

Compost Analysis

Sustainable Soil Management with the Mikhail Balance System

FILE NO : 1708128733	DATE ISSUED : 16/08/2017
LANDTASIA ORGANIC FARMS P/L PO BOX 116 BUNGENDORE, NSW 2621	DATE RECEIVED : 3/08/2017
SAMPLE ID : 50007 GROW MIX	CLIENT ID : LAN055
	PHONE : 02 6238 0565
	REFERENCE :
	REFERENCE PHONE :
	ANALYSIS REQUIRED : CFT-1 + Available

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Analysis

ITEM	unit	RESULT
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Basic Measures:

pH (1:5 Water)		7.61
pH (1:5 0.01M CaCl ₂)		7.11
Electrical Conductivity	EC	μS/cm
TOTAL SOLUBLE SALT	TSS	ppm
		4650
		15345

Major Nutrients:

TOTAL NITROGEN	N	kg/t	10	(Major Nutrients in percentages)	0.997 %
TOTAL PHOSPHORUS	P	kg/t	7.3		0.73 %
TOTAL POTASSIUM	K	kg/t	11.4		1.14 %
TOTAL SULPHUR	S	kg/t	2.5		0.248 %

Total Cations:

TOTAL CALCIUM	Ca	%	1.9
TOTAL MAGNESIUM	Mg	%	0.715
TOTAL SODIUM	Na	%	0.235

Trace Minerals:

TOTAL COPPER	Cu	ppm	98
TOTAL ZINC	Zn	ppm	258
TOTAL IRON	Fe	%	1.52
TOTAL MANGANESE	Mn	ppm	556
TOTAL COBALT	Co	ppm	7.07
TOTAL MOLYBDENUM	Mo	ppm	4.53
TOTAL BORON	B	ppm	24.6

Carbon Content:

TOTAL ORGANIC MATTER		%	27
TOTAL ORGANIC CARBON		%	13.5
CARBON NITROGEN RATIO	C:N		13.5
MOISTURE CONTENT	MC	%	43.6

Plant Available Nutrients

ITEM		unit	RESULT
AVAILABLE CALCIUM	Ca	ppm	4180
AVAILABLE MAGNESIUM	Mg	ppm	2376
AVAILABLE SODIUM	Na	ppm	1980.3
AVAILABLE NITROGEN	N	ppm	821
AVAILABLE PHOSPHORUS	P	ppm	1410
AVAILABLE POTASSIUM	K	ppm	9204
AVAILABLE SULPHUR	S	ppm	730
AVAILABLE COPPER	Cu	ppm	31.8
AVAILABLE ZINC	Zn	ppm	197
AVAILABLE IRON	Fe	ppm	76
AVAILABLE MANGANESE	Mn	ppm	157
AVAILABLE COBALT	Co	ppm	1.02
AVAILABLE MOLYBDENUM	Mo	ppm	3.03
AVAILABLE BORON	B	ppm	6.45

Notes: These results represent the proportion of the Total nutrients (page 2) that will be immediately available for plant uptake.

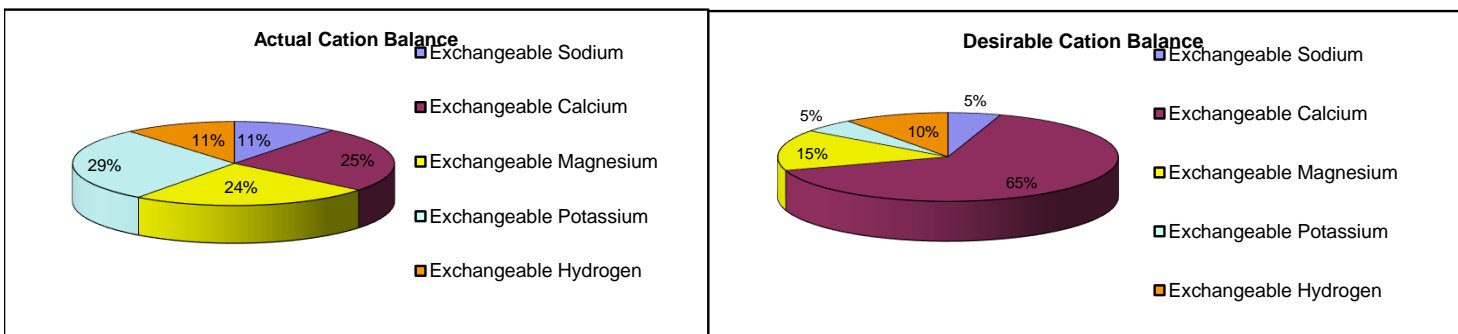
ppm (parts per million) = mg/L (milligram per litre) = mg/kg (milligram per kilogram)
1 % = 10,000 ppm

