

Compost Analysis

Sustainable Soil Management with the Mikhail Balance System

FILE NO : 1504110993	DATE ISSUED : 28/04/2015
LANDTASIA ORGANIC FARMS P/L 867 BUTMAROO RD, MULLOONCREEK	DATE RECEIVED : 20/04/2015
VIA BUNGENDORE, NSW 2621	CLIENT ID : LAN055
SAMPLE ID : 50002	PHONE :
	REFERENCE :
	REFERENCE PHONE :
	ANALYSIS REQUIRED : Compost & Microbes (Total & Available, CEC & Microbes)

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Total Analysis

ITEM	unit	RESULT
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Basic Measures:

pH (1:5 Water)		7.7
pH (1:5 0.01M CaCl ₂)		7.2
Electrical Conductivity	EC μS/cm	3480
TOTAL SOLUBLE SALT	TSS ppm	11484
MOISTURE CONTENT	MC %	35.7

Major Nutrients:

				(Major Nutrients in percentages)
TOTAL NITROGEN	N	kg/t	12	1.2 %
TOTAL PHOSPHORUS	P	kg/t	3.7	0.371 %
TOTAL POTASSIUM	K	kg/t	9.9	0.987 %
TOTAL SULPHUR	S	kg/t	2.2	0.215 %

Total Cations:

TOTAL CALCIUM	Ca	%	2.19
TOTAL MAGNESIUM	Mg	%	0.305
TOTAL SODIUM	Na	%	0.163

Trace Minerals:

TOTAL COPPER	Cu	ppm	50.5
TOTAL ZINC	Zn	ppm	188
TOTAL IRON	Fe	ppm	7580
TOTAL MANGANESE	Mn	ppm	511
TOTAL COBALT	Co	ppm	4.76
TOTAL MOLYBDENUM	Mo	ppm	3.18
TOTAL BORON	B	ppm	24.6

Carbon Content:

TOTAL ORGANIC MATTER	%	26.2
TOTAL ORGANIC CARBON	%	13.1

Microbial Analysis

ITEM	unit	RESULT	% of Total Active Bacteria
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ACTIVE LACTIC ACID BACTERIA		4,000,000	94.27 %
Active Fungi	cells/g	110,000	
Cellulose Utilisers	cells/g	20,000	
TOTAL ACTIVE FUNGI	cells/g	130,000	3.06 %
ACTIVE YEASTS	cells/g	13,000	0.31 %
ACTIVE ACTINOMYCETES	cells/g	100,000	2.36 %
ACTIVE PHOTOSYNTHETIC BACTERIA	cells/g	100	0.00 %
Total Active Population:	cells/g	4,243,100	

cells/g = cells per gram of material

Notes: See notes on Biology Management (page 5).

Plant Available Nutrients

ITEM		unit	RESULT
AVAILABLE CALCIUM	Ca	ppm	11180
AVAILABLE MAGNESIUM	Mg	ppm	1884
AVAILABLE SODIUM	Na	ppm	1205.2
AVAILABLE NITROGEN	N	ppm	661
AVAILABLE PHOSPHORUS	P	ppm	921
AVAILABLE POTASSIUM	K	ppm	7410
AVAILABLE SULPHUR	S	ppm	376
AVAILABLE COPPER	Cu	ppm	23.1
AVAILABLE ZINC	Zn	ppm	132
AVAILABLE IRON	Fe	ppm	69
AVAILABLE MANGANESE	Mn	ppm	188
AVAILABLE COBALT	Co	ppm	0.946
AVAILABLE MOLYBDENUM	Mo	ppm	1.66
AVAILABLE BORON	B	ppm	6.89

