Eco Horticulture Products Ltd
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ALLIANCE TECHNICAL LABORATORIES
Analytical & Consultant Chemists & Microbiologists
Laboratory approved by Renewable Energy Assurance Limited

ANALYSIS REPORT - COMPOSTED MATERIAL

Customer Information		**Laboratory Information**	
PR Number		Date Received	26/04/2019
Composting Site		Report No	2768
Grade (particle size range)	*mm to mm*	Sample Number	RAM001/116/19
Grade Type	*lab constituted with water*	Reported By	SJ
Certification Code		Report Date	24/05/2019
Date Sampled			
Batch Age When Sampled			
Producer's Sample Code	*VIETNAM*		

SUMMARY ~ PAS 100 "PASS" OR "FAIL"

Parameter	Result	PAS 100 Upper Limit	Unit	Pass or Fail	Method Reference
E. coli at 44°C	<100	1000	CFU/g	Pass	BS ISO 16649-2
Salmonella spp. at 37°C	Absent	Absent	Absent or Present in 25g	Pass	BS EN ISO 6579, Schedule 2, Part II
Cadmium as Cd	<0.1	1.50	mg/kg	Pass	BS EN 13650
Chromium as Cr	17.5	100.00	mg/kg	Pass	BS EN 13650
Copper as Cu [1]	36	200.00	mg/kg	Pass	BS EN 13650
Lead as Pb	67	200.00	mg/kg	Pass	BS EN 13650
Mercury as Hg	0.21	1.00	mg/kg	Pass	BS ISO 16772
Nickel as Ni	9.0	50.00	mg/kg	Pass	BS EN 13650
Zinc as Zn [1]	166	400.00	mg/kg	Pass	BS EN 13650
CO_2 (Stability)	2.00	16.0	mg CO_2/g OM/d	Pass	ORG0020
Glass, Metal, Plastic & Other	0.00	0.25	% of 'air-dry' sample > 2 mm	Pass	AfOR MT PCS Issue 1, Revision 2, 05/12/2012
Plastic	0.00	0.12		Pass	
Sharps	0.00	R		R	
Stone in "mulch"	0.00	10.0	% of 'air-dry' sample > 4 mm	Pass	
Stone in other than "mulch"	0.00	8.0		Pass	

R Refer to composter's quality policy for upper limit allocated to the compost grade and intended market / end use, and evaluate sharps result against that limit.

[1] Zinc and copper are required by plants but, similarly as with other PTEs, can be toxic to some plant species at high concentrations. Such effects are influenced by other factors, so may not necessarily occur if corresponding PTE upper limits are exceeded. Check plant response test results for any toxic effects.

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Laboratory Information

#REF!	26/04/2019
Report No	30/07/1907
Sample Number	RAM001/116/19
Reported by	SJ
Report Date	24/05/2019

WATER EXTRACTABLE NUTRIENTS [1]

Parameter	As received (fresh)		In dry matter		Method Reference	Plant Significance
	Result	Unit	Result	Unit		
NH_4-N (ammonium-N)	0	mg/l*	N/D	mg/kg	BS EN 13652	Primary nutrients
NO_3-N (nitrate-N)	0.2	mg/l*	4.7	mg/kg	BS EN 13652	
NH_4-N plus NO_3-N	0.2	mg/l	4.7	mg/kg	Calculated	
Phosphorus as P	19	mg/l	449	mg/kg	BS EN 13652	
Potassium as K	398	mg/l	9273	mg/kg	BS EN 13652	
Calcium as Ca	4.5	mg/l	105	mg/kg	BS EN 13652	Secondary nutrients
Magnesium as Mg	2.1	mg/l	50	mg/kg	BS EN 13652	
Sulphur as S	1.4	mg/l	32	mg/kg	BS EN 13652	
Boron as B	<0.1	mg/l	<3	mg/kg	BS EN 13652	Trace nutrients
Copper as Cu	<0.1	mg/l	<3	mg/kg	BS EN 13652	
Iron as Fe	<0.1	mg/l	<3	mg/kg	BS EN 13652	
Manganese as Mn	<0.1	mg/l	<3	mg/kg	BS EN 13652	
Molybdenum as Mo	<0.1	mg/l	<3	mg/kg	BS EN 13652	
Zinc as Zn	1.0	mg/l	24	mg/kg	BS EN 13652	
Chloride as Cl	539	mg/l	12558	mg/kg	BS EN 13652	See footnote 2
Sodium as Na	60	mg/l	1395	mg/kg	BS EN 13652	

[1] Water extractable values are a measure of nutrient concentrations immediately available to plants.

[2] Sodium together with chloride, influences nutrient uptake by plants and can inhibit this at high concentrations.

