

EverGraze quick guide for interpreting soil tests for south eastern Australia

Element	Symptom	Optimum level			Your farm	Strength (+) or weakness (-)
Phosphorus (P)	Poor growth + high weeds		Olsen	Colwell		
		Low	<6	<20		
		Mod	7–14	20–35		
		High	15–20	>35		
		V. High	>20			
Phosphorus Buffering Index (PBI)	Measure the soils ability to hold onto phosphorus – and let it go! Heavier soils (clays) have higher PBI due to high surface area. PBI is a soil characteristic and can only be changed (slightly) with changes in organic matter.	Low		0–100		
		Med		100–200		
		High		200–300		
		V. High		300–600		
		Marginal		4–8 mg/kg		
Sulphur (S)	Poor growth. Measured using CPC or more accurately with (KCl40)	Adequate		9–12mg/kg		
		High		>20 mg/kg		
Potassium (K)	Poor growth, especially clover. Heavy soils require higher levels of K. Lighter soils require K in small amounts more often.	150–300 mg/kg (Skene) (soil type dependent — see Table 1 next page)				
pH	Poor phalaris and lucerne establishment and persistence, sorrel infestation. In soils with high aluminium, pH may need to be further increased to reduce Aluminium toxicity especially for lucerne and phalaris. Do a soil test at depth as sub-soil aluminium is difficult to correct and susceptible species should be avoided.	5.3+ (water) 4.8+ (CaCl ₂) Any less and may respond to lime				
Aluminium (Al)	Same as pH Highly sensitive: Lucerne and new phalaris	<50 mg/kg (KCl) <2 ppm (CaCl ₂) <1% CEC for lucerne <6% for other species				
Other cations	% CEC The cation exchange capacity is the sum of extractable calcium, magnesium, sodium, potassium and aluminium. It is higher in soils with heavy texture such as clays. High organic matter also increases the CEC.	Calcium (Ca)		65–80%		
		Magnesium (Mg)		10–20%		
		Sodium (Na)		<6%		
		Potassium (K)		3–8%		

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Element	Symptom	Optimum level	Your farm	Strength (+) or weakness (-)
Electrical conductivity	Measure of salinity.	Sub clover, white clover	0-0.75 dS/m	
		Lucerne, strawberry clover	0.75-1.5 dS/m	
		Wheat, phalaris, perennial ryegrass	1.5-3 dS/m	
		Barley, saltbush	3-5 dS/m	
Organic carbon and Organic matter	Provides an indication of organic matter levels in the soil. Can be converted to organic matter by multiplying by 1.6.	Organic matter %: Low rainfall: >4.5 High rainfall: >10		

TABLE 1. Effect of soil type of nutrient status of Potassium

Nutrient status	Sands	Sandy loams	Clay loams	Clays	Peats [†]
	Available Potassium (mg/kg)				
Low	Below 50	Below 80	Below 110	Below 120	Below 250
Marginal	50 to 140	80 to 150	110 to 160	120 to 180	250 to 350
Adequate	141 to 170	151 to 200	161 to 250	181 to 300	350 to 600
High	Above 170	Above 200	Above 250	Above 300	Above 600

Note: This table is not applicable to the Riverina Plains of northern Victoria, where responses to potassium are rare, irrespective of available potassium levels.

[†]In peat soils, plant tissue testing is suggested as a more accurate indicator of available K because few field trials have been done on these soils to verify laboratory analyses.

Tips for soil testing

- Farmers should ask if the company is National Association of Testing Authorities (NATA) and Australian Soil and Plant Analysis Council (ASPAC) accredited.
- Other considerations when choosing a company include cost, turnaround time, independence for interpretation and recommendations.
- Use the same laboratory each year if happy.
- Accuracy depends on a truly representative sample which is packed correctly and sent quickly.
- Sample at the same time each year – early – mid spring is the best time because there is minimal variation, high/low fertility spots are obvious, allows time to plan for ordering fertiliser. Sample at least 8 weeks after last fertilizer application.
- Segregate samples according to major soil types, fertiliser history, paddock history (hay cuts, sacrifice paddocks etc), problem paddocks.
- Avoid water troughs, fencelines, stock camps, trees, gateways, dung/urine patches, old fertiliser dumps.
- Use a sampling corer, not a shovel. Surface samples should be exactly 0-10cm.
- Analyses and interpretations should be calibrated against local/regional soil types.
- Recommendations should be based on analyses, stocking rate, soil type, pasture species etc.
- See the Department of Environment and Primary Industries Soil Fertility Monitoring Tools for further information.