



Keep an eye on your K levels

Balancing potassium levels is essential to maintaining a productive and sustainable pasture system. Incitec Pivot Fertilisers' technical agronomists Jim Laycock and Lee Menhenett explain how to get the most out of your fertiliser investment using potassium.

Any nutrient limitation can constrain pasture growth, including potassium (K).

Potassium is often required in pastures, particularly where hay and silage has been removed, on light sandy soils, in high rainfall areas and on granite-based soils.

Keeping an eye on your potassium levels may allow you to avoid nutrient limitations for strong pasture performance and avoid potential problems with excess potassium levels in feed.

Guidelines for monitoring potassium

- Soil testing is a good way to assess the need for potassium. This shows the extracted or available potassium levels.
- When sampling, be aware that potassium levels may be higher in areas of the paddock where animals tend to gather.
- Critical K values for shallow soil tests (0-10 cm) are a good source of information for pasture fertiliser decisions.
- Deeper soil tests (10-30 cm) can also add to the information on available potassium, particularly for deep-rooted perennials.
- Check on pH, because the immobilisation of potassium increases rapidly as pH(w) decreases below 5.5.
- Take a walk through the pasture and check the urine patches. If the patches are promoting clover and ryegrass responses, the pasture may be responding to both the nitrogen and potassium in the urine. If the patches are dominated by ryegrass, it is more likely a nitrogen response.
- Consider paddock history and soil type. Potassium is more likely to be needed in sandy soils. Large amounts of potassium are removed with hay and silage production.

What fertiliser is best for applying potassium?

Muriate of Potash is the most commonly used potassium fertiliser in pastures and is a good blend partner with other fertilisers.



How much potassium should be applied?

Annual rates can range from 0-120 kg/ha of potassium, depending on requirements.

See the soil test guidelines table for the critical ranges in topsoil for various soil types and relative pasture performance in beef/sheep and dairy systems.

If soil test values for potassium are in or above the critical range, then applying potassium fertiliser will not give a pasture response. When soil test values are in the marginal or deficient range, applying some potassium fertiliser may increase potential pasture yields.

Where large amounts of potassium are being removed from the system in hay or silage, a full or partial replacement strategy may be warranted.

As a rule of thumb, for every tonne of dry matter removed, 25 kg of nitrogen, 2 kg of phosphorus, 25 kg of potassium and 2 kg of sulphur are removed from the soil if that fodder is not fed back on to the paddock.

Maximum single applications of potassium should not exceed 60 kg/ha (Gourlay 1999, Hosking 1986). Plan several smaller applications. At high rates, luxury uptake by plants may lead to nutrient imbalances in livestock, which can contribute to animal health issues.

Cattle are more susceptible than sheep, and cows close to calving or milking during a cold snap are at the greatest risk on high potassium, low magnesium and calcium soils and pastures to hypocalcaemia (milk fever) and hypomagnesaemia (grass tetany).

Grass dominant pastures tend to be a higher risk compared with pastures which have a good clover base.

Soil test guidelines for 0-10 cm samples in relation to pasture performance goals

Dairy type system aiming for 95-98% potential yield at 'adequate' soil test result					
Pasture performance compared to potential	<90%	90-95%	95-98%	98-99%	100%
	Deficient – capital fertiliser required	Marginal – fertiliser required	Adequate – maintenance fertiliser required	High – possible low fertiliser maintenance	Very high – no fertiliser required
	Colwell K (mg/kg)				
Sand	<70	70-120	120-170	170-230	>230
Sandy/Silty loam	<80	80-130	130-190	190-250	>250
Sandy/Silty clay loam	<90	90-130	130-190	190-260	>260
Clay loam and Clay	<100	100-150	150-220	220-280	>280
Beef or sheep type system aiming for 90-95% potential yield at 'adequate' soil test result					



Pasture performance compared to potential	<80%	80-90%	90-95%	95-98%	>98%
	Deficient – capital fertiliser required	Marginal – fertiliser required	Adequate – maintenance fertiliser required	High – possible low fertiliser maintenance	Very high – no fertiliser required
	Colwell K (mg/kg)				
Sand	<40	40-90	90-130	130-170	>170
Sandy/Silty loam	<50	50-100	100-150	150-190	>190
Sandy/Silty clay loam	<70	70-100	100-150	150-210	>210
Clay loam and clay	<80	80-120	120-160	160-220	>220

Source: Department of Primary Industries, Victoria

When should it be applied?

If soil test critical values are marginal to deficient, it is important to get potassium on early in the major growth periods of the pasture.

Typically, this is in autumn, when it can positively influence clover composition, and spring when it can assist in producing extra dry matter or replace fodder conservation losses.

Where paddocks are being cut numerous times in spring, then several smaller applications to replace removal can be used.

How should potassium be applied?

Potassium is easily broadcast to pastures by itself or with other nutrients. For more information on potassium blends, read 'Look to blends for a better investment'.

Correct spreader set-up is important to ensure an even distribution of the nutrients to pastures, particularly with blends. Muriate of Potash will not spread as far as a well granulated single superphosphate.

Care should be taken if applying Muriate of Potash with the seed when establishing pastures, due to its high salt index which heightens the risk of seed burn.

This is a guide only, which we hope you find useful as a general tool. While Incitec Pivot Fertilisers has taken all reasonable care in the preparation of this guide, it should not be relied on as a substitute for tailored professional advice and Incitec Pivot Fertilisers accepts no liability in connection with this guide.