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The tools to tailor nutrition need

Innovation Take control

Yara’s suite of digital farming services has been relaunched, with new options and smart refinements aimed at optimising application. *CPM* reviews what’s available.

By Tom Allen-Stevens

Few could have predicted the kind start to the spring that arable farming has enjoyed. While conditions for March are widely seen as more ‘normal’ for the time of year, growers eager to take control of crops established last autumn will be wondering how to tailor nutrition strategy, notes Mark Tucker of Yara.

“Many have already put on the first spring dressing of N to encourage the early growth we saw in Feb. The question is how to follow that up — is it wise to encourage it, in the knowledge that canopies may get out of control, or hold back, prompting concerns you’re holding back potential?”

Extra demands

His advice leans towards the former. “The crop is growing and will be making extra demands from the soil that may not yet be readily available. It’s important to encourage that momentum, to give the plant every opportunity to lay down the biomass it’ll need to deliver its yield potential, and now’s the best time to do that.

“Equally it’s vital to stay in control as these crops are going to be lush. Appropriate use of PGRs will help steer them through, but big crops will make bigdemands on all nutrients — the availability of these must remain in

Mark Tucker believes it’s important to encourage the crop momentum that’s accrued, but keep nutrient applications in tune with requirements.

Yara has just re-launched its digital farming tools – the N-Tester has been brought together with the app as YaraIrix.

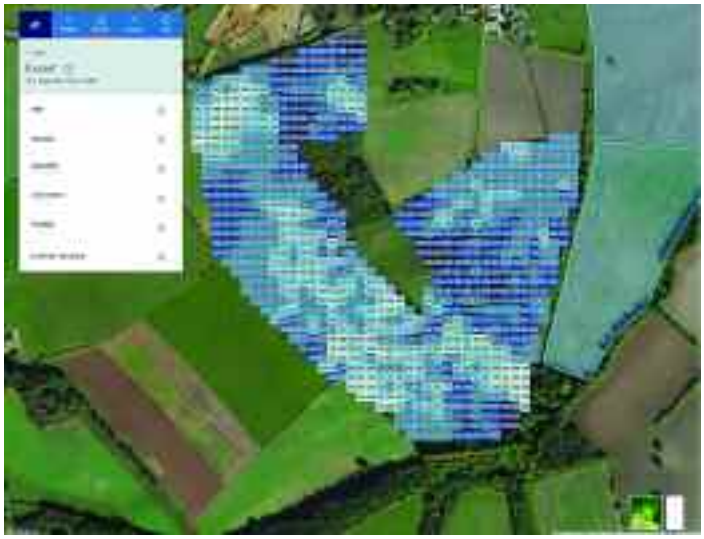
balance and in tune with specific requirements."

Yara has just launched — or rather re-launched — its digital farming tools that help farmers achieve this. "Growers will be familiar with Image IT, our free app that assesses crop canopies and makes recommendations on nutrient applications. There's also the N-Tester — a handheld device that allows you to measure precise crop N demand. We've now brought these together as YaraIrix," explains Mark.

The N-Tester has been redesigned, and connects directly to the Irix app, while there's also a new N-Tester Clip (see panel on p46). "The N-Tester is now recognised across Europe as a reliable tool to assess crop N need," he continues.

"In France for example, there are strict N limits based on nationwide monitoring, and this year permitted applications have been lowered by 17kgN/ha due to higher soil N levels. But those using an N-Tester can use the results as justification to apply more or less N to their crop. There's a similar approach in Denmark."

The N-Sensor has also been redesigned (see panel on p47). Launched at last year's CropTec, the new version is lighter, smarter and has detachable sensors, says Mark. "The N-Sensor allows you to adjust N applications in real ▸



Atfarm brings in satellite-generated NDVI biomass maps and draws up application maps that can be exported in a range of formats.

The Yaralrix app allows you to measure the nitrogen needs of your crops at the first dressing.

Free tissue tests for YEN entrants

Yara is offering all growers in the Yield Enhancement Network (YEN) free tissue tests for the 2019 season to help them achieve their crop's full potential.

The offer is available for both cereals and OSR, with up to four samples of each crop analysed at Yara's Lancrop Laboratory near York. "Growers will receive results across the full range of nutrients," says Yara's Simon Pogson. As well as N, P and K, this includes calcium, magnesium, sulphur, boron, copper, iron, manganese, molybdenum and zinc.

