



27 June 2019

Getting the most out of nitrogen and irrigation in a tight year

As crops approach mid tillering, it is time to start considering crop nitrogen requirements for topdressing. Many winter cereal crops this year will be grown on rice stubble, so there will be little nitrogen available without topdressing. Yet in a year with minimal water availability and a dry seasonal outlook, your nitrogen topdressing requirement should be determined by how much water you have available to finish off your crop, current soil moisture status and likely returns.

Setting a yield target

Setting a realistic yield target is the first step in determining nitrogen top dressing requirements. Consider the crop's establishment, weed status and history of paddock performance as well as water availability. Check your plant population by counting how many plants have established per meter. High yielding crops need 150-200 plants/m² minimum yet will also need approximately 5.5ML/ha (100mm = 1ML) from rain and irrigation to avoid moisture stress. If irrigation water is unavailable, reduce inputs to ensure profitability.

Determining crop nitrogen requirements

There is very little to no soil nitrogen available to crops straight after rice, and mineralisation in crops following rice is very low in cold, wet soils. Crop nitrogen demand can therefore be calculated by the following formula:

$$\text{Crop nitrogen demand} = \frac{\text{Target yield} \times \text{protein \%} \times 1.75}{\text{Nitrogen use efficiency (0.5)}}$$

For example, a target yield of 5 tonnes with 11% protein would need 192 units of nitrogen, or 420 kg urea/ha.

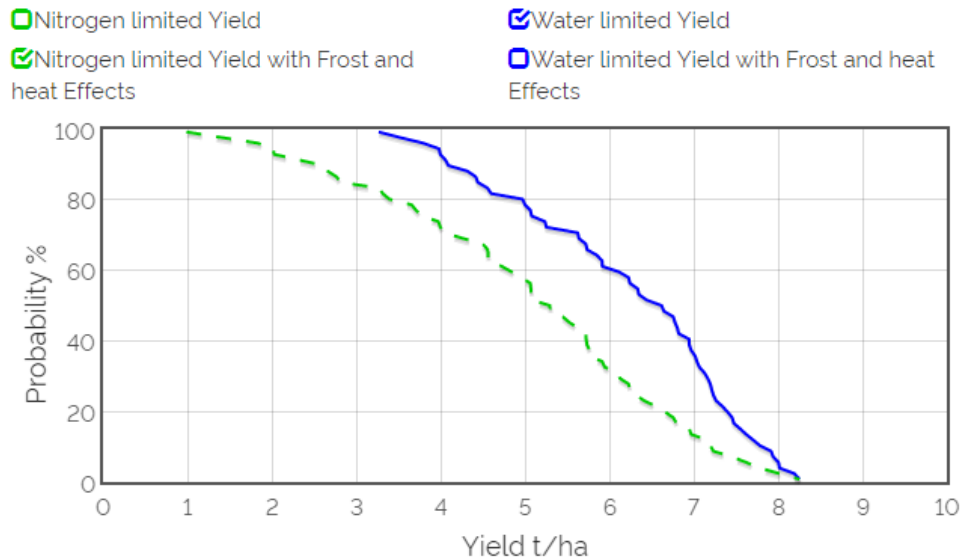
Getting the timing right

You should aim to apply 75% of nitrogen by mid tillering. Additional nitrogen can be added according to seasonal conditions later in the crops growth stage. Urea should be topdressed immediately prior to a good soaking rainfall to minimise losses and ensure it is incorporated into the root zone of crop.



Decision support tool

[Yield Prophet](#) is a free decision support tool that enables you to run scenarios based on different crop types, irrigation, rainfall and topdressing rates to predict yield. It uses information from local weather stations and soil maps, however it also allows you to also input paddock specific details to tailor your scenario if known.



Yield Prophet gives the probability of potential yield for your nitrogen applied under different rainfall and irrigation scenarios.

For more information

[North, S. \(2018\). Growing wheat straight after rice. *Primefact 1617*.](#)

[Fowler, J. \(2017\). Determining nitrogen top dressing requirements. *Rice Extension newsletter June 2017*.](#)