



Soil Chemistry Profile

Mehlich 3 - Multi-nutrient Extractant

Sample Drop Off: 16 Chilvers Road
Thornleigh NSW 2120

Mailing Address: PO Box 357
Pennant Hills NSW 1715

Tel: 1300 30 40 80
Fax: 1300 64 46 89
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Batch N°: 40740 Sample N°: 1 Date Received: 21/9/16 Report Status: ☐ Draft ☒ Final

Client Name: **Graeme Bell** Project Name: **Chemical & Physical Soil Analysis**
Client Contact: **Graeme Bell**
Client Job N°:
Client Order N°:
Address: **32 Jacks Lane**
Maroota NSW

SESL Quote N°: **Q6081**
Sample Name: **Soil Sample**
Description: **Soil**
Test Type: **FSC, TOC_DC, BSP, FC/PWP EWEA**

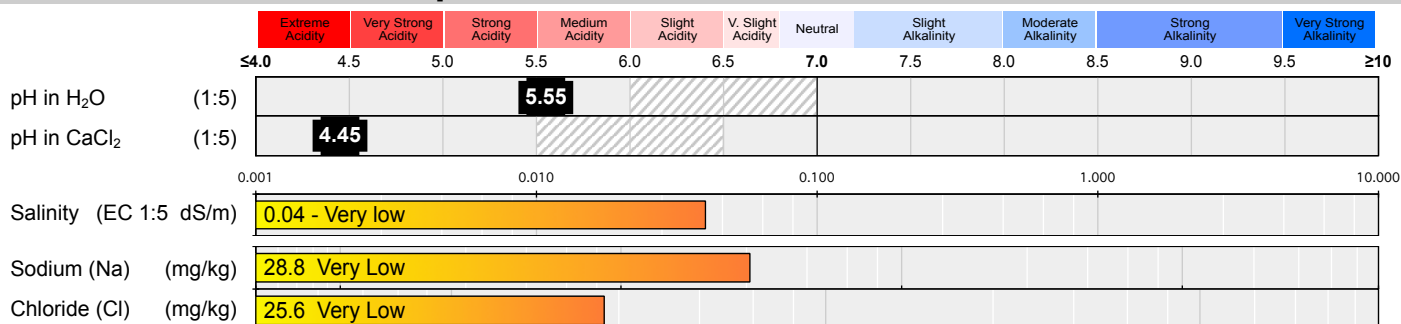
RECOMMENDATIONS

This soil was analysed to determine its suitability as a high performing agricultural soil. The soil is extremely acidic with a high proportion of exchangeable hydrogen. Due to the acidity, aluminium has become available which can be toxic to plants. Being a sandy clay loam, the soil has a low CEC and therefore a poor ability to retain plant nutrients. This is reflected by the plant available nutrients which are deficient. The ability of this soil to hold water is low - the field capacity (amount of water in the soil 48 hours after saturation) is 25.27%, and the plant available water is 116.1mm/m. Most soils are above 150mm/m. Organic matter levels are low.

In it's current state this soil is not an ideal agricultural soil. It is sandy, has poor nutrient and water holding and is strongly acidic. However, this soil can be improved. **Lime at 220 g/sqm (say 2 t/ha)** will raise the pH and balance cations. Applications of a properly composted (conforms to A.S. 4454 CSC) **organic material at up to 10t/ha** will improve water and nutrient holding capacity. A full NPK plus trace element fertiliser program is required appropriate to the enterprise. For pasture a **Pasture Starter at 500 kg/ha** plus annual application will be required for reasonable productivity. For fruit trees and Gardens **"Nitrophoska" at 50-100 g/sqm** is a high analysis well balanced product.

SOIL SAMPLE DEPTH (mm): ☒ 100 ☐ 150 ☐ 200 FERTILITY RATING: ☐ Low ☒ Moderate ☐ High

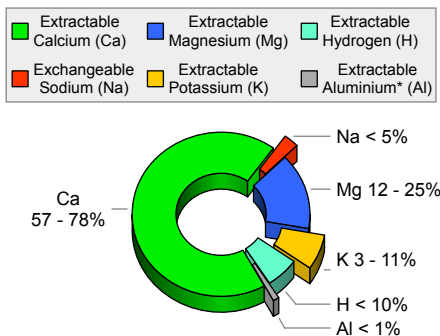
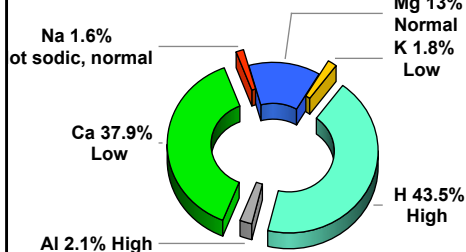
pH and ELECTRICAL CONDUCTIVITY



CATION BALANCE

EXCHANGEABLE CATION PERCENTAGE

Note: Hydrogen only determined when pH in CaCl₂ ≤ 5.5
Al only determined if pH in CaCl₂ ≤ 5.2



ACTUAL

IDEAL

EFFECTIVE CATION EXCHANGE CAPACITY (eCEC)



CATION RATIOS

Ratio	Result	Target Range
Ca:Mg	2.9	4.1 - 6.0
Comment: Calcium low		
Mg:K	7.1	2.6 - 5.0
Comment: Potassium low		
K/(Ca+Mg)	0.04	< 0.07
Comment: Acceptable		
K:Na	1.2	N/A
Sodium Absorption Ratio: D.N.T.		