"We'd advise growers take the samples to coincide with key crop growth stages, which in cereals would be tillering, stem elongation, booting and heading, while for OSR it's stem elongation, head set, flowering and pod set."

Last year, early season UK leaf samples revealed higher than normal levels of sulphur deficiency in crops. Mark suggests taking a sample 2-3 weeks before the application is needed. "The turnaround of the test is just a day or two, but you may need time to get product onto the farm. The key timing to focus on in wheat would be GS37-39, to ensure the crop has everything it needs for grain fill."

▸ time, according to the needs of the crop. The sensors and software have been improved and it scans a bigger area of crop, making it the most accurate means of assessing crop need."

For those who feel they don't need such a high level of accuracy, Yara launched a free satellite-based service last year. "Atfarm is a digital tool that uses the same algorithms as the N-Sensor and draws on the same wealth of trials information that Yara's built up to determine optimum N. But it's freely available to all growers."

To start using it, you simply go to www.at.farm, sign up and upload or draw in your fields. Atfarm then brings in the latest satellite data and calculates the

Innovators sought to clip, connect and fine tune their N

Yara's N-Tester has become something of a trusted tool for progressive growers and agronomists. It takes quick and easy readings in a growing crop to establish its exact nitrogen status and help fine tune application during the growing season.

The new N-Tester comes in two different forms. The N-Tester BT is similar to the old model, although with a smaller, more compact design with Bluetooth connectivity which is compatible with all smartphones, says Yara.

It now works in conjunction with the Yaralrix app. You simply download the app and then connect the N-Tester. All your measurements are automatically sent to the app via Bluetooth, along with their location — another new feature. Within seconds, you receive back an N recommendation to help refine each dressing.

The Irix app is free to download and use, and like its predecessor, Image IT, uses an image of your wheat, oilseed rape, barley or maize to work out the green area index (GAI) and give you an N recommendation. While this is fine for the first N dressing of the season, the N-Tester gives the app much more accurate information for subsequent fertiliser applications, says Yara — a subscription unlocks the capability within the Irix app.

The N-Tester Clip is still in beta-testing, and Yara is looking for around 50 UK on-farm innovators to give it a go this season free of charge, says Mark Tucker. "We're particularly keen for *CPM* readers to join our Innovator Program."

As the name suggests, the Clip simply attaches itself to your smartphone and uses the phone's own camera to make the assessment. "It's simpler and more portable than the N-Tester BT, but its accuracy is only as good as the camera on your phone," notes Mark.

So how does the N-Tester work? The close-up image of the clamped leaf is assessed by the Irix app for chlorophyll content, as this is related to the nitrogen status of the plant. Thirty random measurements from across the field give an average value that's used to indicate how much N the crop requires.

By taking readings through the season at weekly or fortnightly intervals, the N-Tester can be used as a crop-monitoring tool to determine relative changes in crop nitrogen values. A three-digit reading suggests whether the crop has sufficient N, is likely to be deficient, or is somewhere in between, requiring a judgement based on recent N applications, previous organic manure/slurries, and current weather and growing conditions. Yara claims the tool can detect changes in leaf nitrogen content well before these are noticeable to the naked eye.

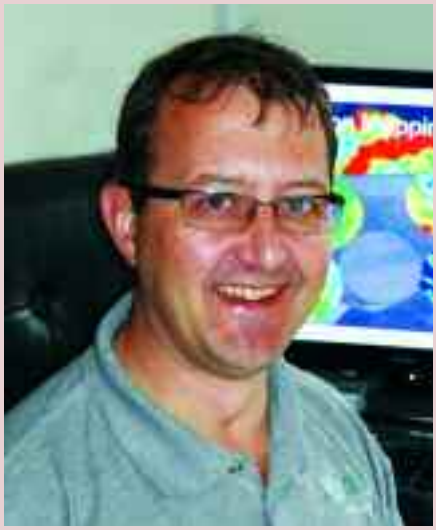
In theory, it could be used on any plant to measure the chlorophyll content, although in the UK, it's only been calibrated for use on winter cereals. Yara's taken the technology through a series of thorough field trials and says these have shown it gives a significant benefit both on yield and grain quality. A test at booting (GS41-49), for example, can give an accurate idea of how much N the crop requires to achieve the desired protein content for a milling wheat.

The N-Tester BT is similar to the old model, although a smaller, more compact design with Bluetooth connectivity.

