

MANAGING NITROGEN TOPDRESS IN 2024.

Clint Sheather - IPF Technical Agronomist

In most areas of the southern region, 2024 is shaping up to be another good winter crop season after what some have described as the ‘best El Nino on record’ delivered unexpected rainfall to many. But, after several big nutrient removal seasons, soil-nitrogen levels are low and growers will need a tailored nitrogen strategy to optimise grain yield and returns.

In 2024, growers and agronomists will need to ensure cereals and canola have an adequate supply of nitrogen (N). This means managing N application rates with application timings and placement methods to maximise N use efficiency.

N is essential for dry matter production, shoot density and potential yield in cereals. When crops begin to mature, N within the plant is redirected to developing grains. Carbohydrates are then deposited within the grain, and it is the level of carbohydrates that determine grain size and yield. This dilution of N in grain also determines final grain protein levels.

In short dry springs, crop yields are reduced because they are unable to fill each grain, and the percentage of grain protein is much higher and often grain size is smaller. Longer soft finishes to the growing season allow crops to fill to full capacity, but if adequate N is not available then low grain protein levels can result from diluted N levels.

Nitrogen budgeting

Achieving the targeted yield, grain size and protein results in winter cereals can be a juggling act when it comes to managing N inputs between preplant and booting, and for irrigated and high-rainfall systems, right through to flowering. As there are numerous things that can affect crop yield and protein potential, it’s critical to identify whether N is the only limitation.

The first step in planning N applications is a simple budgeting process to assess how much N you need to grow a target yield and protein. Once you know the N demand, you can determine the amount of fertiliser required.

Estimating existing N supply

There are several tools available to advisers to help determine the existing nitrogen supply, such as reviewing paddock fertiliser and crop histories, deep soil nitrogen testing, in-crop NDVI, and shoot density. The best decisions are made using reputable information collected from a range of sources.

Information such as previous crop yield, previous grain protein levels, crop rotation, fallow weed control, soil moisture levels, seasonal conditions and expectations can all help guide topdressing decisions.

Pre-plant deep soil nitrogen test results are another excellent resource for nitrogen management. One of the disadvantages in low soil nitrogen paddocks if additional nitrogen has not been applied at seeding is there may be a requirement for early topdressed nitrogen at mid-tillering to establish the desired target shoot density by GS30. Easy N® through streamers or dribble bars is ideally suited to this scenario with accurate placement, timely application and potentially less volatilisation losses than urea on alkaline soils.

Sampling in-crop can also play a role where deep N test weren’t taken pre-plant. When sampling post planting, be careful to avoid any banded pre-plant nitrogen or starter nitrogen fertilisers.

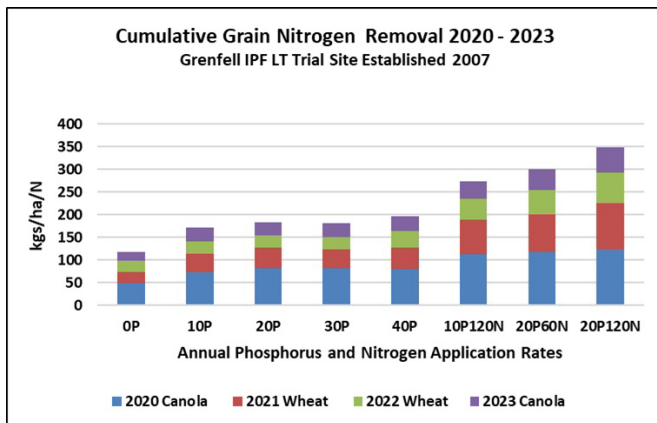


Figure 1. Cumulative Grain Nitrogen Removal 2020-2023

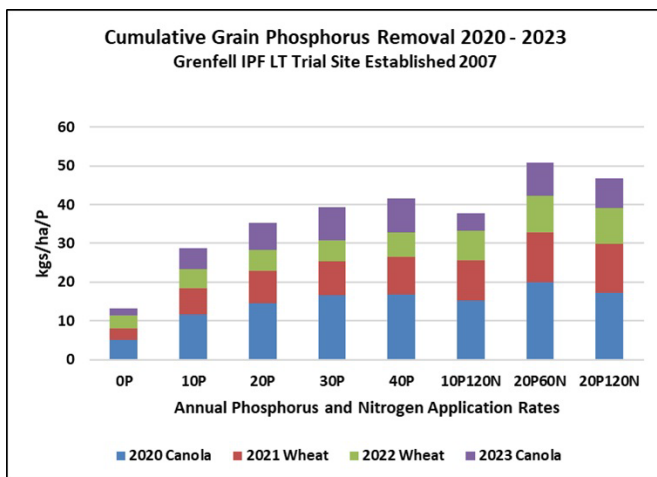


Figure 2. Cumulative Grain Phosphorus Removal 2020-2023

Soil Health Focus May Managing Nitrogen Topdress in 2024.

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N losses when top-dressing

When broadcast on the soil surface both liquid or dry urea or urea containing products or blends can be susceptible to ammonia (NH₃) loss. Factors that can lead to increased NH₃ volatilisation losses from top dressed urea are:

- light rain post application, enough to dissolve the urea granule but not enough to wash the dissolved granule into the soil
- crop residue on the soil surface
- temperatures above 18°C
- alkaline soils
- wind
- low soil cation exchange capacity
- application to a moist soil that dries after application

The safest applications are those made to dry clay soils, in low humidity conditions with no wind and sufficient rainfall to move the urea into the soil within a few days of the application.

Methods to accommodate these losses include increasing the rate of N applied, or using Enhanced Efficiency Fertilisers which are coated to reduce nitrogen losses, like Green Urea NV®.

IPF trial work in the Mallee in 2014 demonstrated the effectiveness of Green Urea NV® over urea with an early September top-dress and 17 days before a welcome rainfall event of 35mm. The Green Urea NV® treatment returned a significant grain yield response over urea (0.41t/ha), protein response (0.7%) and improved nitrogen use efficiency from 33.7% for urea to 60.5% for Green Urea NV®.

All farming systems should aim to maximise nutrient use efficiency. When choosing the most appropriate product to apply consideration should be given to the rate of application, the frequency of application, the timing of the application, the economic objectives, and any environmental consequences.

Further Information

For more information or to discuss strategies for topdressing winter-crop, please contact:

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