Exchangeable Cations

EXCHANGEABLE CATIONS			RESULTS	
CALCIUM	Ca	meq/100g of sample	10.25	
MAGNESIUM	Mg	meq/100g of sample	9.71	
SODIUM	Na	meq/100g of sample	4.22	
POTASSIUM	K	meq/100g of sample	11.57	
HYDROGEN	H	meq/100g of sample	4.50	
ADJ. EXCH. HYDROGEN	H	meq/100g of sample	0	
CATION EXCHANGE CAPACITY			CEC meq/100g of sample	40.25
ADJUSTED CEC			Adj.CEC meq/100g of sample	35.75
SATURATION BASE PERCENTAGE			BSP	94

meq = milliequivalent

EXCHANGEABLE CATION BALANCE		% OF ADJUSTED CEC	DESIRABLE
CALCIUM PERCENTAGE		28.67	65-70%
MAGNESIUM PERCENTAGE		27.16	12-15%
SODIUM PERCENTAGE	ESP	11.80	0.5-5%
POTASSIUM PERCENTAGE		32.36	3-5%
ADJ. HYDROGEN PERCENTAGE		0	<20%
CALCIUM / MAGNESIUM RATIO	Ca/Mg	1.06	2 - 4



CATION BALANCE AMENDMENTS *(For optimum effectiveness on application)*

GYPSUM REQUIREMENT	10.8 kg/m ³			
LIME REQUIREMENT	0.0 kg/m ³			
DOLOMITE REQUIREMENT	0.0 kg/m ³			
MAGNESIUM SULPHATE	0.0 kg/m ³	OR	MAGNESIUM OXIDE	0.0 kg/m ³

NB. The effectiveness of the compost may be improved by mixing in the suggested materials (above) prior to application.

Microbial Analysis

ITEM	unit	RESULT	% of Total Active Bacteria
ACTIVE LACTIC ACID BACTERIA		200,000	51.79%
Active Fungi	cfu/g	68,000	
Cellulose Utilisers	cfu/g	28,000	
TOTAL ACTIVE FUNGI	cfu/g	96,000	24.86%
ACTIVE YEASTS	cfu/g	100	0.03%
ACTIVE ACTINOMYCETES	cfu/g	90,000	23.30%
ACTIVE PHOTOSYNTHETIC BACTERIA	cfu/g	100	0.03%
Total Active Population:	cfu/g	386,200	

Notes: See notes on Biology Management.
 ppm = parts per million = milligrams per kilogram cfu/g = colony forming unit per gram of material
 1 % = 10,000 ppm

Notes on Biology Management

The first thing to remember is that SWEP results are for ACTIVE micro-organisms only. This means only those that will immediately grow under ideal conditions (generally about 7-10% of total soil biomass). This allows us to analyse samples year round, since the microbes that are active in spring will still be present in summer or winter, but at very reduced levels of activity. Given the ideal conditions in our cultures, they will spring back to life and grow much more quickly than others.

