ANALYSIS REPORT:SOIL NUTRITION

TEST NEEDS AUSTRALIA

testneeds

Document No: AR2	Client ID : lake	Crop: Broccoli	Depth 15cm	Date of test: 17/02/2020
Clent Name : Good Brocolli farmer fresh	Sample ID:TN2	Sample Name : Block A	Date of report issuesd:23/03/2020	Date of sample submission:14/02/2020
Phone:	Address: Brocolli farm Vic Australia	Email: fresh@gmail.com	Test: Chemical and biological	Date Received :14/02/2020

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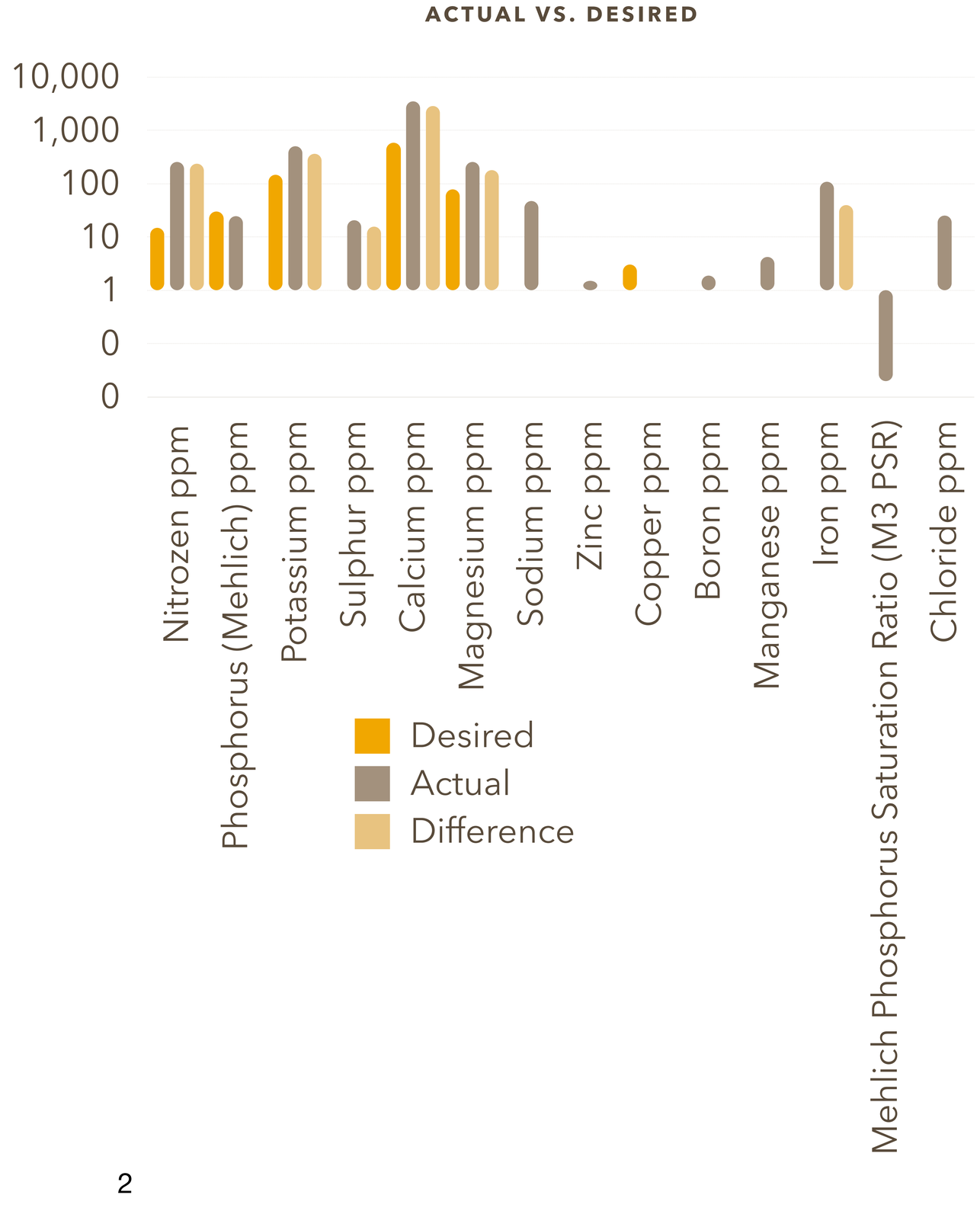
2.0 Nutrient results and desirable levels

