

Maximising potential

“If we can use biostimulants to raise an overall healthier crop across the field, then it's going to help.”

Biostimulant survey

As growers grapple for ways to make the most of every gram of precious fertiliser resources this year, could biostimulants play a role in maximising uptake and utilisation? *CPM* explores the concept...

By Charlotte Cunningham

With record-high fertiliser prices seen this season, growers have been forced to be more efficient with usage to make the most out of what supplies they do — or don't — have.

For many, this has meant looking at and adjusting rates, considering how losses can be minimised by 'little and often' applications, and ensuring crops have everything else they need by means of phosphate, potash, magnesium and sulphur to produce the best possible results in a difficult scenario.

Another aid which has been widely discussed is the use of biostimulants. And while such products won't replace the absence of high volumes of nitrogen, some are claimed to optimise uptake and efficiency by the crop.

But just how beneficial can they be?

To set the scene, in a recent survey carried out by *CPM* and Interagro, 49% of growers said they will be reducing dose rates to make fertiliser go further this season in light of the current prices and shortages. In comparison, just 25% said that the current situation will have no impact due to securing early supplies.

"It's always a bit of gamble with fertiliser — you see the price go up and hold off purchasing thinking it'll come back down, but

that hasn't been the case this year," says Stuart Sutherland, technical manager at Interagro. "Reducing dose rates is an undoubtable outcome, though this has the potential to impact yields."

And it's not just this season that's going to be impacted, adds Kieran Walsh, regional agronomist at Velcourt Advisory.

"With N prices off the charts and looking like they may hold, decisions are already focused on next season's crop nutrient cost/ha."

Tiller counts

"There are a number of areas that should be considered before applying N. This includes the previous year's NUE to gauge tendencies on your farm, as well as assessing the soil nitrogen supply and comparing this with the field assessment method.

"I also recommend carrying out tiller counts as well as assessing backward crops and crops like second cereals. These are just a few small steps which will help improve sustainability, reduce waste and increase efficiency."

However, Dr Syed Shah — regional agronomist at NIAB — believes that reducing rates by 30-40kg in winter cereals and OSR may not produce as severe effects as growers might think. "The breakeven ratio is going to be something that's factored into decision making this year, but the question is, how much is this really going to impact yield?"

"In our gross margin analysis work, we've found that reducing nitrogen may not be overall statistically significant in terms of grain yield."

In winter wheat after OSR field trials at NIAB's Sutton Scotney site, 2019 harvest data showed that the optimum rate was 150kgN/ha, notes Syed. "In 2020, we saw comparable results — with the optimum rate coming in at between 150-175kgN/ha — and

no real difference in yield compared with higher rates of N. This means residue N from the previous crop was making a significant contribution to total N supply resulting in non-significant effects of higher rate of N in the trials.

"Generally speaking, we've found that growers apply far more nitrogen than is actually needed.

"We should take into consideration the previous crop, soil type, rainfall region, soil mineral N, cultivation systems, drilling date, yield potential and organic matter levels. This is because all of them have significant effects on crop N demand and supply during crop growth and development."

But for those who are lacking supplies, the survey suggests that growers are looking at other crop nutrient management strategies to maximise what they do have.

The survey highlighted that 46% of growers are/will be using biostimulants to optimise uptake and use efficiency, while 43% said that they'll be carrying out more in-season soil and leaf tissue tests to target crop needs.

"Biostimulants aren't going to replace a lack of nitrogen, but they can help in certain ►



Interagro has been harvesting data on its biostimulants from a variety of sources, situations, and conditions for a number of years, says Stuart Sutherland.

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Reducing nitrogen rates may not be as damaging as growers think, with studies showing that many have historically overapplied, explains Syed Shah.

► situations,” explains Syed. “For example, if you use a biostimulant and it improves root growth, then the crop will be able to access and utilise more of the available nitrogen. This is often particularly the case when such products are used as a seed dressing, or early in the plants growth cycle.”

With the inclusion of a biostimulant, growers can boost plant health which puts the plant in a stronger position to better carry out key plant functions like utilising what fertiliser it does have available, believes Stuart. “We’ve got plenty of data to show just how much biostimulants can improve plant health if you can get on early with them — T0 and T1 time — before the crop gets into any major stress situations. We’ve seen some fantastic evidence of improving plant health to help overcome disease, improving nutrient uptake and we’ve quantified this through taking leaf analysis throughout the season.

“Ultimately, this has resulted in improvements to both yields and specific weights. That’s where the real benefit comes in.”

The efficient provision of all L-amino acids in an immediately available and useable form, could offer the possibility to reduce the dependence on nitrate and ammonium fertiliser as an N source for amino acid and protein synthesis, adds Stuart. “This is something Interagro is currently

investigating further with research partners.”

Getting in early seems to be a reoccurring theme for success with biostimulants and many growers stated that they’ve used biological/biostimulant seed treatments on winter crops this year. In contrast, just 29% of growers said that they have no plans to use a biological/biostimulant seed treatment in spring crops this year.

