Nitrogen alert

By Charlie Walker - IPF Head of Agronomy Solutions

Early indications suggest many cropping systems are running low on nitrogen and will need significant applications of fertiliser before mid-winter to support yield and quality targets this season.

Incitec Pivot Fertilisers is encouraging growers to check, plan and act for crop productivity this season.

Check soil reserves

An analysis of deep N soil tests from the Nutrient Advantage® laboratory is showing many paddocks are very low in soil nitrogen.

A total of 1,201 soil samples (10-60cm) from Queensland, New South Wales, Victoria and South Australia were analysed for nitrogen by the Nutrient Advantage laboratory in January and February 2017.

Of these, 46% had less than 3 mg/kg of nitrate nitrogen. That's less than 25 kg/ha of plant available nitrogen in the main root zone. The nitrogen tank is running on empty.

At this level, crop yields would be capped at around 1.5 t/ha of APW grade wheat or 1.75 t/ha of malting barley without nitrogen fertiliser assuming some contribution from mineralisation.

While there were some deep N tests with higher nitrogen levels, the average was 6 mg/kg of nitrate nitrogen and 1 mg/kg of ammonium nitrogen.

Deep N soil testing is the best way to quantify carry over nitrogen reserves from 2016 plus any mineralised nitrogen over summer so that a nitrogen fertiliser strategy can be set for this season.

Do not rely on the averages or gut feel. Arrange a soil test before sowing.

Account for mineralisation

Mineralisation from the organic pool is a major source of nitrogen for grain crops, but recent research shows we need to be careful not to over-estimate its contribution.

John Angus from CSIRO showed declining levels of nitrogen from mineralisation in modern continuous cropping systems in his 2013 research. He suggested that nitrogen fertiliser rates on dryland crops would need to double in about four decades to make up the deficit.[1]

Mineralisation of nitrogen tends to be highest when soils are warm and wet. This is typically in late spring, while the crop demand for nitrogen tends to peak in late winter.[2]

Potential mineralisation can be estimated using soil surface (0-10 cm) organic carbon and total nitrogen tests.

Consider yield potential

Following an excellent spring in most southern regions, subsoil moisture levels are likely to be at or ahead of the average for this time of year.

We have seen in past seasons how good levels of stored soil moisture can help with growing useful crops in quite dry years or getting the crop home in a tight finish.

Where good levels of subsoil moisture are available it makes sense to plan for good yields rather than delaying fertiliser applications.

Consider protein premiums

There have been some significant protein premiums on offer for wheat delivered in the 2016/17 season.

While it is impossible to predict the future, it is a good idea to set crops up so they have the potential to achieve high protein if it makes economic sense to do so.

Remember that the crop must first reach its yield potential before additional nitrogen can effectively increase grain protein.

We've looked at more than 1,200 soil tests analysed by Nutrient Advantage in January and February and the results are clear - 46% had less than 3 mg/kg of nitrate nitrogen in the 10-60 cm zone.

Plan to supply early nitrogen

How do we ensure there is enough nitrogen in the crop's root zone before the peak demand period in mid-winter?

While we don't know what the 2017 season will be like, the current short term rainfall outlook from the Bureau of Meteorology[3] is indicating that in-crop nitrogen application options may be limited.

There are a range of ways to supply high rates of nitrogen fertiliser with minimal risk.

Growers can pre-drill urea, band high rates of nitrogen away from the seed at planting, either as urea, EASY N® or BIG N® (where available), spread Green Urea NV® immediately post planting or dribble EASY N along the side of the crop row.

Consider the potential for each timing and application method or use a combination of strategies.

Where soil profile nitrogen levels are very low, aim to supply most of the predicted crop nitrogen requirement by early tillering in cereals or 8-leaf stage in canola. If seasonal prospects improve or protein premiums increase, additional nitrogen can be topdressed later in crop.

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References:

1 John Angus (2013). Meeting the cropping system's demand for nitrogen - Can we do it and manage the profit risk?
https://grdc.com.au/Research-and-Development/GRDC-Update-Papers/2013/02/Meeting-the-cropping-systems-demand-for-nitrogen-Can-we-do-it-and-manage-the-profit-risk

2 John Angus (2015). Model your nitrogen to account for in-crop mineralisation.
https://grdc.com.au/Media-Centre/Media-News/South/2015/06/Model-your-nitrogen-to-account-for-in-crop-mineralisation

3 Bureau of Meteorology Climate Outlook March to May 2017, issued 23 February 2017.
http://www.bom.gov.au/climate/outlooks/#/rainfall/median/seasonal/0

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