Name	Result	Desirable level
Nitrozen ppm	253	15
Phosphorus (Mehlich) ppm	24.8	30
Potassium ppm	506.4	147
Sulphur ppm	20.6	3 to 5
Calcium ppm	3477	591
Magnesium ppm	256.4	78
Sodium ppm	47.4	< 50
Zinc ppm	1.51	4 to 6
Copper ppm	1.02	3
Boron ppm	1.88	0.6 to 1
Manganese ppm	4.2	> 20
Iron ppm	108.6	>30
Mehlich Phosphorus Saturation Ratio (M3 PSR)	0.02	0.06 to 0.23
Chloride ppm	25.15	0 to 200

Actual Nutrients vs.desired levels

Summary by elements

Category	Desired	Actual	Difference
Nitrozen ppm	15	253	238
Phosphorus (Mehlich) ppm	30	24.8	(5.2)
Potassium ppm	147	506.4	359.4
Sulphur ppm	3 to 5	20.6	15.6
Calcium ppm	591	3,477	2,886
Magnesium ppm	78	256.4	178.4
Sodium ppm	< 50	47.4	(2.6)
Zinc ppm	4 to 6	1.51	(4.4)
Copper ppm	3	1.02	(2)
Boron ppm	0.6 to 1	1.88	1
Manganese ppm	> 20	4.2	(16)
Iron ppm	>30	108.6	40
Mehlich Phosphorus Saturation Ratio (M3 PSR)	0.06 to 0.23	0.02	(0.2)
Chloride ppm	0 to 200	25.15	(40)



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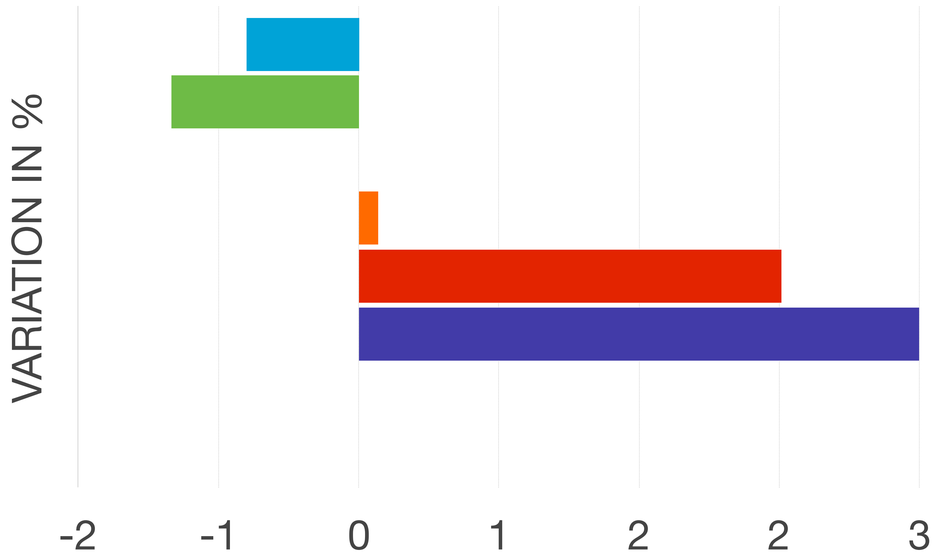
3.0 Fundamental test results

FUNDAMENTAL TEST RESULTS

TEST NAME	Result	Desirable Level	VARIATION IN %
pH (1:5 water)	6.76	6.5 to 8	-1
pH (1:5 0.01 M $Cacl_2$)	6.39	6to7	-1
Electrical conductivity dS/m	0.129	< 0.5	0
Electrical conductivity dS/m	0.154	> 0.05	0
Total carbon %	4.011	1.5 to 2	2
Organic matter %	6.2	4	3
Total Nitrozen%	.253	-	-
Carbon :Nitrozen Ratio	15.844	-	-



3.1 Note Soil Chemistry

All the parameters are in good range and the soil structures have good stability too. There is no salinity and pH is sitting in an ideal range. Good organic carbon indicates better medium for vegetables like Broccoli. Carbon: Nitrogen ratio being slightly higher (meaning slower Nitrogen mineralisation) might ask for better attention to Nitrogen management especially when the plants are meant for vegetative flushes all through the season. However, with the higher OM content, there is likely higher amount of nitrogen load and hence, would need to encourage the mineralisation of Nitrogen by adding well digested compost at adequate level.