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

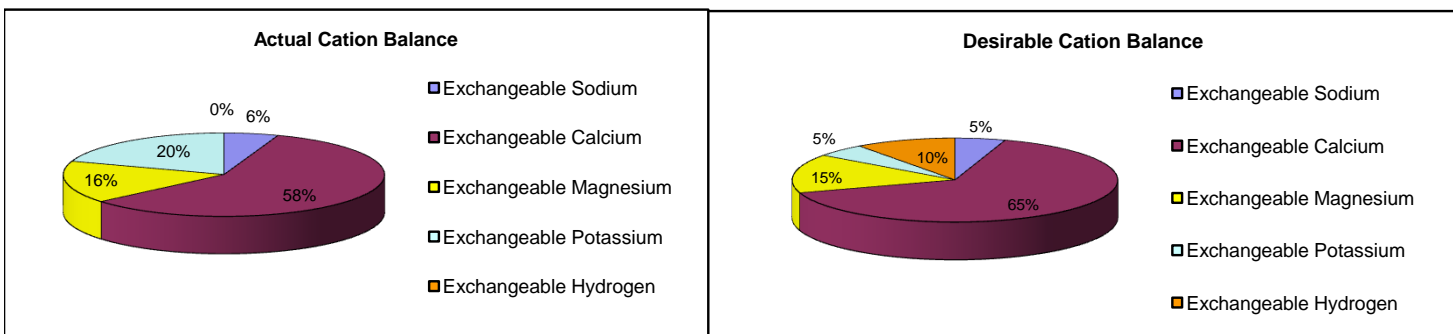
ppm (parts per million) = mg/L (milligram per litre) = mg/kg (milligram per kilogram)
1 % = 10,000 ppm

Exchangeable Cations

EXCHANGEABLE CATIONS		RESULTS
CALCIUM	Ca meq/100g of sample	34.57
MAGNESIUM	Mg meq/100g of sample	9.71
SODIUM	Na meq/100g of sample	3.24
POTASSIUM	K meq/100g of sample	11.75
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	63.77
ADJUSTED CEC	Adj.CEC meq/100g of sample	59.27
SATURATION BASE PERCENTAGE	BSP	

meq = milliequivalent

EXCHANGEABLE CATION BALANCE	% OF ADJUSTED CEC	DESIRABLE
CALCIUM PERCENTAGE	58.33	65-70%
MAGNESIUM PERCENTAGE	16.38	12-15%
SODIUM PERCENTAGE	5.47	0.5-5%
POTASSIUM PERCENTAGE	19.82	3-5%
ADJ. HYDROGEN PERCENTAGE	0	<20%
CALCIUM / MAGNESIUM RATIO	Ca/Mg	2 - 4



CATION BALANCE AMENDMENTS (For optimum effectiveness on application)

GYPSUM REQUIREMENT	1.8 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.

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.

ANALYTICAL METHODS

TOTAL NITROGEN	Dumas method, LECO	TOTAL COBALT	Acid digestion, ICPAES
TOTAL PHOSPHORUS	Acid digestion, ICPAES	TOTAL BORON	Acid digestion, ICPAES
TOTAL POTASSIUM	Acid digestion, ICPAES	TOTAL MOLYBDENUM	Acid digestion, ICPAES
TOTAL SULPHUR	Acid digestion, ICPAES	pH	Method 4A1, water suspension*
TOTAL CALCIUM	Acid digestion, ICPAES	Electrical Conductivity	Method 3A1, water extract*
TOTAL MAGNESIUM	Acid digestion, ICPAES	TOTAL ORGANIC CARBON	Method 6B3, LECO*
TOTAL SODIUM	Acid digestion, ICPAES	MOISTURE CONTENT	Gravimetric method
TOTAL IRON	Acid digestion, ICPAES	CARBON / NITROGEN RATIO	Calculation
TOTAL MANGANESE	Acid digestion, ICPAES		
TOTAL ZINC	Acid digestion, ICPAES	Microbial Analysis	SWEP Methods
TOTAL COPPER	Acid digestion, ICPAES		

* Rayment, G.E. & Higginson, F.R. (1992). Australian Laboratory Handbook for Soil and Water Chemical Methods. Inkata Press, Port Melbourne, Australia.