SoundScience

News from NRM & Sciantec

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Analysis has key part to play


David Caffall

If agriculture is to succeed in *producing more and impacting less* then it will have to do so on the back of sound science and this clearly includes making use of all the analytical tools available. That's the view of David Caffall, Chief Executive of the Agricultural Industries Confederation (AIC).

As David explains, whilst the political climate has shifted and food production is back on the agenda, we are not talking about production at any cost. Politically, environment is still a key driver. For example we will still have to participate in meeting the water quality standards of the Water Framework Directive.

The industry as a whole has to demonstrate that it is making improvements in the way it manages, for example, fertilisers, feedstuffs and manures to prevent pollution and to minimise greenhouse gas emissions. If it delays or fails to deliver then, sure as eggs are eggs, further restrictive regulation will follow and we will lose control of our own destiny.

In essence, *producing more and impacting less* is about improving efficiency. Using resources as efficiently as possible is good for the environment and boosts profitability. Analysis, whether it is of soil, forage, manures or composts, or for myocotoxins, pesticide residues, heavy metals or microbiological organisms, can help in this process.

Analysis identifies what resources are available and, perhaps more importantly, what factors are limiting the business. This in turn allows for more accurate management of those resources unlocking the door to efficiency improvements.

As trusted suppliers, members of the AIC are in a privileged position to advise and influence farmers. Making effective use of the analytical services available should be all part of the service.

NRM earns Irish soils accreditation

NRM has gained full accreditation for the testing of Irish agricultural soils. In doing so it has become one of the first organisations serving the Irish market to achieve ISO/IEC 17025:2005. Critically, the company is one of the only laboratories that includes organic matter within its accredited suite. This is now a required test for tillage farmers in Ireland.

"We were pleased to be able to announce in October that accreditation has been accomplished well before the deadline set by the Irish Department of Agriculture of 1 January 2010," says NRM's General Manager Linda Radnor.

Soil analysis group formed

NRM was pleased to be invited to become a founder member of the new Professional Agricultural Analysis Group (PAAG) recently established by the Agricultural Industries Confederation.

The PAAG has been set up to raise the overall standards of nutrient measurement in agriculture through a new Proficiency Testing scheme and to provide industry-wide trend data on key indicators of soil health such as pH levels and P, K and Mg status. It will produce its first report in early 2010. This will review ten years of data collected by the commercial and research laboratories (including NRM) participating in the PAAG.

Meet the staff








Tony Morgan Analytical Manager NRM

Tony Morgan manages the analytical side of the busy NRM laboratory based near Bracknell in Berkshire.

He has a wealth of experience primarily in the agricultural field having joined ICI Fertilisers (as it was) almost 40 years ago straight from school. When NRM was set up in 1991, Tony was one of the six original people who took on the challenge to build an independent analytical laboratory business. NRM has since expanded and now employs over 60 people. "Nearly 50% of our work is to do with soils," explains Tony. "It's a very busy department and has to operate like a well-oiled machine. We have up to 3,500 samples a day to process and sample turnaround times of between 24 and 72 hours depending on the tests required. That gives us an enormous dataset which allows us to comment on long-term trends such as soil PK indices, for example."

There are several other departments, including those servicing the environment, horticulture, contaminated land and amenity sectors.

"The business employs a very diverse group of people from school leavers to PhD graduates which makes for an interesting mix," comments Tony.

One of the biggest challenges for any laboratory is to be able to react quickly.

"You really have no idea what might come through the door when the courier arrives in the morning," says Tony.

The business is constantly expanding. "For example we recently won a big environmental contract," he comments. "To meet customers' needs you have to assess their analytical requirements, work out the most cost effective, and fit for purpose testing methods that can be used, and on occasions source and purchase significant new analytical equipment, as was the case with the new contract to ensure we deliver what is needed"

It's all about reacting quickly and rising to the challenge which is clearly something Tony relishes. Hands-on analytical work still gives him a buzz.

Ask him what he dislikes about the job and he says it's the office side. "I couldn't sit behind a desk all day, every day!"

Tony is married with two grown up sons, one of whom, Andy has also worked at NRM for over 10 years, and now manages the sample preparation team.

In his spare time he is a big Chelsea supporter having followed them through the bad as well as the good times. He used to go weekly to the match but the price of a ticket now means it's only an occasional treat!

