

FACTSHEET

Hill Country Futures: Nitrogen fertiliser use

February 2023

Hill country pasture growth is limited by the availability of nitrogen (N) throughout the year. As a consequence, N fertilisers can be used as a management tool to lift pasture production at any time – across the whole farm or on parts of the farm – to address a predicted feed shortage.

🔑 Key messages

- N can be applied strategically to increase grass growth when it rains after a dry period. It can also be used in colder winter conditions, when legumes are not growing, to increase early spring feed supply for lactating ewes and cows.
- The application of N to steep or sunny slopes – if there is little legume present – gives a greater response than when applied to easy or shady slopes.

The role of N fertiliser

Strategic use of N fertiliser can help lift grass growth throughout the year, particularly in late autumn and early spring. Spring application yields the highest and most predictable response.

N is particularly effective where:

- Soil temperature is limiting the mineralisation of organic N and/or
- Low summer/autumn rainfall (especially if accompanied by excessive wind) has limited legume growth on steep, sunny slopes.

Pasture production response

The pasture production response to N in hill country differs with time of year, aspect and slope.

The presence of obvious urine patches is an indicator of a N deficiency.

White clover grows more on south aspects and easy slopes, because these areas retain moisture comparatively well, and the grazing of white clover can supply N to the soil.

Conversely, grasses that grow on north aspects and steep slopes show a greater response to N, if there is less legume present due to low soil moisture. This is particularly apparent in summer dry environments if management has not focused on increasing the content of the winter annual subterranean clover.

Variable application

If hill blocks have different aspects on a sufficient scale, then N can be differentially applied from conventional topdressing planes.

Timing of N application

Spring application

The critical period for pasture growth on most sheep and beef farms is late winter/early spring. This is when lactating ewes and cows have high feed requirements, but low temperatures limit both pasture growth and N mineralisation. N is therefore strategically applied 4-6 weeks before lambing or calving.

For the greatest impact, apply N to pastures on north aspects in late winter/early spring, with the intention of lambing multiple-scanned ewes on the area.

Autumn application

Autumn-applied N can increase winter feed supply following a dry period. However, at least 20-30 mm rainfall is required to initiate pasture growth.

Rate of N application

Depending on feed demand, applying 30-50 kg N/ha (65-110 kg urea*/ha) at one time is appropriate.

* Urea = 46%N

Which N fertiliser to use?

If 5-10 mm of rainfall is unlikely to fall within 24 hours of application, use a product such as Sustain or N-Protect to minimise the loss of N through volatilisation.

In ryegrass-dominant pastures, the most effective response will be obtained by also applying sulphate-sulphur (e.g. Sulphate of Ammonia** (SOA)) in early spring.

** Sulphate of Ammonia = 21%N

Other factors to consider

Pasture cover: Pasture production responses to N will be greater if residual pasture cover is at least 1200 kg DM/ha.

If phosphorus is also lacking use a fertiliser such as di-ammonium phosphate (DAP) in autumn or winter/early spring.

Conclusion

Strategically applying N in spring or autumn can significantly lift pasture production. The response is particularly beneficial:

- On steep and sunny slopes,
- Where soil temperature is cold, and/or
- When summer/autumn rainfall is low.

Further reading

This factsheet is part of the Hill Country Futures soil and fertiliser series. The full series can be found at www.hillcountryfutures.co.nz/resources/soil-and-fertiliser-series

“Fertiliser use on New Zealand sheep and beef farms” booklet, produced the Fertiliser Association of New Zealand booklet. Download at: www.fertiliser.org.nz/Site/resources/booklets.aspx

B+LNZ web page: “Making the most of nutrients” www.beeflambnz.com/compliance/environment/making-most-nutrients

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