



“ This is how to achieve return on investment – placing products within a crop’s lifecycle where they’re most likely to deliver impact.”

Bioscience in practice

Working in synergy

Utilising synergistic activity between two foliar biostimulants could help cereal crops to overcome nutrient deficiencies and bounce back from adverse autumn conditions. *CPM* finds out more.

By Janine Adamson

It’s widely acknowledged that when it comes to crop nutrition, rather than abundance of macronutrients, the most critical factor is availability. And in the case of phosphate specifically, despite existing in three pools, it’s only the inorganic form dissolved in soil water which is readily available to the plant.

At the same time, growers are striving to balance reducing their reliance on conventional, applied fertilisers with overcoming 18 months of challenging weather conditions – sharpening the focus on ensuring optimised crop nutrition, suggests Unium Bioscience’s Andrew Cromie.

“As we move through the autumn and

into the spring with crops approaching GS30, thoughts shift towards rooting and phosphate availability. This is even more prevalent following the wet weather of the past season and depleted soil reserves, as well as the potentially compromised establishment of this year’s winter cereals,” he explains.

“There’s also the influence of soil biological activity – as the weather turns, biology shuts down whether a crop is ready to be dormant or not, which can result in a transient deficiency. With all of these factors combined, the importance of crop rooting and scavenging for nutrients comes to the fore.”

Alternative solution

Rather than revert solely to conventional phosphate products, Andrew adds that there’s an alternative in the guise of two foliar biostimulants – Calrite Extra (calcium phosphite+ L-PGA) and Luxor (a nutrient blend+ humic acid+ fulvic acid+ L-PGA).

“Calrite Extra is a stimulant designed to improve crop rooting and maximise nutrient uptake. It essentially tricks the plant into scavenging and therefore boost its roots and exudates which feed the soil biology.

“Working in synergy with this is Luxor which provides an efficient phosphate supply through maximising availability and reducing adsorption in the soil. Because

Luxor contains pidolic acid (L-PGA), the overall combination helps a crop to make the most of this availability while increasing nitrogen assimilation,” he explains.

Having used Unium products for several years, Agrovista agronomist, Rob Sheets, was keen to assess the two biostimulants for himself. This began with Calrite Extra, which he started working with in 2020.



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Agronomist Rob Sheets recommends using Calfite Extra as the crop is waking up in the spring because in challenging soil conditions, strong roots are critical.

► “Many of the farms I manage are aiming to utilise more sustainable approaches to crop management but without compromising on productivity or hiking input costs, meaning there’s a growing interest in alternative technologies.

“As with conventional phosphate, Calfite Extra helps a crop to push roots out, and the more roots, the better. This has been a consistent effect and coupled with its cost-effective price-point, the farmers I work with have become accustomed to the product and trust the science.

“In fact, used with Luxor, it’s certainly playing a role in making the switch from granular phosphate for many of the farms I advise on,” highlights Rob.

Waking up

He points out that GS25-30 is the most achievable application time due to autumn conditions becoming increasingly difficult across his region (East Anglia and the Midlands). “A post-em application isn’t possible in reality, instead, I recommend using Calfite Extra as the crop is waking up in the spring. This is because in challenging soil conditions, strong roots are critical.”

As for Luxor, Rob’s experience with the product began in 2022. “Aside from being an available form of phosphate, Luxor’s particle size is very small which helps with solubility and uptake within the plant. I’ve found it to be a useful product in maize too because the crop has such a high energy demand early on in its lifecycle.

“Used with Calfite Extra, the two products exhibit a synergistic effect meaning I rarely recommend one without

What it means for ROI

Trials which took place at Russell McKenzie’s farm in Cambridgeshire last season explored the impact of different biostimulant programmes on a crop of Bamford first wheat.

Most notably, an application of Calfite Extra 0.5 plus Luxor 0.5 at GS30, resulted in a 1t/ha yield increase come harvest, compared with the farm standard.

Analysing this for return on investment by dividing the net income by the cost of the treatment (see table), Andrew Cromie says the figure of 16:1 for the two products should speak for itself.

But what does Russell think?

“Not only is it reassuring to see a positive yield response from the two products, but because they’re cost-effective, they reduce some of the risk associated with making the investment in the first place,” he says.

“Using them certainly supports exploring new approaches to phosphate while reducing input costs, but with the added benefit of



Farmer Russell McKenzie says because Unium products are cost-effective, they reduce some of the risk associated with making the investment in the first place.

knowing that the products consistently work. If you work out the ROI of conventional phosphate versus the Calfite-Luxor approach, the latter wins hands down.”

	Yield t/ha	Difference t/ha	Additional yield value (wheat at £188.8)	Cost/trt	MOIC	ROI
Farm standard	12.2	-	-	-	-	-
Farm standard plus Calfite 0.5 l/ha	12.4	0.2	£37.76	£6.30	£31.46	5:1
Farm standard plus Luxor 1.0 l/ha	13.1	0.9	£169.92	£10.20	159.72	16:1
Farm standard plus Calfite 0.5 l/ha and Luxor 0.5 l/ha	13.2	1	£188.80	£11.40	£177.40	16:1

*1st wheat: Bamford

the other. Equally, knowledge is improving regarding TSP in that it’s a waste unless aspects such as pH and calcium levels are at their absolute optimum. This means using the biostimulants is a far more efficient approach,” he comments.