Claire Marshall Team Leader Forage Sciantec

Up in Yorkshire Claire Marshall is a Team Leader in the forage section for Sciantec Analytical Services based near Cawood, North Yorkshire.

Claire, 25, joined the company six years ago straight from college and has spent the last 15 months in the forage section. As Claire explains, "I've received plenty of on the job training since coming to Sciantec which has provided me with a good understanding of the analytical services we provide."

She clearly thrives on the challenge of getting the job done. With up to 400 forage samples coming into the laboratory on any one day, the ability to work accurately under pressure is essential.

"All the samples have to be carefully mixed and prepared before being put through the Near Infra Red (NIR) equipment," she explains.

"Whilst the machine does the analysis and automatically produces the report, we always do a reasonability check on every report. If anything looks strange then we will re-do the analysis, just to be sure. Someone will be relying on the results so it is essential that they are accurate," she adds.

When she's not at work, Claire and her partner, Mark, who also works at Sciantec, enjoy the cinema and socialising with friends.

Millers set more mycotoxin limits


Mike Robinson

The demand for mycotoxin analysis continues to rise as millers and brewers have joined the feed compounders in keeping a critical eye on the levels of these toxic substances in grain.

"It wasn't that long ago that mycotoxins were only of interest to feed compounders and it was the stored-grain vomitoxin and aflatoxin that we were testing for," explains Sciantec's Mike Robinson.

However, these days, the millers and brewers have not only become interested in these substances, legal limits have been set for the most commonly encountered toxin, DON (deoxynivalenol).

Up until this year millers have been taking a risk assessment approach and, provided the supplier of the grain had conducted a risk assessment for DON, no test results proving the grain was DON-free were required.

Following recent years with poor harvests however where wet conditions have encouraged fungal growth, two changes have been instigated.

Firstly NABIM (the National Association of British and Irish Millers) has pulled back from this risk assessment approach.

A certificate stating a full quantified DON figure is now needed with each delivery to the mill. Secondly the millers have added another toxin to their '*not wanted here*' list – Zearaleone.

Whilst in the feed sector there are no legal limits, there is talk of EU regulation. Either way, due diligence requirements already mean that compounders take a lively interest in mycotoxin levels.

"Our challenge is to keep up with what customers are going to need which can be a difficult balancing act," says Mike. "We have to have the technology in place and ready as close as possible to the time customers start to demand it."

Fortunately at Sciantec there is plenty of expertise which allows the company to respond rapidly to changing market requirements.

"We are fully equipped to conduct standard ELISA tests and our five and six mycotoxin screens have both proved very popular," adds Mike.

Where more detailed analysis to lower detection limits and/or a greater degree of characterisation of individual toxins is required, Sciantec can turn to using High Performance Liquid Chromatography analysis.

"This, for example, allows us to breakdown a toxin such as aflatoxin into its major components which would be useful where customers require a more detailed review of their samples" noted Mike.

Developing a uric acid testing capability


Sean Stevenson

NRM has become the only laboratory to offer a uric acid testing service in the UK. "The new service, which was launched in September, was developed in response to customer demand," explains NRM's Business Development Manager Sean Stevenson. "It is an excellent example of the way in which we try to work closely with customers to develop the analytical capabilities that they need," he adds.

The uric acid test now available from NRM has been developed and validated in-house by NRM staff using reliable and cost effective methodology.

Uric acid can account for up to 40% of the readily available nitrogen content of broiler litter, poultry layer and duck manure. This means that any laboratory analysis for the nutrient content of poultry manures should include a measure of the Uric Acid N content otherwise it will not provide an accurate figure of the total available N content of the manure.

The ability to measure Uric Acid N accurately is also a key service for environmental researchers involved in assessing the risk of nitrates leaching to watercourses.

"At the end of the day, understanding the nutrient content of organic manures is an essential part of any farm nutrient management plan," adds Sean. "Indeed, making the most of the N, P, K and S supplied from applications of organic manures often allows farmers to save money on bought-in fertiliser inputs."

For farmers in Nitrate Vulnerable Zones (NVZs) accurate analysis of manures will also allow them to meet their regulatory responsibility to take full account of the nitrogen supplied from organic manures when planning inorganic nitrogen fertiliser applications.

