

Fert\$mart Nitrogen

This fact sheet is part of the Profitable Dairying series - *Good business management reduces greenhouse gas emissions.*

The Australian dairy industry has committed to reducing greenhouse gas emissions intensity (emissions per L milk produced) by 30% by 2020.

Fert\$mart is a key component of the Profitable Dairying project, aimed at reducing greenhouse gas emissions intensity and improving the profitability of dairy farmers.

Farm specific strategy

Nitrogen cycles through dairy farming systems from the soil, through the cow and back onto the pasture through urine. In addition to applied nitrogen, nitrogen can be supplied by legumes, mineralisation of organic matter and soil bacteria.

This makes managing nitrogen complex. There are no simple recipes as pasture available nitrogen will be influenced by:

- Your climate
- Your soils
- Your pasture species
- Your grazing system
- Your management practices
- Your fertiliser history

Nitrogen management is specific to your farm.

Why do dairy farms need nitrogen?

- All living organism require nitrogen (N)
- Nitrogen is essential in building proteins
- Essential for pasture growth. Generally between 2.5-4.0% in ryegrass pastures
- For pasture N must be supplied in the form of either ammonium or nitrate
- Intensive farming systems generally rely on the provision of additional N fertiliser
- It takes about 600kg N to grow 12t DM/ha regardless of where the N comes from.

Start with what you get for nothing

- Legumes (clovers) in a typical pasture can contribute up to 200 kg/ha N.
- [Mineralisation](#) of organic carbon (OC) can contribute up to 25 kg N/ha for every % of OC
- Soil bacteria and thunderstorms fix small amounts of atmospheric nitrogen (N₂).





Managing the nitrogen fertiliser you buy in

Local knowledge and experience will give you the best understanding of how to use nitrogen strategically and profitably.

Some practical references on N for farmers and advisers are:

- [Fert\\$mart Nitrogen Information](#)
- GippsDairy [Nitrogen Use on Dairy Farms](#) Fact Sheet, prepared by John Mulvany, OMJ Consulting.
- Summary of [Best Management Practices for N on pastures](#), by Richard Eckard, University of Melbourne.
- [Greener Pastures Project](#) Nitrogen for intensively grazed dairy pastures.

Rules of thumb for N fertiliser use.

Below are a few rules of thumb that are applicable nationally to help with decision-making:

- Urea is the cheapest source of N fertiliser. There is no difference in yield between N sources (urea/DAP) if the same rate of nitrogen is applied – as long as there is no deficiency in any other nutrients. (Urea is 46% N. DAP is 18% N).
- Apply N when the grass is actively growing. This is soil temperature related. Know your region and pasture species.
- Apply maximum of 50 kg N/ha (100 kg/ha urea) *in a single application*. The rate response curve for single applications peaks here – additional N does not give additional economic response and the risk of losses to the environment (leaching and nitrous oxide emissions) increases.
- Nitrogen applications over 250 kg/ha (544 kg/ha urea) *annually* need to be considered carefully in terms of pasture consumption. Are you consuming more than 10 t DM/ha?
- Manage N fertiliser applications to avoid any risk of nitrate poisoning. For annual and short-rotation ryegrass ensure a minimum of 2.5 or preferably 3 leaves before grazing, if high nitrate is suspected. The main defense against nitrate poisoning is making sure that the cows are: a) not hungry b) have some grain in the diet to handle the higher nitrate (replacement heifers are more at risk) c) are not moving from a low N diet to a high N diet and d) most nitrate toxicity comes to from cape weed or volunteer brassicas so avoid these. [Click here](#) for more information.

Further reading:

[Fert\\$mart Nitrogen Resources](#)
[Nitrogen Use on Dairy Farms](#)

[Fertiliser Australia Nitrous Oxide review, industry science and BMPs](#)

[Fertiliser Australia - Nitrous oxide losses from intensive pasture](#)

[Fertiliser Australia Best Management Practices for Intensive Pasture](#)

[Best Management Practices for Reducing Greenhouse Gas Emissions from Dairy Farms, University of Melbourne](#)

[Quick Guide to Farm Nitrogen Sources](#)

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