Want to shave one-third off your nitrogen costs?

Urea will cost you 33% less than CAN with no reduction in grain yield.

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CAN has always been somewhat more expensive than urea. The differential has grown over the last 12 months because CAN is largely produced in Europe where gas prices have been volatile. Urea, by contrast, is produced all over the world, including areas where gas prices have not been as high.

Financial

In the 2023 Teagasc 'costs and returns' listings, fertiliser represents 45% of the cost of growing winter wheat and 42% for spring barley. Any savings that farmers can make on fertiliser will therefore make a significant difference to profitability in 2023.

The fertiliser nitrogen costings are based on CAN at €800/t (€2.96/kg N) and urea at €900/t (€1.96/kg N), which is a 33% differential per kg of nitrogen in favour of urea.

Based on these figures, a 40ha winter wheat grower switching from CAN to urea for nitrogen (N) top dressing (190kg/ha) would save €191/ha or €7,640. The equivalent saving for a 40ha spring feed barley grower is €84/ha or €3,360.

Research

To evaluate the relative performance of protected urea, a field experiment was conducted (reported by Roche et al, 2016) on a free draining loam, long-term spring barley site in Marshalstown, Co Wexford between 2013 and 2015.

CAN, urea and protected urea (NBPT urease inhibitor) were compared. Grain yield, N uptake, gaseous emissions and nitrate leaching were measured. An unfertilised control area was included. The N, totalling 150kg/ha, was applied in line with normal farmer practice - 30kg/ha at sowing and 120kg/ha at mid-tillering.

The results showed that grain yields (Figure 1) between CAN, protected urea and urea were similar, but N uptake was, on average, 13kg/ha higher with protected urea when compared with CAN. Average protein percentage was slightly higher from protected urea (0.3%) when compared to CAN.

We must bear in mind that other studies have found reduced yields when using urea, due to ammonia volatilisation. Applying urea to moist soil followed by drying will increase the risk of ammonia loss. Protected urea should be used in these circumstances.

Environment

The experiments also found that using protected urea reduced N (ammonia NH_3) losses compared to urea. N_2O emissions from spring barley are low, but can be reduced further by using inhibitors. Yields are not impacted. There was no significant effect of fertiliser formulation on nitrate leaching. Overall, when using urea protected with NBPT, you can be confident of producing at least the same spring barley yields as can be achieved using CAN, while gaining cost and environmental benefits.