N/D = Not Determined, N/A = Not Applicable

* The *QP Manager* (the 'web tool') requires the test result associated with this unit.

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Laboratory Information	
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TOTAL NUTRIENTS [1]

Parameter	As Received (fresh)		In dry matter		Method Reference	Plant Signifincance
	Result	Unit	Result	Unit		
Nitrogen as N	297	mg/l	6920	mg/kg	Dumas, BS EN 13654-2 [2]	Primary Nutrients
Nitrogen as N	0.10	% m/m	0.69	% m/m	Dumas, BS EN 13654-2 [2]	Primary Nutrients
Phosphorus as P	92.2	mg/l	2149	mg/kg	BS EN 13650	Primary Nutrients
Phosphorus as P	<0.1	% m/m	0.21	% m/m*	BS EN 13650	Primary Nutrients
Potassium as K	300	mg/l	6983	mg/kg	BS EN 13650	Primary Nutrients
Potassium as K	0.10	% m/m	0.70	% m/m*	BS EN 13650	Primary Nutrients
Calcium as Ca	850	mg/l	19800	mg/kg	BS EN 13650	Secondary Nutrients
Calcium as Ca	0.29	% m/m	1.98	% m/m	BS EN 13650	Secondary Nutrients
Magnesium as Mg	87.9	mg/l	2049	mg/kg	BS EN 13650	Secondary Nutrients
Magnesium as Mg	<0.1	% m/m	0.20	% m/m	BS EN 13650	Secondary Nutrients
Sulphur as S	76.9	mg/l	1791	mg/kg	BS EN 13650	Secondary Nutrients
Sulphur as S	<0.1	% m/m	0.18	% m/m*	BS EN 13650	Secondary Nutrients
Boron as B	<0.1	mg/l	<0.1	mg/kg	BS EN 13650	Trace Nutrients
Iron as Fe	363	mg/l	8449	mg/kg	BS EN 13650	Trace Nutrients
Manganese as Mn	14	mg/l	324	mg/kg	BS EN 13650	Trace Nutrients
Molybdenum as Mo	0.2	mg/l	4.6	mg/kg	BS EN 13650	Trace Nutrients
Sodium as Na	57.8	mg/l	1347	mg/kg	BS EN 13650	See Footnote 3

[1] This method uses a hydrochloric- and nitric-acid extractant ("aqua regia") and approximates "total" rather than "bioavailable" concentrations of the above elements.

[2] Unsuitable for materials containing free ammonia because this may be lost when samples are flushed with oxygen during the procedure, e.g. if compost sample contains > 500 mg/l ammonium.

[3] Together with chloride, influences nutrient uptake by plants and can inhibit this at high concentrations.

* The QP Manager (the 'web tool') requires the test result associated with this unit.

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POTENTIALLY TOXIC ELEMENTS [1]

Parameter	As Received (fresh)		In dry matter		PAS100 Upper Limit	Pass or Fail	Method Reference
	Result	Unit	Result	Unit			
Cadmium as Cd	<0.1	mg/l	<0.1	mg/kg*	1.50	Pass	BS EN 13650
Chromium as Cr	0.7	mg/l	17.5	mg/kg*	100.00	Pass	BS EN 13650
Copper as Cu [1]	<3	mg/l	36	mg/kg*	200.00	Pass	BS EN 13650
Lead as Pb	3	mg/l	67	mg/kg*	200.00	Pass	BS EN 13650
Mercury as Hg	<0.1	mg/l	0.21	mg/kg*	1.00	Pass	BS ISO 16772
Molybdenum as Mo	0.2	mg/l	4.6	mg/kg	N/A	N/A	BS EN 13650
Nickel as Ni	0.4	mg/l	9.0	mg/kg*	50.00	Pass	BS EN 13650
Zinc as Zn [1]	7	mg/l	166	mg/kg*	400.00	Pass	BS EN 13650

[1] Zinc and copper are required by plants but, similarly as with other PTEs, can be toxic to some plant species at high concentrations. Such effects are influenced by other factors, so may not necessarily occur if corresponding PTE upper limits are exceeded. Check plant response test results for any toxic effects.

