Get wide, keep precise

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Technical
Fertiliser spreading

New trials are highlighting how some solid fertilisers can be spread with accuracy to the wider widths usually associated with liquid fertiliser systems. *CPM* reports.

By Rob Jones and Lucy de la Pasture

Uniformity of spread helps ensure every plant within the crop is able to access the precise amount of nitrogen it needs. Achieving spreading accuracy, even at just 12m, demands operator, machine and fertiliser are working in perfect harmony — heading towards 24m and beyond introduces several new challenges.

But get the calibration and set up correct, choose the right fertiliser product and many popular high-capacity spreaders will now take 36m in their stride, as a new set of trial results are proving. Carried out by independent specialist SCS Spreader and Sprayer Testing Ltd, the work has shown CF Fertiliser's benchmark ammonium nitrate fertiliser, Nitram (34.5%N), is capable of consistency at applications of 36m, tested across a range of popular spreaders.

In all cases, the fertiliser achieved coefficients of variation (CV) for distribution of less than the 10% which is considered to be 'excellent' performance, says Charlotte Foxall of SCS.

"The range was typically between 7-9% across the five spreaders we tested, with even application of material across the full 36m spread width combined with a good reliable overlap. Overlap can reduce significantly at wider widths so it's critical it remains consistent, with material being accurately distributed to the edges of the bout and this was certainly the case with Nitram in the tests."

Wider widths

Growing numbers of UK producers are now looking at spreading solid fertilisers at wider widths to match sprayer boom widths, she says. "We're seeing 10% more machinery with 24m plus spreading capability every year, so fertilisers proven to work reliably at these widths are increasingly important."

Ross Leadbeater of CF Fertilisers says Nitram, and the company's range of true granular compounds, have been proven to deliver at all popular spread widths but the 36m results are of particular significance.

"Accuracy at 36m is key because many people believe liquid fertilisers are the only option to fit in with wider tramlines, but the SCS results show this isn't necessarily the case.

"Using Nitram at 36m gives greater flexibility, reduces costs and achieves higher levels of Nitrogen fertiliser Use Efficiency (NfUE) compared with liquid options, and this is something growing numbers of producers are realising.

"Fewer passes with lighter equipment can also help avoid any soil compaction issues which may be encountered with liquid fertilisers," he believes.

While recent developments in spreading technology have undoubtedly helped to deliver consistently even distribution of Nitram at 36m, much is down to the characteristics of the product, he says.

"Nitram is British-made to world class manufacturing standards, with rigorous quality control implemented along the way. The carefully engineered prills are the result of a precision manufacturing process that guarantees optimum flight performance and an even distribution.

"Optimum density ensures the prills don't shatter when the high level of energy which is needed to spread to wider widths is transferred to them. And a range of pre-determined prill sizes in every bag means distribution remains consistent across the full bout width," explains Ross.

"This isn't only important to make sure you get as much out every kg of nitrogen applied but has significant environmental benefits too."

Charlotte Foxall is keen to point out that whether spreading at more traditional widths or 36m, accurate spreader calibration is essential.

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Callibration is important so the tractor and forward speed set-up, the wear on a particular machine and the product being used can all be taken fully into account.

"Having spreading equipment checked and tray tested is vital at any width. Manufacturer settings are generated in a test hall, so are a good starting point but they don't take external conditions into account.

"Individual on-farm tray testing is therefore essential," she says. "Especially as you head to the wider widths of 30m and beyond, so the tractor and forward speed set-up, the wear on a particular machine and the product being used can all be taken fully into account."

Trumpington Estate spreads Nitram at up to 40m widths, covering 300ha/day with total precision across 2600ha of combinable crops, says the operation's general manager David Knott. The farm's rotation is based around two wheats followed by barley, oilseed rape or maize, he explains.

Having tried liquid fertilisers and urea-based products in the past, the Cambridgeshire-based farming business has now settled on Nitram and CF NPKS compound fertilisers for all its major nutrient needs.

"It's important that our approach to fertiliser applications keeps step with the technical and environmental advances we continue to make across the business."

David believes there are specific reasons why ammonium nitrate (AN) is the right choice for the farm and having made that decision, it made sense to go for the best quality product.

Efficient application

"Consistency of product, rapid uptake and evenness of distribution play a key role in maximising NfUE, but speed of application is also essential to achieve the work rates we have to. With increasingly variable weather conditions and consequently narrower windows for application, being able to use wider tramline widths and cover large areas each day, without worrying about other machinery considerations, is invaluable," he says.

"We're pretty focused on combinable crops so efficiency of fertiliser spreading is absolutely key to our operation and quality of product lies at the heart of this. All our fertiliser is purchased through Frontier and goes through an Amazone ZA-TS 4200 spreader, which is tested and calibrated by SCS every year. Proper set up is critical when you're spreading up to 40m.

"We've tried liquid fertilisers but find we can achieve easily double the work rate with Nitram, so we're effectively halving the number of days it takes us to cover the land compared with liquids.

"We've dismissed solid urea now, too. We've bought it on price in the past, but concerns over volatilisation and the inflexible nature of its use with regard to the weather,

David Knott says that spreading AN at 40m halves the number of days it takes to cover the land compared with liquid fertiliser application.

makes AN our long-term preference. We can also spread CF's AN-based true granular NPKS compounds to 40m with the same accuracy of distribution, evenness of spread and high work rates."

While quality, consistency and spread pattern are important factors when working at wider widths, there are other considerations when choosing fertiliser these days, adds David.

"We're increasingly conscious of environmental issues, so CF's work on reducing greenhouse gas emissions in its manufacturing and establishing carbon footprints for its products is going to be increasingly relevant to us.

"There are indications that grain buyers will be looking at the carbon footprint of cereal production in the future and the role of fertiliser will be a key element in this," he adds.

"As a result, NfUE is something we're going to be increasingly focused on, but there are also real economic advantages to be gained from improving this too. It makes sense all round to ensure as much of the nitrogen we apply ends up in the crop as possible." ■

Coefficient of variation of Nitram

	Spreader A	Spreader B	Spreader C	Spreader D	Spreader E	Average
Coefficient of variation (%)	7.2	7.3	7.8	9.0	7.8	7.8

Why NfUE is so important

CF's head of agronomy Dr Sajjad Awan says making the right product choices and management decisions around fertiliser spreading can have a profound effect on NfUE.

"Getting the most out of every kg of nitrogen and other vital nutrients you apply is one of the most important things you can do to maximise crop productivity and minimise potential environmental issues in the future.

"Product choice and fertiliser management can take your NfUE from 50% or lower, to 80% and above. This can have a profound effect on your economics of production and business resilience.

"In the UK AN has proven itself time and time again to be the best choice for achieving optimum NfUE. Across national trials and our own farm trials, the fertiliser systems that consistently deliver the highest NfUE are based on solid AN, with Nitram very much at the forefront of these.

"The NfUE gains shown by Nitram in these trials over other forms of solid and liquid nitrogen used on farm today are typically 10-15%, with superior spread a key element of this," he claims.

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