Here, the two booms in the back of the tractor are also



folded hydraulically to operate two rows twice. With the TOPPA 400 haulm topper, the road transport width is 3.29 metres with a row width of 4 x 75 cm.

On both the TOPPA 600 Combi and the TOPPA 800 Combi, the two booms can be controlled separately from each other via a hydraulic control box or optionally via ISOBUS with AUX-N assignment. In conjunction with the standard wide-angle PTO shafts, it is therefore possible to lift the haulm toppers independently of each other on wedge-shaped surfaces.

The two housings are also pendulum suspended, allowing them to adapt to uneven ground. An optional hydraulic side shift is also available, which can be controlled manually or, in the highest configuration level, adapt automatically to the alignment of the ridges. This is particularly relevant if the number of rows of the planter does not match the number of ridges of the haulm topper.

## Eight-row in solo operation

With the TOPPA 800, GRIMME offers an eight-row haulm topper for rear mounting, which can be hydraulically folded to an external width of 3m for road transport. The machine is particularly



suitable for farms with 8-row planting methods and for tractors without a front PTO shaft.

In the TOPPA series, the typical GRIMME flails are still used. In addition to other flail types, counter-blades can be installed for optimum haulm shredding. These are completely closed and can be positioned closer to the flail shaft in the event of flail wear. The manufacturer states that, in combination with the new, extended haulm deflector plates, the placement of the potato haulm between the ridges is significantly improved.

## Wheels and working heights

Optionally, superficial ridge pressing wheels (so-called RidgeRunner) can be selected for each row, which close cracks on the top of the ridges after haulm has been topped. The individual suspension enables optimum adaptation to each row. Low tyre pressure allows the wheels to roll in a targeted manner so cracks in the ridges are closed. The potatoes can thus be protected from direct sunlight and the risk of green tubers can be reduced, while fulling ensures that the wheels clean themselves. **PR**



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## Limited edition self-propelled harvester

AVR, which is celebrating its 175th anniversary this year, has unveiled its Limited Edition Puma 4.0.

The high-tech self-propelled harvester is being given a retro look to tie in with the anniversary and showcase its history.

This year AVR is also presenting its first miniature Puma 4.0 in response to long-standing demand. Every customer who buys a Puma 4.0 this year will also receive a miniature version.

Delivery of the miniature versions is expected in early November, in time for Interpom, the Belgium potato trade association's event, and pre-ordering is now available.



## Family-run business joins dealer network

NORTH Herefordshire-based Turners Agricultural Engineers has joined the Standen Engineering Ltd dealer network.

Turners Agri is a family-run firm headed up by Adam Turner and has been operational since 2013

It will sell and offer parts and maintenance for a wide range of potato cultivation and maintenance machinery including Standen and Standen Imports' products which include Baselier, VHM, Forigo, Ferrari, Brettmeister, Ortomec, ARC, Simon, Imants, Bassi, Vegniek, Hoaf and MOM.

Adam Turner said: "This area and its bordering counties is well known for being a large root cropping area with farms growing as few as 50 to as many as 1,000 acres. We are pleased to be able to offer well-engineered British machinery to our customers as well as competitive, strong European imported products. Not only will we be stocking parts at our Pencombe depot, we will also be operating an out-of-hours, seven-days-a-week planting and harvesting call-out service."



Adam Turner of Turners Agri with Standen's Duncan Pound

## Royal visit to manufacturer



THE Princess Royal and the Lord-Lieutenant of South Yorkshire, Dame Hilary Chapman, saw one of Haith's Rota-Tip box tipping systems in action during a recent visit to the manufacturer's premises in Armthorpe, near Doncaster.

Following an introductory presentation by Managing Director Duane Hill, they toured the company's facilities, gaining an insight into the manufacturing process, from initial design, sheet metal cutting & folding, welding, machining, assembly, and pre-delivery testing.

Princess Anne also unveiled a plaque to commemorate the visit and met with employees and founding family members.

Duane said: "The Princess Royal was genuinely interested in how Haith Group helps growers, food packers, and processors operate more efficiently and took the time to visit all of our departments, talking to the team and hearing about how we develop our handling solutions."



Any dealers or manufacturers interested in sharing video demonstrations with our readers via our website and social media, should contact Theresa Geeson at [theresag@warnersgroup](mailto:theresag@warnersgroup)

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## At-line analyser brings even more to series offering

NORDSON Measurement & Control Solutions (formerly NDC Technologies) has launched a new, improved at-line analyser to help potato companies maximise their process performance and KPIs.

In 2022, Nordson introduced the InfraLab Series 9, an at-line analyser that combines the best features of the previous model, the InfraLab e-Series, with the expanded capabilities of the Series 9 on-line gauge. Over the past two years, this established itself as a valuable measurement device in the food industry thanks to its user-friendly design and ability to simultaneously measure moisture, oil, protein, and other key constituents straight out of the box.

Building on this success, Nordson has expanded the InfraLab Series 9 family with a new model, the InfraLab Series 9 Top-Loader which can measure colour as well as moisture, fat/oil, and protein in five seconds. It is ideal for fibre, flakes, and powder products and replaces time-consuming laboratory or at-line instrument methods while providing deeper process insight.

[www.ndc.com/food-bulk-materials-processing/products/food/infralab-series-9-top-loader/](http://www.ndc.com/food-bulk-materials-processing/products/food/infralab-series-9-top-loader/)



## New centre for processed projects demo

TOMRA Food, a provider of optical sorting, grading and peeling solutions, has inaugurated a new centre for processed projects in Valencia, Spain.

The site will conduct occasional demonstrations for processed food, although Belgium will continue to be the main centre for these. It will also deliver training for company staff and TOMRA Food customer operators.

TOMRA Food's regional sales manager for Southern Europe, Alejandro Palacios said: "For us, demonstration centres are very important. They enable us to show our customers what our sorting machines can achieve for them."

The majority of demonstrations at the Valencia centre are for whole potatoes, citrus fruit and blueberries.



## Crop research company moves in at Hartpury Agri-Tech Centre

Emerald Research Ltd (ERL) has moved to a new head office at the University of Hartpury's Agri-Tech Centre.

ERL is an agricultural biotechnology-focused company, carrying out research, trials and development into soil science, crop nutrition and software engineering in collaboration with many of the UK's leading soil, crop and agricultural organisations, including Dyson Farming Research, Bangor University and the James Hutton Institute. Its OptiYield System is a complete soil health and crop performance system that harnesses digital agronomic tools to deliver advanced proprietary crop input programmes for agronomists and farmers.



## 10-year bioherbicide partnership

AGRICULTURAL biotech company Moa Technology and Croda International plc have formed a strategic partnership to develop next-generation bioherbicides by combining Croda's extensive research into the marine microbiome developed by its Nautilus Biosciences subsidiary in Canada with Moa's own herbicide discovery engine.

Spun out of the University of Oxford in 2017 to develop new and more sustainable ways to help ensure global food security, Moa is backed by leading agritech and life sciences venture capital firms. Its proprietary biotechnology platforms work to identify herbicides with novel modes of action (MOAs), and it operates its own glasshouse testing facilities. It is developing biological and synthetic herbicides on its own and with industry partners.





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