

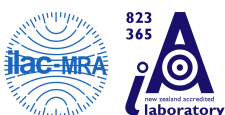


ANALYSIS REPORT

Client: Trevelyan's Pack & Cool Limited	Lab No: shpv1
Address: 310 No 1 Road RD 2 TE PUKE 3182	Date Registered: 24-Apr-2015
Phone: 07 573 0085	Date Reported: 29-Apr-2015
	Quote No:
	Order No:
	Client Reference:
	Submitted By: Daniel Birnie

Sample Name:		Lab Number:				
Sample Type: SOIL Avocado (S28)						
Analysis		Level Found	Medium Range	Low	Medium	High
pH	pH Units	6.3	6.0 - 6.5			
Olsen Phosphorus	mg/L	30	25 - 50			
Potassium	me/100g	0.59	0.50 - 0.80			
Calcium	me/100g	13.2	7.0 - 18.0			
Magnesium	me/100g	3.03	1.00 - 3.00			
Sodium	me/100g	0.10	0.00 - 0.50			
CEC	me/100g	23	12 - 25			
Total Base Saturation	%	75	60 - 85			
Volume Weight	g/mL	0.78	0.60 - 1.00			
Phosphorus (Mehlich 3)*	mg/L	148	55 - 110			
Iron (Mehlich 3)*	mg/L	141				
Manganese (Mehlich 3)*	mg/L	21.6	8.0 - 35.0			
Zinc (Mehlich 3)*	mg/L	15.39	5.00 - 15.0			
Copper (Mehlich 3)*	mg/L	14.4	2.0 - 5.0			
Boron (Mehlich 3)*	mg/L	7.57	2.50 - 4.50			
Cobalt (Mehlich 3)*	mg/L	0.1				
Aluminium (Mehlich 3)*	mg/L	1,180	900 - 1300			
Soil Sample Depth*	mm	0-100				
Base Saturation %		K 2.6	Ca 58	Mg 13.3	Na 0.4	
MAF Units		K 9	Ca 13	Mg 53	Na 4	

The above nutrient graph compares the levels found with reference interpretation levels. NOTE: It is important that the correct sample type be assigned, and that the recommended sampling procedure has been followed. R J Hill Laboratories Limited does not accept any responsibility for the resulting use of this information. IANZ Accreditation does not apply to comments and interpretations, i.e. the 'Range Levels' and subsequent graphs.





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Sample Name:		Lab Number:			
Sample Type: LEAF Avocado (P28)					
Analysis	Level Found	Medium Range	Low	Medium	High
Nitrogen*	% 2.3	2.4 - 2.9			
Phosphorus	% 0.12	0.12 - 0.18			
Potassium	% 1.0	0.9 - 1.2			
Sulphur	% 0.22	0.20 - 0.30			
Calcium	% 1.21	1.20 - 2.00			
Magnesium	% 0.34	0.30 - 0.55			
Sodium	% < 0.003	0.00 - 0.250			
Iron	mg/kg 45	40 - 100			
Manganese	mg/kg 152	80 - 300			
Zinc	mg/kg 29	25 - 50			
Copper	mg/kg 52	5 - 15			
Boron	mg/kg 37	30 - 50			

The above nutrient graph compares the levels found with reference interpretation levels. NOTE: It is important that the correct sample type be assigned, and that the recommended sampling procedure has been followed. R J Hill Laboratories Limited does not accept any responsibility for the resulting use of this information. IANZ Accreditation does not apply to comments and interpretations, i.e. the 'Range Levels' and subsequent graphs.



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Analyst's Comments

Sample 1 Comment:

The medium range guidelines shown in the histogram report relate to sampling protocols as per Hill Laboratories' crop guides and are based on reference values where these are published. Results for samples collected to different depths than those described in the crop guide should be interpreted with caution.

For pastoral soils, the medium ranges are specific for a 75mm sample depth, but if a 150mm sampling depth is used the nutrient levels measured may appear low against these ranges, as nutrients are typically more concentrated in the top of the soil profile. These soil profile differences are altered upon cultivation or contouring.

