

AGRONOMY

News and agronomy advice for arable farmers

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**Mark Lancaster,
Frontier agronomist,
Southern England**

Nitrogen: make every kilo count



Charlotte Tomkins

Fertiliser costs continue to dominate decision-making on nutrient use, but don't forget about the importance of crop yield potential and utilisation efficiency when planning nutrient strategies.

"Although the focus is on the cost of nitrogen, it is important to remember that there is a dynamic relationship between nitrogen application and crop yield potential," stresses

Edward Downing, Frontier national crop nutrition technical manager.

"Grain and fertiliser prices change, so the optimum application rates and breakeven ratios also change based on that information. You may have also bought nitrogen at different prices or sold grain forward, all of which needs to be considered."

Charlotte Tomkins, Frontier fertiliser business development manager, adds: "The other key consideration is nitrogen use efficiency (NUE) and how to best optimise nitrogen use by the crop to maximise margins, as well as minimising any unwanted effects on the environment due to leaching or volatilisation."

Due to price there is more urea in the marketplace this year, while the amount of liquid fertiliser used on farm continues to increase annually.

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With many growers possibly using urea for the first time in a while, it's important to consider how best to apply it and how to mitigate any environmental losses. Edward points out that urea should only be applied when soils are moist, or if rainfall is forecast within 24-72 hours of application to minimise nitrogen loss from ammonia volatilisation.

Liquid fertiliser, which always contains some urea, has an advantage over solid urea in that growers can decide whether or not to treat with a urease inhibitor such as Limus Clear (or Limus Perform as it's due to be known) on the day of application, based on the risk factors. However, Edward points out that the use of such inhibitors will become an enforced requirement from 1 April 2024.

“You can make the decision about whether you require it based on the technical factors at the time.”

Frontier agronomist, Rob Norman, says one of the big advantages of Limus Clear/Perform is its flexibility.

He adds: “You can make the decision about whether you require it based on the technical factors at the time – later applications, bare land and low crop cover, higher rates of nitrogen and high soil pH all increase the risk of loss and therefore increase the benefits of using a urease inhibitor like Limus Clear/Perform.

“It has a low inclusion rate and the product is easily added to the tank when filling the sprayer.”

With the new legislation in 2024 making the use of such products mandatory in all situations where urea is applied after 1 April, Edward suggests growers use 2023 to become familiar with products such as Limus Clear/Perform where a risk assessment shows it would be beneficial.

He says: “When it is warm and dry and there is a risk of urea volatilising, or any situation where the urea sits on the soil surface, you definitely want to be using an inhibitor.

“The warmer it is, the higher the risk and losses can happen very quickly after application.”

The loss of ammonia from urea fertiliser can affect crop performance so prevention is not only good for the environment, but also crop margin.

Edward says: “In some trials we have seen a 7% increase in nitrogen use efficiency when using Limus Clear/Perform; in turn that benefits both yield and grain quality.”

One farmer who has seen positive results is Ralph Proctor, who farms near Dereham in Norfolk. Ralph wants to make sure that crops such as Crusoe milling wheat meet their maximum potential in terms of yield and quality and that the high rates of nitrogen applied are fully utilised by the plant.

Rob Norman has been working with Ralph almost since the introduction of Limus Clear/Perform and has noticed real benefits. “The nature and potential of the crops being grown means we are using high rates of nitrogen to maximise yield, but that also increases the potential for losses,” he says.

“We have seen clear yield and protein benefits from using Limus, showing that more of the nitrogen applied is actually being used by the crop.”

Edward continues, “Given where we are with costs and prices this year, the stakes are high. It makes sense to do everything you can to maintain and maximise margins.”



Varying N rates can improve crop performance



Edward Downing

The economic relationship between nitrogen and crop value is key to determining nitrogen application rate, but the latter can also be adjusted to improve nitrogen use efficiency to account for crop variability in the field.

“Growers will usually know which field performs best or worst in terms of yield in the long-term,” explains Frontier national crop nutrition technical manager, Edward Downing.

