

## HANEY SOIL ANALYSIS REPORT

3 samples supplied by Environmental Analysis Laboratory on 1st November, 2018. Lab Job No. H7777.

Analysis requested by Graham Lancaster. Your Job: Example

PO Box 157 LISMORE NSW 2480

Sample ID:

Crop:

Client:

Sample 1 Sample A	Sample 2 Sample B	Sample 3 Sample C	AVERAGE  (120 random samples)
N/A	N/A	N/A	
EAL	EAL	EAL	

Test	Parameter	Method reference	H7777/1	H7777/2	H7777/3	
	Haney Soil Health Score	Calculation: (Solvita CO <sub>2</sub> /10) + (Total Water Extractable Carbon/100) + (Total Water Extractable Nitrogen/10)	16	11	18	8.2
Solvita	Microbial Respiration (mg/kg CO <sub>2</sub> )	Solvita CO <sub>2</sub> Burst	106	21	116	44
Water Extraction	Water Extractable Organic Carbon (mg/kg C)	Shimadzu TOC-L	279	442	339	185
	Water Extractable Nitrogen (mg/kg N)	Shimadzu TNM-L	30	41	31	20
	Water Extractable Nitrate (mg/kg N)		9.6	1.5	0.4	5.4
	Water Extractable Ammonium (mg/kg N)	Haney 2010 FIA (Water Extract)	0.6	0.6	0.6	2.0
	Water Extractable Inorganic Phosphorus (mg/kg P)		0.7	0.7	2.7	2.2
	Organic Carbon:Organic Nitrogen ratio (C:N ratio)	Calculation: Total Water Extractable Carbon:Total Water Extractable Nitrogen	9.2	11	11	9.5
	Inorganic Nitrogen (mg/kg N)	Calculation: Water extractable Nitrate + Ammonium	10	2.1	1.0	7.4
	Organic Nitrogen (mg/kg N)	Calculation: Total Water Extractable Nitrogen - Inorganic Nitrogen (Nitrate + Ammonium)	20	39	30	13
Haney Extraction	Calcium (mg/kg)		261	279	450	453
	Magnesium (mg/kg)		255	234	288	123
	Potassium (mg/kg)		95	90	465	87
	Sodium (mg/kg)		231	225	254	62
	Sulfur (mg/kg)		29	26	126	30
	Zinc (mg/kg)	Haney 2010 ICP-OES (H3A-2 Extract)	1.3	1.7	5.8	3.1
	Manganese (mg/kg)		5.5	4.8	3.9	17
	Iron (mg/kg)		1738	2111	757	314
	Copper (mg/kg)		0.3	0.2	0.2	1.2
	Aluminum (mg/kg)		1990	1870	1073	577
	H3A-2 Nitrate (mg/kg N)		13	8.4	5.2	7.3
	H3A-2 Ammonium (mg/kg N)	Haney 2010 FIA (H3A-2 Extract)	18	37	14	9.5
	Total Available Phosphorous (mg/kg)	Haney 2010 ICP-OES (H3A-2 Extract)	12	19	62	25
	H3A-2 Inorganic Phosphorus (mg/kg P)	Haney 2010 FIA (H3A-2 Extract)	9.0	12	60	19
Organic Phosphorus (mg/kg P)	Calculation: (Total Available Phosphorus - H3A-2 Extracted Inorganic Phosphorus)	3.3	6.8	1.9	5.8	
Other	pH <sub>w</sub>	Rayment & Lyons 2011 - 4A1 (1:5 Water)	6.02	5.66	5.73	..
	Electrical Conductivity (dS/m)	Rayment & Lyons 2011 - 3A1 (1:5 Water)	0.057	0.062	0.043	..
	Labile Carbon (%)	Blair 1995 - 0.333 M Potassium Permanganate	0.47	0.46	0.91	..
	Total Carbon (% C)		2.34	2.29	4.56	..
	Total Nitrogen (% N)	Inhouse S4a (LECO Trumac Analyser)	0.17	0.20	0.38	..
	Estimated Organic Matter (% OM)	Calculation: Total Carbon x 1.75	4.1	4.0	8.0	..
	Carbon/Nitrogen Ratio	Calculation: Total Carbon/Total Nitrogen	14.0	11.6	12.2	..

### Notes:

- All results presented as a 40 °C oven dried weight. Soil sieved and lightly crushed to < 2 mm.
- Methods from Haney RL, Haney EB, Hossner, LR and Arnold JG. 2010a. Modifications to the new soil extractant H3A-1: a multnutrient extractant. *Communications in Soil Science and Plant Analysis*. **41(12)**:1513–1523. This method uses the modification to H3A-1 and is referred to as H3A-2.
- Analysis conducted between sample arrival date and reporting date.
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Quality Checked: Kris Saville  
 Agricultural Co-Ordinator

KS

## Understanding your Haney soil results

An EAL Haney soil test report holds a wealth of information. To assist in its interpretation, please refer to the colour coded text below and within the report. For example, microbial respiration results can be quickly located by looking for the purple bar to the left of the data. The Parameter column of the report defines the test undertaken, while the Method reference indicates the technique used. To the right of your data, an average of 120 results has been provided as a guide. There are currently no published Australian guidelines.

	<b>Haney Soil Health Score</b>	<b>Haney Soil Health Score</b> - Based on a calculation from Rick Haney using the CO <sub>2</sub> burst, water extractable organic carbon and water extractable nitrogen to provide a soil health score. Results < 7 are considered low and can range between 0 and 50. The score looks at the balance of carbon and nitrogen compared to the microbial respiration.
	<b>Microbial respiration</b>	<b>Microbial respiration</b> – Using the Solvita methodology the microbial respiration is determined by the CO <sub>2</sub> burst that is measured over a 24 h period after a dry sample is rewetted. The CO <sub>2</sub> evolved from re-wetting is proportional to the microbial biomass and available substrate. This will also increase when the available carbon is increased. This test can also be used as an indicator for overall soil health. Indicative ranges for CO <sub>2</sub> -C in mg/kg: < 12 for Low Biology, 12–70 for Medium Biology, > 70 for High Biology. Results are typically between 5 and 200 mg/kg.
	<b>Water Extractable Organic Carbon</b>	<b>Water Extractable Organic Carbon (WEOC)</b> – This is the amount of organic carbon extracted with water from the soil. This result shows the energy source used by microbes and hence is an indicator of microbial activity.
	<b>Water Extractable Nitrogen</b>	<b>Water Extractable Nitrogen (WEN)</b> – This is the total nitrogen extracted with water from the soil. It includes both extractable soil organic and inorganic sources of nitrogen.
	<b>Organic Carbon/Nitrogen Ratio</b>	<b>Organic Carbon/Nitrogen Ratio</b> – This compares WEOC to WEN. Generally a result above 20 would indicate low nitrogen and phosphorus mineralisation. An ideal result is between 8 and 15 to 1.
	<b>Inorganic Nitrogen</b>	<b>Inorganic Nitrogen</b> – This is the sum of plant available NO <sub>3</sub> -N and NH <sub>4</sub> -N and is susceptible to leaching and surface run-off.
	<b>Organic Nitrogen</b>	<b>Organic Nitrogen</b> – This is the WEN–Inorganic Nitrogen. It is broken down by microbes releasing Nitrogen to the growing plant.
	<b>Water Soluble Nutrients</b>	<b>Water Soluble Nutrients</b> – This provides the nutrients readily extracted from the soil by water.
	<b>Haney H3A-2 Extractant</b>	<b>Haney H3A-2 Extractant</b> – Created by Rick Haney, the extractant mimics the organic acids produced by plant roots and indicates available nutrients.