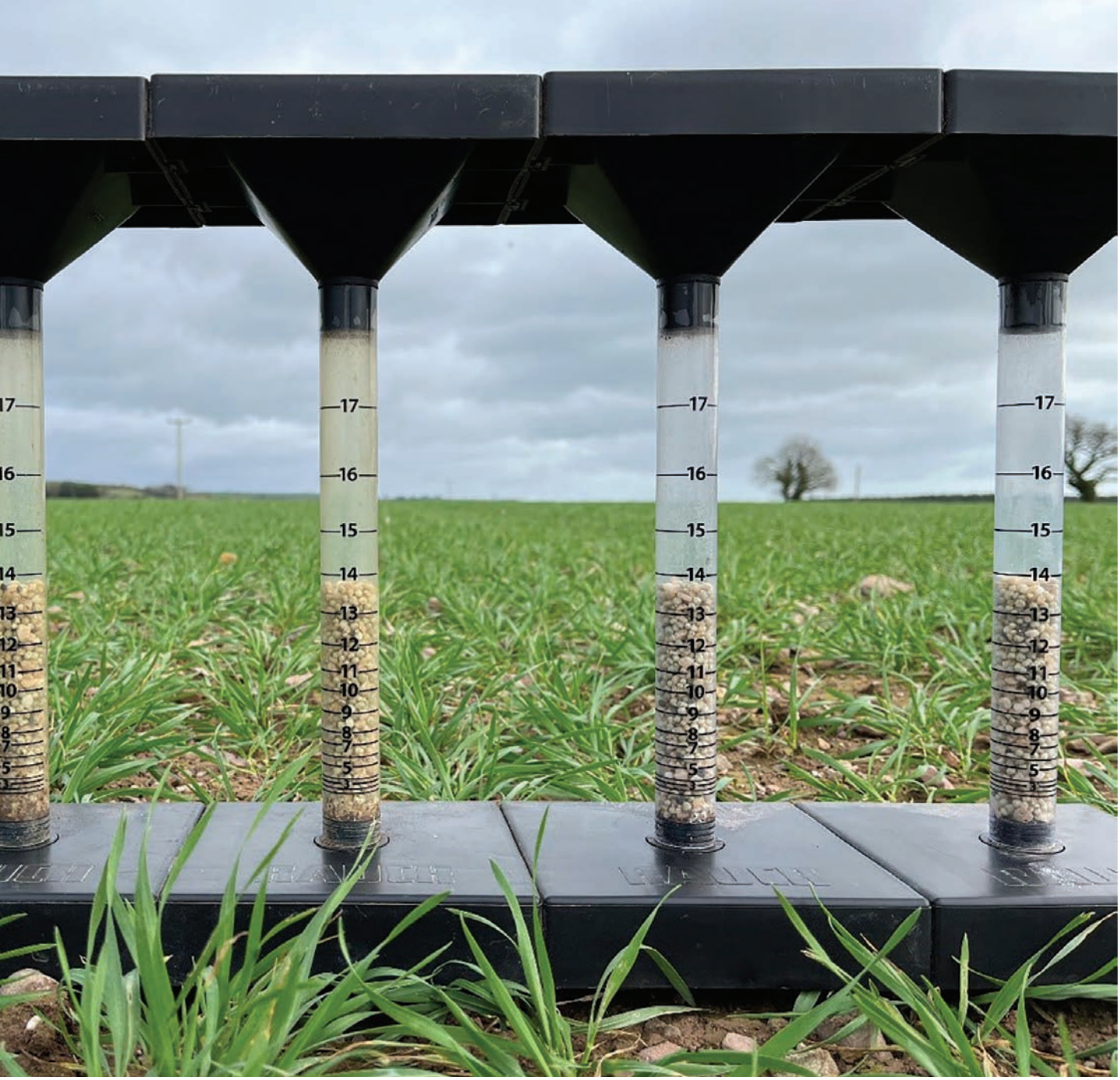
Tray testing is vital to check spread pattern.

Sulphur

When using urea or protected urea, sulphur (S) application needs to be considered. Responses to sulphur are most likely on sandy, free draining soils where sulphur release from the soil can be low. In addition, sulphur can be leached from these soils. On land where you anticipate sulphur deficiency, apply 15kg/ha S. Responses are less likely on heavy soils.

A number of protected urea blends contain sulphur, typically 38% N and 7% S, however care needs to be taken at wide bout widths. Many compound fertilisers contain sulphur and a 470kg/ha (3.75 bags/ac) application of a compound containing 4%

S can meet crop requirements. Sulphate of ammonia (21% N, 24% S) or



ASN (26% N, 14% S) can also be used in your programme to fulfil S requirements.

Spreading urea

Urea is less dense than CAN, typically 75 – 80% that of standard fertiliser. This makes it more difficult to spread evenly at wide bout widths. Think of applying the same force to a table tennis ball and a golf ball. Urea will also be impacted by wind to a greater extent.

Using good-quality urea is essential when spreading at wide bout widths and it is crucial that the fertiliser spreader is set up correctly. The settings for spreading urea will obviously be different than those for spreading CAN. Consult the spreader manufacturer's recommendations for the specific product you plan to spread. Once you have calibrated your spreader, the next step is to use trays or mats to check the spread pattern in the field. The correct spread pattern will ensure the best return on your very large investment in fertiliser.

Figure 1: Spring barley grain yield across three years (2013, 2014, 2015). Roche et al., 2016.