Active Indicator Organisms

Photosynthetic bacteria like *Rhodospseudomonas spp* and *Bradyrhizobium spp* require only sunlight, carbon dioxide and mineral nutrients to survive. They are important in recycling organic matter, particularly compounds that are difficult to break down - such as pesticide and petrochemical residues. They are also important for synthesis of bio-active compounds that are known to stimulate plant growth.

Yeasts such as *Saccaromyces spp*, *Debaryomyces spp*, *Torulopsis spp* and *Rhodotrula spp* synthesise plant growth substances from amino acids and sugars that are produced by photosynthetic bacteria. These substances also promote the growth of Lactic acid bacteria and Actinomycetes.

Lactic acid bacteria such as *Lactobaccillus spp*, *Leuconostoc spp*, *Lactococcus spp* and *Pediococcus spp* produce Lactic Acid from sugars and carbohydrates. Lactic acid is a strong bio-suppressive compound that helps control harmful micro-organisms. This effect, together with other trace nutrients produced by members of this group, is particularly beneficial to the growth of Photosynthetic bacteria and Yeasts.

Actinomycetes such as *Actinomyces spp* and *Streptomyces spp* produce antibiotic compounds that are effective suppressants of pathogenic organisms. They have also been shown to produce plant hormones - especially when treated with kelp extracts.

Fungi such as *Aspergillus spp*, *Penecillium spp*, *Mucor spp* and *Rhizopus spp* have many beneficial effects on plant growth. These include the production of enzymes, antibiotics and various growth regulators. They are also important in the conversion of organic matter to humic substances. Some of the less complex compounds produced from this process are also important food sources for some bacteria.

Cellulose Utilisers like *Trichoderma spp* require only minerals and cellulose for growth. These fungi break down plant remains into organic materials that are beneficial to other micro-organisms such as Protozoa.

ANALYTICAL METHODS

Items	Methods
pH (1:5 Water)	4A1
pH (1:5 CaCl ₂)	4B1
Electrical conductivity (1:5 Water)	3A1
Total Soluble Salts	Calculation from Electrical conductivity
Total Nitrogen	Dumas method, 7A5
Total Calcium, Magnesium, Sodium, Potassium	Acid digestion, ICPAES
Total Phosphorus, Sulphur, Copper, Zinc, Boron	Acid digestion, ICPAES
Total Iron, Manganese, Cobalt, Molybdenum	Acid digestion, ICPAES
Exchangeable Calcium, Magnesium, Sodium, Potassium	15D3 or 15A1
Exchangeable Hydrogen	Barium Chloride-Triethanolamine method*
Available Nitrogen	Copper-cadmium reductor column at a pH of 8.0
Available Phosphorus	Olsen extractable, 9C2a
Available Sulphur	KCl 40, 10D1
Available Copper, Zinc, & Cobalt	EDTA, 12B1
Available Molybdenum	Ammonium Oxalate-Oxalic acid-di-iso propyl ether
Available Iron & Manganese	method of E.H. Mikhail (1981)
Available Boron	12C2
Total Organic Carbon	Method 6B3
Total Phosphorus, Calcium, Magnesium	Acid digestion

NB. For available Iron and Manganese, SWEP uses the method developed by E.H. Mikhail (1980) due to the tendency for the standard EDTA method to produce erroneously high results.

For numbered test methods:

Rayment, G.E. & Lyons, D.J. (2011). Soil Chemical Methods - Australasia. CSIRO Publishing, 150 Oxford Street, Collingwood Vic 3066, Australia.

*Peech, M., Cowan, R.L. & Baker, J.H. (1962). Soil Science Society American Procedures, A critical study of the Barium chloride-

AQIS Approved Quarantine Site.

Victorian DPI accreditation to receive samples from PIZ and PCN infested zones.

Disclaimer: All results and/or recommendations in this report are made in good faith and are based on past and ongoing research by SWEP Pty Ltd. However, limitations such as the vagaries of climatic conditions mean that we cannot guarantee production of any crop by the use of this test and associated recommendations, and cannot be held responsible for any results obtained.