"Of course standard figures are available but the variable nature of organic manures caused by losses during storage, dilution by rainfall, yard run-off and so on means that these often do not accurately reflect nutrient content on a particular farm. Analysis offers a much more reliable approach," he concludes.

Where next for forage analysis?

Based just outside Cawood in North Yorkshire, Sciantec Analytical Services is the UK's biggest UKAS accredited independent laboratory for the animal feed, nutrition, forage and animal health sectors.

"We became the largest fully accredited provider of animal nutrition testing services in 2008 with the purchase of Central Laboratories at Banbury," explains Linda Forbes, one of Sciantec's Business Development Managers. "Being big brings some economies of scale but it doesn't mean that we are resting on our laurels," she maintains.

Sciantec is always looking to upgrade its customer service and core activities such as forage testing, are no exception.

"Benchmarking is a bit of a buzz word at present but if you look behind the jargon it does have something valuable to offer most businesses," explains Linda. "That's why we are developing a monthly summary report service to allow customers to compare their forage against the UK average."

As you might expect, all the usual analytical services are offered including rapid silage nutrition scans using Near Infra Red (NIR) technology as well as the more complex wet chemistry techniques.

In the busy silage section, samples arrive in the morning and are prepared, scanned and reports produced, ready for emailing out to farmers the same evening.

Wet chemistry is a longer more complex process taking up to ten working days. Sciantec is one of the few laboratories in the UK which regularly conducts wet chemistry validation to support the quicker NIR scan.

"Grass silage accounts for the biggest volume of work but we also analyse maize and whole crop and we have a growing business for the equine market testing hay and haylage," adds Linda.

Linda Forbes

Whilst farmers are generally looking for detailed nutrient information to allow them to maximise milk yields from home-grown forage, the equine market is more focused on avoiding health problems.

Quality matters

When choosing an analytical laboratory there is one factor which stands head and shoulders above all others – the quality of the test results.

"Of course, speed of turn-around, price and customer service, are clearly all important," says NRM's Linda Radnor. "But, if the testing procedure itself is suspect then the whole process falls down."

The simplest way to check the quality of an analytical laboratory is to look for the UKAS logo. UKAS is the sole accreditation body recognised by government to assess analytical services laboratories against the internationally recognised standard for competence – ISO/IEC 17025.

"Beware, you may come across laboratories that are certified to ISO 9000 but this standard only relates to the laboratory's quality management systems. It does not evaluate technical competence. ISO 9000 should never be thought of as an acceptable alternative to ISO/IEC 17025," she warns.

UKAS accreditation is specific to the particular sample types and methods used so for example, a laboratory may hold UKAS accreditation for vegetable testing but may well not have accreditation for other tests such as soil or water.

Achieving UKAS is an exceptionally rigorous process and once achieved there is an annual surveillance visit. Every four years a full inspection is carried out.

"Both NRM and Sciantec have been fully UKAS accredited for a number of years so customers can have confidence in our competence, impartiality and performance capability," she concludes.

Estimating silage DM is a risky business

Estimating the dry matter content of silage is much harder than many farmers and forage consultants think, according to the results from a challenge laid down by Sciantec Analytical Services at the *2009 Dairy Event.*

Sciantec asked visitors to estimate the Dry Matter (DM) content of six different samples. These had previously been tested in the laboratory using the very accurate wet chemistry method for silage DM.

Linda Forbes, one of Sciantec's Business Development Managers explains, "Whilst it was only intended as a bit of fun at the event, it has clearly demonstrated that in-field assessments are fraught with difficulties. Many of those who participated have years of practical experience and, even they found it difficult – especially when estimating the higher DM silages."

The average estimates for the two highest DM silages (actual DM values of 61.3 and 55.2) were just 49 and 37.5 respectively. In both cases the contribution from the silage was effectively undervalued which, had this happened in the field, is likely to have led to inflated feed bills.

At the lower end (actual DM contents between 27.2 and 24.9), the average estimates were much closer to the actuals. However, there was a wide variation in individual estimates. For example, the sample with an actual DM of 27.2 was estimated at levels between a maximum of 60 and a minimum of 17.

Testing silage makes sure consultants and farmers know exactly what they are dealing with.

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