

"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

"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. →



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.*



The new UPM SolargoTM 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, microbes 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 trialed in Europe and will be available in the UK. **PR**



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Simon Fox, Founder, Emerald Research Limited

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