Compost Analysis Report

Laboratory approved by the Association for Organics Recycling

Site Details: NS 204

Ref: 15-145471

Grade Type: ESS-CL-0010

Grade / Size: 0-10mm

Sample Point: 6 Weeks

Sample Number: 28941

Date Analysis 24 April 2015

Date Sampled: 23 April 2015

SUMMARY ~ PAS 100 "PASS" OR "FAIL"

Parameter	Result	PAS 100 upper limit	Unit	Pass or Fail	Method Reference
E. coli	50	1000	CFU/g	**Pass**	BS ISO 16649-2
Salmonella spp	Absent	Absent	Absent or Present in 25 g	**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	16	100.00	mg/kg	**Pass**	BS EN 13650
Copper as Cu	37	200.00	mg/kg	**Pass**	BS EN 13650
Lead as Pb	62	200.00	mg/kg	**Pass**	BS EN 13650
Mercury as Hg	0.06	1.00	mg/kg	**Pass**	BS ISO 16772
Nickel as Ni	10	50.00	mg/kg	**Pass**	BS EN 13650
Zinc as Zn	140	400.00	mg/kg	**Pass**	BS EN 13650
CO_2 (stability)	3.2	16.0	mg CO_2/g OM/d	**Pass**	ORG0020
Weed plants [1]		0.0	number/l compost as received		OFW004-006
Glass, metal, plastic & other [2, 3]	0.03	0.25	% of 'air-dry' sample > 2 mm	**Pass**	AfOR MT PC&S
Plastic [3]	0.00	0.12		**Pass**	
Sharps [3]	0.00	R		R	
Stones in "mulch" [3]	3.69	10.0	% of 'air-dry' sample > 4 mm	**Pass**	
Stones in other than "mulch" [3]	3.69	8.0		**Pass**	

1. If negative value, weed(s) present in control only, or if in test mix are attributable to its peat content.
2. Excluding stones.
3. Please see 'N.B.' note near the bottom of the Physical Contaminants report sheet.

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.

PLANT RESPONSE TEST

Parameter	Result	PAS 100 min.	Unit	Pass or Fail	Method Reference
Tomato plants germinated		80.00	no. of plants, tests as % of controls		OFW004-006
Tomato plant top growth		80.00	average g / plant, tests as % of controls		
Tomato plant abnormalities		Absent	abnormal tomato plants in test trays		

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VALIDITY OF THE PLANT RESPONSE TEST

Parameter	Result	Validity criterion	Outcome
Germination of tomato seeds sown in control trays		≥ 27 tomato seeds germinated in control trays by 14 days after sowing	
Tomato plant top growth in control trays		≥ 1.50 g per tomato plant in control trays	
Abnormal tomato plants in control trays		No abnormal tomato plants in control trays	

ND = Not Determined, N/A = Not Applicable

WATER EXTRACTABLE NUTRIENTS [1]

	As received (fresh)		In dry matter		Method Reference	Plant significance
Parameter	Result	Unit	Result	Unit		
NH_4-N (ammonium-N)	13	mg/l*	49	mg/kg	BS EN 13652	Primary nutrients
NO_3-N (nitrate-N)	10	mg/l*	38	mg/kg	BS EN 13652	
NH_4-N plus NO_3-N	23	mg/l	86	mg/kg	Calculated	
Phosphorus as P		mg/l		mg/kg	BS EN 13652	
Potassium as K		mg/l		mg/kg	BS EN 13652	
Calcium as Ca		mg/l		mg/kg	BS EN 13652	Secondary nutrients
Magnesium as Mg		mg/l		mg/kg	BS EN 13652	
Sulphur as S		mg/l		mg/kg	BS EN 13652	
Boron as B		mg/l		mg/kg	BS EN 13652	Trace nutrients
Copper as Cu		mg/l		mg/kg	BS EN 13652	
Iron as Fe		mg/l		mg/kg	BS EN 13652	
Manganese as Mn		mg/l		mg/kg	BS EN 13652	
Molybdenum as Mo		mg/l		mg/kg	BS EN 13652	
Zinc as Zn		mg/l		mg/kg	BS EN 13652	
Chloride as Cl	276	mg/l	1037	mg/kg	BS EN 13652	See footnote 2
Sodium as Na		mg/l		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.

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

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CAT-EXTRACTABLE NUTRIENTS [1, 2]

	As received (fresh)		In dry matter			
Parameter	**Result**	**Unit**	**Result**	**Unit**	**Method Reference**	**Plant significance**
NH_4-N (ammonium-N)		mg/l		mg/kg	BS EN 13651	Primary nutrients
NO_3-N (nitrate-N)		mg/l		mg/kg	BS EN 13651	
NH_4-N plus NO_3-N		mg/l		mg/kg	BS EN 13651	
		% m/m		% m/m	Calculated	
Phosphorus as P		mg/l		mg/kg	BS EN 13651	
Potassium as K		mg/l		mg/kg	BS EN 13651	
Magnesium as Mg		mg/l		mg/kg	BS EN 13651	Secondary nutrients
Sulphur S		mg/l		mg/kg	BS EN 13651	
Boron as B		mg/l		mg/kg	BS EN 13651	Trace nutrients
Copper as Cu		mg/l		mg/kg	BS EN 13651	
Iron as Fe		mg/l		mg/kg	BS EN 13651	
Manganese as Mn		mg/l		mg/kg	BS EN 13651	
Molybdenum as Mo		mg/l		mg/kg	BS EN 13651	
Zinc as Zn		mg/l		mg/kg	BS EN 13651	
Sodium as Na		mg/l		mg/kg	BS EN 13651	See footnote 3