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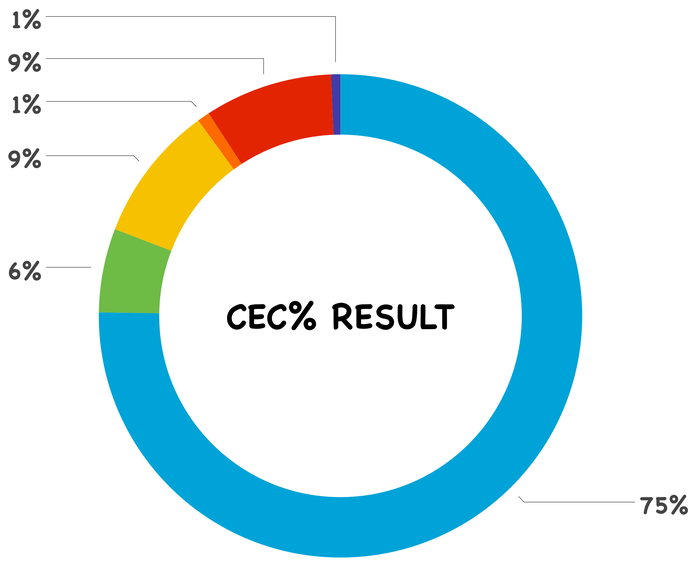
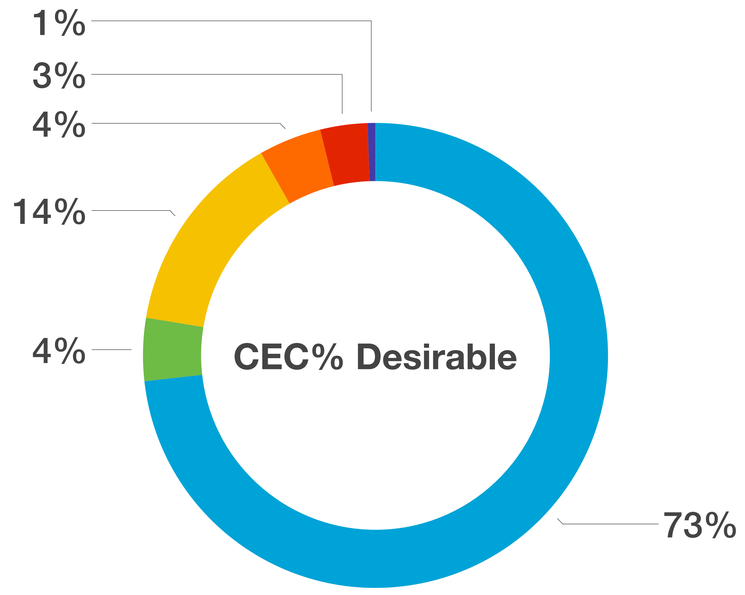
3.1 Cation exchange

3.3 Cation results and desirable levels

Exchangeable cation balance	Result CEC in %	Desirable CEC in %
Calcium %	72.4	67
Potassium %	5.4	4
Magnesium %	8.8	13
Sodium %	0.8	4
Calcium/Magnesium ratio	8.24	3
Potassium/ Magnesium ratio	0.6	0.5

Cation Results and Desirable Levels:		
Exchangeable cations	Result	Desirable level
Calcium meq/100 of soil	17.3	2.69
Potassium meq/100 of soil	1.3	0.21
Magnesium meq/100 of soil	2.1	0.62
Sodium meq/100 of soil	0.2	< 0.21
Cation exchange capacity meq/100 of soil	24	
Base saturation percentage	87.1	80 to 87
Exchangeable Acidity meq/100 of soil	3.1 (12.9% of CEC)	13 to 20% of CEC
Aluminium saturation %	0.00	





4.0 Summary :

Higher CEC (28.4 meq/100 g) indicates heavy country with higher clay amount. Looking at the lower aerobic biological activity (refer to Microwise results) thee seems to be room for proper aeration of the paddock. The difficulty with the compaction can be minimised by having raised beds and also by growing cover crops (mixture of oats, rye, peas and beans) in between the seasons and slashing them & working into the soil.
High content of Calcium calls for stopping Gypsum for few seasons. Instead, any other magnesium source like Kieserite / Magnesium Oxide added with the other soil inputs like Neem cake and chook manure would enhance better soil balance (Ca:Mg) as the result indicates an imbalance at the moment.