“Historic knowledge and tools such as grain testing are useful to adjust the nitrogen rate for different fields, but also show the potential to make such adjustments at a smaller scale.

“For example, our grain analysis service shows that many fields still receive either too much or too little nitrogen.”

Different areas of the field – such as wet headlands or dry ridges – may well produce less crop biomass. This can be measured and assessed as a basis for yield potential and in turn nitrogen application rates.

“There is correlation between biomass and yield, so we’re now building on that.”

SOYL pioneered a variable rate nitrogen service using satellite data to map biomass and how it changes through the season. Explaining how it works, SOYL technical manager, Simon Griffin, says: “We have been using satellite biomass data for around 15 years and the technique is well established.

“There is a correlation between biomass and yield, so we’re now building on that. We have various models to adjust nitrogen requirement based on how much biomass you have in the field. What we want to do is create even more value for growers from that data.”

The team is now trialling a new system that uses biomass maps to predict yield. These can then be used alongside historic data to make an informed decision about yield potential and the required nitrogen rate.

The ‘yield potential’ map is created ahead of the last fertiliser application – in late April or early May – and the information is combined with known data about the required amount of nitrogen to achieve that yield.

As a result, the final fertiliser application can be adjusted accordingly to match known data about the crop nitrogen demand for wheat, helping to achieve a particular yield.



Simon says: “The basic principle is that high yielding areas will have higher N demand and will need to be supplied with more of it.

“Growers are asking for more information about the last fertiliser application to make final adjustments to yield, which is what this new system will deliver.

“The new tool will be available via MySOYL through MyFarm and the data can be exported, for example, via an internet connection to an iPad or directly with the spreader or sprayer.”

The tool will further improve nitrogen use efficiency, as application rates will be increased where there is crop demand and reduced where applications cannot be fully utilised.

“This service is especially pertinent to milling wheat growers,” says Edward, “where the grain protein can be adversely affected if yield potential is not judged correctly.”





Nick Badger

Closed transfer system delivers exceptional efficiency and reduced environmental exposure

The risk of operator and environmental contamination from crop inputs can be highest when a container is first opened, but an innovative closed transfer

system (CTS) from Frontier and Wisdom Systems is offering valuable protection.

While CTS packaging and dispensing equipment is not new for some crop protection products, Frontier commercial manager, Nick Badger, believes it's an important solution for handling more materials such as foliar fertilisers and micronutrients.

"They are applied using a sprayer but haven't always benefitted from CTS technology, particularly those in containers larger than 20 litres such as IBCs. However, for logistical, safety and environmental reasons more products are now being supplied in larger containers. This presents a great opportunity to reduce operator and environmental exposure while increasing application efficiency."

Frontier has been working with Richard Garnett of Wisdom Systems to expand the use with glyphosate, maleic hydrazide and a range of performance micronutrients.

Richard explains, "The established industry standard is to dispense products from larger containers using a CTS that connects and disconnects cleanly to a dedicated valve on the top of the container.

"Our approach is based on the Micro-Matic container valve, which is permanently installed into the top of approved containers. The valve is stainless steel or a composite material allowing for repeated use, greatly reducing the amount of single-use plastic per litre of product delivered on farm."

The Wisdom CTS technology ensures concentrated products are fully contained while being dispensed and diluted inside the sprayer. Nick explains: "Concentrate losses have the greatest potential to cause surface water contamination so containing them is essential. Great progress is being made to reduce or eliminate these losses, the Wisdom CTS delivers significant reductions in operator and filling site contamination and the time taken to fill the sprayer.

"They say 'prevention is better than cure'. We understand operators want to adopt more sustainable farm operations and remove risk before it becomes a problem that has to be rectified later, often at considerable cost."

Fitting a three-way valve to the induction bowl outlet allows almost any sprayer to connect to the Wisdom CTS. Nick adds: "As well as reducing the manual handling of containers, it speeds up filling to around 25 litres/minute. Depending on the tank mix, this can potentially mean one or two extra loads applied per day."

