

Balanced soil nutrient profile can help reduce nitrogen rates

Rather than reaching for a bag of nitrogen when crop performance starts to drop, a more viable alternative could be boosting levels of other nutrients in the soil profile throughout the season, which could allow nitrogen inputs to be scaled back.

Using less nitrogen to increase crop growth and quality may seem a little far-fetched, but the inclusion of other essential nutrients to provide the crop with more of what it requires, could offer improved returns over spreading straight nitrogen this season.

With fertiliser prices rising over the past 18 months, many farmers will have been tempted to scale back on secondary nutrients in favour of maintaining nitrogen inputs, but according to Tom Oates, nutrition agronomists at Origin Fertilisers, it is possible in some circumstances for growers to use less nitrogen and have a greater influence on nutrient availability.

“Plants require access to up to 14 key nutrients for growth and this will be limited by the most deficient nutrient within the soil, so understanding where these are can help supply the plant with what it requires to increase yield and quality.

“Grassland systems will always need a certain amount of nitrogen as it is the building blocks of life. However, we must increase its use efficiency and prevent environmental losses, which means we could apply less and use a greater percentage of it. Without a balanced soil profile, more nitrogen applied will be left unused,” says Mr Oates.

Deficient nutrients

The British Survey of Fertiliser Practice 2021 (BSFP) showed that only 15% of grazed and 25% of silage grass received a sulphur application. The average application rate has remained relatively unchanged in the last five years too, with 32kg/ha SO_3 for grazed grass, and 38kg/ha SO_3 for silage ground.

Nutrient Management Guide (RB209) recommends 40kg/ha of SO_3 after each cut, so the above figures for sulphur applications over the past five years fall short of what grass requires. Mr Oates says farmers should be looking at applying the recommended rates to achieve higher fertiliser use efficiency.

“Sulphur plays a key role in helping nitrogen use efficiency and a sulphur application of 40kg/ha should be the target as little is held in the soil from year to year. High nitrogen systems require high sulphur inputs to maximise the return, so increasing sulphur to the required level even on small nitrogen applications will make better use of the nitrogen.”

Mr Oates went on to say that nitrogen is still the key driver in crop growth, and crop requirements still need to be fulfilled, however, ensuring other nutrients, such as sulphur and sodium, are available to the plant can increase the nitrogen conversion and reduce wastage.

Testing soils

Although there may be a temptation to reduce applications of other nutrients, including potash and phosphorous, getting a full picture of the soil's profile requires data from detailed soil testing.

Mr Oates warns that not applying other nutrients can quickly see soil reserves drop which can then take years to build back up to sufficient levels. “A soil test should be taken every four years and records compared to make changes where required. A useful way to track micro and macronutrients within the profile is a tissue sample taken from a grazing or silage field. This can highlight minor deficiencies on an annual basis.”

Every farm should be considering if its fertiliser strategies are making the most from their investment this year, and the individual requirements such as production systems, sward management, and cutting and grazing frequency, all contribute to how fertiliser is used by the crop.

Mr Oates explains, “Making sure the fertiliser is applied at the right rate, is the right type, and is correctly placed for the crop and at the right time, will help improve fertiliser use efficiency. Following a nutrient management plan and getting advice and recommendations from a FACTS qualified advisor should be key to understanding where savings can be made.”

Environmental concerns

From an environmental perspective, ensuring any fertiliser applied can be efficiently used by the crop will prevent losses to the atmosphere. “Applying nitrogen that can’t be used by the crop is a significant waste of money that could be better spent increasing the levels of other nutrients. Leaching and volatilisation risks will be lower if application rates are tailored to meet the crop requirements.”

Becoming smarter with fertiliser applications and ensuring the crop has the nutrition it requires to maximise growth and quality should be a key focus for dairy farmers as they look to make investments in crop nutrition go further.

Farmer case study

Increased milk yield with consistent butterfats and reduced cow looseness thanks to more palatable forage have been key results for Midlands farmer Andrew Hall, after he switched from his traditional straight nitrogen fertiliser to a balanced fertiliser grade.

He is now in to his second year of using the Sweetgrass product – containing nitrogen, sulphur and sodium – and, along with buying a bigger milk tank to cater for the increased yield, the 150-strong Ayrshire herd can consume more of the forage and keep it in the rumen for longer, making the most of the additional quality.

Mr Hall explains, “I believe plants can only use so much straight nitrogen, so it is about balancing the inputs. We have never applied sodium directly, but its addition has increased the palatability of the sward and allowed the cows to graze tighter and make the most from the young leaves.”

He says the reduced nitrogen fertiliser has helped to stabilise fat content, too, due to raising the levels of secondary nutrients. “We aim for 4.3% fat content in the milk, but this had dropped to 3.8% in the past, incurring penalties of 2ppl. Since we started using the tailored fertiliser it has remained constant, never dropping below 4.1%, and milk yield has increased too.”