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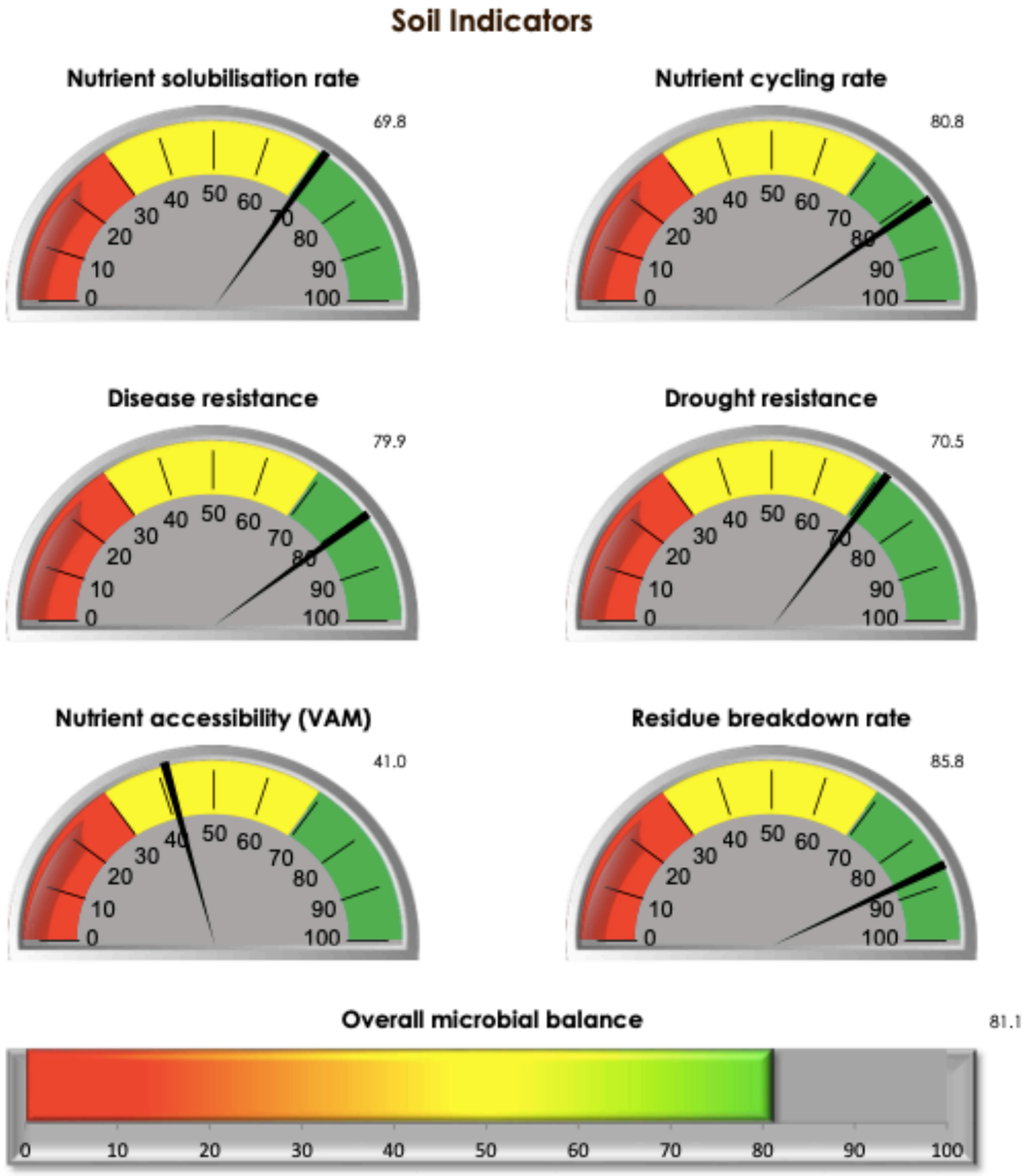
4.1 Soil Biology test results



