

FACTSHEET

Hill Country Futures: Soil and pasture testing protocols

April 2022

Knowing the soil nutrient status across your hill country property provides powerful insights to assess your business performance, identify imbalances, target any nutrient shortfalls, and limit negative impacts on the environment.

Key messages

- Soil test: The nutrient status of hill country soils is variable, so a robust soil testing regime that accurately reveals long-term trends is essential.
- Pasture test: Analysis of legumes' nutrients and trace elements indicates whether adequate levels of specific nutrients are being taken up from the soil.

Why soil test?

Across a single hill country property, soil test results will differ markedly, due to variable distribution of fertiliser nutrients from topdressing planes and animals' tendency to redistribute plant nutrients inefficiently by transferring them from steeper areas to concentrated camping spots.

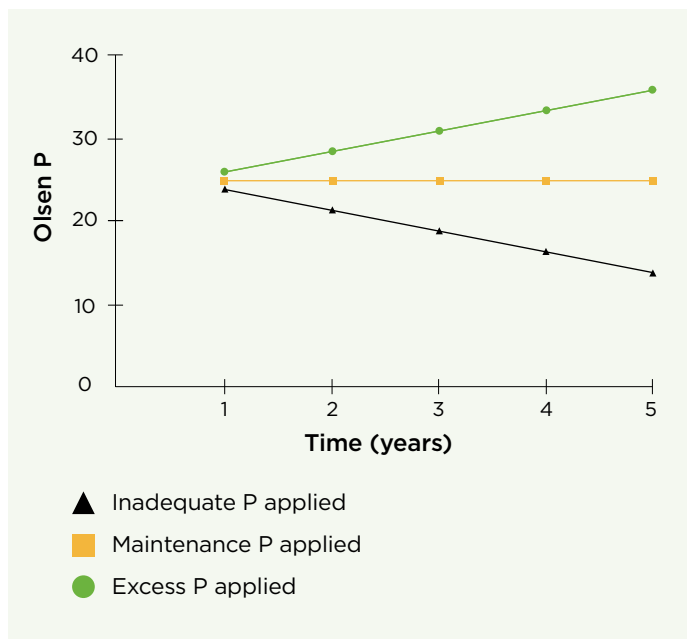
It is therefore critical that soils are tested using strict protocols that ensure year-to-year results are meaningful.

How to test accurately:

1. Select at least five paddocks, representative of blocks with the different soils and land forms within your property.
2. Set up transects in the middle of the main slope and aspect. Use GPS to record the start and end points.
3. Take samples between late autumn and mid spring, when soil moisture levels are more likely to be consistent between years.
4. Within each paddock, take 15-20 soil cores along the transect each year.
5. After five years, you will see trends over time. If you see a near-constant trend in nutrient levels over time, then the applied rate of fertiliser nutrient is maintaining soil test levels (see graph overleaf). Ensure this is within the optimum range for your soil type.



Using trends in Olsen P to assess maintenance P requirements



If the trend is near constant (yellow line) and in the desired range, the rate of maintenance fertiliser being applied is appropriate. If it is increasing (green line) then you may be able to reduce fertiliser inputs to this block and target more fertiliser into any areas showing a declining trend (black line).

Why pasture test?

Annual pasture testing of legumes allows you to assess if you have adequate trace elements.

How to test accurately:

1. Select three to five paddocks that are due to be grazed.
2. Take leaf samples mid-to-late spring, when growth is not limited by other factors, such as temperature and moisture. Concentrate on getting as much legume leaf in the sample as possible.
3. Within each paddock, take 12-15 legume samples each year. The samples from one paddock can be placed together in a plastic bag.
4. Keep the bag in the fridge until you send it. Use an overnight courier.

Conclusion

By building soil and pasture testing into your annual management calendar, you can accurately monitor your operation's soil nutrient status. Making subsequent corrections to address nutrient or trace element imbalances will optimise pasture growth and therefore animal production.

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

"Fertiliser use on New Zealand forage crops" booklet, produced by the Fertiliser Association of New Zealand. Download at: www.fertiliser.org.nz/Site/resources/booklets.aspx

Acknowledgement

Funding for this project was provided by Beef + Lamb New Zealand, MBIE, Seed Force New Zealand and PGG Wrightson Seeds, as part of the "Hill Country Futures" research programme (BLNZT1701).

Factsheets are made possible by sheep and beef farmer investment in the industry. Beef + Lamb New Zealand is not liable for any damage suffered as a result of reliance on the information contained in this document. Any reproduction is welcome provided you acknowledge Beef + Lamb New Zealand as the source.