

A few of the latest products and research to help boost maize crops

Get more from your maize

Our round up includes a tool that measures nitrogen availability, a controlled-release fertiliser, and research that highlights the importance of accurate maize silage analysis.

text **Rachael Porter**



David Christensen: "This tool helps to increase our efficiency"



Elaine Jewkes: "Accurate measurement is vital"

Measure nitrogen to improve maize management

A tool to help producers manage their maize crop more effectively has been introduced by fertiliser manufacturers GrowHow UK.

N-Min for maize is an extension of a well-established service for wheat, barley and oilseed rape. It measures the amount of nitrogen the crop will get from the soil during its growing season. In this way it allows producers and their agronomists to calculate whether any additional nitrogen is required to ensure that the crop achieves its optimum yield potential.

On-farm trials across a variety of scenarios during the past five years have shown that the N-Min service can be extended successfully to maize cropping.

Producer and maize grower David Christensen, from Kingston Hill Farm in Oxfordshire, has been involved in the trial. He milks a 600-cow herd, averaging 8,500 litres per

cow per year, and at any one time there will be around 700 other cattle on the 650-hectare holding. Maize silage is an important part of the cow ration in what is a relatively dry part of the country.

"We are trying to improve our efficiency in every respect, from the productivity of the herd and the land, through to our use of manures and our environmental performance," explains Mr Christensen. "Tools like N-Min will help us achieve that and we need more of them."

GrowHow's Elaine Jewkes worked with David and his agronomist during the trial: "Even though running a large dairy herd means that fields receive regular supplies of manures, most of David's maize fields were measured at the equivalent of SNS index 1.

"There were some fields with higher results, particularly where cereals had been the previous crop. Interestingly, according to the Fertiliser Manual (RB209), these should have been index 1 too, but they were not. There are a

number of possible reasons for this – perhaps crop off take or something in the field history. Such results demonstrate the benefit of actual and accurate measurement.

"David's yields have been generally good in the years he has helped us with this trial. The mean dry matter yield we measured was more than 15t per ha, or a fresh weight of more than 50t per ha," says Ms Jewkes.

Across the farms and the years of the trials work, the N-Min measured 'N reservoir' – or N that will be available to the crop over the growing season – varied widely. The values ranged from less than 55kg to more than 500kgN per ha. "It was interesting to see that while the lowest results were generally on sites that did not routinely receive manure, not all of the lower results were from unmanured fields.

"And nor were the highest ones always from sites that had received organic material of some kind," adds Ms Jewkes.

Apply nitrogen during growing season to boost yields



Peter Townley: "Option for greater yields"

Maize crops saw an average increase in total fresh weight yields of 14% and cob weight of 13% during trials using a late application of a slow-release foliar nitrogen fertiliser. The work was carried out by Agro-Vital in 2012 and 2013. The company's Efficie-N-t 28 is a controlled-release foliar nitrogen, developed for maximum efficiency and crop safety, to reduce the problems of leaching and

volatilisation of nitrogen associated with conventional fertilisers.

"Trials across a variety of crops, during a four-year period, have shown that 7kg of nitrogen from Efficient 28 can replace 40kg of nitrogen from granular fertilisers, making it particularly useful for producers needing to comply with increasing environmental regulations," says the company's Peter Townley.

It is applied to maize between the eight- and 12-leaf stage, as a supplement to soil applied nitrogen. "Until the product's launch, we didn't have a 'safe' form of nitrogen fertiliser to apply to maize during the growing season," says Mr Townley.

Agronomist Neil Potts, from Exeter-based Matford Arable, says that the controlled-release foliar nitrogen should be a planned input in all maize crops.

"In 2013 we saw increases in cob weight ranging between 15% and 35%. Even at the lower end of the response range, the product is delivering a handsome return on its input cost.

"It is easily mixed with a maize eyespot fungicide and the timings coincide. It really is a 'no-brainer' for maize."

Cob weight increased by 13%



Re-think maize analysis to balance rations



Robin Hawkey: "Cows may be being underfed"

Research carried out by Mole Valley Farmers and Sciantec, as part of the Forage Analytical Assurance (FAA) group, has highlighted how current maize silage analysis could be under estimating rumen available protein and energy levels. "This means, in practice, that it is likely cows are possibly being under fed by up to two litres a cow a day," says Mole Valley Farmers' Robin Hawkey.

"Maize silage augments diets by supplying starch, enhancing energy supply and supporting milk protein, body condition and fertility. Mixing forages can increase total dry matter intake and maize silage may account for in excess of 50% of forage dry matter intake. As a result, understanding the quality and digestive characteristics of maize silage is fundamental to accurate rationing," he explains.

Anecdotally, many producers have reported increased output a few months after ensiling – commonly in January and February after October harvesting. This is a consequence of increased starch digestibility with time (see Figure 1).

"Some farms now delay opening clamps to utilise increased digestibility and balance high protein grazing by buffering with maize silage," adds Mr Hawkey.

"In addition to increasing starch digestion with time, there are additional variables such as variety and agronomic factors. Understanding maize silage digestion and ensuring analyses that reflect maize degradability is pivotal to accurate rationing."

The Forage Analytical Assurance (FAA) group has studied how both nitrogen (protein) and dry matter are ruminally digested to predict more accurately how maize silage supplies the rumen with energy and protein.

"This affects how rationing models predict the nutrients that maize silage can supply. This latest FAA LINK study indicates some degradability parameters are lower in practice, impacting on microbial protein and metabolisable protein. This means cows could be being underfed.

"Practically, this has resulted in the reassessment of dry matter and

rumen degradability with respect to maize analyses to more accurately predict maize silage utilisation and enable rationing programs to calculate microbial protein yield.

"As a consequence of these findings, it may be relevant to increase starch supply in the ration. However, doing so could raise the potential for SARA or acidosis, which will lower the efficacy of fibre digestion in the rumen," he says.

Mr Hawkey adds that company research has used eCow rumen boluses to assess rumen pH. "Initial findings show that, through good management and buffering, higher starch levels can be safely fed without detriment to rumen health. However, it's important to consider the differing digestibility of starch feeds to ensure a balanced and rumen safe ration."

Figure 1: Effect of time on starch degradability in maize silage (Newbold 2006)