Bedfordshire farmer, Matt Fuller, is a self-confessed advocate of biostimulants and uses them across the entirety of 1000ha Heathcote Farms to help maximise crop health and efficiency. He includes biostimulants in most tank

mixes across a range of combinable crops including Group 1 wheats.

After seeing the benefits of this approach, Matt says it led him to question exactly how crop nutrition is being delivered. “Having purchased a microgranular applicator a few years ago, we’d been applying Primary-P around the seed in our oilseed rape and cereal crops topped up by foliar phosphite applications in the autumn and spring.

“However, I wasn’t sure if this was



According to Bedfordshire farmer Matt Fuller, a stand-out benefit of Luxor is that it has activity whether it's soil- or foliar-applied.

the correct method for the cereals in particular, and wanted to know whether we could fine-tune both product choice and application timings," he explains.

This led to a conversation with Unium which explored the 'supply and demand' effect of the Calfite Extra/Luxor combo. But Matt says a particular stand-out benefit was that Luxor has activity whether it's soil- or foliar-applied. "This means the crop's biomass, which can vary during difficult conditions, is less of a concern and we gain greater flexibility on timings, especially for backward crops."

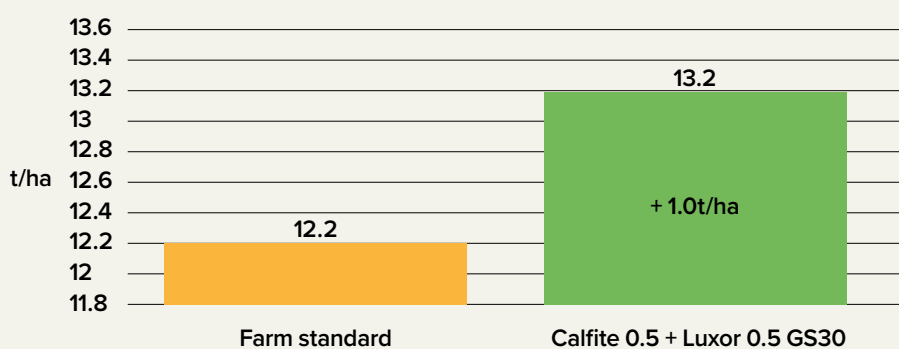
As such, this led to him trialling Luxor for the first time last year (2023/24). "We tried the product across various first and second wheats and also some spring peas with applications being made in the spring to boost crop vigour and overcome any stress.

"The main crop which I was interested in was 110ha of Extase (second wheat). Despite the difficult conditions throughout the season, which in many ways has made it difficult to conduct and assess trials, we achieved 9.39t/ha average, which I was very pleased with.

"Although that can't be attributed to the addition of Luxor alone, I believe it has contributed to the crop's performance," suggests Matt.

He also highlights that managing take-all in second wheats can be a challenge on the farm and therefore he perceives Luxor to have value in offsetting that disease threat. "Due to the weather and heavy land, we'd usually have to be drilled up in early October but of

Yield response in winter wheat – Calfite Extra and Luxor



Source: Unium Bioscience, 2024

course, it increases the risk of take-all.

"Biostimulants such as Luxor can't eradicate take-all, but they can help to increase rooting which supports a crop to grow through the disease pressure," he explains.

Biostimulant programme

Crucial to his success with biostimulants has been creating a suitable programme depending on mode of action and what each product contains, stresses Matt. "I believe this is how to achieve return on investment – placing products within a crop's lifecycle where they're most likely to deliver the greatest impact.

"For second cereals, Calfite Extra and Luxor certainly fit well during the high supply and demand period in the spring," he adds.

To revert back to his point regarding how best to deliver crop nutrition, Matt says he conducts regular tissue testing to support tailored applications and avoid wastage. "We have a lot of data from the past few years which we've been

able to collate and start to extract trends based on the weather, for example.

"We're also conducting grain analysis too which helps to understand the impact of biostimulant products which are applied later in the season, such as 3 ALO T6P (trehalose-6-phosphate), and whether they're influencing grain quality."

Cambridgeshire grower, Russell McKenzie, has also been trialling Calfite Extra and Luxor. Despite the testing conditions of last season, he says the products still performed which is reassuring.

"We regularly see uplifts of at least 1t/ha from using Calfite Extra and Luxor, which includes last year. You can't always see a difference with the naked eye comparing treated with farm standard, but it's apparent during NDVI scanning.

"Half the battle with biostimulants is managing conflicting claims about their performance as they don't all work, but through trials, we've seen that the Unium products are effective year-on-year," he concludes. ■

Bioscience in practice

As the chemistry toolbox continues to shrink, an array of new biosolutions are coming to market, offering a range of benefits and complementary additions. Evaluating how effective they are and where they're best placed can be tricky, however.



This series of articles opens a window on the science behind these innovations. CPM has teamed up with Unium BioScience to explore the background, unravel the physiological processes and provide analysis on trial results. Above all, these articles give the grower an insider's view on some of the exciting opportunities biosolutions offer in the field, including Calfite Extra and Luxor.

Calfite Extra is a foliar nutrient complex designed to improve crop rooting and maximise nutrient uptake from the soil. Luxor is a soil- or foliar-applied fertiliser based on two forms of available phosphorus, which aim to maximise availability and reduce adsorption in the soil.

Learn more by joining the Unium Bioscience technical group <https://www.uniumbioscience.com/unium-technical-group>