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Key Microbe Groups

Group	Biomass (mg/kg) Yours	Guide
Total microorganisms	**36.1**	50.0
Total bacteria	**10.0**	15.0
Total fungi	**24.2**	33.8
Bacteria		
Pseudomonas	**0.986**	1.000
Actinomycetes	**1.537**	1.000
Gram positive	**4.297**	4.000
Gram negative	**5.686**	11.000
Methane oxidisers	**BDL***	0.500
Sulphur reducers	**BDL***	< 0.005
True anaerobes	**0.221**	< 0.005
Eukaryotes		
Protozoa	**1.958**	1.250
Mycorrhizal fungi (including VAM)	**4.096**	10.000

Useful indicators	Yours	Guide
Microbial diversity	**34.8**	80.0
Fungi : Bacteria	**2.4**	2.3
Bacterial stress	**0.4**	< 0.5

Nutrients held in microbes	Concentration (mg/kg) Yours	Guide
Nitrogen (N)	**2.639**	3.450
Phosphorus (P)	**1.084**	1.500
Potassium (K)	**0.361**	0.500
Sulphur (S)	**0.361**	0.500
Calcium (Ca)	**0.361**	0.500
Magnesium (Mg)	**0.361**	0.500
Carbon (C)	**16.856**	22.688

Key *BDL = Below Detectable Limit (0.001 mg/kg)

Poor **Fair** **Good**

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4.3 Note Soil Biology

The Soil Indicators for Nutrient Solubilisation, Drought Resistance and Nutrient Accesibility were low. The Soil Indicators for Nutrient Cycling, Disease Resistance and Residue Breakdown were fair, but could be improved. The total mass of microbes in your sample was fair to good. Biomasses of other key desirable microbe groups ranged from poor, to poor to fair, except for Protozoa, which were effectively absent. Protozoa are important for nutrient transfer and cycling between soil trophic levels, and can be sensitive to agrochemicals, particularly herbicides. True anaerobes were elevated, which indicates that this soil was recently waterlogged, or compacted. Microbial diversity was fair to good, but could be improved. These results suggest that management practices should initially focus on building general microbial biomass. Re-test periodically, and once biomass has improved concentrate on building microbial diversity and biomasses of any key desirable groups that remain low.

General Note on Soil Biology:

The Microbe Wise test measures the biomasses of key microbial groups directly from your sample. It uses molecular ('DNA type') technology to analyse the unique cell membrane 'fingerprint' of each microbe type to identify and quantify key groups important to soil processes. This method is more accurate and precise than other methods, such as direct microscopy or plate culture, because it uses chemical extraction to remove the maximum amount of microbial material from the sample and is repeatable to 0.01% between replicate analyses. It measures organisms that are alive or recently dead (within a few days). Always compare your results with a control sample. Guide values are included as a help, but because a large number of factors affect microbiology the guide levels may not be optimal for your specific conditions.

Disclaimer:

Analysis by Test Needs traded by Plant Needs pty Ltd ACN. The information in this report should be used under consideration of particular production conditions. The guide levels are derived from published data and ongoing research carried out by Test Needs Australia . They are intended as a general guide only and do not take into account your specific conditions. Comparison of results with those obtained using other methods may be inaccurate, as accurate interpretation relies on specific sampling and analysis methods. Test Needs Australia and its employees or agents will not be liable for any loss or damage arising from the use of the information supplied in this report. Please seek specific guidance and recommendations from a qualified agriculture professional.

5.0 Recommendation

Basal application :
Soil Amendment like neem cake @350kg/ha
Chook Manure @ the recommended rate
Fish Meal or fish liquid @100kg/ha to balance the biology
Compost @ 2-4 tonnes/ha
Mg granular @ 100 kg/ha
 Phosphate / Soft rock phosphate @ 300 kg/ha
Potassium nitrate @ 100 kg /ha

Top dressings: might need few applications-
{First application in the first month (say 3rd / 4th week of planting) and repeat it every fortnight or monthly depending on the growth and performance of the crop. Ideally, it is better to test the leaves/ tissues (sometime after the first topdressing, say 15 days after the application) before fine tuning the crop.}

@ Manganese Sulphate @ 5 kg/ha + Copper sulphate @ 3 kg/ha + Zinc sulphate @ 3 kg/ha + Sodium Borate @ 2 kg /ha along with Potassium Nitrate @ 50 kg/ha

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