Sample 1 Comment:

Results for the Mehlich 3 soil test are shown above. Medium ranges have been derived from in-house correlations with more established NZ soil tests and are not crop-specific. Mehlich 3 trace element results may appear higher than the medium range, particularly where significant levels of spray are used. Details of the Mehlich 3 test are available from our website and in a Technical Note, available on request.

Sample 1 Comment:

The Medium ranges for Mehlich 3 copper, zinc and manganese are based on typical levels and are subject to review. Interpretation should consider leaf levels and visual symptoms also.

To convert the Mehlich 3 boron reported above to a hot water soluble boron equivalent, multiply by 1.5.

Sample 1 Comment:

As the Mehlich 3 test is an acid extraction it is not measuring plant available Al, but the dilute acid soluble Al. This tends to be the amorphous, non-crystalline Al, i.e. that Al likely to fix applied soluble P. In-house investigations have shown reasonable correlation between m3-Al and the Phosphate Retention (PR) test. M3-Al does not determine the likelihood of aluminium toxicity.

Sample 2 Comment:

Revised Medium Range levels for Avocado leaves have been introduced in March 2007. These new ranges are based on levels found in NZ avocado samples over the previous five seasons. The previous interpretive ranges had been taken from overseas research, which did not appear to fit well with NZ crops for certain elements, notably P, B, Zn. For other elements, the Medium Ranges have been contracted significantly, to reflect the typical levels found in the NZ crop. No distinction has been made for varietal differences.

Sample 2 Comment:

Elevated trace element levels (Mn, Zn, Cu, Fe) may be due to spray residues, foliar fertilizer or dust contamination on the foliage.

Sample 2 Comment:

The medium range guidelines shown in the histogram report relate to sampling protocols as per Hill Laboratories' crop guides and are based on reference values where these are published. Results for samples collected at different growth stages or from different plant parts than those described in the crop guide should be interpreted with caution.

SUMMARY OF METHODS

The following table(s) gives a brief description of the methods used to conduct the analyses for this job. The detection limits given below are those attainable in a relatively clean matrix. Detection limits may be higher for individual samples should insufficient sample be available, or if the matrix requires that dilutions be performed during analysis.

Sample Type: Soil			
Test	Method Description	Default Detection Limit	Sample No
Sample Registration*	Samples were registered according to instructions received.	-	1-2
Soil Prep (Dry & Grind)*	Air dried at 35 - 40°C overnight (residual moisture typically 4%) and crushed to pass through a 2mm screen.	-	1