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PHYSICO-CHEMICAL PROPERTIES

Parameter	As Received (fresh)		In dry matter		Method Reference
	Result	Unit	Result	Unit	
Bulk Density [1]	296	g/l*	43	g/l	BS EN 13040
Dry Matter	14.5	% m/m	N/A		BS EN 13040
Moisture	253	g/l	N/A		BS EN 13040
Moisture	85.5	% m/m*	N/A		BS EN 13040
Organic Matter (Loss On Ignition)	99	% m/m	94.5	% m/m*	BS EN 13039
Organic Carbon (LOI ÷ 1.72)	57.7	% m/m	54.9	% m/m*	Calculated
pH	6.45	N/A*	N/A		BS EN 13037
Electrical Conductivity	473	µS/cm@25°C	N/A		BS EN 13038
Electrical Conductivity	47.3	mS/m @ 25°C	N/A		BS EN 13038

[1] Bulk density in dry matter is termed 'Dry Weight Density' and expressed in (g/l). DWD = fresh bulk density (g/l) - volumetric moisture content (g/

[2] 'The Fertilisers (Sampling and Analysis) Regulations 1996' Schedule 2, Part II Section 6 - 'Determination of the neutralising value of liming materials.' Method adaptation: the stage of passing the sample through a 1 mm sieve is omitted and results are expressed as % by weight of CaO on the undried sample, as received.

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PATHOGENS

Parameter	As Received (fresh)			Pass or Fail	Method Reference
	Result	PAS100 Upper Limit	Unit		
E. coli at 44°C	<100	1000	CFU/g	Pass	BS ISO 16649-2
Salmonella spp. at 37°C	Absent	Absent	Absent or Present in 25g	Pass	BS EN ISO 6579, Schedule 2, Part II

STABILITY / MATURITY

Parameter	As Received (fresh)			Pass or Fail	Method Reference
	Result	PAS100 Upper Limit	Unit		
Carbon Dioxide (evolution rate)	2.00	16	mg CO_2 / g organic matter / day	Pass	ORG0020
Proportion of particles < 20 mm	100	N/A	% g/g	N/A	ORG0020

Parameter	As Received (fresh)		In Dry Matter		Method Reference
	Result	Unit	Result	Unit	
NH_4-N : NO_3-N (ratio)	0.00	:1	0.00	:1	Calculated
Carbon : Nitrogen (ratio)	79.4	:1	79.4	:1	Calculated

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PHYSICAL CONTAMINANTS

Sieve Apertures[1]	Glass	Metal	Plastic	Other[2]	Description	Total[3]	Of which Sharps[4]	Stones[5]	Method Reference: AfOR MT PC&S [1] 05/12/2012
mm	g	g	g	g		g	g	g	
31.5	0	0	0	0		0	0	0	
16.0	0	0	0	0		0	0	0	
8.0	0	0	0	0		0	0	0	
4.0	0	0	0	0		0	0	0	
2.0	0	0	0	0		0	0	0	
1.0	0	0	0	0		0	0	0	
Pan	0	0	0	0		0	0	0	
% of total sample > 2 mm	**0.00**	**0.00**	**0.00**	**0.00**		**0.00**	**0.00**	N/A	
% of total sample > 4 mm	N/A	N/A	N/A	N/A		N/A	N/A	**0.00**	
PAS 100 upper limit for "mulch"			0.12			0.25	R	10.0	
Pass or Fail			**Pass**			**Pass**	R	**Pass**	
PAS 100 upper limit for other than "mulch"			0.12			0.25	R	8.0	
Pass or Fail			**Pass**			**Pass**	R	**Pass**	

Contaminants Key - Other[2]

A = Paper/Card B = Fibre C = String/Twine D = Rubber E = Matting

[1] 10 or 12.5 omitted

[2] Any different physical contaminant type; use key to identify or name in 'Description'

[3] 'Total' is for glass, metal, plastic and 'other'. N.B.: excludes stones

[4] Sharps > 2 mm, of any inorganic physical contaminant type (excludes woody fragments)

[5] Stones and other consolidated mineral contaminants

R Refer to composter's quality policy for upper limit allocated to the compost grade and intended market / end use, and evaluate sharps result against that limit.

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Producer's sample code	VIETNAM		

PARTICLE SIZE DISTRIBUTION (air-dry sample)

Sieve apertures [1]	**Sample**	**of which Compost**	**Cumulative**		**Method Reference**
mm	Retained g	Retained g	Retained %	Passing %	
31.5	0.0	0.0	0.0	100.0	AfOR MT PC&S [1] 05/12/2012
16.0	0.0	0.0	0.0	100.0	
8.0	2.2	2.2	3.8	96.2	
4.0	3.7	3.7	10.1	89.9	
2.0	6.0	6.0	20.4	79.6	
1.0	19.7	19.7	54.1	45.9	
Pan	26.8	26.8	100.0	0.0	
Total	**58.4**	**58.40**			

[1] State whether with modification, i.e. apertures of any sieves added or omitted.

N/D = Not Determined, N/A = Not Applicable

Note: Moisture at 40°C : 1.8 % m/m