Yara is seeking growers to join its Innovator Program and test the N-Tester Clip which uses a smartphone camera to make the assessment.

For more information and to join the Yaralrix Innovator Program, go to www.yarairix.com

Lighter, smarter N-Sensor sets the sensors free



Clive Blacker's MiFarm software platform synchronises seamlessly with the N-Sensor, backing up data to the cloud.

The latest changes on the N-Sensor take the tool into a different league and may potentially open up a whole new array of precision application and monitoring, reckons Clive Blacker of Yorks-based Precision Decisions.

Since 2004, the company has fitted, provided training and support for the N-Sensor. "It's seen subtle changes over the years as the technology behind the components has advanced. But this is the first wholesale change to the equipment since the ALS sensor was launched in 2006," he says.

The biggest change is that the box of gadgetry that traditionally sits atop the tractor cab is smaller and neater, making it much easier to fit, and to swap between machines. The design also ensures flexible mounting options on sprayers so booms that fold up close to the cab don't hit the unit.

Another major change is that the sensors are individual units. "This is really handy for those who'd like them mounted in different configurations and you can now network up to eight sensors if you wish, which could be useful on irrigation booms, for example. The new sensors also see a 25% larger area than the previous ALS unit, which further increases precision," notes Clive.

In a further change, the algorithms that work their digital magic on all the data churning through from the sensors, can now even take account of a bit of morning dew. "It's always been an issue that damp, wet leaves can skew the calibrations. Yara's pinpointed the wavelength and fine-tuned the software that now compensates for this, giving you a true reading all day."

The new N-Sensor has been designed with Absolute N in mind. This is where you completely hand over control to the machine, without even setting a target field application rate — the system will determine exactly what rate of N your crop needs as it travels through and makes adjustments accordingly. "It's been available for OSR for some time, and you can now use it for winter wheat, although it's still in its testing phase," says Clive.

"Those mounting sensors on the spray boom should note there is a slight time lag between sensing and changing the rate at the nozzle, so accurate real-time liquid fertiliser applications, for example, aren't really possible unless you keep the sensors a suitable distance in front of the booms."

Precision Decisions have developed a software platform that automatically manages this stream of data. MiFarm, has multi-layer functionality, allowing you to view information from the N-Sensor to help decision-making. It's partly compatible with Gatekeeper, reads your soil-sampling and other spatially variable data, and the beauty of the system, he says, is that everything synchronises seamlessly.

"It backs up the N-Sensor data to the cloud — you don't even need a memory stick to transfer application maps to and from the tractor cab. The aim has been to make it simple and as open as possible, so that every time the N-Sensor goes through the crop, all your records are updated — it puts the data at your fingertips so you can take control of the big decisions that maximise productivity," says Clive.

A new N-Sensor is available at a cost of £4500/year.

The unit is smaller and neater, and the sensors are individual units that can be mounted in different configurations.

vegetative index. You can view standard NDVI biomass maps, or N-Sensor biomass overlays, which have a better correlation to nitrogen uptake. Application maps can be drawn up in just a few clicks and exported in a range of formats.

Cloud cover

"Atfarm has its limitations," notes Mark. "The main one is that the images available will depend on cloud cover — there was a 10-week period last spring during which the skies were just too grey for decent data collection. The N-Sensor does its job whatever the light levels are, even at night.

"Resolution is another issue — the N-Sensor will take higher resolution images compared to satellites so it's horses for courses," he reasons.

"But however you tailor N needs, the chances are you'll be faced with crops that require careful management this year. There are also greater pressures in terms of minimising ammonia emissions and nitrate losses to ground water. If we can maximise the amount the crop takes up, we minimise these losses. So we have to use all the tools available to take control and make every kilogram of applied fertiliser count." ■

Take control

When Britain exits the EU, the move will create unprecedented uncertainty and change for farmers. While much of the change is beyond the control of the average arable business, it highlights the importance of those elements that can be managed.

Few aspects of crop production are more critical than a plant's nutrition, which is why *CPM* has teamed up with Yara in a series of articles that brings in some of the latest understanding to build on established knowledge. The aim is to take back control of how a plant draws in and assimilates nutrients to optimise every aspect of crop and field performance.

With decades of evidence-based knowledge, Yara continues to be at the forefront of crop macro and micronutrient advice. Investment in technology has resulted in world-leading products that support in-field decision making and precision nitrogen application.