



Tactics for Tight Times

Fert\$mart nitrogen



Quick tips

- › Best responses occur on actively growing pastures.
- › Urea will be the cheapest source of N and there is no difference in yield for the same amount of nitrogen applied unless another nutrient is limiting production (e.g. Phosphorus).
- › Application rates should be between 25 and 50 kg N/ha per grazing rotation (0.8–1.5 kg N/ha/day depending on rotation length).
- › Nitrogen is ideally applied soon after grazing, but within 2–3 days either side of grazing is acceptable.
- › Nitrogen should be applied where the greatest response will be seen. Consider: Pasture species and quality, soil temperature, slope, soil moisture levels.

Situations to avoid

- › Low soil temperatures – (below 4 degrees C): very low responses to N.
- › Not enough soil moisture for growth
- › Waterlogged soils – where the excess water is actively running off the paddock it can move both dissolved urea and nitrate with it.
- › Blanket applying nitrogen to the whole farm at once – rather double the rate (within the limits above) on half the area, applying to paddocks closer to and from grazing.

Figure 1 Urea application timeline



As rotations shorten in response to faster growth rates it becomes more important to get the timing right as the ideal window to maximise response

narrows – this is where the nitrogen rate should be reduced accordingly as well, using the 0.8 to 1.5 kg N/day calculation. Nitrogen should

be used when plants will respond to extra nutrition and when extra feed is needed. Blends can be a good option where other nutrients are limiting.

Strategic nitrogen use also means, before each nitrogen application, considering whether purchased feed will be a cheaper means of filling the feed gap than buying the nitrogen fertiliser required to grow the additional pasture; this decision should be made based on the likely response you will get to nitrogen and therefore the cost of the additional feed produced. For example, in a hot and dry summer without irrigation the response could be well below 6 kg extra DM per 1 kg nitrogen – under these conditions it would be cheaper to buy in the feed than apply nitrogen. Decisions concerning feed sources (home grown vs purchased) need to be considered in a whole farm context in conjunction with your feed budget and expected feed requirements.

Pasture conservation

In the case of pasture conservation, it is recommended to apply N at a higher rate (up to 60 kg of N/ha in later spring), after grazing when the pasture is closed up for conservation. Results from using split applications of N, for example after grazing and again partway through regrowth, are more variable, and this practice isn't recommended.

How much does nitrogen grown grass cost?

This will depend on the cost of urea, the response rate and the utilisation (how much of the extra growth is wasted). Table 1 shows, even at average response rates e.g. 10:1, providing wastage rates are minimised additional pasture grown compares

favourably with purchased feeds (particularly purchased hay and silage).

What influences the response rate to nitrogen?

The amount of pasture grown in kg DM/kg N applied is the 'response rate'. For example where 30 kg N/ha is applied and an additional 300 kg DM/ha of pasture is grown the response rate is 10 kg DM/kg N fertiliser applied. The response rate is dependent on:

1. Amount of available N in the soil – the greater the deficit, the higher the response.
2. Soil temperature – the warmer the soil, the greater and more immediate the response i.e. target north facing slopes in mid-winter.
3. Plant growth – the higher the growth rate potential, the greater and more immediate the response. Also better species composition means better responses.
4. Moisture – too much or too little water will lower the response.
5. Rate of N applied per application – there is a diminishing response at high application rates, but also an unreliable response at low rates, therefore stick to rates between 20 and 50 kg N/ha per application depending on the additional growth required.
6. The availability of other plant nutrients and soil pH.

For regionally specific nitrogen response rates please see: [Gippsland](#), [Western Victoria](#), [Northern Irrigation Region](#), [Tasmania](#)

Where to apply nitrogen?

Fertiliser should be placed where conditions will be most conducive to plant growth. This means the warmer northern slopes in winter, and in paddocks with good species composition and nutrient profile. For example, 40 kg N/ha spread on a north facing paddock would grow more grass in mid-winter than the same amount of N spread on a south facing slope. The reverse may be true in the hotter months. A similar principle applies to areas with good and poor species composition.

Areas already high in nitrogen – such as around gateways, water troughs and shelter belts where urine and dung tend to be deposited – don't need fertiliser. Avoiding these areas saves money and reduces nitrogen loss.

Some practical references on nitrogen are:

- > [Fert\\$mart Nitrogen Information](#)
- > [Gipps Dairy 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
- > [Dairy NZ. \(2012\) Seasonal nitrogen use \(7–11\). Factsheet](#)
- > [Using Nitrogen: what is best practice? SIDE 2005](#)
- > [Nitrate poisoning information](#) DPI NSW

Table 1 Variation in the cost of additional pasture consumed when urea around \$500/T

Extra response Kg/DM/kg N	Utilisation	Cost of Extra Pasture Consumed
High response 20:1	75%	\$75/T DM
	50%	\$110/T DM
Average response 10:1	75%	\$150/T DM
	50%	\$220/T DM
Low response 5:1	75%	\$300/T DM
	50%	\$440/T DM

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