

Key considerations for nutrition this spring



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DICK NEALE

With spring just around the corner, **CPM** seeks advice on nutrient planning to counteract deficiencies and optimise crop production this season.

By Charlotte Cunningham

As the spring tentatively rears its head, thoughts for many growers turn to nutrition plans. With nutrient management not only impacting crop yields but also the environmental sustainability of arable operations and economic profitability, getting it right is key.

But to plan efficiently for what the crop requires, it’s vital to know your starting point, explains Hutchinsons’ Dick Neale. “Pre-Christmas, crops were generally looking pretty good and had continued to grow well over the autumn and winter. Since then, we’ve had quite a lot of rain and there are damp fields out there now.

“That said, crops still look pretty good overall with signs of continued growth. At this point (mid-January), I can’t say I’ve seen any vast areas of nutrient deficiency. Lots of crops are still nice and green.

“Having said that, at this time of year, I

always get asked questions about what growers should or shouldn’t be applying, but the answer is – I don’t know. The reason for that being unless you’ve measured the plant and had it analysed via a lab, then you can’t second guess it. So I would say that should be a priority this spring rather than just applying nutrition based on a standard plan.”

Looking more generally at what Hutchinsons’ crop monitoring has shown, Dick says while every farm is different, one nutrient in particular to hone in on during analysis is magnesium. “Based on our seven years of monitoring, it’s likely to be one of the biggest shortcomings in crops this year.

“Something important to remember about magnesium is that it’s a secondary macronutrient – not a trace element. Historically, it tends to be bundled in with a product that’s a mixture of manganese,

zinc etc. This means you’re applying maybe 20/30/40g/ha of magnesium to a crop that’s looking for 30-50kg.”

While crops access magnesium quite readily from the soil, extreme weather patterns during recent years have hampered availability, notes Dick. “We’ve been going through these extreme weather events in the



Measure to manage

Starting with tissue testing in the spring is a vital first step before applying any nutrition, recommends Hutchinsons’ Dick Neale.



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Magnesium deficiencies

Crop monitoring carried out by Hutchinsons has showed that magnesium could be revealed as a significant deficiency this spring.

- UK – it's either very wet or tends to go very dry for a period of time.
- “When this happens, the two things – from a nutritional perspective – that will run out of steam first when it goes very dry, are potassium and magnesium. So while you may have enough magnesium in your soil, it's important to consider whether the plant can access it at the right time.
- “This of course is in the spring when the plant really starts to grow. If we do go into an 8-10 week dry period, the crop isn't likely to access the magnesium as freely as it wants. So if you're inputting magnesium, it's important to think about the product you're using because something with 20g/ha just doesn't cut it.”
- As the crop grows larger in terms of its canopy, it's also important to adjust the magnesium content in turn, adds Dick.
- “While a lot of the foliar, bottled products will suffice at GS30, they're not enough at GS37-39, so that's worth bearing in mind too as the season progresses.”
- In terms of other nutrients, Dick says phosphate isn't likely to be short, with the exception of those fields with poor indices, high calcium levels or high pH. “Look at your pH and consider how that might affect your P levels. However, P doesn't wash down through the soil like other nutrients do – it's locked away fairly well.
- “Whereas potassium over winter will be one to watch, particularly where it's been wet because it can be lost down the soil profile. Nitrogen is obviously another significant consideration nutrition-wise.
- “This is because it's been relatively warm over winter so soil microbiology will have converted some ammonium

to nitrate. Ammonium won't leach out – it's positively charged – but nitrate is negatively charged so moves down the soil profile freely.”

SOIL TYPE INFLUENCE

While Dick says manganese isn't generally a major concern, based on his monitoring, some regions and soils will be more prone to deficiencies than others. “We have a range of soils that have natural manganese deficiency, these are typically the sands that tend to go acid, the Fens and the light sands across Norfolk, for example,” he highlights. “But I think some farmers outside of these areas might be seeing more manganese deficiencies lately, largely due to more cultivations off the back of the 2023 season.

“The theory was that this would let more water through the soil. However, the challenge is soils become slightly open and fluffy making for a loose seedbed which can then lead to a manganese deficiency. Otherwise, general monitoring of manganese suggests that it's not deficient in most circumstances.”

For growers who are hampered by manganese deficiencies, ensuring applied sources are readily available to the crop is vital, says Robert Hawkin of Fielder Nutrition. “It's something we're seeing more of.”

As a solution, he suggests the firm's Mn350 product – based on a sulphate-nitrate mix – can deliver litre-for-litre 2.5x more manganese to the crop, making it an option for growers experiencing deficiencies this spring. “By treating plants with a high dose of readily-available manganese, farmers

Don't overlook the micros

Playing a considerable role in crop production

While it's macronutrients like nitrogen which usually grab attention, not losing sight of the value of micronutrition is equally as important, says Origin Soil Nutrition's Peter Scott.