Ian Margetts is the manager at Malshanger Farm near Basingstoke and has been using the Wisdom CTS for some time. "I'm a fan for several reasons," he says. "One is obviously operator safety, but also the reduction in packaging and the fact it's easier to transfer large volumes continuously instead of using and rinsing lots of small containers. It's much tidier and very accurate, you can see exactly how much you are putting in."

In a season, Malshanger Farm typically uses two IBCs of glyphosate, two more of Nutrino Pro and one each of manganese and magnesium. "We would use more large containers if they were available," says Ian. "I'd like to see a growth regulator in a larger container, for example, and I would always choose a product in larger packs with the CTS technology over smaller containers. I would also like to see more support for reuse and recycling of the IBCs."



One key benefit is reducing the potential for point source contamination

Frontier is already addressing these suggestions for the coming season, with chlormequat now available in IBCs. Container management is also a priority, with Frontier's depots recovering empty IBCs they have supplied from farms and prepping them for reuse or recycling as part of its service commitment.

Nick concludes: "We're very proud to be able to support farms with their adoption of safer working conditions and reduced plastic use. This system, together with the easy connect CTS technology for smaller containers, is a great example of the industry collaborating to improve the sprayer filling process and protect farm workers and the environment. We're committed to supporting customers to improve their operational efficiency and sustainability, so we're looking forward to working with more suppliers to provide more product options."

Don't discount new chemistry to protect valuable crops



Dr Paul Fogg

Despite low disease pressure last year, Septoria and yellow rust remain big challenges for wheat growers. Frontier crop production technical lead, Dr Paul Fogg, explores how to make the most of chemistry – new and old.

“The issues seen with Inatreq™ last year understandably grabbed the headlines, but in practice less than 1% of sprayers were affected,” says Paul.

“As an industry we cannot discount the benefits that new products like this bring to our crop protection options, in particular for Septoria control.

“High nitrogen costs mean growing a crop is a greater risk than ever so it makes sense to protect that investment.”

Revysol® remains fundamental to any disease management strategy, offering excellent protectant and curative activity. Fluopyram can also improve Septoria control and boost the efficacy of older, second-generation chemistry.

“Robust resistance management strategies are essential to protect the products we have. Although new third-

generation SDHI products are on the horizon, they're not yet available,” says Paul.

He says prothioconazole, which is now less effective against Septoria, still aids the control of yellow rust and stem-based diseases, which have perhaps been ignored previously.

“Don't discount the benefits of compounds like tebuconazole and Folpet too,” he adds.

“Why would you not adopt the best available chemistry? Your fungicide programme should be appropriate for the level of risk and potential return on investment.”

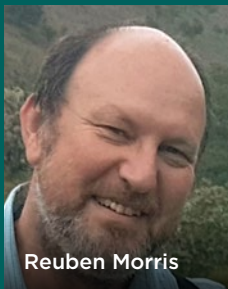
Inatreq™ application advice

Frontier has worked closely with Corteva to understand the issues which arose in 2022 and mitigate future risks so this valuable product can continue to safeguard crops in the coming season.

It's also worth noting recommendations on minimum spray volumes and concentrations, not leaving spray solution in tanks overnight and thoroughly rinsing tanks, pumps and lines at the end of each day.

Growers should refer to Corteva's Inatreq™ application advice for 2023.

Profit from sugar beet



Reuben Morris

With sugar beet set to be one of the most profitable arable crops this year, Frontier crop production specialist, Dr Reuben Morris, looks at maximising yields.

The potential returns mean many growers are planning to increase their sugar beet acreage. As

usual, the decision on seed treatment to prevent virus yellows transmission isn't made until 1 March 2023, based on the Rothamsted aphid model.

“In reality, drilling in March is fine,” says Reuben. “Even after last season's droughts and dry weather leading to issues with beet moth, beet remains an attractive crop.”