Looking at the reasons for applying these products to winter crops, growers cited a number of drivers behind their decision to do so, including to speed up germination and establishment (19%), to optimise nutrition close to the seed (14%) and to maximise soil biology (12%).

“In our experience with our own products, like Newton, we’ve seen both improved root and shoot mass when used as a seed treatment,” explains Stuart. “This has been easily measured in Nottingham University testing and when we’ve taken it out to field, we’ve seen some brilliant examples of just how beneficial they can be.

“An example of this is where we direct drilled winter oats with Newton seed treatment into a standing cover crop. The farmer himself phoned me up to tell me to come out and look at the crop, and when he dug them up the difference in root and shoot mass was phenomenal.

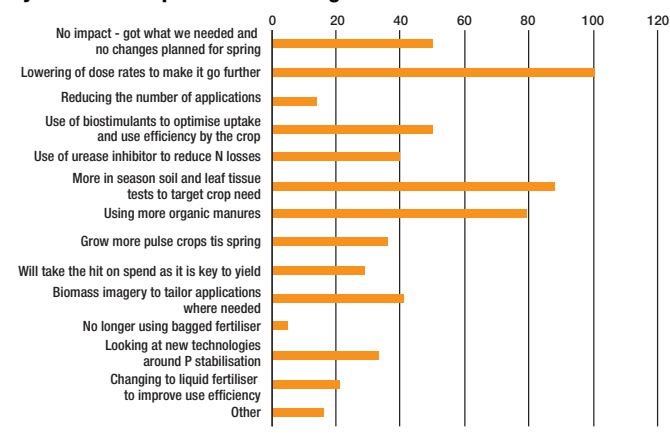
“He reckoned it sped up germination by 2-3 days and that difference then accelerated the rest of the crop growth. As things turn colder over the winter, what was a few days extra growth in September could be the difference of a few weeks in November/December.

“This farmer now uses it across all of his winter crops.”

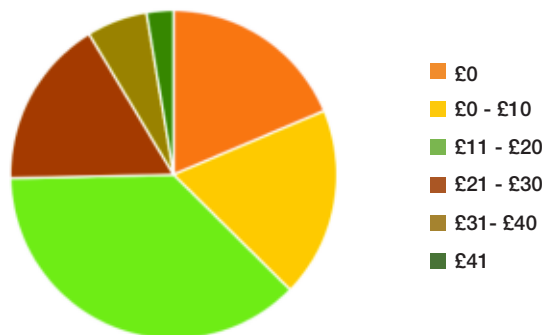
Turning focus to foliar applied biologicals/biostimulants just 19% noted that they won’t be using a foliar applied product in the spring/summer.

Of those who are planning foliar treatments, 47% of growers said this will be on winter wheat (47%), 25% on winter barley and

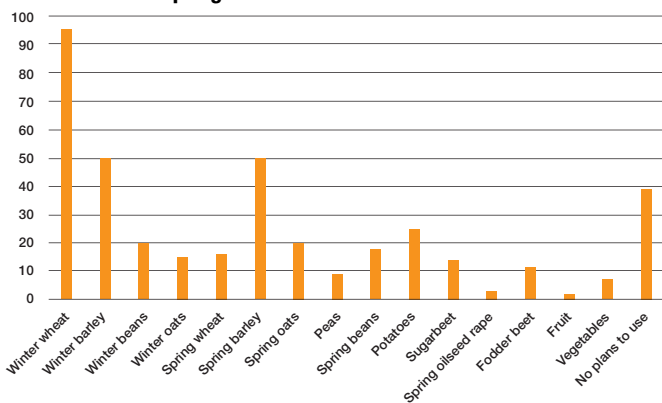
How have your crop nutrient management decisions been affected by the fertiliser prices and shortages?



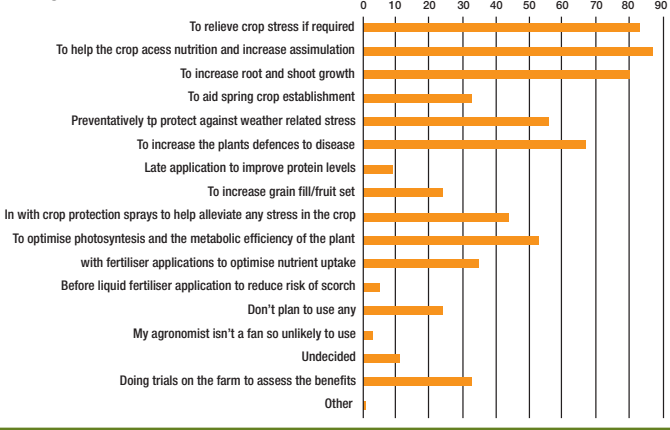
What are you budgeting to spend per ha on your foliar biostimulant application in cereals this spring/summer 2022?



In which crops do you plan to use a foliar applied biological or biostimulant in spring/summer 2022?



What are the main reasons you plan to use a foliar biostimulant in 2022?



a further 25% noting that they're likely to use it on spring barley.

But just how helpful can foliar biostimulants be?