[1] See note i to Table C.1 in Annex C of PAS 100:2011, for information about CAT-extractable nutrients results.
[2] Calcium and chloride are not determined as these are in the extractant and would affect corresponding results.
[3] Together with chloride, influences nutrient uptake by plants and can inhibit this at high concentrations.

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TOTAL NUTRIENTS [1]

	As received (fresh)		In dry matter			
Parameter	**Result**	**Units**	**Result**	**Units**	**Method Reference**	**Plant significance**
Nitrogen as N	ND	mg/l	ND	mg/kg	Modified Kjeldahl, BS EN 13654-1	Primary nutrients
	ND	% m/m	ND	% m/m*		
	2170	mg/l	8150	mg/kg	Dumas, BS EN 13654-2 [2]	
	0.45	% m/m	0.82	% m/m		
Phosphorus as P	360	mg/l	1351	mg/kg	BS EN 13650	
	0.07	% m/m	0.14	% m/m*	BS EN 13650	
Potassium as K	944	mg/l	3546	mg/kg	BS EN 13650	
	0.20	% m/m	0.35	% m/m*	BS EN 13650	
Calcium as Ca	6354	mg/l	23870	mg/kg	BS EN 13650	Secondary nutrients
	1.31	% m/m	2.39	% m/m	BS EN 13650	
Magnesium as Mg	530	mg/l	1992	mg/kg	BS EN 13650	
	0.11	% m/m	0.20	% m/m	BS EN 13650	
Sulphur as S	287	mg/l	1080	mg/kg	BS EN 13650	
	0.06	% m/m	0.11	% m/m*	BS EN 13650	
Boron as B	4.3	mg/l	16	mg/kg	BS EN 13650	Trace nutrients
Copper as Cu	9.8	mg/l	37	mg/kg	BS EN 13650	
Iron as Fe	2531	mg/l	9507	mg/kg	BS EN 13650	
Manganese as Mn	53	mg/l	200	mg/kg	BS EN 13650	
Molybdenum as Mo	0.9	mg/l	3.2	mg/kg	BS EN 13650	
Zinc as Zn	37	mg/l	140	mg/kg	BS EN 13650	
Sodium as Na	138	mg/l	520	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.

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POTENTIALLY TOXIC ELEMENTS[1]

	As received (fresh)		In dry matter				
Parameter	**Result**	**Unit**	**Result**	**PAS 100 upper limit**	**Unit**	**Pass or Fail**	**Method reference**
Arsenic as As	N/D	mg/l	N/D	N/A	mg/kg	N/A	
Cadmium as Cd	0.03	mg/l	0.1	1.50	mg/kg*	**Pass**	BS EN 13650
Chromium as Cr	4.3	mg/l	16	100.00	mg/kg*	**Pass**	BS EN 13650
Copper as Cu [1]	9.8	mg/l	37	200.00	mg/kg*	**Pass**	BS EN 13650
Fluoride as F	N/D	mg/l	N/D	N/A	mg/kg	N/A	
Lead as Pb	17	mg/l	62	200.00	mg/kg*	**Pass**	BS EN 13650
Mercury as Hg	0.02	mg/l	0.06	1.00	mg/kg*	**Pass**	BS ISO 16772
Molybdenum as Mo	0.9	mg/l	3.2	N/A	mg/kg	N/A	BS EN 13650
Nickel as Ni	2.7	mg/l	10	50.00	mg/kg*	**Pass**	BS EN 13650
Selenium as Se	N/D	mg/l	N/D	N/A	mg/kg	N/A	
Zinc as Zn [1]	37	mg/l	140	400.00	mg/kg*	**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

	As received (fresh)		In dry matter		Method Reference
Parameter	**Result**	**Units**	**Result**	**Units**	
Bulk Density 1	484	g/l*	266	g/l	BS EN 12580
Dry Matter	55.0	% m/m	N/A		BS EN 13040
Moisture	218	g/l	N/A		BS EN 13040
	45.0	% m/m*	N/A		
Organic Matter (Loss On Ignition)	64.2	% m/m	34.9	% m/m*	BS EN 13039
Organic Carbon (LOI ÷ 1.72)	37.3	% m/m	20.3	% m/m*	Calculated
pH	7.3	N/A*	N/A		BS EN 13037
Electrical Conductivity		µS/cm @ 20 °C	N/A		BS EN 13038
		mS/m @ 20 °C	N/A		
Liming potential		% m/m CaO	N/A		See footnote 2

[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/l)

[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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