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Sample Type: Soil			
Test	Method Description	Default Detection Limit	Sample No
pH	1:2 (v/v) soil:water slurry followed by potentiometric determination of pH.	0.1 pH Units	1
Olsen Phosphorus	Olsen extraction followed by Molybdenum Blue colorimetry.	1 mg/L	1
Potassium (MAF)	1M Neutral ammonium acetate extraction followed by ICP-OES.	1 MAF units	1
Calcium (MAF)	1M Neutral ammonium acetate extraction followed by ICP-OES.	1 MAF units	1
Magnesium (MAF)	1M Neutral ammonium acetate extraction followed by ICP-OES.	1 MAF units	1
Sodium (MAF)	1M Neutral ammonium acetate extraction followed by ICP-OES.	2 MAF units	1
Phosphorus (Mehlich 3)*	Mehlich 3 Extraction followed by ICP-OES.	1 mg/L	1
Iron (Mehlich 3)*	Mehlich 3 Extraction followed by ICP-OES.	1 mg/L	1
Manganese (Mehlich 3)*	Mehlich 3 Extraction followed by ICP-OES.	0.2 mg/L	1
Zinc (Mehlich 3)*	Mehlich 3 Extraction followed by ICP-OES.	0.15 mg/L	1
Copper (Mehlich 3)*	Mehlich 3 Extraction followed by ICP-OES.	0.2 mg/L	1
Boron (Mehlich 3)*	Mehlich 3 Extraction followed by ICP-OES.	0.15 mg/L	1
Cobalt (Mehlich 3)*	Mehlich 3 Extraction followed by ICP-OES.	0.1 mg/L	1
Aluminium (Mehlich 3)*	Mehlich 3 Extraction followed by ICP-OES.	1 mg/L	1
Potassium	1M Neutral ammonium acetate extraction followed by ICP-OES.	0.01 me/100g	1
Calcium	1M Neutral ammonium acetate extraction followed by ICP-OES.	0.5 me/100g	1
Magnesium	1M Neutral ammonium acetate extraction followed by ICP-OES.	0.04 me/100g	1
Sodium	1M Neutral ammonium acetate extraction followed by ICP-OES.	0.05 me/100g	1
Potassium (Sat)	1M Neutral ammonium acetate extraction followed by ICP-OES.	0.1 %BS	1
Calcium (Sat)	1M Neutral ammonium acetate extraction followed by ICP-OES.	1 %BS	1
Magnesium (Sat)	1M Neutral ammonium acetate extraction followed by ICP-OES.	0.2 %BS	1
Sodium (Sat)	1M Neutral ammonium acetate extraction followed by ICP-OES.	0.1 %BS	1
CEC	Summation of extractable cations (K, Ca, Mg, Na) and extractable acidity. May be overestimated if soil contains high levels of soluble salts or carbonates.	2 me/100g	1
Total Base Saturation	Calculated from Extractable Cations and Cation Exchange Capacity.	5 %	1
Volume Weight	The weight/volume ratio of dried, ground soil.	0.01 g/mL	1

Sample Type: Plant			
Test	Method Description	Default Detection Limit	Sample No
Plant Prep (Dry & Grind)*	Oven dried at 62°C overnight and ground to pass through a 1.0mm screen. Analytical results are reported from this sample fraction and are not corrected for residual moisture (typically 5%), unless units denoted as %DM.	-	2
Avocado Acid Detergent Wash*	Leaves were washed with an Acid Detergent solution prior to drying and grinding.	-	2
Nitrogen*	Estimated by NIR, calibration based on N by Dumas combustion. Result not corrected for residual moisture (typically 5%).	0.1 %	2
Phosphorus	Nitric Acid/Hydrogen Peroxide digestion followed by ICP-OES.	0.02 %	2
Potassium	Nitric Acid/Hydrogen Peroxide digestion followed by ICP-OES.	0.1 %	2



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Sample Type: Plant			
Test	Method Description	Default Detection Limit	Sample No
Sulphur	Nitric Acid/Hydrogen Peroxide digestion followed by ICP-OES.	0.02 %	2
Calcium	Nitric Acid/Hydrogen Peroxide digestion followed by ICP-OES.	0.02 %	2
Magnesium	Nitric Acid/Hydrogen Peroxide digestion followed by ICP-OES.	0.02 %	2
Sodium	Nitric Acid/Hydrogen Peroxide digestion followed by ICP-OES.	0.002 %	2
Iron	Nitric Acid/Hydrogen Peroxide digestion followed by ICP-OES.	5 mg/kg	2
Manganese	Nitric Acid/Hydrogen Peroxide digestion followed by ICP-OES.	3 mg/kg	2
Zinc	Nitric Acid/Hydrogen Peroxide digestion followed by ICP-OES.	2 mg/kg	2
Copper	Nitric Acid/Hydrogen Peroxide digestion followed by ICP-OES.	1 mg/kg	2
Boron	Nitric Acid/Hydrogen Peroxide digestion followed by ICP-OES.	1 mg/kg	2

These samples were collected by yourselves (or your agent) and analysed as received at the laboratory.

Samples are held at the laboratory after reporting for a length of time depending on the preservation used and the stability of the analytes being tested. Once the storage period is completed the samples are discarded unless otherwise advised by the client.

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Wendy Homewood
Operations Support - Agriculture Division