

# GUIDELINES FOR INTERPRETING SOIL TEST RESULTS

Nutrient	Unit	Optimal range	Notes
Ammonium (NH <sub>4+</sub> )	mg/kg	0-5	Nitrogen in organic matter first must be converted to ammonia or nitrate before it is in a state available for plants.
Nitrate nitrogen (NO <sub>3</sub> )	mg/kg	10-50	Nitrate nitrogen makes up the largest proportion of nitrogen in the soil and is the form most readily available for plants.
Phosphorus buffering index (PBI)		100-200	If the PBI is high, soil will bind to P quicker making it unavailable to the plant. At higher PBI levels more P is required to maintain maintenance levels than a soil with a low PBI.
Phosphorus P: (Colwell)	mg/kg	Wimmera clay: 15-35 Mallee SCL: 20-25 Acid soils: 25-30	Colwell P test can be unreliable on alkaline clays. Most likely to see a P response if Colwell P is less than 15mg/kg.
Phosphorus (P) DGT	C <sub>DGT</sub> µg/L	Marginal: 47 – 60 C <sub>DGT</sub> µg/L Low: 18 – 47 C <sub>DGT</sub> µg/L	Trials across southern Australia have demonstrated that the DGT method is producing more consistent response predictions than the Colwell P test across soil types.
Organic Carbon (OC)	%	0.9-1.5 The higher the better	Organic carbon varies, depending on soil type and management. Highest OC% comes from clay soils under long-term pasture.
pH <sub>H2O</sub>		6.5-8	pH determines the availability of nutrients in the soil.
pH <sub>CaCl</sub>		5-7.5	
EC 1:5 (soil:water)	dS/m	< 0.2-0.4 but depends on soil type	EC is the electrical conductivity of the soil. Pulses could encounter problems if above 0.21ds/m Issues if above 0.4dS/m in subsoil (below 10 cm).
ECe	dS/m	<4-8	ECe is the EC calibrated for soil type.

<b>Nutrient</b>	<b>Unit</b>	<b>Optimal range</b>	<b>Notes</b>
Chloride	mg/kg	<700-800	Levels above 800mg/kg cause impaired root growth and become toxic at 1300mg/kg.
Exchangeable sodium percentage (ESP)	%	<6 topsoil <15-19 subsoils	ESP gives a measure of sodicity. A soil is defined as sodic when ESP is above 6% and highly sodic when ESP is above 15%.
Zinc Zn (EDTA)	mg/kg	Neutral pH: 0.7-1.2 adequate	It is difficult to make fertiliser recommendations from soil tests for Zn and Cu. Use tissue testing to confirm whether trace elements are required before applying in the fertiliser.
Copper Cu (EDTA)	mg/kg	Alkaline soils: Add Zn or Cu if < 2mg/kg.	
Potassium (K)	mg/kg	60-160	Wimmera/Mallee soils are generally high in K. Potassium responses are rare, even when levels are low. K is easily leached.
Sulfur (S) – (KCL)	mg/kg	5-6+ topsoil tests <2 subsoil tests	Surface (0-10cm) tests can be a poor indicator as crops can access S in the subsoil. Canola has a higher requirement for S than other crops. S levels will be very high after gypsum applications.
Boron (B)	mg/kg	<10 in 0-60cm <14 over a 20-30cm increment	Tests of 10 and above over a 0-60cm soil test can indicate a problem, as the level is averaged over 60cm of soil. Re-test in increments to see where the B becomes a problem.
Aluminium (Al)	%	<5	These elements comprise the cation exchange capacity which measures the ability of the soil to 'hold' and exchange cations (aluminium, calcium, magnesium, sodium, potassium, hydrogen).
Calcium (Ca)	%	60-85	
Magnesium (Mg)	%	6-18	
Sodium (Na)	%	<6	
Potassium (K)	%	0.26-0.4	
Ca:Mg		<5	