EXCHANGEABLE CATIONS (meq/100g)

Na:	K:	Ca:	Mg:	H:	Al:
0.13	0.15	3.11	1.06	3.57	0.17

SOLUBLE CATIONS (meq/100g)

Na:	K:	Ca:	Mg:
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A member of the Australasian Soil and Plant Analysis Council
† This laboratory has been awarded a Certificate of Proficiency for specific soil and plant tissue analyses by the Australasian Soil and Plant Analysis Council (ASPAC). Tests for which proficiency has been demonstrated are highlighted in this report.

Disclaimer: Tests are performed under a quality system complying with ISO 9001: 2008. Results are based on the analysis of the sample taken or received by SESL. Due to the variability of sampling procedures, environmental conditions and managerial factors, SESL does not accept any liability for a lack of performance based on its interpretation and recommendations. This document must not be reproduced except in full.



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PLANT AVAILABLE NUTRIENTS

Major Nutrients	Result (mg/kg)	Very Low	Low	Marginal	Adequate	High	Result (g/sqm)	Desirable (g/sqm)	Adjustment (g/sqm)
Nitrate-N (NO ₃)	7.2						1	4	3
Phosphate-P (PO ₄)	25.2						3.4	8.4	5
Potassium (K) [†]	58.5						7.8	29.3	21.5
Sulphate-S (SO ₄)	15						2	9	7
Calcium (Ca) [†]	624						83	208.3	125.3
Magnesium (Mg) [†]	129						17.2	21.7	4.5
Iron (Fe)	149						19.8	73.4	53.6
Manganese (Mn) [†]	8.3						1.1	5.9	4.8
Zinc (Zn) [†]	2.5						0.3	0.7	0.4
Copper (Cu)	0.8						0.1	0.8	0.7
Boron (B) [†]	0.2						0	0.4	0.4

Explanation of graph ranges:

Very Low

Growth is likely to be severely depressed and deficiency symptoms present. Large applications for soil building purposes are usually recommended. Potential response to nutrient addition is >90%.

Low

Potential "hidden hunger", or sub-clinical deficiency. Potential response to nutrient addition is 60 to 90%.

Marginal

Supply of this nutrient is barely adequate for the plant, and build-up is still recommended. Potential response to nutrient addition is 30 to 60%.

Adequate

Supply of this nutrient is adequate for the plant, and only maintenance application rates are recommended. Potential response to nutrient addition is 5 to 30%.

High

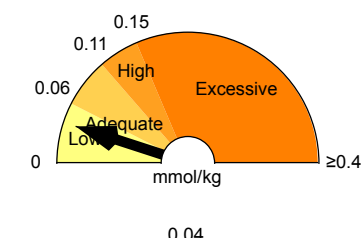
The level is excessive and may be detrimental to plant growth (i.e. phytotoxic) and may contribute to pollution of ground and surface waters. Drawdown is recommended. Potential response to nutrient addition is <2%.

NOTES: Adjustment recommendation calculates the elemental application to shift the soil test level to within the **Adequate** band, which maximises growth/yield, and economic efficiency, and minimises impact on the environment.

Drawdown: The objective nutrient management is to utilise residual soil nutrients. There is no agronomic reason to apply fertiliser when soil test levels exceed **Adequate**.

* g/sqm measurements are based on soil bulk density of 1.33 tonne/m³ and selected soil depth.

Phosphorus Saturation Index



Low. Plant response to applied P is likely.

Exchangeable Acidity

Adams-Evans Buffer pH (BpH): **7.4**
Sum of Base Cations (meq/100g⁻¹): **4.5**
Eff. Cation Exch. Capacity (eCEC): **8.2**
Base Saturation (%): **54.88**
Exchangeable Acidity (meq/100g⁻¹): **3.57**
Exchangeable Acidity (%): **43.54**

Lime Application Rate

– to achieve pH 6.0 (g/sqm): **220**
– to neutralise Al (g/sqm): **17**

Gypsum Application Rate

– to achieve 67.5% exch. Ca (g/sqm): **0**
The CGAR is corrected for a soil depth of 100mm and any Lime addition to achieve pH 6.0.

Physical Description

Texture: **Sandy Clay Loam**
Colour: **-**
Estimated clay content: **20 - 30%**
Size: **Fine (1 - 10mm)**
Gravel content: **Gravelly**
Aggregate strength: **Pedal - Weak**
Structural unit: **Crumb**
Potential infiltration rate: **Moderate**
Permeability (mm/hr): **5 - 20**
Calculated EC_{SE} (dS/m): **0.4**

– Non-saline. Salinity effects on plants are mostly negligible.

Organic Carbon (OC%)[†]: **0.7 – Low**

Organic Matter (OM%): **1.2**

Additional comments:

Consultant: Chantal Milner

Authorised Signatory: Simon Leake

Date Report Generated 18/10/2016

METHOD REFERENCES:

pH (1:5 H₂O) - Rayment & Higginson (1992) 4A1,
pH (1:5 CaCl₂) - Rayment & Higginson (1992) 4B1,
EC (1:5) - Rayment & Higginson (1992) 3A1,
Chloride - Rayment & Higginson (1992) 5A2,
Nitrate - Rayment & Higginson (1992) 7B1
Aluminium - SESL in-house,
PO₄, K, SO₄, Ca, Mg, Na, Fe, Mn, Zn, Cu, B - Mehlich 3 (1984),
Buffer pH and Hydrogen - Adams-Evans (1972)
Texture/Structure/Colour - PM0003 (Texture-
"Northcote" (1992), Structure- "Murphy" (1991), Colour- "Munsell" (2000))



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