A colder winter coupled with normal spring rainfall patterns should diminish beet moth populations. CONVISO® SMART beet varieties, which are tolerant to ALS herbicides, make it easier to control many problem weeds.

“Herbicide timing is crucial, as weeds can severely limit yields in conventional varieties,” Reuben warns.

“You want to maximise early growth. Beet tends to grow slowly until four true leaves, then it quickens considerably.

“While you have to be cautious not to damage the crop with herbicides or nitrogen, you should absolutely make sure you apply the nitrogen early.

Without it you won't get leaf coverage as quickly and it's that rapid development that gets the crop away and drives yield.”

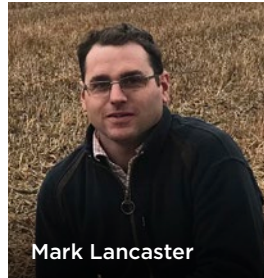
Virus management should also be considered, as later sown crops can be vulnerable to early aphid populations.

“If Cruiser seed treatment has been used that's not an issue,” says Reuben. “If not then you need to overlay an insecticide programme and there are limited products available.”

Once the crop canopy is established, disease control is vital. Reuben notes that in many situations, full rate applications of an older, more cost-effective product may give more economic benefits than reduced rates of new chemistry.

VIEW FROM THE FIELD

Mark Lancaster, Frontier agronomist



“Despite the dry summer last year we had excellent harvests, particularly on the chalk where water wasn’t so much of a limiting factor. It will be interesting to see if we have similar conditions for 2023.

At present most winter crops look good, although some growers drilled early following the dry September and in those early sown crops we’re starting to see some black-grass.

Most will be applying fertiliser as soon as they can travel and the price of nitrogen means more growers will be using urea this year. As mentioned earlier in the issue, many will be considering the risks of volatilisation and should opt for an inhibitor such as Limus Clear/Perform or Sustain.

Interestingly, I recently visited South Africa and it was fascinating to see the contrasts. For example, many crop protection products that have been revoked in the UK and the EU are still authorised for use there.

Here though, the first week of March is a crucial time for oilseed rape, so growers need to be thinking about fungicides as well as any outstanding broadleaf

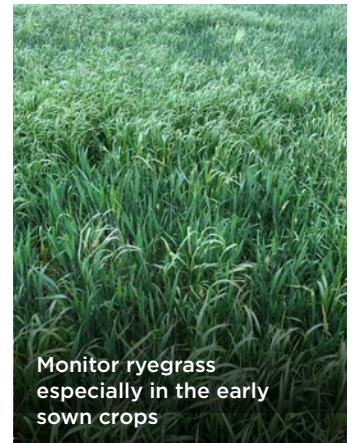
herbicides. Manganese is also an issue, particularly in Oxfordshire, so I recommend applications are made in early March (if not before).

With winter barley, forward crops may need plant growth regulators (PGRs) but early broadleaf weed control is also important, especially when targeting bur chervil. Other weeds to monitor include black-grass, brome, wild oats and ryegrass, but control can be tricky on the latter so target weeds before stem extension.

Winter wheat typically will be at T0 by the end of March and I’ll be identifying which varieties are more prone to rust so we can target them at this timing.

For spring-sown crops including barley and beans, this time of year is about cultivations and preparing for drilling – getting seed cleaned if necessary and servicing machinery to hopefully keep the wheels moving. Spring is also a chance for me to work with farmers to get nutrient management plans for farm assurance in place before any fertiliser is applied.

In addition, the recently announced SFI package within the Environmental Land Management scheme is generating some good discussion on farm, with most units already qualifying for the introductory soil standard which goes some way to mitigating the impact of reducing BPS payments.”



Frontier has a UK-wide team of 130 BASIS qualified agronomists, including 44 Diploma holders, working with growers to deliver fully integrated agronomy advice on all aspects of profitable and sustainable crop production. To find out more about Frontier’s agronomy services in your area email agronomy@frontierag.co.uk, call 0800 227 445 or visit www.frontierag.co.uk

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