Almost half of growers (43%) said they will be using them to help the crop access nutrition and increase assimilation, while 41% revealed that they'd be optimising them to relieve crop stress, if required. "With a foliar treatment, what we're trying to achieve is all of the above, and it's possible to target different things at different timings," explains Stuart. "In a set of trials carried out with NIAB around 18 months ago, we saw some really good benefits from early application of amino acid-based biostimulant, Bridgeway, on varieties that were more responsive to fungicides. We actually saw the best response from these 'dirtier' varieties. Earlier application is all about setting the crop up for its life in the soil.

"When we start heading towards T2, the opportunity is there to maintain your programme of biostimulation and plant health via foliar applications. By this point, we're entering the period where it may start to get quite hot and dry, putting the crops under a lot of stress.

"In potatoes and sugar beet particularly, we've a lot of evidence to show that an application of a foliar biostimulant prior to heat significantly reduces the impact of crop stress and the subsequent effects this has on growth and performance.

However, if growers are hoping to make a foliar application, a proper assessment should be carried out first, warns Kieran. "Many products are being promoted to optimise uptake and nutrient-use efficiency by the crop.

Biostimulants can comprise many materials which aim to stimulate natural plant processes to boost crop health, enhance tolerance to environmental stresses and ultimately improve performance."

"However, for those looking for

alternatives to cut back their bagged N this season, routine crop assessments should be taken before foliar treatments are applied or even using seed treatments."

Like any product, there's a cost associated with biostimulants, and this can vary hugely between individual brands. Over a third of growers (37%) said they're budgeting a spend of £11-20/ha this spring/summer.

High prices

"Last year and the year before, I probably wouldn't have recommended any significant biostimulant spend," notes Syed. "But now, with fertiliser prices being so high, some of the better products may actually be worth putting budget towards.

"One of these is Bridgeway, and we've seen in our own trials the benefit this can have on rooting, for example. The yield benefit isn't always as obvious, but in a low fertiliser situation, if you have an enhanced rooting system that will allow plants to better scavenge the nitrogen available within the soil."

Though, according to the experts, the benefits of biostimulants may be clear, the 'snake oil' tag is still often thrown around. According to the survey, 47% of growers said the need for more trial results is the biggest barrier preventing a wider use of biostimulants on farm. Others believed there's too much choice and 16% said they're not sure where to source the best options.

"The biostimulants market is rather crowded and can be hard to pull apart," notes Kieran. "Anecdotal evidence shows there have been improvements in green leaf retention and grain protein but it's vital that you can access and review independent trials before making any application on a large scale, ensuring margin over input costs are carefully monitored.

"Trials data sets are increasing from some independent sectors showing that stress levels can reduce, small yield increase and specific weights are built, but it's

important to understand what you're trying to achieve before following market fashions."

So to address these concerns, what trial results and information is available both now and in the future?

Stuart says Interagro has invested in a wide range of trials and have independent data from firms like NIAB. "We've been harvesting data from a variety of sources, situations and conditions for a number of years now and are confident that we have a fairly robust data set to back up the claims of products like Bridgeway and Newton. We'll continue to do this as the year progresses to help build up a better picture of exactly how biostimulants can be best used in the programme."

Relating it back to the circumstances this year, Syed says that some of the yield results have been variable in NIAB's studies, but this comes down to largely being trialled within robust fungicide programmes or under very high rates of fertiliser. "If biostimulants are used under low fungicide/low fertiliser system — then yes, they can reduce reliance on inputs and tend to show a benefit yield-wise."

For those who are sitting on the fence, Stuart advises carrying out trials on their own farm to see the results for themselves first-hand. "We do a lot of



For those looking for alternatives to cut back their bagged N this season, routine crop assessments should be taken before seed or foliar biostimulant treatments are applied, warns Kieran Walsh.

field trials on small plots, but I genuinely believe you see a bigger response when trialled at field scale.

"When you do small plot work, the trialists tend to use an even area of the field. However, a biostimulant is going to be bringing up yield on sadder/poorer areas of the crop — perhaps where it's been waterlogged or under stress — and this is only going to be truly noticeable at scale.

"This is where we see the best feedback from growers who are using products like Bridgeway and Zonda too.

"Relating this back to the current nitrogen challenge, if we can use biostimulants to raise an overall healthier crop across the field, then it's going to help crops overcome the stress of potentially less nitrogen and less fertility." ■

Winner announcement

Congratulations to our winner Stephen Evans from Northamptonshire who responded to the CPM/Interagro survey on biostimulants and has won the fabulous prize of an Apple iPhone 13 Pro worth over £900.

Stephen responded to the survey and completed the tie-breaker question, which asked respondents to explain — in their experience — what the biggest benefit is they've seen from biostimulants.

His answer made the link

between biostimulants and increased plant health and said: "Healthy crops cope better with stress and disease."

The answer demonstrated an understanding of the benefits of incorporating biostimulants into the programme — which may be even more relevant in a challenging season — and impressed the judges.

To take part in the next survey, make sure we have the correct details for you by emailing angus@cpm-magazine.co.uk