“Micronutrients are fundamentally important. The only difference between a macronutrient such as nitrogen, and a micronutrient such as molybdenum, is that the word macro means it's required in larger amounts and micro in smaller quantities.

“That doesn't mean that it's any less important than nitrogen, however, there seems to be a tendency to not apply the same level of detail and rigor to managing molybdenum as we do nitrogen.”

Peter believes this approach could be to the detriment of crop production, with an important synergy between molybdenum and nitrogen in particular becoming apparent in the latest research.

“Molybdenum is used by bacteria and enzymes as a catalyst to stimulate the transformation of nitrogen in the soil into forms of nitrate that the plant can take up,” explains Peter. “It's also then a key catalyst in breaking that nitrate down into a protein which the plant can use to build dry matter and yield.”

Peter says as increasing nitrogen use efficiency is a trending topic at the moment, it's important to identify what the limiting factors potentially are, and his experience has shown that this can sometimes come down to suboptimal micronutrient levels – particularly molybdenum.

“We've undertaken trial work in winter wheat, winter barley and oilseed rape, which saw us investigate the impact on crops when molybdenum was coated onto the nitrogen fertiliser.

“As a result, we saw significant increases in the amount of nitrogen that the crop took up which drove increases in yields and protein levels.”

Peter says while the landscape is beginning to change, up until now many fertiliser manufacturers have focused on macronutrients while agronomy and crop protection



Breaking new ground

Origin Soil Nutrition is undertaking new research looking at the largely untapped area of the synergy between molybdenum and nitrogen, explains the firm's Peter Scott.

sectors have focused on micronutrients. "If we can apply micronutrients as part of the macronutrient package then there's the potential to bridge a hunger gap between soil-applied and foliar-applied nutrition, which will have a huge benefit on crop production."

This – particularly the role molybdenum plays in stimulating crop uptake of nitrogen and assimilation into protein – is new ground for the industry as there's no data to show critical levels of molybdenum to specifically stimulate soil bacteria and plant enzymes, believes Peter.

As such, it's something the firm is going to study in greater detail during the coming years in a new, environment-controlled glasshouse. Origin also has plans to develop micronutrient catalysts to stimulate increased nitrogen fixation in both field and glasshouse trials

"There's a limitation to the work that we can do in field trials because it's expensive and you only

get a view of that particular geography and soil type, for example," explains Peter. "In our field trials, we've verified proof of concept with the relationship between molybdenum and nitrogen, but what we now have to understand is exactly how much molybdenum is required to make that difference."

The new greenhouse testing facilities mean it'll be possible for researchers to control temperature, light intensity, shading and moisture, among other variables to produce detailed work on a relatively quick basis, he adds.

"Efficient use of micronutrients will help us to get more nitrogen from what's applied to the crop, which benefits the farmer and is an economic win. Additionally, in doing so, there's less at risk of being leached or lost to the environment too.

"It's a win-win, scenario, and I think that's the most exciting, innovative part of it," concludes Peter.



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- can correct any deficiencies quickly and easily before impacting crop yield.”

Dick continues by highlighting one of the major nutrients – one often overlooked – which is likely to impact crop performance this year – sulphur. “When we monitor crops either through grain, soil or tissue analysis, sulphur repeatedly comes up short,” he comments.

“This is for a number of reasons. Firstly, the atmospheric deposition isn’t there anymore, but sulphur is also a negatively charged anion, so it’s always sloshing around in a soil solution.

“This means as soils wet up and you start to get movement within the profile, sulphur will be taken down through the soil and away from the rooting zone. For this reason, I advise applying it every year; there’s just no argument.”

With the incredibly wet season just passed, Dick says sulphur was one of the biggest deficiencies he saw last year which resulted in poor nitrogen performance too. “Without sulphur, nitrogen won’t function.

“Unfortunately, sulphur deficiency is demonstrated by the crop going yellow and without an educated set of eyes

looking at it, growers can presume this is down to a nitrogen shortage and apply more, which actually makes the situation even worse. You don’t require much sulphur – 30-50kg in cereals, slightly more in oilseed rape – but it’s really important.” More about the current state of play for sulphur losses and the impact of this on crops can be found on page 31.

TISSUE ANALYSIS

In terms of next steps, Dick advises carrying out tissue analysis as soon as crops get moving again. “But it’s important to not test too early, though. At the moment, the crops look fine because they don’t need an awful lot of nutrition, and there’s clearly enough nutrition out there.

“So if we take a tissue analysis in February because we’re not busy and have the time to do it, we can see a false reading which can lead to underapplication. As soon as that crop starts to accelerate away – between GS30 and GS31 – it demands a lot more nutrition and that’s where the deficiencies start to appear because the availability can’t keep up with the growth of the plant.



Shrinking sulphur

Tissue and grain testing has revealed rapidly declining levels of sulphur in crops which could be negatively impacting nitrogen use efficiency.

“I’d generally recommend taking a tissue analysis at around GS30 at the earliest, and then another at GS31 just before you spray to ensure you have time to plan and make an adjustment if required.” ●

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