FACTSHEET

Hill Country Futures: Nutrient and lime requirements for red and white clover swards

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Under good management, white clover dominant swards will last for 5-10 years and red clover swards for 2-3 years. This factsheet discusses the key nutrient and lime requirements of pure clover swards, to optimise their productivity.

Key messages

- Pure or legume dominant swards of white and red clover generally require annual applications of phosphorus (P) and sulphur (S). They may also require potassium (K) depending on soil Quick Test K (QT K) levels, lime to maintain soil pH and molybdenum (Mo), depending on herbage levels.
- Carry out regular soil testing for pH, P, S and K and regular herbage testing for Mo, so you are aware of the situation on your property.

pH

At sowing, soil pH should be at least 5.8-6.0.

If not, it can be elevated by applying 1 t/ha of lime, which will increase pH by about 0.1 units.

Soil pH can be maintained by applying 2.5 t/ha of lime every 3-5 years.

Phosphorus (P)

Soil Olsen P levels need to be 20-30 for near-maximum production from clover swards.

For a grazed high-yielding crop (i.e. 10-12 t DM/ha/yr), maintenance P requirements will be 20-30 kg/ha/yr.

Sulphur (S)

The amount of S required to overcome a deficiency on Sedimentary soils is 30-40 kg/ha/yr.

Soil sulphate S levels should be 10-12 ppm, but 6-10 ppm is adequate. S levels decrease more quickly in high rainfall areas.

Potassium (K)

For near-maximum production, soil QT K levels should be:

- 5-8 on Sedimentary and Organic soils
- 7-10 on Ash and Pumice soils.

On sedimentary brown soils, to raise the soil QT K test by one unit, apply 60 kg K/ha.

Magnesium (Mg)

On all soil groups except pumices, soil QT Mg levels will generally be above the target range of 8-10 for near-maximum pasture production.

If soil QT Mg levels are below 6, apply 20-30 kg Mg/ha/yr as Kieserite.

If soil QT Mg levels decline over time to below the target range, apply 10-15 kg Mg/ha/yr.

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Trace elements

Molybdenum (Mo)

To maximise nitrogen fixation, clover herbage Mo levels should be above 0.3 ppm and nitrogen levels above 4.5%.

If below these optimum levels, apply 100 g/ha of sodium molybdate OR 200 g/ha of granular Mo every 4-5 years.

Copper (Cu)

Some Pumice and Sand soils may require an application of Cu at 5 kg/ha at sowing.

Other trace elements

There should be sufficient supply of all other trace elements from the soil.

NB Herbage should be tested in periods when legume growth is not limited by lack of moisture or low temperature.

Conclusion

Pure clover swards can increase animal intake and production. However, they need to be fertilised and limed adequately to replace the high levels of nutrients removed in milk and meat.

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/resouces/booklets.aspx

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